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IN THE
Supreme Court of the United States

October Term 2014

STATE OF MONTANA,
Plaintiff,

v.

STATE OF WYOMING
and
STATE OF NORTH DAKOTA,
Defendants.

**SECOND INTERIM REPORT OF THE
SPECIAL MASTER
(LIABILITY ISSUES)**

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December 29, 2014

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term</u>
af	Acre foot*
BLM	United States Bureau of Land Management
CBM	Coal bed methane
cfs	Cubic feet per second*
Commission	Yellowstone River Compact Commission
Compact	Yellowstone River Compact, Pub. L. No. 82-261, 65 Stat. 663 (1951)
Compact Commission	Yellowstone River Compact Commission
Compact Reservoirs	11 reservoirs in Wyoming for which Wyoming reports information for the annual report of the Yellowstone River Compact Commission
Conservation Board	Montana State Water Conservation Board
DNRC	Montana Department of Natural Resources & Conservation
ET	Evapotranspiration*

* This term is defined in Appendix G (Key Water Terms).

Abbreviation**Term**

Northern Cheyenne
Compact

Northern Cheyenne-Montana
Compact, quantifying the
Northern Cheyenne Tribe's
water rights in the Tongue
River (ratified in the
Northern Cheyenne Indian
Reserved Water Rights
Settlement Act of 1992, 106
Stat. 1186 (1992)).

Notice Periods

The periods during 2004 and
2006 when Wyoming was on
notice that Montana was
short of water (i.e., after April
14 in 2004, and after July 28
in 2006)

NRCS

United States Natural Re-
sources Conservation Service

NWS

United States National
Weather Service

O&M Manual

Operation and Maintenance
Manual for the Tongue River
Reservoir

Operating Plan

Operating Plan for the
Tongue River Reservoir

Padlock Ranch
Reservoirs

Three reservoirs in Wyoming
furnishing water to the
Padlock Ranch (Fivemile,
Wagner, and Padlock
Recovery Reservoirs)

Reservoir

Tongue River Reservoir

<u>Abbreviation</u>	<u>Term</u>
Stateline	The line dividing the Tongue River between Montana and Wyoming (a USGS gauge measures flow at this point)
Storage Declaration	Declaration of Intention to Store, Control, and Divert River Water
Technical Committee	Yellowstone River Compact Commission Technical Committee
Tribe	Northern Cheyenne Indian Tribe
TRWUA	Tongue River Water Users Association
USGS	United States Geological Survey
WDEQ	Wyoming Department of Environmental Quality

IN THE
Supreme Court of the United States

No. 137, Original

October Term 2014

STATE OF MONTANA,
Plaintiff,

v.

STATE OF WYOMING
and
STATE OF NORTH DAKOTA,
Defendants.

**SECOND INTERIM REPORT
OF THE SPECIAL MASTER
(LIABILITY ISSUES)**

I. INTRODUCTION

This is an interstate dispute over the waters of the Tongue River. The Tongue River begins in Wyoming and flows north into Montana before merging with the main stem of the Yellowstone River. In 1951, Montana, Wyoming, and North Dakota agreed on how the waters of the Yellowstone River system, including the Tongue River, should be allocated in the Yellowstone River Compact, Pub. L. No. 82-231, 65 Stat. 663 (1951) (attached as Appendix B hereto) (the “Compact”). Although the factual dispute in this case

concerns the Tongue River, the Compact covers all of the Yellowstone River and its tributaries. Resolution of many of the legal issues therefore could affect other portions of the Yellowstone River system. Indeed, the case initially dealt with both the Tongue River and the Powder River, another tributary to the Yellowstone. Montana and Wyoming have long disagreed over how to interpret and implement key provisions of the Compact, including the provisions at issue in this case.

Montana alleges that Wyoming violated the Compact by diverting and storing water from the Tongue River for certain uses arising after January 1, 1950 when pre-1950 rights in Montana went unmet. According to Montana, Wyoming's actions violated Article V(A) of the Compact, which provides that "Appropriative rights to the beneficial uses of the water of the Yellowstone River System existing in each signatory State as of January 1, 1950, shall continue to be enjoyed in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation."

Wyoming initially moved to dismiss. In my first report to the Court, I recommended that the Court deny Wyoming's motion. First Interim Report of the Special Master, Feb. 10, 2010, at 90 (hereinafter "First Interim Report"). I also concluded that Article V(A) "protects pre-1950 appropriations in Montana from new surface and groundwater diversions in Wyoming, whether for direct use or for storage, that prevent adequate water from reaching Montana to satisfy those pre-1950 appropriations." *Id.* at 14-15. Wyoming did not file an exception to my report, and in *Montana v. Wyoming*, 563 U.S. ___, 131 S. Ct. 1765 (2011), the Court confirmed that "Article V(A) of the Compact protects '[a]ppropriative rights to the

beneficial uses of [water]' as of 1950 'in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.'" *Id.* at 1771 (quoting Article V(A) of the Compact).

Following the Supreme Court's decision, Montana and Wyoming agreed to bifurcate this action into two phases: (1) a liability phase (examining whether Wyoming violated the Compact and, if so, the size of any violation), and (2) a remedies phase (determining what, if any, retrospective or prospective remedies are appropriate). The liability phase of the case is now complete. Both parties filed summary judgment motions, which I granted in part and denied in part. I subsequently tried the remaining issues in Billings, Montana, during the fall of 2013. Closing arguments were presented at a post-trial hearing at Stanford, California, on May 1, 2014.

This report covers my findings, conclusions, and recommendations on the liability issues. It does not address the issue of remedies, which is reserved for later proceedings if the Court concludes that Wyoming violated the Compact and that remedies are appropriate.

II. THE RECORD

Along with this report, I am providing USB flash drives that contain copies of all admitted trial exhibits.¹ The parties previously prepared a Joint Appendix containing the legislative history of the Yellowstone River Compact. Introduced at trial, the Joint Appendix is now Exhibit J-72. A copy of the docket is attached as Appendix I. All motions, briefs,

¹ Montana and Wyoming jointly assembled the admitted trial exhibits.

and other filings, including affidavits and declarations, as well as transcripts of all pre-trial and trial proceedings, can be downloaded electronically at <http://web.stanford.edu/dept/law/mvn/>.

In this report, citations to exhibits admitted at trial are indicated by "Ex." and the number of the exhibit. Exhibits beginning with the letter "J" are joint exhibits; exhibits beginning with the letter "M" were offered by Montana; and exhibits beginning with the letter "W" were offered by Wyoming.² Citations to the trial transcript are indicated by the volume of the transcript, followed by "Tr." and the relevant page and line numbers in the transcript. Citations to motions and papers found in the docket list the title, date, and docket number of each document.

A list of common abbreviations and acronyms is found at page xxi, immediately following the Table of Authorities. This report also includes definitions of frequently used water terms and phrases (Appendix G). Finally, the report includes a list of all witnesses, along with a brief identification of each witness and the page numbers of his or her testimony (Appendix H).

III. FACTUAL BACKGROUND

A. The Tongue River

The Tongue River is one of four major tributaries to the Yellowstone River. Like the other tributaries, the Tongue flows north from Wyoming into Montana. As shown on the maps in Appendix C, the Tongue River

² When citing to specific pages in an exhibit, I typically have cited to internal page numbers in the original document. Where a document does not have internal page numbers or there are duplicate page numbers, I have cited instead to the Bate stamp numbers.

begins in the Big Horn Mountains of Wyoming. Four major tributaries (Goose Creek, the Little Tongue, Prairie Dog Creek, and Wolf Creek) join the main stem of the Tongue before it reaches the Montana border. *See* 1 Tr. 66:15-67:5 (Dale Book); Ex. M-5, p. 3 (Book expert report).

Once the Tongue River crosses the Montana-Wyoming border, the river flows 15 miles before arriving at the Tongue River Reservoir ("the Reservoir"). 1 Tr. 65:8-10 (Book). The Tongue River Reservoir is an onstream reservoir, designed to impound and store water along the river's channel. Originally constructed in the late 1930s and described in more detail below, the Tongue River Reservoir is the largest reservoir in the watershed and is a critical source of water for farmers and ranchers in the Tongue River valley of Montana. After the Tongue River Reservoir, the river flows for another 180 miles through farms and ranch lands before it reaches the main stem of the Yellowstone River in Miles City, Montana. *Id.* at 65:11-14 (Book). Although a handful of smaller tributaries join the Tongue River in this stretch, including Pumpkin Creek, Otter Creek, and Hanging Woman Creek, there are no major tributaries to the Tongue River in Montana. Ex. M-5, p. 2 (Book expert report); 1 Tr. 65:4-7 (Book). As a result, users in Montana are reliant almost entirely on the waters that flow over the border from Wyoming or are stored in the Tongue River Reservoir. *See* 2 Tr. 394:7-395:12 (Charles Dalby).

The Tongue and Yellowstone Rivers merge at Miles City, Montana. The Yellowstone River thereafter runs in a generally northeast direction and crosses over into North Dakota near Sidney, Montana. The Yellowstone then flows for just 16 miles before

merging into the Missouri River. The Missouri ultimately flows into the Mississippi River, which empties into the Gulf of Mexico. The Tongue River thus is ultimately part of one of the largest river systems in the world.

Like many western rivers, the Tongue River relies largely on snowmelt in the late spring of each year. W-2, p. 8 (Fritz expert report). As a result, flows in the Tongue River peak sharply in May and June. For example, 56 percent of the annual runoff of the Tongue River near Dayton, Wyoming, is concentrated in just those two months. *Id.*

The sharp peak in Tongue River flows is also reflected in the pattern of water flowing over the course of a typical “water year” from Wyoming into Montana.³ A gauge near the Stateline between Montana and Wyoming measures this flow. From 1961 through 2007, flows at the Stateline gauge averaged between approximately 11,000 and 21,000 acre-feet (“af”) per month during the first seven months of the water year—i.e., from October through April.⁴ Ex. M-5, p. 26 (Book expert report). The flows

³ The “water year” for the Tongue River runs from October through September. (For example, the 2010 water year began on October 1, 2009 and ended on September 30, 2010.)

⁴ Western states generally measure water in two different ways for purposes of administering water rights. Overall volumes of water are generally measured in acre-feet. An acre-foot (typically abbreviated in this report as “af”) is the amount of water that would fill an acre of land to a depth of one foot. It is equivalent to 325,851 gallons of water. To give a better sense of how much water is in an acre foot, “farmers west of the 100th meridian usually apply between two and six AF per year to each acre of irrigated crops (although the exact amount applied varies considerably among regions, soil types, and crops). Many municipal water suppliers estimate that they must provide one

were lowest from November through February. *Id.* In May, however, the average flow at the Stateline gauge jumped over three-fold to approximately 70,000 af and then jumped again to almost 95,000 af in June. *Id.* After that, average flow levels dropped precipitously – to approximately 27,000 af in July and to only about 10,000 af and 12,000 af in August and September respectively. *Id.*

The amount of water available in the Tongue River also varies significantly from year to year, as it does in most western rivers. From 1961 through 2007, the amount of water that passed the Stateline gauge over the course of an entire water year averaged about 313,000 af. *Id.* However, there was no such thing as a “normal” water year. Yearly flows varied by a factor of six. In 2002, one of the drought water years at issue in this case, the total amount of water flowing into Montana did not even total 100,000 af. *Id.* By contrast, 1978 saw 623,781 af of water pass over the Stateline, leading to massive flooding and significant damage to the Tongue River Reservoir. *Id.* This damage led Montana to rehabilitate and enlarge the Reservoir, setting the stage for one of the disputes between Montana and Wyoming over how to account for the Reservoir under the Compact. See pp. 141-144 *infra*.

The total volume of water flowing past the Stateline in May and June combined has averaged about 164,000

acre foot of water per year for every five persons in their service area.” Barton H. Thompson, Jr., John D. Leshy, & Robert H. Abrams, *Legal Control of Water Resources* 26-27 (5th ed. 2013).

Flows of water are measured in cubic feet per second (often abbreviated as “cfs”). One cfs of flow generates 1.98 af in a day (and 722.7 af in a year). *Id.* at 27.

af. Ex. M-5, p. 26 (Book expert report). In the flood year of 1978, the total volume of water during May and June exceeded 414,000 af. *Id.* A long-term drought in the early and mid-2000s, however, saw total volumes that were often less than a quarter of the typical volumes for May and June – 30,000 af in 2001, 38,000 in 2002, 23,000 in 2004, and 50,000 in 2006. *Id.*

This hydrography makes water storage critical in both Montana and Wyoming. Storage allows the states to capture water during the winter and spring, when water is available, and store it for use later in the year when water flows drop at the same time that irrigation demands often peak. “Carryover storage” from one water year to the next also permits water users to store water in wet years for use in drought years.

The Tongue River also can suffer from “flash events” and floods. 5 Tr. 1037:23-25. Flows “can go from 200 CFS to 2000 CFS and back down within a 24- or 48-hour period.” *Id.* at 1038:11-13. In the 1978 flood, water flows peaked at 18,000-19,000 cfs. 6 Tr. 1132:2-8. The Tongue River Reservoir filled within one or two days and began spilling. *Id.* at 1132:8-11. Although the Reservoir reduced downstream flows, there was still serious damage. *Id.* at 1132:12-18.

B. Tongue River Water Use

Most of the water of the Tongue River is used for agricultural purposes, although a small amount of water is also used for municipal and industrial purposes. *See, e.g.,* Ex. W-2, p. 9 (Fritz expert report) (97 percent of total consumption of Tongue River surface water is by agriculture). Grass and alfalfa are the primary crops in both states; Montana farmers also produce some corn. *Id.*; 1 Tr. 101:20-25 (Dale

Book). The irrigation season varies from land owner to land owner and from year to year depending on the weather. However, the irrigation season generally begins in April or May and lasts until September or October. 1 Tr. 106:15-18 (Book); 15 Tr. 3325:17-21, 3326:10-12 (Charles Kepper).

1. Wyoming's use of the Tongue River.

In Wyoming, water from the Tongue River irrigates at least 57,000 acres of land. Ex. M-5, pp. 3, 5 (Book expert report); Ex. W-2, p. 8 (Fritz expert report).⁵ Most of the irrigation dates to the late 19th century. Ex. W-2, p. 9. Because of the rapid dropoff in river flow after June, only the most senior water rights generally have enough water to sustain irrigation throughout the growing season. *Id.*

Wyoming water users store water in a variety of reservoirs during the winter and spring in order to help them get through the low-flow months in the summer. Wyoming tracks and reports on 11 of the largest reservoirs. These reservoirs have capacities ranging from 79 af (Willits Reservoir) to 11,058 af (Park Reservoir). Ex. M-5, pp. 3, 36 tbl. 6 (Book expert report); Ex. J-56, p. 22 (2006 annual report of the Compact Commission). Dozens of other reservoirs, however, also store water under pre-1950 and post-1950 rights. See Ex. M-5, p. 39 tbl. 9 (listing reservoirs with over 20 af of post-1950 storage capacity). Reservoirs generally fill until they are full or senior appropriators need the water that the reservoirs

⁵ There are about 70,000 acres of irrigated land in Wyoming's Tongue River Basin. Ex. M-5, p. 3; Ex. W-2, p. 8. Approximately 13,000 acres, however, are lands along Prairie Dog Creek, and many of these acres are irrigated with water from the Powder River system. Ex. M-5, pp. 3, 5; Ex. W-2, pp. 14, 54.

would otherwise store. In dry years like 2004 and 2006, some junior reservoirs may stop filling as early as April when direct-flow irrigators assert their senior rights. Ex. W-2, p. 13 (Fritz expert report).

2. Montana's use of the Tongue River.

Irrigation in Montana dates to the late 1800s. Ex. M-5, p. 2 (Book expert report). The largest user of water in Montana is the T&Y Canal, which is located just south of Miles City and serves close to 400 farms and ranches, comprising about 10,000 acres. 1 Tr. 70:20-22 (Book). In addition to these water users, 76 other pre-1950 Montana water users, irrigating somewhat less than 15,000 acres in 2009, use water from the Tongue River. 1 Tr. 70:17-19 (Book); Ex. M-5, p. 3 (Book expert report); Ex. M-6, app. D (Book rebuttal expert report).

Early water rights in the Montana portion of the Tongue River were adjudicated in 1914 in *Miles City Canal & Irrigating Co. v. Lee*, Case No. 2089 (7th Judicial Dist. of Mont., Custer Cty., 1914) ("Miles City Decree"). See Ex. M-5, p. 2 (Book expert report). The Miles City Decree recognized 22 different rights, totaling approximately 430 cfs, with priority dates before 1911. The senior most water right under the Miles City Decree is Nance Cattle, with a right of 10.48 cfs and a priority date of July 6, 1886. 7 Tr. 1434:22-23 (Art Hayes); Ex. M-6, pp. 125-138 (Book rebuttal expert report). Next in seniority is the T&Y Canal, which is entitled to 187.5 cfs of flow from the Tongue, for use on slightly less than 10,000 acres of land. 7 Tr. 1436:2-3 (Hayes); Ex. M-5, p. 2 (Book expert report). Farmers and ranchers upstream of the T&Y Canal, totaling 9,766 acres of land, received 1 cfs for every 40 acres. Ex. M-5, p. 2 (Book expert report).

The Montana Water Court is currently adjudicating water rights in the Tongue River Basin of Montana. That adjudication has verified 77 water rights in the Tongue River that predate the Compact and are therefore protected under Article V(A) of the Compact. *See* Ex. M-6, app. D, pp. 120-821 (Book expert rebuttal report). The two most senior rights remain the Nance right, followed by the water right for the T&Y Canal. *Id.* at 125-138, 139-143. The 77 rights in total hold entitlements to some 350 cfs. *Id.* at 120-821.

Both the direct flow of the Tongue River and storage in the Tongue River Reservoir are critical to pre-1950 users in Montana. 12 Tr. 2679:5-23 (Richard Moy). Farmers and ranchers in Montana often hold both direct flow rights and storage rights in the Tongue River Reservoir. These farmers and ranchers rely first on their direct flow rights and then, when water flows decline sufficiently to limit or preclude their ability to use these rights, call on their storage rights.

Landowners are better off the longer they can meet their needs with their direct flow rights. For example, farmers who can “eek out . . . direct flow rights to July 15th and not draw on [their] storage rights out of the reservoir . . . might get a third cutting” of hay. 1 Tr. 46:23-47:1 (John Tubbs). For this reason, water users worry about the availability of both direct-flow and storage rights. 12 Tr. 2679:15-23 (Richard Moy). *See* 16 Tr. 3657:1-3658:22 (John Hamilton) (explaining the importance of direct flow rights). Flow in the Tongue River on the Montana side of the border drops below the total of all pre-1950 direct-flow rights at some point virtually every irrigation season. *See* Ex. M-5, p. 35 (Book expert report); Ex. M-6, p. 32 (Book rebuttal expert report). In some years with heavy precipitation such as 1998, water flows may remain high enough

to satisfy the needs of pre-1950 direct-flow users throughout the summer. Ex. M-6, p. 32. However, in several of the years at issue in this case, low flows at the Stateline forced pre-1950 users to switch to storage rights in June or before. See pp. 172-173 *infra*.

C. The Tongue River Reservoir

In the first half of the 20th century, the Montana State Water Conservation Board (the "Conservation Board") built numerous water storage projects, including the Tongue River Reservoir. 5 Tr. 991:12-993:10 (Kevin Smith). In response to the Great Depression, the Conservation Board used state and federal funds to build local irrigation projects that would help Montana farmers. The priority date for the Reservoir is April 21, 1937.

The Montana Department of Natural Resources and Conservation ("DNRC") is the successor in interest to the Conservation Board and holds title to the water in the Tongue River Reservoir. The State Water Projects Bureau ("Water Projects Bureau") is the proprietor of the Reservoir on behalf of the DNRC. See Ex. M-3, p. 4 (Smith expert report). The Water Projects Bureau provides the stored water to the Tongue River Water Users Association ("TRWUA") under a water marketing contract. The TRWUA in turn sells the water to its members.

The Reservoir fills primarily during the spring months of April, May, and June. 6 Tr. 1185:6-10 (Kevin Smith). Farmers then rely on water from the Reservoir to irrigate their crops during the low river-flow months of July, August, September, and October. 1 Tr. 113:12-16 (Dale Book); Ex. M-5, p. 8 (Book expert report). In some dry years, farmers must turn to reservoir water earlier in the year. According to the

operating manual for the Reservoir, the "date irrigation releases begin varies from year to year, with May 1 usually being the earliest. Irrigation releases usually end by September 30." Ex. M-3, attach. 1, at 20 (Smith expert report)

Managing water deliveries from the Tongue River Reservoir can be complex and difficult. 7 Tr. 1460:23-24 (Art Hayes); 9 Tr. 1835:25-1836:11 (Gordon Aycock). The Reservoir markets water for use as far away as Miles City, Montana, approximately 180 miles downstream. 1 Tr. 65:11-14 (Dale Book); 7 Tr. 1463:20-22 (Hayes). Water takes a full week to flow from the Reservoir to the T&Y Canal. 7 Tr. 1459:15-17 (Hayes). Water can take even longer to get to users downstream of the T&Y Canal. *Id.* at 1463:23-1464:2. Because water cannot be recovered once it is released, users must predict ahead of time when and how much water they will need. *Id.* at 1460:23-1461:1.

The original capacity of the Tongue River Reservoir was 72,510 af. Ex. M-557E, p. 3 (August 1949 Bureau of Reclamation report). Over time, the Reservoir lost several thousand acre feet of capacity due to the accumulation of sediment. 5 Tr. 1034:17-1035:6 (Kevin Smith). In the late 1990's, however, the State Water Projects Bureau rehabilitated and enlarged the Reservoir to its current capacity of 79,071 af. 6 Tr. 1214:9-12 (Smith). Two events led to the enlargement. First, a flood in 1978 badly damaged the dam and caused significant property loss downstream. In the aftermath of the flood, the dam was unsafe, and Montana decided that a new dam was needed to avoid future flood loss. *Id.* at 1133:17-20, 1137:14-16 (Smith). Second, Montana entered into a compact with the Northern Cheyenne Indian Tribe and the United States settling the Tribe's claim to Indian

reserved water rights. *See* pp. 22-24 *infra*. Under the settlement, the Tribe received the right to up to 20,000 af of stored water in the Reservoir. To effectuate the settlement, Montana, the Tribe, and the United States cooperated in the rehabilitation and enlargement of the Reservoir. *See* 8 Tr. 1599:25-1600:8 (Christian Tweeten).

IV. LEGAL BACKGROUND

A. The Yellowstone River Compact

The Yellowstone River Compact, Pub. L. No. 82-231, 65 Stat. 663, governs the allocation of Tongue River water among Montana, North Dakota, and Wyoming. The three states ratified the Yellowstone River Compact in 1951. Congress promptly consented to it. Act of Oct. 30, 1951, 65 Stat. 663. Appendix B sets out the Compact in full.

Unfortunately, the Compact is not exemplary legal writing. The Compact does not explicitly address many key issues, perhaps because they were not anticipated. The Compact also is sometimes vague and ambiguous. As a result, Montana and Wyoming have argued over the meaning of various provisions of the Compact since its ratification. The Compact nonetheless is sufficiently comprehensive and clear to resolve the issues raised by this case.

1. Key provisions of the Compact.

Just as in the Court's earlier opinion in *Montana v. Wyoming*, *supra*, the key provision of the Compact is Article V(A), which protects pre-1950 appropriative rights. Under Article V(A), "Appropriative rights to the beneficial uses of the water of the Yellowstone River System existing in each signatory State as of January 1, 1950, shall continue to be enjoyed in

accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.” The “Yellowstone River System” includes the Tongue River and its tributaries. See Compact, *supra*, art. II(D) (“‘Yellowstone River System’ means the Yellowstone River and all of its tributaries”) & art. II(E) (“Tributary” includes “interstate tributaries and tributaries thereof”); First Interim Report, *supra*, at 90-92.

The Compact allocates the waters of the Tongue River and the other tributaries to the Yellowstone River System under a three-tier structure. See *Montana v. Wyoming*, *supra*, 131 S. Ct. at 1770. The Compact first protects pre-1950 appropriative rights under Article V(A). Pre-1950 rights thus are the “senior” rights in the Tongue River and the other tributaries. Of the remaining water of each tributary, the Compact next allocates to each State the “quantity of that water as shall be necessary to provide supplemental water supplies” for the pre-1950 uses protected by Article V(A). Compact, *supra*, art. V(B). Finally, “the remainder of the unused and unappropriated water” of each tributary is divided between Montana and Wyoming by percentages that differ from tributary to tributary. *Id.* In the case of the Tongue River, Montana receives 60 percent of the remaining water, while Wyoming receives 40 percent. *Id.*, art. V(B)(3). The Compact thus divides the water of each tributary into three categories, which are, in order of priority: (1) pre-1950 appropriative rights, (2) supplemental water supplies, and (3) all other water.

Several provisions of Article V(A) are important to the resolution of this case. First, Article V(A) explicitly incorporates the law of prior appropriation. See *Montana v. Wyoming*, *supra*, 131 S. Ct. at 1771.

Under Article V(A), pre-1950 rights are to be enjoyed “in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.” This language is important because the Compact is often silent on the specifics of how to interpret and enforce pre-1950 rights. Where the Compact is otherwise silent, the Compact looks to the doctrine of prior appropriation to fill the gap.

Second, Article V(A) limits its protection of pre-1950 rights to the *beneficial uses* of waters from the Tongue River and other tributaries. The Compact defines “beneficial use” as “that use by which the water supply of a drainage basin is depleted when usefully employed by the activities of man.” Compact, *supra*, art. II(H). As the Supreme Court has held, this language limits the uses that are protected. Only appropriative rights that lead to the depletion of water are protected. *Montana v. Wyoming, supra*, 131 S. Ct. at 1777-78. For example, the Compact protects irrigation rights, but not hydropower. When the states negotiated the Compact, “Wyoming had a statutory preference for irrigation, a depletive use, over power generation, a nondepletive use.” *Id.* at 1778. It therefore “makes sense that the Compact would have been written to protect the irrigation uses that were legislatively favored and represented the predominant use of the Yellowstone River system.” *Id.* at 1778.

The Compact’s incorporation of the term “beneficial use” also means that the Compact protects only reasonable uses of water, not wasteful uses or mere “paper” water rights that are not actually used. As this Court again has noted, the concept of “beneficial use” imposes a reasonableness standard on the amount of water that can be appropriated. “So, water

put to '[b]eneficial use is not what is actually consumed, but what is actually necessary in good faith.'" *Id.*, quoting 1 Samuel C. Wiel, *Water Rights in the Western States* § 481, at 509 (3d ed. 1911).

The Compact does not establish a specific procedure for enforcing pre-1950 rights under Article V(A). The Compact creates a Commission to administer the provisions of the Compact between Montana and Wyoming. Compact, *supra*, art. III(A). The Commission consists of three representatives—one representative from Montana, one from Wyoming, and one member selected by the Director of the United States Geological Survey ("USGS"). *Id.* The Commission has "the power to formulate rules and regulations and to perform any act which they may find necessary to carry out the provisions" of the Compact. *Id.*, art. III(E). If the Montana and Wyoming representatives cannot "agree on any matter necessary to the proper administration of [the] Compact, then the member selected by the Director of the United States Geological Survey" can vote. *Id.*, art. III(F).

Two other provisions of the Compact are also relevant to this case. First, Article VI provides that nothing 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." Second, Article XVIII provides that no provision or phrase in the Compact "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."

2. Difficulties in administering the Compact.

Although the Compact is over sixty years old, Montana and Wyoming have never been able to agree on how to administer the allocation provisions of Article V. *See* 3 Tr. 580:16-581:1 (Timothy Davis) (disputes go back decades). The disagreements have dealt not only with the protection of pre-1950 water rights under Article V(A), but also with how to administer the apportionment provisions for the third tier of water under Articles V(B) and (C). *See, e.g.*, 2 Tr. 433:2-5 (Charles Dalby). That the Compact suffers from a variety of interpretation and implementation challenges is an understatement.

Montana and Wyoming tried unsuccessfully to agree on how to administer the Compact at various points during the time period involved in this case. Various witnesses testified to efforts to develop effective administration systems in the 1980s, 1990s, and early 2000s. The ultimate failure of these efforts led to a good deal of frustration, particularly on the part of Montana, which is the downstream state and thus at a geographic disadvantage. *See, e.g.*, 5 Tr. 1070:5-7 (Gary Fritz) (Montana was frustrated by failure to make progress in administration of the Compact). These frustrations, and the severe drought that hit both states in the first half of the 2000s, ultimately led to this lawsuit.

B. Western Water Law

Western water law, and the prior appropriation doctrine that dominates it, form an important backdrop to the Yellowstone River Compact and to the factual and legal issues in this case. As already noted, the Compact explicitly protects Montana's pre-1950

rights “in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.” *Montana v. Wyoming, supra*, 131 S. Ct. at 1771, quoting Compact, *supra*, art. V(A). As a result, a brief review of prior appropriation law is important to the issues that follow.

The prior appropriation doctrine has governed water in Montana, Wyoming, and all other western continental states since the 19th century. *Montana v. Wyoming, supra*, 131 S. Ct. at 1772. Under prior appropriation, older “senior” rights have priority over more recent “junior” rights. When water is scarce, senior rights are entitled to water before junior rights. Junior appropriators must reduce or even cease their water diversions to the degree necessary to ensure that there is enough water to meet senior water rights. *Id.*, citing *Hinderlider v. La Plata River & Cherry Creek Ditch Co.*, 304 U.S. 92, 98 (1938); *Arizona v. California*, 298 U.S. 558, 565-566 (1936). When water flows are insufficient to meet everyone’s rights and senior appropriators want to reduce or shut off junior diversions, the seniors “call” the river by notifying state authorities or the upstream juniors that they are not receiving the water to which they are entitled. See Barton H. Thompson, Jr., John D. Leshy, & Robert H. Abrams, *Legal Control of Water Resources* 1197 (5th ed. 2013).

As this Court has also emphasized, the scope of a prior appropriation right “is limited by the concept of ‘beneficial use.’ That concept restricts a farmer ‘to the amount of water that is necessary to irrigate his land by making a reasonable use of the water.’” *Montana v. Wyoming, supra*, 131 S. Ct. at 1772, quoting 1 C. Kinney, *Law of Irrigation and Water Rights* § 586, pp. 1007-1008 (2d ed. 1912). No one is entitled to more

water than they can place to beneficial use. *See State Dept. of Ecology v. Grimes*, 852 P.2d 1044, 1049-1052 (Wash. 1993). Where a senior appropriator is not making beneficial use of water, junior appropriators are entitled to take the water instead.

Although the general contours of the prior appropriation system are the same in all western states, the specific details and administration of each system differs, sometimes substantially. For example, states have adopted very different systems for administering appropriative rights. Wyoming was the first state in the nation to create an administrative agency to issue water permits and administer appropriative rights. As a result, records generally exist from early in the state's history documenting the date and quantity of appropriative rights. All water users must apply for and obtain a permit from the State Engineer. *See Wyo. Stat. Ann.* §§ 41-4-501 to -502. The Wyoming State Engineer administers the permit system and oversees its operation. State-employed water "hydrographers" or commissioners oversee the use of appropriative rights in each watershed and ensure that priorities are observed within the State. *See generally* 6 Waters and Water Rights 865-866 (Robert E. Beck ed., 1994 repl. vol.).

Montana came much later to an administrative permit system and has historically relied more on its courts to administer its water system. Prior to July 1, 1973, water users could acquire appropriative rights on most streams by recording notice or merely by putting water to a beneficial use; written permits were not required. 2 Tr. 400:7-14 (Timothy Davis). Where disputes arose over the waters of a particular river or stream, water users could sue in court. Where requested, courts would determine all or some of the

rights on a river system, and their relative priorities, through a stream "adjudication." *Id.* at 462:8-11 (Davis). The resulting water decree would govern who received what water and under what conditions, based upon priority date and historic beneficial use; new users in an adjudicated basin had to petition the court for the right to withdraw additional water.

In 1973, Montana adopted a permit system for post-July 1, 1973 water use and provided for the state-wide adjudication of pre-July 1, 1973 water rights. 1973 Mont. Laws, ch. 452. The Water Resources Division of the Montana DNRC oversees the state's water system through various water bureaus. New users of water apply to the Water Rights Bureau for an appropriation permit. To adjudicate existing water rights, Montana required all holders of existing water rights to submit a claim by April 30, 1982 and created a Water Court to oversee the adjudication. *See* Ex. M-230, pp. 5, 7 (explanation of Montana water rights); 1979 Mont. Laws, ch. 697; Mont. Code Ann. §§ 85-2-212 et seq. The Water Adjudication Bureau assists the Water Court by examining the claims and issuing reports on the water rights in each basin. Although Montana originally expected that the adjudication process could be completed in 15 years, most of the adjudications, including that for the Tongue River, are still on-going. Ex. M-230, p. 5 (explanation of Montana water rights).

Unlike Wyoming, the Montana DNRC does not employ state water commissioners to oversee its water system. Water users, however, can petition state courts for the appointment of water commissioners to administer the water rights on a particular river or stream. Although these commissioners are not state employees as in Wyoming, they receive training from the state, have broad authority to regulate water

use, and are supervised by the local court. Mont. Code Ann. §§ 85-5-101 to -109; 15 Tr. 3228:13-15, 3238:15-3272:21 (Mike Roberts). Commissioners were employed on the Tongue River during the drought years at issue in this case in the 2000s. 15 Tr. 3307:18-19 (Charles Kepper).

Montana and Wyoming water laws also differ in various other respects. Of most importance to this case, the two states follow very different rules with respect to water storage, leading to quite different expectations for how reservoirs should be handled under the Compact. For example, where a reservoir retains some water in storage at the end of a water year, Wyoming counts this “carryover” against the amount of water that the reservoir can store in the next year. Ex. W-2, p. 10 (Fritz expert report). Montana does not. 3 Tr. 565:12-17, 644:24-645:10 (Timothy Davis). See pp. 114-115, 121-122 *infra*.

Neither Wyoming’s nor Montana’s rules and procedures are inherently better. While administrative permit systems dominate in the western United States, Colorado still uses its courts to oversee water rights. 2 Water & Water Rights ¶ 15.01, at 15-2 to 15-3 (Robert E. Beck ed., 1991 ed.) While Wyoming employs state hydrographers to carefully oversee water rights on all its rivers, many states do not.

C. The Northern Cheyenne Compact

A portion of the Tongue River in Montana forms the eastern border of the Northern Cheyenne Indian Reservation and provides the main source of water for the reservation. Brief of *Amicus Curiae* Northern Cheyenne Tribe in Support of Montana’s Exceptions, May 2010, Docket No. 58, p. 3 (“Brief of the Northern Cheyenne Tribe”). The United States initially withdrew

lands along the Tongue River in 1881 for the Northern Cheyenne Tribe (the "Tribe"), and President Chester Arthur formally created the reservation by executive order in 1884. *Id.* See Executive Order of Nov. 26, 1884, 5 Indian Affairs: Laws and Treaties 860 (Charles J. Kappler, ed., GPO, 1904). The reservation currently contains 444,000 acres. Brief of the Northern Cheyenne Tribe, *supra*, at 3.

In 1975, the Tribe and the United States, acting on behalf of the Tribe, filed lawsuits in federal district court to establish the Tribe's federal reserved water rights. When Montana began the general stream adjudication for the Tongue River in 1983, the federal district court stayed these suits. Like many Native American tribes, the Northern Cheyenne ultimately chose to settle the Tribe's federal water right claims rather than to litigate them in court.

In 1991, the Tribe and Montana agreed on a compact that quantifies the Tribe's water rights. Mont. Code Ann. §§ 85-20-301 et seq. (the "Northern Cheyenne Compact") (admitted into evidence as Ex. M-527). Congress subsequently ratified the Northern Cheyenne Compact in the Northern Cheyenne Indian Reserved Water Rights Settlement Act of 1992, 106 Stat. 1186 (1992). Three years later, the Montana Water Court entered the Northern Cheyenne Compact as a decree. See *In the Matter of the Adjudication of Existing and Reserved Rights of the Northern Cheyenne Tribe*, Case No. WC-93-1 (Mt. Water Ct., 1995) (introduced at trial as Exs. M-362A & M-362B).

The Tribe holds at least three water rights in the Tongue River under the terms of the Northern Cheyenne Compact. First, the Tribe has a "right to divert or use or permit the diversion or use of up to 12,500 acre-feet of water per year from direct flow

of the Tongue River and its tributaries with a priority date of October 1, 1881.” Northern Cheyenne Compact, *supra*, art. II(A)(2)(a). Second, the Tribe has a “right to divert or deplete, or permit the diversion or depletion of, up to 20,000 acre-feet per year from a combination of water stored in the Tongue River Reservoir and exchange water.” *Id.*, art. II(A)(2)(b). Third, the Tribe has a right to certain “excess water,” as defined by the Northern Cheyenne Compact. *Id.*, art. II(A)(2)(d). The Tribe also has a separate contract right for 7,500 af per year, dated March 15, 1938, with the TRWUA and the State of Montana, which the Northern Cheyenne Compact explicitly does not affect. *Id.*, art. II(A)(2)(e).

Because the Northern Cheyenne Compact gives the Tribe an interest in the Tongue River Reservoir, the Northern Cheyenne Compact also provides for the development of a “reservoir operation plan” for the Reservoir. To develop the plan, the Compact establishes a five-member “advisory committee” with representatives of Montana, the TRWUA, the Tribe, and the United States, along with a “fifth member to be selected by the other four.” *Id.*, art. III(D)(1).

V. PROCEDURAL HISTORY

The Supreme Court granted leave to Montana to file its Bill of Complaint in 2008 and appointed me to serve as special master. 552 U.S. 1175 & 555 U.S. 968 (2008). Montana listed both Wyoming and North Dakota as defendants. However, Montana seeks no relief against North Dakota, which it included as a defendant only because North Dakota is a signatory to the Compact. Bill of Complaint, Docket No. 1, ¶ 4. Although counsel for North Dakota has attended all hearings and the trial, North Dakota has not played an active role in this case. Three *amici curiae* have

participated in portions of the case: Anadarko Petroleum (which operates coal-bed methane wells in the Yellowstone River basin), the Northern Cheyenne Tribe (which holds water rights in the Tongue River), and the United States of America. No amicus participated in the trial. Both Anadarko and the Northern Cheyenne Tribe participated in the post-trial argument of the case.

A. Montana v. Wyoming, 131 S. Ct. 1765 (2011)

In 2008, Wyoming moved to dismiss the Complaint for failure to state a claim upon which relief could be granted. In my First Interim Report, I recommended that the Court deny Wyoming's motion, because at least some of Montana's allegations stated a claim. In particular, I concluded that the Compact prevents Wyoming, in at least some settings, from using water for (1) post-1950 irrigation, (2) post-1950 storage, and (3) post-1950 groundwater withdrawals (potentially including the pumping of groundwater associated with coal-bed methane production) when the water is needed to meet pre-1950 uses in Montana. Wyoming did not file an exception to my report. I intentionally left open some questions regarding the exact situations when such uses in Wyoming would violate the Compact, because their resolution depended on a clearer factual record. In particular, my report did not address the question of "exactly what groundwater is covered or the exact circumstances under which groundwater pumping violates Article V(A)." First Interim Report, *supra*, at 54.

Montana filed exceptions to two portions of my report. First, Montana excepted to my finding that "efficiency improvements by *pre-1950* appropriators in Wyoming" did not violate the Compact even if such

improvements reduced the water available for pre-1950 uses in Montana. *Id.* at 15 (emphasis added). In *Montana v. Wyoming*, *supra*, the Supreme Court overruled this first exception and agreed that Montana's allegation of Compact violations stemming from increased efficiency by pre-1950 Wyoming appropriators did not state a claim. This allegation therefore is no longer before the Court. The only issues remaining deal solely with post-1950 uses of water in Wyoming.

Second, Montana excepted to my conclusion that Montana could not object to post-1950 uses in Wyoming if Montana could remedy a shortage of water by curtailing its own post-1950 uses (First Interim Report, *supra*, at 15), on the ground that Wyoming's Compact obligations are not contingent on Montana's actions. See Montana's Exception and Brief, May 13, 2010, Docket No. 56, at 37-40. The Supreme Court did not rule on this exception, but recommitted the issue to me. *Montana v. Wyoming*, *supra*, 131 S. Ct. at 1771 n.2; *Montana v. Wyoming*, 562 U.S. ___, 131 S. Ct. 497 (2010).

B. Subsequent Pre-Trial Proceedings

Following the Supreme Court's decision, Montana and Wyoming agreed to bifurcate proceedings into two phases: a liability phase and a remedies phase. Case Management Plan No. 1, Dec. 20, 2011, Docket No. 118, ¶ II. The parties engaged in extensive discovery on the liability issues between January 2012 and July 2013. To govern and guide this discovery, I entered a case management plan that incorporated a modified version of the Federal Rules of Civil Procedure appropriate for this action. *Id.*, ¶ VIII.

Both before and after the completion of discovery, I also considered various motions for summary judgment and resolved various substantive disputes between Montana and Wyoming. As described below, several of these legal proceedings helped narrow the factual issues that needed to be tried in the liability phase.

1. Wyoming's 2011 motion for partial summary judgment.

During a telephonic status conference following the Supreme Court's 2011 decision, Wyoming raised the issue of whether Montana could claim damages for years in which it did not notify Wyoming that insufficient water was reaching Montana to meet its pre-1950 appropriative rights. Because resolution of the issue could reduce discovery needs and speed resolution of the case, I requested that Wyoming file a motion for partial summary judgment on the issue. In a December 20, 2011 memorandum opinion, I concluded that, with limited exceptions, Montana was not entitled to damages for a violation of Article V(A) in any year when it did not provide notice to Wyoming that insufficient water was reaching Montana to satisfy its pre-1950 rights. Memorandum Opinion of the Special Master on Wyoming's Motion for Partial Summary Judgment (Notice Requirement for Damages), Dec. 20, 2011, Docket No. 120, at 3-4. However, I also concluded that I should delay ruling on the specific years for which Montana could seek damages at trial, pending further discovery. *Id.* at 11. See *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986) (summary judgment typically is appropriate only after adequate opportunity for discovery on key factual issues); *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 257 (1986) (same).

By agreement of the parties, Wyoming filed a renewed Motion for Partial Summary Judgment on June 15, 2012. After a full briefing and hearing, I issued an opinion reaffirming my previous conclusion that, in order to pursue damages for any given year, Montana must have given Wyoming notice of any pre-1950 shortage in that year. Memorandum Opinion of the Special Master on Wyoming's Renewed Motion for Partial Summary Judgment (Notice Requirement for Damages), Sept. 28, 2012, Docket No. 214, at 6-16. Applying this rule to the facts, I found that Wyoming was entitled to summary judgment for all years except 1987-1989, 2000-2004, and 2006. For all of these years except 2004 and 2006 (when written notice was provided to Wyoming), I also ordered Montana to provide additional information regarding the exact dates of each notice, so that I could try to further narrow the time periods at issue in each year. *Id.* at 33-34. After reviewing the two sets of declarations submitted by Montana in response to my order, I concluded that Montana could not claim damages or other relief for dates prior to (1) May 1 in the years 1987-1989 and 2001-2003, and (2) the end of the irrigation season in 2000. Memorandum Opinion Regarding Wyoming's Motion for Partial Summary Judgment (Montana's Supplemental Evidence), Dec. 22, 2012, Docket No. 249, at 18-19.

Part VII(C)(2)(a) discusses the legal and factual grounds for my resolution of Wyoming's motion for partial summary judgment. *See* pp. 68-73 below.

2. Montana's claims under Article V(B).

After the Supreme Court's 2011 opinion, it became apparent that the parties disagreed over the scope of Montana's Complaint and therefore what was at issue in this case. In particular, Montana believed that the

Complaint was broad enough to permit a wide variety of claims under both Articles V(A) and V(B) of the Compact, while Wyoming contended that the Complaint permitted Montana to raise issues only under Article V(A). To resolve this disagreement, I asked Montana for a statement identifying any claims that it wished to make under Article V(B), invited legal briefs, and held a hearing on the issue.

After considering the parties' arguments, I concluded that Montana, under its Complaint, can raise claims under both Articles V(A) and V(B), but only where the claims are relevant to its allegations that it did not receive adequate water to satisfy its pre-1950 water rights. As I noted in a memorandum opinion, the dispute over the scope of Montana's Complaint raised two related questions. First, could Montana claim relief under Article V(B)? Second, could Montana claim relief for water shortages suffered by post-1950 water users? While the Complaint broadly asserts violations of Article V of the Compact and is not limited by its terms to Article V(A), the only violation of the Compact clearly alleged in Montana's Complaint is that Wyoming denied Montana sufficient water to meet its pre-1950 water uses. Memorandum Opinion of the Special Master on Montana's Claims under Article V(B), Dec. 20, 2011, Docket No. 121, at 6. I therefore concluded that Montana was free to raise arguments under Article V(B) regarding pre-1950 shortages. However, if Montana wished to raise violations of post-1950 rights, it had to seek leave to amend the Complaint. *Id.* at 15-17.

3. Montana's voluntary dismissal of its Powder River basin claims.

Montana's Complaint originally alleged violations in both the Powder and Tongue River basins. However, Montana voluntarily agreed to dismiss with prejudice its Powder River basin claims, except with respect to groundwater pumping in the Powder River basin that may affect the waters of the Tongue River Basin. Stipulated Dismissal with Prejudice of Montana's Powder River Basin Claims, June 28, 2013, Docket No. 330.

4. Wyoming's 2013 Motion for Summary Judgment.

Immediately prior to trial, Wyoming moved for summary judgment on multiple grounds. After full briefing and a hearing on Wyoming's motion, I concluded that Wyoming's motion for summary judgment should be denied, with one exception. Montana's expert reports attempted to quantify post-1950 diversions in Wyoming and the potential impact of those diversions on pre-1950 water rights in Montana only for 2001, 2002, 2004, and 2006. Because there is no direct evidence of post-1950 uses in Wyoming for the other years at issue, it is impossible to quantify any violation of Article V(A) without such expert assistance. I therefore concluded that Montana could not seek to quantify liability or claim damages for years other than 2001, 2002, 2004, and 2006. I permitted Montana to present evidence of violations in other years, but for the purpose only of establishing the need for prospective relief. Memorandum Opinion of the Special Master on Wyoming's Motion for Summary Judgment, Sept. 16, 2013, Docket No. 380, at 27-29.

5. Montana's 2013 Motion for Partial Summary Judgment.

Prior to trial, Montana also moved for partial summary judgment that the Compact does not impose specific requirements for intrastate regulation and administration of water rights as a prerequisite for a state's enjoyment of its pre-1950 rights. After considering the arguments of both sides, I concluded that Montana is not required to adopt any specific intrastate regulations or administration, but that Montana's regulations and administration must comply with the requirements and obligations of the Compact—in particular, the “beneficial use” and prior-appropriation provisions of Article V(A) of the Compact. See Memorandum Opinion of the Special Master on Montana's Motion for Summary Judgment on the Compact's Lack of Specific Intrastate Administration Requirements, Sept. 16, 2013, Docket No. 381, at 5.

C. The Trial

1. *In limine* motions.

Wyoming filed seven motions *in limine* prior to trial.

Two of the motions went to the admissibility of affidavits and scientific literature. In response to one motion, I denied the admission of the prior affidavits of witnesses under Rule 807 of the Federal Rules of Evidence. Transcript of Pretrial Hearing, Oct. 15, 2013, 9:8-10:3 (“Pretrial Hearing Tr.”). On the other motion, I ruled that Montana could admit a scientific paper if an expert witness relied on the paper and the paper is reliable authority. *Id.* at 10:14-24:19.

Two other *in limine* motions dealt with the admissibility of specific expert testimony that Montana

wished to present. Wyoming first sought to exclude the expert report and testimony of Dr. Douglas B. Littlefield, a historian testifying on the history of the Compact, on the ground that the testimony is irrelevant and would be a waste of time. I admitted the report and testimony, but sought to limit Dr. Littlefield's testimony to those issues where the history of the Compact is still relevant and useful—specifically, what, if any, intrastate procedures or standards are required under the Compact. *Id.* at 24:12-29:17.

Wyoming also sought to exclude the expert report and testimony of Mr. Steven Larson, Montana's groundwater expert, on the ground that Mr. Larson's expert report misuses an existing model and is unreliable under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). I chose to take Wyoming's motion under advisement until after I had heard Mr. Larson's testimony. Given the nature of original proceedings, I saw no disadvantage to waiting until after Mr. Larson's testimony, when I would have a better sense of its reliability. Pretrial Hearing Tr., 29:18-31:24. As explained below, I have concluded that Mr. Larson's model is insufficiently reliable to prove that Wyoming's groundwater pumping violated the Compact. *See* pp. 211-219 *infra*.

Two other motions, although cast as motions *in limine*, sought to limit Wyoming's liability for shortfalls in Tongue River Reservoir storage. One motion argued that Article V(A) does not protect storage capacity added to the Tongue River Reservoir in 1999, while the other argued that Montana should not be able to complain about shortages attributable to Montana's voluntary operational decision to allow water to flow through the Reservoir during winter

months. I decided not to grant the motions, which raised complex legal issues that I did not believe appropriate for an *in limine* motion, and instead to address the issues at the conclusion of the trial as part of this report. *Id.* at 48:17-25, 52:9-54:15, 70:13-20, 78:20-25. My resolution of these issues is discussed below at pp. 141-157.

Finally, Wyoming sought to limit the presentation of evidence to the nine years that survived Wyoming's 2011 motion for partial summary judgment. The major question was whether my earlier ruling precluded Montana from proving liability for other years or only precluded Montana from seeking damages for other years. I concluded that Montana's failure to provide notice in a given water year should prevent Montana from proving liability and seeking any relief, whether retrospective or prospective. Pretrial Hearing Tr. at 32:19-33:9, 45:9-47:11. However, I ruled that Montana could present evidence from or about other years in order to establish context or background or to help prove that notice was provided in those years for which I had denied Wyoming's motion for summary judgment. *Id.* at 33:10-33:17.

During the discussion of this final motion *in limine*, I learned that Wyoming had recently discovered and turned over to Montana a file that discussed apparent conversations in 1981 between Gary Fritz, the head of Montana's DNRC Water Resources Division, and the Wyoming State Engineer regarding pre-1950 shortages and asking whether Wyoming could regulate post-1950 rights to make more water available to Montana. *Id.* at 36:21-37:8. In response, I ruled that Mr. Fritz could testify about the documents in the file and his recollections regarding them. I also reserved the

right to change my summary judgment ruling regarding 1981 or other related years. *Id.* at 47:12-48:4.

2. Trial proceedings.

Trial began on the liability issues in Billings, Montana on October 16, 2013 and ended on December 4, 2013, after 25 days of testimony. Various motions discussed above, as well as Montana's voluntary dismissal of its Powder River claims, narrowed the issues that needed to be tried.

- Only the Tongue River remained at issue.
- Liability was at issue for only nine years—1987-1989, 2000-2004, and 2006—although I reserved the right to allow Montana to prove liability in other years if the testimony of Mr. Fritz, based on the new evidence discovered by Wyoming, established that notice was provided in those years.
- Although Montana was free to prove liability in all of these years, Montana could prove the amount of water involved in any violation only in the four years for which it had presented expert testimony regarding post-1950 uses in Wyoming: 2001, 2002, 2004, and 2006.

Trial therefore focused primarily on alleged violations on the Tongue River in 2001, 2002, 2004, and 2006.

In trying the case, I used the Federal Rules of Civil Procedure and Federal Rules of Evidence as guidance. If there was any question regarding the relevance or admissibility of evidence, I generally erred in favor of admitting the evidence. Over the course of the 25 days of trial, 50 witnesses testified, and over 350 documents were admitted into evidence. To ensure a complete record and to better understand the testimony of each

witness, I typically questioned each witness at the conclusion of counsels' direct and cross examinations. In those cases, I allowed counsel for both sides to ask any additional questions raised by my examination.

Following trial, the parties filed extensive post-trial briefs and reply briefs. I held a full-day post-trial hearing on May 1, 2014, at which counsel for Montana and Wyoming presented closing arguments. I also permitted counsel to supplement their prior filings with any additional citations they believed were responsive to my questions during the post-trial hearing. On August 25, 2014, I circulated a draft of this report to counsel, so that they could bring any factual errors or issues to my attention.

VI. SUMMARY OF THE ISSUES AND CONCLUSIONS

Both Montana and Wyoming agree that, to establish Wyoming's violation of Article V(A) in any given year, Montana has the burden of proving that:

(1) Montana provided adequate notice to Wyoming that Montana was receiving insufficient water to enjoy its pre-1950 appropriative rights (assuming that notice is required at all, which Montana disputes),

(2) Montana did not receive sufficient water to enjoy its pre-1950 rights,

(3) Wyoming allowed post-1950 storage or use of water while Montana was suffering a pre-1950 shortage, and

(4) Wyoming's post-1950 storage or use reduced the amount of water available to Montana at the Stateline of the Tongue River between Wyoming and Montana.

Montana's Post-Trial Reply Brief, April 25, 2014, Docket No. 460, at 3-4; Wyoming's Post-Trial Brief,

March 31, 2014, Docket No. 454, at 6-7. The parties disagree on whether Montana also must prove that (1) shortages at the Stateline injured pre-1950 appropriators in Montana, and (2) Montana engaged in intrastate regulation sufficient to ensure that post-1950 Montana appropriators were not receiving water at the time violations of Article V allegedly occurred.

A. Notice

Wyoming argues that, to trigger Wyoming's responsibilities under Article V(A), Montana must formally notify Wyoming whenever Montana does not have sufficient water to enjoy its pre-1950 rights. Montana contends notice is unnecessary. I agree with Wyoming that Montana must provide notice. Any post-1950 storage or use that takes place in Wyoming prior to notice does not violate the Compact. Such notice need not take any specific form, but must alert Wyoming to Montana's need for additional water.

As a factual matter, Montana and Wyoming disagree whether Montana provided such notice in any years other than 2004 and 2006. Wyoming also argues that Montana's notice in 2004 was defective because it sought the wrong relief. I conclude that Montana provided effective notice to Wyoming in 1981, 2004, and 2006. In 1981, however, no injury occurred. While Montana also provided notice in other years, Montana has failed to establish when such notices occurred, preventing Montana from establishing that Wyoming failed to regulate post-1950 uses after the notices in violation of the Compact.

B. Pre-1950 Shortages in Montana

Montana recognizes two types of pre-1950 appropriative rights: storage rights in the Tongue River Reservoir, and direct-diversion rights. Montana

and Wyoming disagree on whether Montana was able to enjoy either set of rights after Montana notified Wyoming of shortages in 2004 and 2006.

Montana was unable to fill the Tongue River Reservoir in either year to its current capacity of 79,000 af. The Reservoir's storage peaked at 49,680 af in 2004 and 73,400 af in 2006. The states, however, disagree on whether Montana was entitled to fully fill the Reservoir under Article V(A) and, if not, how much water Montana could store. While Montana contends that the Compact entitles it to fully fill the Reservoir, Wyoming argues that Montana has a right to store a total of only 32,000 acre feet, and perhaps less, under Article V(A). Wyoming also argues that Montana failed to store as much water as it could have in the winter months and cannot complain because it subsequently found itself short of water. I conclude that Montana is entitled to store at least 32,000 af of water each year on top of any carryover storage from prior years and that the Compact did not require it to store more water during the winter months. Montana was unable to store 32,000 af of additional water in either 2004 or 2006.

The parties also disagree whether Montana suffered shortages in its direct-diversion rights. Little contemporaneous evidence is available regarding the direct-diversion needs of pre-1950 appropriators in Montana in 2004 and 2006. Montana and Wyoming presented conflicting expert testimony. I conclude that Montana did not receive sufficient water to enjoy its pre-1950 direct-diversion rights during significant periods after it notified Wyoming in 2004 and 2006.

C. Post-1950 Wyoming Diversions and Storage

Montana argues that Wyoming made three types of post-1950 use after Montana notified Wyoming of shortages in 2004 and 2006: (1) direct diversions of water from the Tongue River and its tributaries under post-1950 appropriative rights, (2) storage of water in various reservoirs under post-1950 rights, and (3) pumping of groundwater in connection with coal-bed methane production ("CBM").

Both Montana and Wyoming presented expert testimony on direct diversions of water from the Tongue River in 2004 and 2006. Because records of post-1950 diversions in Wyoming in 2004 and 2006 are incomplete, the experts had to rely on aerial photos, satellite imagery, interviews with water users, and other secondary evidence. No expert, moreover, testified as to exactly when during the irrigation season post-1950 water was used, presenting the challenge of determining how much post-1950 water was used after the notice dates. I conclude that post-1950 Wyoming irrigators diverted at least 204 af of Tongue River water in 2004 and at least 62 af in 2006 after Montana provided notice.

Montana and Wyoming largely agree on the total amount of post-1950 water stored in Wyoming reservoirs in 2004 and 2006. The major disagreement is how much of that water was stored after the notice dates. I conclude that Wyoming stored at least 1,260 af of water after Montana provided it with notice in 2004. Montana has failed to prove that any storage took place after it provided notice in 2006.

Turning to groundwater, Montana and Wyoming disagree both on whether the Compact applies to CBM

groundwater pumping and, if it does, on whether Montana has shown that CBM groundwater pumping impacted Stateline flow in either 2004 or 2006. I conclude that Article V(A) precludes, any CBM groundwater pumping that would interfere with the continued enjoyment of pre-1950 surface rights in Montana. Expert testimony centered on the reliability of a groundwater model originally developed by the U.S. Bureau of Land Management and used by Montana's expert to estimate impacts on surface flow of CBM operations. I conclude that the model was not sufficiently reliable to demonstrate that CBM groundwater pumping in Wyoming negatively affected Tongue River flows in either 2004 or 2006.

In summary, I conclude that Wyoming stored or diverted 1,464 af after receiving notice in 2004 (204 af of direct diversions, and 1,260 af of storage). After receiving notice in 2006, Wyoming diverted 62 af.

D. Impact at the Stateline

While Montana and Wyoming disagree on the amount of post-1950 storage and diversions in Wyoming after Montana provided notice in 2004 and 2006, there was little controversy over how such storage and use would have impacted flows at the Stateline. Both sides agree that transit losses of 10 percent and a small volume of return flow would have reduced the impact of post-1950 storage and use. I therefore conclude that the 1,464 af of post-1950 storage and diversions in 2004 reduced flows at the Stateline by 1,300 af. The 62 af of diversions in 2006 reduced flows by 56 af.

E. Intrastate Regulation

Wyoming argues that Montana must show that it engaged in intrastate regulation sufficient to ensure

that post-1950 Montana appropriators were not receiving water at the time any violations of Article V(A) occurred. However, Wyoming has the burden of showing that Montana could have avoided the need for an interstate call by regulating post-1950 uses in Montana. The record contains no evidence showing that Montana could have remedied its pre-1950 shortages in 2004 or 2006 by regulating post-1950 uses in Montana. Montana water commissioners, oversaw water use on the Tongue River in 2004 and 2006 and enforced priorities.

F. Injury to Montana Appropriators

Finally, Wyoming argues that Montana must prove that post-1950 storage or diversions in Wyoming not only led to shortages at the Stateline but caused harm to individual pre-1950 appropriators in Montana. Montana, however, need prove only that Wyoming's post-1950 storage or use reduced Stateline flows. Wyoming was free to show as an affirmative defense that increases in Stateline flows would have made no difference to Montana appropriators, but Wyoming bore the burden of proof on that defense. Neither party presented significant evidence on the impact of Stateline flows on Montana appropriators. However, I conclude that reductions in Stateline flow at a minimum would have negatively affected storage in the Tongue River Reservoir.

VII. ANALYSIS

A. The Appropriate Standard of Proof

Both Montana and Wyoming agree that the standard of proof for liability is preponderance of the

evidence.⁶ See Montana's Post-Trial Brief, March 31, 2014, No. 456, at 80-81; Wyoming's Post-Trial Brief, *supra*, at 10. The Supreme Court itself has not yet had occasion to decide the appropriate standard of proof for liability under an interstate water compact. In *Kansas v. Colorado*, 514 U.S. 673 (1995), the Special Master concluded that the preponderance of the evidence standard applies in deciding liability under an interstate compact. *Id.* at 693. The Court, however, declined to decide the issue because the Special Master found that Kansas would have carried its burden even if the clear and convincing evidence standard applied. *Id.* at 693-694. The resolution of this case, unlike *Kansas v. Colorado*, depends on the appropriate burden of proof.

I agree with prior special masters that the appropriate standard in compact disputes is preponderance of the evidence. See *id.* at 693; Report of the Special Master, *Kansas v. Nebraska*, No. 126, Orig., 136 (Nov. 15, 2013); Report of the Special Master, *Oklahoma v. New Mexico*, No. 109, Orig., 86-87 (Oct. 15, 1990) (all concluding that the preponderance standard is appropriate). The Supreme Court has applied the higher standard of clear and convincing evidence in cases involving equitable apportionments of interstate rivers. See, e.g., *Colorado v. New Mexico*, 467 U.S. 310,

⁶ Wyoming argues that, if the Court concludes that Montana is liable under Article V(A) of the Compact and goes on to consider injunctive relief, the burden of proof switches to "clear and convincing evidence" and the Court must find both that Wyoming's breach of the Compact has been of a "serious magnitude" and that there is a "real and immediate threat of repeated injury." Wyoming's Post-Trial Brief, *supra*, at 10-11, quoting *Connecticut v. Massachusetts*, 282 U.S. 660, 669 (1931) and citing *City of Los Angeles v. Lyons*, 461 U.S. 95, 102 (1983). See pp. 228-229 *infra*.

312 (1984); *Colorado v. Kansas*, 320 U.S. 383, 393 (1943); *Washington v. Oregon*, 297 U.S. 517, 522 (1936); *Connecticut v. Massachusetts*, 282 U.S. 660, 669 (1931). The Court has emphasized that it will not “exert its extraordinary power to control the conduct of one State at the suit of another, unless the threatened invasion of rights is of serious magnitude and established by clear and convincing evidence.” *Connecticut v. Massachusetts*, *supra*, 282 U.S. at 669.

However, in the more recent case of *Nebraska v. Wyoming*, 507 U.S. 584 (1993), the Supreme Court concluded that enforcement of a prior judicial decree is subject to a simple preponderance standard, although modifications of a decree are subject to the higher standard of clear and convincing evidence required for initial apportionments. *Id.* at 590-593. As the Court explained, a higher standard is important where the “plaintiff essentially seeks a reweighing of equities.” *Id.* at 593. Equitable apportionments and new injunction actions “work a new infringement on sovereign prerogatives.” *Id.* Further, “the interests of certainty and stability counsel strongly against reopening an apportionment of interstate water rights absent considerable justification.” *Id.* By contrast, an action to enforce a preexisting decree is primarily “one of interpretation,” where the more conventional civil standard of proof should apply. *Id.* at 592.

Cases for the enforcement of an interstate compact more closely resemble actions for the enforcement of an existing judicial decree than they resemble actions either to modify a decree or to seek an equitable apportionment. Like an action to enforce a decree, an action to enforce a compact is “one of interpretation.” In compact disputes, the Court is enforcing commitments voluntarily undertaken by the states who are

party to the compact, not working “new infringements on sovereign prerogatives.” Compacts, moreover, are effectively contracts between states. And the standard burden of proof in contract actions between private parties is preponderance of the evidence. See *Addington v. Texas*, 441 U.S. 418, 423 (1979).

There are also practical arguments for using the lower standard in compact actions. As this case shows, compact enforcement cases are often fact specific; memories can erode and documents can be lost with the passage of time; and direct evidence of water use is often unavailable. For these reasons, a state seeking to vindicate its compact rights may often find it difficult to meet a standard of clear and convincing evidence. As the Special Master in *Kansas v. Colorado* observed, the relationship of compacting states is also inherently unequal. Upstream states, like Wyoming, can divert water to which they believe they are entitled without seeking judicial relief. Downstream states, like Montana, must bring and prosecute judicial actions. Forcing the downstream state to meet a more difficult standard of proof would compound this inequality. Report of the Special Master, *Kansas v. Colorado*, No. 105, Orig., pp. 68-69 (July 29, 1994).

For all of these reasons, I have used a preponderance of the evidence standard in evaluating the liability issues in this case. On many issues in this case, the standard of proof would not matter. However, a preponderance of the evidence standard makes it possible to determine (1) that Montana suffered shortage in post-1950 direct diversions in 2004 and 2006, and (2) the exact amount of post-1950 diversions and storage that took place after Montana notified Wyoming of its shortages.

B. The Need for Caution in Restricting State Practices

Many of the questions in this case rest on the broad language of Article V(A) that pre-1950 rights to the “beneficial uses” of the water of the Yellowstone River System shall “continue to be enjoyed in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.” Wyoming tries to read a lot into the general reference to the “doctrine of appropriation.” For example, as explained below, Wyoming argues that this language requires Montana to not only notify Wyoming when it is short of water but to formally demand more water and that the language requires Montana to store water in the winter rather than the spring. See Wyoming’s Post-Trial Brief, *supra*, at 18-27, 38-39.

For at least three reasons, however, the Court should use great caution in reading too many specific requirements into Article V(A)’s general incorporation of the “doctrine of appropriation”—particularly when deciding how each state must internally use and administer its pre-1950 rights. First, the appropriation laws of Montana, Wyoming, and other western states often diverge on key issues, making it impossible to say that there is a universal rule under the “doctrine of appropriation.” Montana and Wyoming, in particular, follow different rules in administering water-right priorities, storage rights, and groundwater extraction. Nor is there consensus on these issues among other western states. While western states agree on the broad contours of appropriation law (e.g., senior rights get priority over junior rights), states differ on many details. This was not a problem in the Court’s earlier decision in *Montana v. Wyoming*, *supra*, because the laws of

Montana and Wyoming agreed on the key question of whether a senior appropriator can change his method of irrigation, even if that reduces return flow. Unfortunately, the laws of Montana and Wyoming differ significantly on some of the key issues now before the Court.

Second, states seldom cede their sovereignty except in clear terms. As this Court has recently written in *Tarrant Regional Water Dist. v. Herrmann*, 569 U.S. ___, 133 S. Ct. 2120 (2013), the “background notion that a State does not easily cede its sovereignty has informed our interpretation of interstate compacts.” *Id.* at 2132. When a compact is silent on an issue “touching on the States’ authority to control their waters,” the most appropriate inference from that silence, assuming any is appropriate, “is that each State was left to regulate the activity of her own citizens.” *Id.*, quoting *Virginia v. Maryland*, 540 U.S. 56, 67 (2003). “States rarely relinquish their sovereign powers, so when they do we would expect a clear indication of such devolution, not inscrutable silence.” 133 S. Ct. at 2133.

Finally, the Compact is careful to protect each state’s sovereignty over its pre-1950 rights. Under the Compact, each state retains jurisdiction over the waters of the Yellowstone River system, including the Tongue, allocated to it under the Compact: “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, *supra*, art. XVIII. According to the legislative history of the Compact, the parties did not intend to “regulate” or “administer” pre-1950 rights.

Instead, each state enjoys continued authority to manage its own pre-1950 rights, subject only to the explicit protections and obligations established by the Compact. *See, e.g.*, S. Rep. No. 883, 82d Cong., 1st Sess. 11 (1951) ("little could be gained . . . by attempting in the compact, the regulation and administration of existing appropriative rights") (introduced at trial as Ex. J-72, pp. 12, 22); H. Rep. No. 1118, 82d Cong., 1st Sess. 2 (1951) (same) (Ex. J-72, pp. 25, 26); Yellowstone River Compact Commission, Meeting Minutes of Oct. 24-25, 1950, p. 6 (Wyoming opposed a "provision in the Compact that existing rights shall be administered under the Compact by the Administrative Commission that may be established") (Ex. J-72, pp. 55, 60).

Where provisions of the Compact or prior appropriation law set out clear obligations, the states of course must comply. By entering into the Compact, both Montana and Wyoming bound themselves to its requirements and, in the process, restricted their freedom to manage the waters of the Tongue River as they each alone saw fit. *See State ex rel. Intake Water Co. v. Board of Natural Resources & Conservation*, 645 P.2d 383, 387 (Mont. 1982) ("Montana's water statutes are subordinate to the Compact provisions"). Wyoming, for example, must ensure that it does not divert water for post-1950 storage and use when Montana has inadequate water for its pre-1950 rights. Montana, in turn, cannot call for water under Article V(A) if that water would be wasted in violation of the beneficial-use doctrine expressly adopted by the Compact and central to prior-appropriation law. Where the Compact and the "doctrine of appropriation" are not clear, however, Montana and Wyoming retain their sovereign authority to regulate and use their water rights as they see fit.

C. Notice

The Court first must decide (1) whether Montana must provide Wyoming with notice in order to trigger Montana's right to water under Article V(A) of the Compact, and if it must, (2) whether Montana did so in this case and when. For the reasons discussed below, I conclude that Montana must notify Wyoming that it needs additional water for its pre-1950 appropriative rights, unless the states or the Compact Commission establish an alternative procedure. Absent notice, Wyoming is not liable under Article V(A) if it fails to reduce or eliminate post-1950 diversions or storage when Montana is short of water for its pre-1950 uses.

On the facts, I find that Montana has proven that it provided adequate notice at a time when Wyoming could have reduced its water use in 1981, 2004, and 2006. In 1981, Montana complained only of shortages to the Tongue River Reservoir, which ultimately filled. As a result, Wyoming is potentially liable for post-1950 storage or use of water only in 2004 and 2006. For all other years, Wyoming is entitled either to summary judgment or a judgment in its favor based on the evidence presented at trial.

1. The Compact requires Montana to notify Wyoming when it needs water for pre-1950 appropriative rights under Article V(A).

Interstate compacts do not inherently require states to provide notice to each other when asserting their rights. States can be liable for failing to deliver water even when they are unaware of their compact obligation or disagree that they have an obligation. In *Texas v. New Mexico*, 482 U.S. 124 (1987), the Special

Master found that the upstream state, New Mexico, had acted in the good faith belief that it had no obligation to provide more water to Texas. *Id.* at 129. Indeed, New Mexico could not even have determined its obligation until the proceedings before the Court established a methodology for doing so. *Id.* The Court nonetheless found that New Mexico was liable for failing to deliver the water required by the compact:

[G]ood-faith differences about the scope of contractual undertakings do not relieve either party from performance. A court should provide a remedy if the parties intended to make a contract and the contract's terms provide a sufficiently certain basis for determining both that a breach has in fact occurred and the nature of the remedy called for. There is often a retroactive impact when courts resolve disputes about the scope of a promisor's undertaking; parties must perform today or pay damages for what a court decides they promised to do yesterday and did not. In our view, New Mexico cannot escape liability for what has been adjudicated to be past failures to perform its duties under the Compact.

Id. (citations omitted).

The Yellowstone River Compact, moreover, does not explicitly set out any specific procedure for enforcement of its provisions. No provision of the Compact explicitly requires one state to notify another state of its water needs. As noted earlier, the Compact Commission has the power to "formulate rules and regulations . . . which they may find necessary to carry out the provisions of this Compact." Compact, *supra*, art. III(E). Under this provision, the

Commission presumably could establish a specific procedure for enforcing Article V(A) that does or does not require any notice. To date, however, the Commission has not enacted any rules or regulations for the enforcement of Article V(A). 21 Tr. 5068:5-7 (Sue Lowry).

I nonetheless conclude that Article V(A) requires that Montana provide notice to Wyoming of any pre-1950 shortage, unless the Commission or the parties agree to an alternative procedure. Both the language of the Compact and the parties' historical practice support this conclusion. Wyoming therefore should not generally be liable for any post-1950 uses that occur prior to such notice. The notice requirement, however, should be applied flexibly, with an eye to its purposes rather than as an exercise in formalism. The notice need not follow any specific form so long as it adequately alerts Wyoming to Montana's shortage, and exceptions to the notice requirement may sometimes apply.

a) The language of the Compact.

Article V(A) of the Compact provides that pre-1950 rights shall be governed by the "doctrine of appropriation," which typically requires senior appropriators to notify junior appropriators when they are short of water if they wish junior appropriators to reduce their diversions – an action known as "calling the river." See A. Dan Tarlock, *Law of Water Rights and Resources* § 5:33, at 5-61 (2008) ("senior right must be enforced by a call against a junior"). "Calls" ensure that water is not wasted and are therefore central to the prior appropriation doctrine. Absent a call, a senior appropriator cannot maintain an action for damages against a junior appropriator for failing to reduce his or her diversion. *Worley v. United States*

Borax & Chemical Corp., 428 P.2d 651, 654-55 (N.M. 1967).

Upstream junior appropriators often have no way to know when they need to reduce diversions to protect the rights of downstream seniors, unless the seniors tell them. The impact of junior diversions on downstream senior rights can depend on overall stream flow. At any particular point in time, moreover, downstream seniors may not need all the water to which they have a right. Because of these uncertainties, western states generally require senior appropriators who are short of water to give notice of that fact by calling the river. Before the river is called, juniors may continue to divert their full water rights without concern for liability; once the river is called, however, juniors must reduce their diversions. Both Montana and Wyoming follow the general rule requiring senior appropriators to call the river when they are short of water.

Wyoming therefore is not liable under Article V(A) in years when Montana did not notify Wyoming that Montana was short of water for its pre-1950 rights. *Worley v. United States Borax & Chemical Corp.*, *supra*, is directly on point. The facts in *Worley* were undisputed. The defendants, who were upstream junior appropriators, diverted water, preventing enough water from reaching Worley to satisfy his senior water right. According to the New Mexico Supreme Court, the defendants "knew or should have known they were taking water that [Worley] had a right to divert for the use on which the senior right was based." *Id.* at 653. Worley, however, had never demanded more water or notified the defendants that he needed more water. As a result, the New Mexico Supreme Court held that Worley could not maintain

an action for damages. If a downstream appropriator needs water “and if the water is not reaching his diversion point, *he must make his needs known.*” *Id.* at 654 (emphasis added). Upstream junior appropriators cannot be held liable for a downstream senior’s “shortage of water unless [the senior appropriator has] demanded that water, to the extent of his needs and within his senior appropriation, be allowed to reach his diversion point. The absence of such a demand [is] decisive.” *Id.* at 654-55.

As the New Mexico Supreme Court emphasized in *Worley*, the call requirement is not an idle mandate, but serves the important function of avoiding the possibility that water will be wasted. Because water is scarce in the West, senior appropriators are not entitled to water that they do not need. *See id.* at 654. Article V(A) incorporates this principle by protecting only appropriative rights that are put to “beneficial use.” If juniors had to let water flow past their headgates even when downstream senior appropriators do not need the water, water could be wasted. Water that the junior could have used would instead travel unused downstream. Requiring the downstream senior to provide notice when the senior needs water therefore avoids the “possibility of wasting water.” *Id.* *See also City of Aurora v. Simpson*, 105 P.3d 595, 607 (Colo. 2005) (a junior appropriator is not liable for water diversion where “senior water rights do not have a call on the river” and the diversion therefore “would not cause injury”).

Montana’s lawsuit against Wyoming demonstrates the purpose and wisdom of the “call” requirement. When the Compact was signed, Montana did not have accurate and detailed information on all of its pre-1950 appropriative rights and the extent to which

those rights were still in use. Moreover, the parties understood that this would be the case for at least some time still when they entered into the Compact. As late as 2001, a key Montana water official wrote that Montana did not yet have a complete “handle on pre-1950 water” on the Tongue River. 12 Tr. 2653:7-15 (Richard Moy); Ex. W-64 (2001 written communication from Moy). While the 1914 Miles City Decree and a more recent water resource survey provided substantial information regarding pre-1950 rights, the Montana Water Court had not completed its general adjudication of Tongue River water rights (and still has not). 12 Tr. 2654:5-23. In short, there was no complete and authoritative list and quantification of pre-1950 rights.

Compounding the problem, Montana water users do not make full use of their pre-1950 water rights throughout the year. Without any call from Montana, Wyoming would have had to guess how much water Montana users needed at any point in time. For example, the T&Y Canal, which is the largest user of Tongue River water in Montana, varies its diversion throughout the irrigation season—typically using a higher percentage of its water right in the peak summer months of July and August than in June, and much more in those months than in May and September. Ex. M-5, p. 10 (Book expert report). In his expert report, Montana’s principal water expert, Dale Book, was unable to directly determine how much water pre-1950 water-right holders in Montana needed at any particular point. He therefore had to

estimate demand, using assumptions that were challenged by Wyoming's experts. *Id.* at 10-11.⁷

In these circumstances, notice from Montana that it needed more water for its pre-1950 rights would often have been the only way that Wyoming could have determined that it needed to deliver more water to the Stateline for Montana. Requiring Wyoming to have guessed at the amount of water required at the Stateline would have invited substantial and unneeded waste. Notice, in short, ensured that Wyoming did not have to reduce its diversions when Montana did not need additional water. Calls avoided waste without undermining Montana's Article V(A) rights.

As this case illustrates, the call requirement also helps avoid and mitigate injury. In most if not all the years in question, Montana was in the best position to determine and know whether it was receiving enough water to enjoy its pre-1950 rights. If Montana knew that it was not receiving adequate water, notifying Wyoming would have given Wyoming the opportunity to provide additional water and thus reduce or avoid any injury.

Montana argues that two early 20th century cases show that notice is not a prerequisite for liability. See *Tucker v. Missoula Light & Ry. Co.*, 250 P. 11 (Mont. 1926); *Van Buskirk v. Red Buttes Land & Live Stock Co.*, 156 P. 1122 (Wyo. 1916). Neither case, however, stands for this proposition. Although the defendant in *Tucker* alleged that the plaintiff failed to "notify

⁷ Mr. Book estimated that demand in July and August would be 100 percent of decreed rights, but "scaled down [demand] to account for relatively lower rates of crop demand in the other months of May, June and [September]." Ex. M-5, p. 10.

defendant that he required water for irrigation,” the record showed that the plaintiff “went repeatedly to the agents and the manager of defendant company, and requested and demanded water for the irrigation of his crops, but each time was refused.” 250 P. at 13, 16. The issue in *Tucker* was not whether a call was necessary, but whether the plaintiff had to seek appointment of a water master pursuant to a statutory enforcement process. *Id.* at 13-14. The Montana Supreme Court found that the statutory remedy was not exclusive and that the plaintiff could pursue traditional common-law relief. *Id.* at 14.

Van Buskirk also says nothing about whether a call is required under the appropriation doctrine. As in *Tucker*, the question was whether the plaintiff’s failure to ask for statutory regulation by a water commissioner precluded pursuing common-law relief. 156 P. at 1125. The Wyoming Supreme Court found that the statute did not provide the exclusive remedy for interferences with an appropriative right, and that the plaintiff could pursue common-law relief. *Id.* at 1125-26. *Van Buskirk* does not state whether the plaintiff notified the defendant of its need for water, since this was not an issue.

b) Previous practice of the States.

The previous practice of Montana and Wyoming further supports the conclusion that Article V(A) requires Montana to provide notice. As the Court has recently observed, a “‘part[y]’s course of performance under the Compact is highly significant’ evidence of its understanding of the compact’s terms.” *Tarrant Regional Water Dist. v. Herrmann, supra*, 133 S. Ct. at 2135, quoting *Alabama v. North Carolina*, 560 U.S. 330, 346 (2010). See also *United States v. Stuart*, 489 U.S. 353, 369 (1989) (“practice of treaty signatories

counts as evidence of the treaty's proper interpretation"); *O'Connor v. United States*, 479 U.S. 27, 33 (1986) ("course of conduct of parties to any international agreement, like the course of conduct of parties to a contract, is evidence of its meaning"). Tellingly, Montana and Wyoming previously agreed that Montana should provide notice to Wyoming when Montana is short of pre-1950 water, and Montana provided such notice to Wyoming in the two most recent years when water flows were inadequate.

According to the 1982 annual report of the Yellowstone River Compact Commission, Montana "voiced its concern" at the Commission's 1982 meeting 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. J-32, p. IV. The report, which was signed by the Compact commissioners for both Montana and Wyoming, goes on to note that "Montana, in turn, *must notify Wyoming* when it is not able to obtain its pre-1950 water." *Id.* (emphasis added). See also 5 Tr. 1080:19-25 (Gary Fritz) (testimony of Montana commissioner confirming the discussion in the report). The 1983 report of the Compact Commission, which again was signed by the Compact commissioners of both states, similarly reports Montana's concerns regarding its pre-1950 water rights and states that Montana "must notify Wyoming when it is not able to obtain its pre-1950 water." Ex. J-33, p. IV.⁸

⁸ Wyoming suggests that Montana should not be permitted to argue that notice is unnecessary under the Compact when it agreed in the early 1980s to provide notice to Wyoming. Wyoming's Reply Brief in Support of its Motion for Partial Summary Judgment, Sept. 28, 2011, Docket No. 101, at 9. Because the Compact clearly incorporates a notice requirement

In the two most recent years in which Montana faced insufficient water, Montana provided such notice to Wyoming. When Montana believed that it was not receiving sufficient water to satisfy its “developed and protected pre-1950 appropriative rights” in 2004, Jack Stults, who was both the Administrator of the Montana Water Resources Division and Montana’s Compact Commissioner, furnished the Wyoming State Engineer with both oral and written notice. *See* Ex. J-64; pp. 88-97 *infra*. The written notice specifically refers to the notice as a “call, under the terms of the compact”:

As Compact Commissioner for Montana, and as directed by Governor Martz, I am notifying you that this letter constitutes Montana’s call, under the terms of the compact, for our valid and protected pre-1950 water rights on the Tongue River and Powder Rivers. We are calling for all pre-1950 junior water in Wyoming to satisfy our senior pre-1950 water on the Tongue and Powder Rivers.

Id., p. 2. As discussed later, Montana also orally notified Wyoming earlier in the year of its shortage. *See* pp. 90-92 *infra*.

When Montana became concerned about Stateline deliveries in 2006, Mr. Stults again notified the Wyoming State Engineer in writing. Ex. J-68. Unlike the 2004 letter, however, the 2006 letter—perhaps anticipating possible litigation in this Court—denied that any notification was needed:

for the reasons discussed in the text, the Court need not decide whether Montana is estopped from arguing that no notice is required.

Although this letter is not required by the Compact, as Compact Commissioner for Montana, and as directed by Governor Schweitzer, this letter constitutes Montana's call and demand, under the terms of the Compact, for water to satisfy our valid and protected pre-1950 water rights on the Tongue and Powder Rivers.

Id., p. 2.

Montana argues that a notice requirement would improperly add an unwritten provision to the Compact, noting the Court's reluctance "to read absent terms into an interstate compact." *Alabama v. North Carolina, supra*, 560 U.S. at 352. As discussed, however, a notice requirement is not an enlargement of the Compact, but inherent in Article V(A)'s incorporation of prior appropriation law. Article V(A) provides not for the unfettered enjoyment of pre-1950 rights, but for their enjoyment "in accordance with the laws governing the . . . use of water under the doctrine of appropriation." Compact, art. V(A).⁹

Montana also argues that any notice requirement would be unprecedented. As discussed earlier, the Supreme Court has held states liable for violating other interstate water compacts without notice and even where states could not determine their exact obligations. *See, e.g., Kansas v. Colorado*, 514 U.S. 673 (1995); *Texas v. New Mexico, supra*, 482 U.S. at 129. However, none of those compacts incorporated the

⁹ As noted at pages 48-49, the Compact Commission appears to have the authority to establish a procedure for enforcing Article V(A) without notice. To date, however, the Compact Commission has not exercised that power, leaving the prior-appropriation requirement in place.

doctrine of appropriation, nor was there a recognized practice of providing notice. The key provisions of those compacts, moreover, either specified set amounts of water to be delivered to the downstream state or guaranteed historical flows.¹⁰ As a result, the upstream state could determine when it was violating the compact without knowing whether the downstream state was receiving enough water to meet particular needs, so a notice requirement was unnecessary. Here, by contrast, the Compact protects the continued enjoyment of pre-1950 rights, and as explained above, some form of notice is generally necessary for Wyoming to know when Montana is not receiving enough water to meet its pre-1950 needs.

c) Notice does not need to take any particular form or contain any particular information other than Montana's water shortage.

Wyoming argues that, under the Compact, Montana must provide not only notice but also notice in a specific form and incorporating particular substantive elements. At various points in time, for example, Wyoming has argued that the notice must be in writing,¹¹ that the notice must come from Montana's

¹⁰ In *Kansas v. Colorado*, for example, the Arkansas River Compact barred Colorado from materially depleting flows in "usable quantity or availability." Arkansas River Compact, 63 Stat. 145, art. IV-D (1949). In *Texas v. New Mexico*, the Pecos River Compact guaranteed Texas "a quantity of water equivalent to that available to Texas under the 1947 condition." Pecos River Compact, S. Doc. No. 109, 81st Congress, 1st Sess., art. III(a) (1949).

¹¹ Wyoming's Brief in Support of its Motion for Partial Summary Judgment, Sept. 12, 2011, Docket No. 88, at 25-26.

compact commissioner,¹² and that the notice must include an explicit request or demand that Wyoming reduce its water use.¹³ Yet nothing in the Compact or the general law of prior appropriation mandates that the notice take any particular form or include any information other than Montana's need for additional water to ensure that pre-1950 rights are met. Different states follow different procedures for making calls on a river, and nothing in the Compact favors one form of call over another.

While Wyoming argues that notice must be in writing, there is no reason that oral notice cannot be adequate under the Compact. Wyoming's regulations require that calls be in writing, using either the state form or a letter containing "essentially the same information." Wyo. State Bd. of Control, Regulations & Instructions, ch. V, § 24. Yet Wyoming's hydrographers have often recognized non-written calls. *See*, e.g., 8 Tr. 1705:2-21 (Michael Whitaker); 9 Tr. 2007:17-23 (Carmine Loguidice); 10 Tr. 2232:16-18 (Pat Boyd); 11 Tr. 2333:9-14 (David Schroeder); 18 Tr. 4227:16-22 (Gordon Fassett); 22 Tr. 5312:20-25 (Patrick Tyrrell). In Montana, calls have typically been informal and often oral, and there is no legislative or administrative requirement that calls be in writing. *See* 2 Tr. 461:5-25 (Timothy Davis) (calls could be oral and informal prior to 1973); 3 Tr. 510:23-511:5 (Davis) (calls are "typically made informally" and can involve water

¹² *Id.* at 24-25.

¹³ *Id.* at 27. From the outset, Wyoming has conceded that the notice does not need to "contain complete information about every aspect of the shortage being suffered by pre-1950 users in Montana." *Id.* at 26

users “simply talking to each other”).¹⁴ Montana would be well advised to put all calls in writing, for ease and clarity of proof if Wyoming fails to respond, but the Compact does not require written notice.

There also is nothing in the Compact that requires that notice include an explicit demand or request. As Wyoming notes, courts sometimes say that seniors must “demand” additional water. *See, e.g., Worley, supra*, 428 P.2d at 654-655 (junior cannot be held liable for diverting water when the senior appropriator has not “demanded” more water). According to the witnesses and exhibits in this case, however, Wyoming water commissioners often regulate junior appropriators when seniors tell them they need more water or even when they spot a shortage themselves. *See, e.g.,* 8 Tr. 1705:2-7 (Michael Whitaker) (would verify if short of water); 9 Tr. 1967:23-1968:9 (Carmine Loguidice) (seniors told him they needed some water in their ditch); 10 Tr. 2204:23-2205:10 (William Knapp) (will see whether or not appropriators want more water); *id.* at 2232:19-2233:4 (Pat Boyd) (just need to make it clear that you need water). *See also* 9 Tr. 2009:15-20 (Loguidice) (will regulate stream on his own without a call if shortages are occurring); 10 Tr. 2233:5-11 (Boyd) (will sometimes regulate on his own when streams are dropping); 11

¹⁴ As Wyoming notes, Montana’s guidelines on water-right disputes provide that, if a water user seeks to protect its water right either administratively or judicially, the water user should contact the offending party to make a “call” for his water, “document the call,” and “file a written complaint.” Ex. M-552, p. 2 (Montana guidelines); *see* 3 Tr. 554:9-12 (Timothy Davis). Nothing in these informal guidelines, however, provides that the call itself be in writing, only that the call be documented.

Tr. 2333:2-8 (David Schroeder) (has acted on own in response to shortages).

Because states do not have uniform call standards, the purpose of the call requirement should ultimately dictate the minimum necessary content of a call under the Compact. As discussed earlier, that purpose is to notify the junior appropriator—here Wyoming—that the senior appropriator—Montana—needs additional water to meet its senior rights. To satisfy Article V(A) of the Compact, therefore, any call from Montana must place Wyoming on clear notice that Montana believes it needs additional water to satisfy its pre-1950 rights. At that point, Wyoming continues to use water for post-1950 uses at the risk of violating Article V(A) by preventing the continued enjoyment of pre-1950 rights in Montana.

Similarly, neither the Compact nor the general doctrine of appropriation requires that notice be delivered by or to any particular individual. To ensure that Wyoming is placed on effective notice, Montana should generally furnish the notice to those Wyoming officials with authority to implement the Yellowstone Compact. In most cases, that presumably would be the Governor, the State Engineer, or the State's Compact Commissioner. Notice to other individuals, however, should be sufficient when the information makes its way to an official with such authority or would reasonably be expected to do so.

Setting any more specific standards for the form or substance of the required notice would threaten to add provisions to the Compact that the state parties never contemplated and to which they did not agree. As noted earlier, the Court has been reluctant to “read absent terms into an interstate compact given the federalism and separation-of-powers concerns that

would arise were we to rewrite an agreement among sovereign States, to which the political branches consented.” *Alabama v. North Carolina, supra*, 560 U.S. at 352. Particularly given the differences in the notices required by Montana, Wyoming, and other prior appropriation states, the general incorporation of the “doctrine of appropriation” in Article V(A) should not be read to require any specific form of notice or any substantive provisions not needed to ensure that Wyoming understands that Montana needs more water for its pre-1950 rights. Article V(A) guarantees Montana the continued enjoyment of its pre-1950 rights, and that guarantee should not be constrained by details not inherent in appropriation doctrine.

Wyoming suggests that specific standards are needed to make it clear when Wyoming must reduce post-1950 uses. In Wyoming’s view, the Court can avoid unnecessary future disputes by requiring written calls with clear demands for more water. Wyoming, however, overstates the challenges of a more flexible standard. If Wyoming has any question whether Montana is notifying Wyoming that it needs more water under Article V(A) of the Compact, Wyoming can seek clarification. In the future, moreover, Montana will have every incentive to be as clear as possible.

d) The date of notice is critical in determining Wyoming’s liability, if any.

In determining Wyoming’s liability, if any, under the Compact, the date that Montana provides notice is critical. Under prior appropriation law, a call triggers a junior appropriator’s obligation to cease or reduce her diversion. Before the notice, the junior appropriator is free to continue to divert water

because there is no evidence that the senior needs the water. *See, e.g., City of Aurora v. Simpson, supra*, 105 P.3d at 607 (no liability where “senior rights do not have a call on the river”); *Worley v. U.S. Borax & Chemical Corp., supra*, 428 P.2d at 654 (junior cannot be liable absent a call). In the same way, Wyoming is free to make use of water from the Tongue River for post-1950 rights pursuant to Article V(B) of the Compact until it receives notice from Montana. The date of any notice is thus essential in determining whether Wyoming diverted water for post-1950 use in violation of Article V(A) and, if it did, by what amount.

For this reason, evidence that Montana provided notice in a particular year but without any indication of when the notice was provided during the year cannot support a finding of liability. Without any evidence of the notice’s date, it is impossible to know whether any post-1950 use or storage in Wyoming was illegal under the Compact. For example, notice in October, after the irrigation season has ended, does not entitle Montana to damages for post-1950 uses or storage during the irrigation season. Even evidence that notice was provided at some unspecified time during the irrigation season cannot establish liability if post-1950 uses and storage stopped at some point in the middle of the irrigation season.¹⁵

¹⁵ Montana suggests it did not understand the importance of pinpointing at trial when Montana notified Wyoming. However, in ruling on Wyoming’s earlier motion for partial summary judgment on the notice issue, I specifically emphasized the importance of knowing the dates of any notices and ordered Montana to provide additional information. As I wrote, “Wyoming should not suffer where Montana is unable to provide more specific information regarding the dates of conversations. If an official cannot recall when he provided notice in a given year, the assumption will be that the notice was given at the end of the

In ruling on Wyoming's motion for partial summary judgment, I suggested that Wyoming's liability might extend to dates before notice if the shortages began earlier and Montana acted diligently in notifying Wyoming of those shortages. See Memorandum Opinion of the Special Master on Wyoming's Motion for Partial Summary Judgment (Notice Requirement for Damages), Dec. 20, 2011, Docket No. 120, at 8. Montana might not immediately know when post-1950 Wyoming uses are leading to pre-1950 shortages in Montana. In such cases, all that reasonably can be asked of Montana is that it notify Wyoming as soon as possible. Because the Compact protects Montana's pre-1950 rights and Wyoming would enjoy the benefit of any water that it uses prior to notice, it would seem reasonable to hold Wyoming liable for the period of time that it reasonably takes Montana to investigate a shortage and notify Wyoming.¹⁶ However, as discussed below, Montana has failed to prove that this exception should apply to any of the years in question. See pp. 93, 96-97 *infra*.

year, effectively precluding Montana from seeking damages for that year." Memorandum Opinion of the Special Master on Wyoming's Motion for Partial Summary Judgment (Notice Requirement for Damages), Sept. 28, 2012, Docket No. 214, at 34.

¹⁶ As I noted, Wyoming might even be liable from the start of a water year if the shortage begins then and Montana acts diligently in notifying Wyoming. Memorandum of the Special Master on Wyoming's Motion for Partial Summary Judgment (Notice Requirement for Damages), Dec. 20, 2011, Docket No. 120, at 8. The key questions are when the shortage begins and how promptly Montana notifies Wyoming of that shortage.

e) Exceptions to the notice requirement.

In ruling on Wyoming's motion for partial summary judgment, I also suggested that Montana need not have provided notice in any year when notice would have been "futile" because Wyoming had made it clear that it would not reduce its post-1950 uses in response to a call. The concept of futility seems particularly applicable to the prior appropriation's call requirement, although no case appears to have addressed the issue. Futility is an established exception to the requirement of exhaustion of administrative remedies. *See, e.g., McCarty v. Madigan*, 503 U.S. 140, 144-149 (1992) (exhaustion of administrative remedies is unnecessary "where the administrative body is shown to be biased or has otherwise predetermined the issue before it"). And the requirement that administrative remedies be exhausted prior to seeking judicial relief is closely akin to the requirement that a call be made before seeking judicial relief under the prior appropriation doctrine. If Wyoming is unwilling to reduce its post-1950 uses, moreover, the notice requirement does not serve its normal function of avoiding waste. Requiring Montana to provide formal notice in that setting would seem an exercise in pure formalism.

Montana argues that Wyoming always denied that it had an obligation under Article V(A), that notice therefore was always futile, and that it therefore should be excused from the notice requirement. Mr. Moy, who worked closely with Wyoming officials on Compact issues, testified that Wyoming consistently took the position that it had no obligation to regulate post-1950 rights. *See, e.g.,* 12 Tr. 2631:12-21 ("That was Wyoming's position from day one"), 2553:21-2554:11 (describing Wyoming's position in the 1980s),

2557:2-4 (“Wyoming’s position has never changed”). At the same time, Wyoming never flatly closed the door on regulating its post-1950 rights in response to a call, at least prior to its response to Montana’s 2004 call letter. Telephone notes indicate that, when Montana asked Wyoming in 1981 whether it would be willing to regulate post-1950 uses in response to pre-1950 shortages in Montana, Wyoming said that they did not think they would, but suggested further discussion. Ex. M-136, p. WY048191. As discussed earlier, the 1982 Annual Report of the Compact Commission also suggests that the question of post-1950 regulation was still open and that Montana would provide notice if it needed water for pre-1950 uses. According to the report, “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. Montana must, in turn, notify Wyoming when it is not able to obtain its pre-1950 water.” Ex. J-32, p. IV. *See also* Ex. J-33, p. IV (1983 Annual Report) (“Montana, in turn, must notify Wyoming”). For these reasons, Montana has failed to prove that it was futile prior to Wyoming’s May 24, 2004 call letter to notify Wyoming of shortages, as it had agreed to do in the early 1980s. Whether Montana needed to provide notice after May 24, 2004 is discussed later at pages 94-96.

2. Factual findings.

Montana originally contended that it provided adequate notice in 15 years: 1981-1982, 1985, 1987-1989, 1992, 1994, 1998, 2000-2004, and 2006. The flow of water in the Tongue River at the Stateline between Montana and Wyoming was below average in all of these years, ranging from less than 100,000 af to almost 290,000 af (compared to an average flow of over

310,000 af). Ex. M-5, p. 26 (Book expert report). Wyoming has argued throughout this phase of the case that Montana provided notice only in 2004 and 2006, when Montana sent written notices to the Wyoming State Engineer. Wyoming also asserts that Montana's 2004 notice was invalid because it asked for the wrong relief.

Wyoming sought partial summary judgment for all years except 2004 and 2006. See Wyoming's Motion for Partial Summary Judgment, Sept. 12, 2011, Docket No. 87; Wyoming's Renewed Motion for Partial Summary Judgment, June 15, 2012, Docket No. 179. As explained below, I concluded at that time that Wyoming was entitled to summary judgment for six years: 1981, 1982, 1985, 1992, 1994, and 1998. In none of those years did Montana present evidence sufficient to establish a genuine issue as to whether it had provided notice to Wyoming. However, because evidence subsequently produced by Wyoming indicated that Montana might have provided notice in 1981, I permitted Montana to present evidence at trial regarding any notice provided in that and surrounding years.

Based on the evidence presented at trial, I find that Montana provided sufficient notice in 1981 that it needed more water for the Tongue River Reservoir. However, because Montana subsequently received sufficient water to fill the Reservoir in 1981, there is no liability for that year. Montana also provided sufficient notice in 2004 and 2006 and therefore is entitled to pursue its action under Article V(A) for both of those years. Montana provided notice in yet other years, but the evidence at trial was not sufficient to determine the dates of any other notices and therefore

to support an action under Article V(A) for those other years.

a) Wyoming is entitled to summary judgment for 1982, 1985, 1992, 1994, and 1998.

In deciding whether Wyoming was entitled to summary judgment for any years, I read the record in the light most favorable to Montana. *See United States v. Diebold, Inc.*, 369 U.S. 654, 655 (1962) (record should be read in light most favorable to party opposing summary judgment). Where the evidence for a particular year was “susceptible of different interpretations or inferences” (*Hunt v. Cromartie*, 526 U.S. 541, 553 (1999)) or where “reasonable minds could differ as to the import of the evidence” (*Anderson v. Liberty Lobby, Inc.*, *supra*, 477 U.S. at 250), I permitted Montana to go to trial. As noted earlier, I also allowed Montana six months to conduct relevant discovery before ruling on Wyoming’s motion for partial summary judgment. *See pp. 27-28 supra*. And I permitted Montana to supplement its evidence to clarify ambiguities that I found in reviewing the record.

A moving party is entitled to summary judgment if it “shows that there is no genuine dispute as to any material fact” and “is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a). In support of its motion, Wyoming presented affidavits from all of its former Yellowstone River Compact Commissioners still living. These commissioners were able to speak to the years 1965 to 1974 and 1984 to 2006. All of the commissioners stated that they never received a “call, claim, demand, or other notification, either orally or in writing, from a Montana Commissioner or an acting commissioner to the Yellowstone River Compact, or

anyone acting under their authority.” Each also noted that, if a call had been made to “any agent of the state with authority over the regulation or adjudication of any waters of the State of Wyoming,” the call would have reached them “through the chain of command and proper protocols.” *See, e.g.*, Affidavit of Gordon A. Fassett, Sept. 9, 2011, Docket No. 90, ¶¶ 2-5 (Commissioner from 1987-2000, Deputy State Engineer from 1984-1987); Affidavit of Patrick T. Tyrrell, Sept. 12, 2011, Docket No. 94, ¶¶ 4-5 (Commissioner since 2011). For the years about which Wyoming’s living commissioners had no knowledge, Wyoming submitted the annual reports of the Compact Commission, none of which makes any mention of a call or notification by Montana.

While Montana was able to establish a genuine dispute as to whether it provided notice in many of the years at issue, it failed to do so for 1981, 1982, 1985, 1992, 1994, and 1998. While Montana presented broad statements by some witnesses suggesting that notice *might* have been provided in these years, none of the statements was sufficiently specific and certain to justify denial of summary judgment. The “mere possibility that a factual dispute may exist, without more, is not sufficient to overcome a convincing case by the moving party.” *DeFabio v. East Hampton Union Free School Dist.*, 623 F.3d 71, 81 (2d Cir. 2010), quoting *Quinn v. Syracuse Model Neighborhood Corp.*, 613 F.2d 438, 445 (2d Cir. 1980). *See Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587 (1986) (“must do more than simply show that there is some metaphysical doubt as to the material facts”).

(1) 1981, 1982, and 1985

Montana presented no specific evidence of notice in 1981, 1982, and 1985. In a declaration, Richard Moy,

who was Montana's Water Management Bureau Chief from 1981 to 2008, stated that Montana "experienced shortages" during the time that he was Bureau Chief, that Montana believed these shortages were "caused by Wyoming's overuse under the Compact," and that Montana representatives complained to Wyoming officials "in other years" than just 2004 and 2006. Declaration of Richard M. Moy, Sept. 22, 2011, Docket No. 100, ¶ 4 ("Moy Declaration"). However, Mr. Moy did not identify any specific years in which Montana complained.

In a subsequent deposition, Mr. Moy testified that he "thought" that 1981, 1982, and 1985 were "drought years" in which "Montana pre-'50 experience[d] shortages." Deposition of Richard Moy, April 18, 2012, p. 50:1-13 ("Moy Deposition"). At a later point in the same deposition, Mr. Moy, who was with the Montana Water Resources Division for almost 30 years, stated broadly that Montana complained "every time there was a drought year or the flows were very low on the Tongue and the Powder Rivers." *Id.* at 92:13-15. Montana argued that this statement, combined with Mr. Moy's earlier testimony that he "thought" 1981, 1982, and 1985 were drought years, raised a genuine issue of fact. By itself, however, such a broad conclusory statement is insufficient. In neither his declaration nor deposition did Mr. Moy ever identify a specific conversation in 1981, 1982, or 1985 during which he notified Wyoming officials that Montana needed water for its pre-1950 rights.

Mr. Moy, moreover, testified that Montana's complaints to Wyoming generally took place at the meetings of the Yellowstone River Compact Commission after the irrigation season was over and therefore after Wyoming could have taken any action

to increase the flow of water to Montana. According to Mr. Moy, none of the complaints was made “at a time when, if [Wyoming] had complied with it, it was the irrigation season ... and water would now come” (because most Commission meetings “were not tied to the irrigation season”). *Id.* at 106:7-20.¹⁷ Although Mr. Moy testified vaguely that “I *think* there were verbal calls made during the irrigation season” (*id.* at 226:5-6 (emphasis added)), Mr. Moy did not identify any particular years in which he believed such verbal calls were made, to whom they were made, or when during the irrigation season they were made.

Lujan v. National Wildlife Federation, 497 U.S. 871 (1990), is instructive on the inadequacy of Montana’s evidence. In support of the plaintiff’s standing to challenge reclassification of 4,500 acres of public lands, the plaintiff presented an affidavit of one of its members stating that she used lands “in the vicinity.” *Id.* at 886. The Court of Appeals held that this was sufficient to withstand summary judgment because the affidavit was at a minimum ambiguous regarding the specific lands used and that ambiguity should be resolved in favor of the plaintiff. *Id.* at 889. This Court disagreed, emphasizing the importance of specificity:

In ruling upon a Rule 56 motion, “a District Court must resolve any factual issues of controversy in favor of the non-moving party” only in the sense that, where the facts specifically averred by that party contradict

¹⁷ The annual Compact Commission meetings for 1981, 1982, and 1985 were held on December 21, November 10, and November 26, respectively, all long after the irrigation season. See J-31, p. II (1981 annual Commission report); J-32, p. II (1982 annual Commission report); J-35, p. II (1985 annual Commission report).

facts specifically averred by the movant, the motion must be denied. *That is a world apart from “assuming” that general averments embrace the “specific facts” needed to sustain the complaint.*

Id. at 888 (emphasis added). Rule 56 is “assuredly not satisfied by averments which state only that one of respondent’s members uses unspecified portions of an immense tract of territory.” *Id.* at 889. As described, Montana’s averments for 1981, 1982, and 1985 were equally conclusory and unspecific.

(2) 1992, 1994, and 1998

Montana also failed to present facts showing that it provided notice to Wyoming in 1992, 1994, and 1998. The only evidence that Montana presented notice in these years was the deposition testimony of Keith Kerbel, the regional manager for the Billings Office of the Montana DNRC. In this position, Mr. Kerbel was responsible for administering the Tongue River in Montana.

In his deposition, Mr. Kerbel never stated that he notified Wyoming of shortages in Montana in any particular year in the 1990s. Instead, Mr. Kerbel testified that he had notified Wyoming in various unspecified years. According to Mr. Kerbel, he “had conversations historically about shortages that occurred in the late ‘80s and the early 2000s. *And there was a couple years in 1990s, but I don’t remember the years.*” Deposition of Keith Kerbel, April 23, 2012, p. 142:11-15 (emphasis added). All of Mr. Kerbel’s references to the 1990s were vague and mainly emphasized that water was less of an issue in that decade because of generally higher precipitation. For example, Mr. Kerbel testified that he and Mike

Whitaker, a Wyoming official, “had conversations in the ‘80s. We had less in the ‘90s because we had better water years in the ‘90s. And then we had several discussions in the drought years of the 2000s.” *Id.* at 278:22-25. According to Mr. Kerbel, his and Mike Whitaker’s conversations were “[m]ostly ‘80s and 2000s.” *Id.* at 279:4. Again, there is nothing in Mr. Kerbel’s deposition specifically stating that Montana provided notice of shortages to Wyoming in 1992, 1994, or 1998. Nowhere, moreover, is there any testimony of when, where, or to whom he provided notice in those years. Once again, Montana’s evidence was insufficient to avoid summary judgment.

b) Trial evidence.

Whether Montana provided notice to Wyoming in the remaining years at issue was a major focus at trial. As explained below, Montana water officials adamantly insisted that they often provided notice to their counterparts in these years. Wyoming water officials testified with equal adamancy that they never received a demand or call for water except in 2004 and 2006, when they received written letters. *See, e.g.*, 21 Tr. 4889:6-10, 4936:4-20 (Sue Lowry). And Wyoming contends that the 2004 notice was ineffective because it asked for the wrong relief.

The apparently conflicting testimony of Montana and Wyoming officials may be more the result of differing views on what constitutes an adequate notice than of differing memories. Montana officials testified that they frequently used conversations and meetings with Wyoming officials in the years at issue to complain about water shortages and post-1950 uses in Wyoming. To Wyoming, however, such conversations were not “calls” unless they included a formal demand for more water. As one Wyoming official testified, it

was not sufficient that Montana inform Wyoming that it was short of water; "Montana had to ask us to do something." 21 Tr. 5067:5-9 (Sue Lowry). Wyoming officials acknowledged that they sometimes became aware of Montana shortages, but they never considered any of the oral communications with Montana to be a call.

Having listened to the testimony of both sides, I am convinced that Montana officials shared concerns about water shortages with Wyoming officials at various points prior to 2004. These informal communications often occurred at meetings after the irrigation season was over and therefore when it was too late for Wyoming to reduce its post-1950 diversions and storage. But some almost certainly took place during the irrigation season when Wyoming possibly could have provided more water to Montana by regulating its post-1950 uses. I also am convinced that, as a result of these conversations, Wyoming knew, or should have known, at the time of the conversations that Montana needed additional water. These conversations were thus sufficient to trigger Wyoming's obligations under the Compact. As discussed earlier, the Compact does not require that notice include a specific demand or request for water.

Because of the lapse of time, however, memories of these conversations were generally vague at best by the time of trial. No witnesses could be specific regarding dates. Lacking any documentary record for most of the years, it is impossible to know when the conversations took place in those years and therefore whether Wyoming used or stored post-1950 water after receiving notice. As a consequence, it is impossible in most years to determine whether

Wyoming violated Article V(A) of the Compact or to quantify that violation.

Three years are exceptions. In 1981, records establish that Montana's chief water official informed his Wyoming counterpart early in the irrigation season that the Tongue River Reservoir was short of water and asked whether Wyoming could provide additional water. However, as explained below, the Reservoir subsequently filled. Although Montana provided adequate notice at a time when Wyoming probably could have reduced its post-1950 uses, no injury or liability resulted.

The other exceptions are 2004 and 2006. In both years, Montana provided written notice to Wyoming. Although Montana sought the wrong relief in its 2004 letter, the letter was sufficient to place Wyoming on notice that Montana was not receiving enough water to enjoy its pre-1950 rights. Both the 2004 and 2006 letters therefore met the Compact's notice requirement. In 2004, moreover, Wyoming officials received oral notice prior to the written letter.

(1) 1981

As noted earlier, I originally concluded that Wyoming was entitled to summary judgment for 1981. However, after my summary judgment ruling but before trial, Wyoming discovered a file with handwritten notes indicating that Gary Fritz, who was Administrator of Montana's Water Resources Division from 1979 through 1996, might have provided notice to Wyoming in 1981. Pretrial Hearing Tr. 37:15-39:16. In light of the new evidence and the possibility that it might refresh Mr. Fritz's memory of any notices provided in 1981 and surrounding years, I permitted Mr. Fritz to testify at trial regarding any notices he

could recall in those years. I also reserved the right to reverse my summary judgment ruling for any year in which Mr. Fritz testified that he provided notice. *Id.* at 47:12-48:4.

The evidence at trial establishes that, on April 30, 1981, Mr. Fritz notified George Christopulos, Wyoming's then State Engineer, that Montana was concerned that the Tongue River Reservoir would not fill and inquired whether Wyoming might regulate post-1950 rights in order to provide Montana with more water under the Compact. According to an internal note to Mr. Christopulos, Mr. Fritz had called his office, stated that the Tongue River Reservoir was low in storage "due to a safety problem," and inquired whether Wyoming could regulate "the junior to 1950 rights ... to provide water to supply" the Reservoir. Ex. M-136, at WY048197. Mr. Fritz testified at trial that the note was consistent with his memory of conversations that he had with Mr. Christopulos at the time. 5 Tr. 1073:16-23, 1078:2-5. According to Mr. Fritz, he "talked to George Christopulos about regulating post-1939 and post-1950 rights because our Tongue River Reservoir was likely not going to fill." *Id.* at 1070:7-11. Contemporaneous notes show that Mr. Fritz stated that "he definitely thought that regulation of post '50 rights was necessary to make the Compact work." Ex. M-136, at WY048191.¹⁸

¹⁸ Somewhat curiously, the minutes of the 1981 meeting of the Compact Commission say nothing about these conversations. See Ex. J-31 (1981 annual Commission report). The first reference to the conversations is in the minutes of the 1982 Compact Commission meeting, which notes that a "situation developed during the spring of 1981 in which Montana was almost unable to fill the Tongue River Reservoir even though it has a pre-1950 water right." Ex. J-32, p. IV. As discussed earlier, Mr. Fritz

Wyoming, however, “decided there was nothing they could do to help [Montana] with that situation.” 5 Tr. 1070:12-13 (Gary Fritz). While Wyoming officials told Mr. Fritz that regulation of post-1950 rights would have freed up only 20 cfs of water (Ex. M-136, at WY048190), Mr. Fritz testified that this amount was “not de minimus” and would have been “absolutely” useful (5 Tr. 1075:2-11). Mr. Fritz testified that he felt frustrated by Wyoming’s reply and by the general inability to administer the Compact. *Id.* at 1070:5-7.

Given the testimony of Mr. Fritz and the contemporaneous notes regarding the conversations that he had with Wyoming officials in 1981, I find that Montana provided appropriate notice to Wyoming in that year. Because Wyoming did not produce the notes until after I ruled on its summary judgment motion, Montana could not have provided the evidence in response to that motion. Wyoming therefore is not entitled to summary judgment for 1981. Instead, the Court should find that Montana notified Wyoming no later than April 30, 1981 that it was receiving insufficient water to fill the Tongue River Reservoir. Under Article V(A), Wyoming was therefore under an obligation to reduce any post-1950 uses in Wyoming to the degree needed to meet Montana’s pre-1950 storage rights.

Montana’s notice, however, became moot when the Reservoir ultimately filled. Although Tongue River flows later in the summer may have dropped to a level that was insufficient to meet pre-1950 *direct-flow*

expressed concern at both the 1982 and 1983 meetings 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.” *Id.*; Ex. J-33, p. IV (1983 Compact Commission report).

rights in Montana, Mr. Fritz's discussions with Wyoming officials in April appear to have focused entirely on the Tongue River Reservoir. According to Mr. Fritz, he specifically was "asking and concerned about the Tongue River Reservoir." 5 Tr. 1082:21-22. Although Mr. Fritz also testified that he *might* also have been "concerned with other kinds of water rights," he did not recall whether that was the case. *Id.* at 1082:18-21. None of the contemporaneous documents reference any water rights other than that of the Tongue River Reservoir. See Exs. M-136 (1981 Wyoming notes); J-32 (minutes of 1982 Compact Commission meeting). Montana's expert reports, moreover, indicate that direct-flow shortages would not have resulted until at least July, making it unlikely that Mr. Fritz would have raised concerns regarding direct-flow rights in April. See Ex. M-5, p. 35 tbl. 5 (Book expert report); Ex. M-6, p. 33 tbl. 5-B (Book rebuttal expert report).¹⁹

In summary, although Wyoming was on notice no later than April 30, 1981 that Montana needed more water for the Tongue River Reservoir, the Reservoir ultimately filled. See 5 Tr. 1081:7-10 (Gary Fritz); J-32, p. IV (minutes of 1982 Compact Commission meeting).²⁰ Indeed, while flows at the Stateline were

¹⁹ Montana contends that separate testimony by Richard Moy, a Montana water official who worked closely with Mr. Fritz during this period, shows that Mr. Fritz requested water for both the Reservoir and the State's pre-1950 direct-flow rights. Mr. Moy's testimony on this issue is ambiguous, but appears to state only that Mr. Moy was concerned about both storage and direct-flow rights, not that Mr. Fritz discussed direct-flow rights in his conversations with Wyoming officials. See 12 Tr. 2579:12-15.

²⁰ The fact that the Tongue River Reservoir ultimately filled shows one of the challenge's that storage can pose under the prior appropriation system. Montana should be entitled to call post-

abnormally low when Mr. Fritz contacted Wyoming in April, flows in May and June were above average. *See* Ex. M-5, p. 26 tbl. 1 (Book expert report). As a result, total storage in the Reservoir was low in April, but above the average for the Reservoir's pre-2000 history in May, June, and July. *See id.* at 29-30 tbl. 4-A. Because Montana suffered no injury, Wyoming is not liable for violating Article V(A) in 1981.

(2) 1982, 1985, 1992, and 1994

Mr. Fritz also was director of Montana's Water Resource Division in four other years for which I granted Wyoming summary judgment—1982, 1985, 1992, and 1994. In light of the 1981 notes that Wyoming produced after I ruled on the summary judgment motion, I permitted Montana at trial to ask Mr. Fritz whether the notes led him to recall any notice that Montana provided Wyoming in these other years.²¹ Mr. Fritz testified at trial that he did not

1950 uses and storage in Wyoming when it wishes to fill the Tongue River Reservoir and there is significant evidence showing that, without more water, the Reservoir might not fill. This raises a risk that Montana will demand water that it later turns out that it did not need. *See* 6 Tr. 1210:3-12 (Kevin Smith) (noting the difficulty of forecasting in the Tongue River basin). Presumably, however, the additional water Montana stores early in the fill period will lead to a reduction later during the fill period, allowing post-1950 water users in Wyoming to take water that they otherwise would not get. In short, the total amount of water to which Montana is entitled would not change, although the timing of storage and calls might differ.

²¹ Mr. Fritz had left his position before 1998, the only other year for which I concluded summary judgment was appropriate. No evidence has come to light since my ruling on Wyoming's motion for partial summary judgment that would suggest that Montana provided notice to Wyoming in that year. Summary judgment therefore remains appropriate for 1998.

“have a specific recollection of calling on Wyoming for water in other years while [he] served as the administrator.” 5 Tr. 1086:7-13. Nor do any documents suggest that he or any other Montana official provided notice in those years. Summary judgment therefore remains appropriate for those years.

(3) 1987-1989

Although Mr. Fritz could not specifically recall making calls on Wyoming except in 1981, two other Montana officials – Richard Moy and Keith Kerbel— testified that they provided notice to Wyoming during the three year period running from 1987 to 1989.

Mr. Moy was Montana’s Water Management Bureau Chief from 1981 to 2008 and was actively involved in Compact activities during those years. According to Mr. Fritz, Mr. Moy was authorized, “in general” terms, to discuss water supply issues with Wyoming and to request water. *Id.* at 1066:17-21, 1088:11-13. Mr. Moy testified that he asked Wyoming officials in 1987, 1988, and 1989 to “stop using post-’50 so we could get some water across the border to help Montana water users.” 12 Tr. 2573:16-2574:23; *see also id.* at 2698:9-19. Mr. Moy was very confident that he asked Wyoming officials in all three years. *Id.* at 2704:3-15. He also believed that the conversations were “pretty specific” about the need to have Wyoming shut down its post-1950 uses in order to protect Montana’s pre-1950 uses. *Id.* at 2700:3-10. According to Mr. Moy, he did not phone or reach out to Wyoming officials to notify them of Montana’s shortages; instead, he raised the issue in meetings that otherwise took place, such as Compact Commission meetings or meetings of technical working groups. *Id.* at 2700:22-2701:9.

According to Mr. Moy, Wyoming did not take any action in response to reduce post-1950 uses or storage. "Wyoming had no desire to actually administer the compact and had no desire to regulate post-'50 uses in Wyoming for the benefit of Montana pre-'50 uses." *Id.* at 2553:21-2554:11. Indeed, Mr. Moy became "so frustrated that we were not doing anything to protect pre-'50 rights in Montana that I quit working on the compact for ten years. I mean, it was – got to a point that the water users were getting hurt too badly on our side of the border, and I just had no desire to continue working on it, and I did not." *Id.* 2573:3-12.

Mr. Kerbel was a far more peripheral player on the Tongue River from 1987 to 1989. Mr. Kerbel was the field manager for the Billings office of the Montana DNRC, which did not have oversight of the Tongue River at the time, and he did not attend Compact Commission meetings. Nonetheless, Mr. Kerbel believed that he had conversations about the Tongue River with Wyoming officials in the late 1980s, "probably" in 1988. 4 Tr. 971:24-972:8. Because Mr. Kerbel was relatively new to his job, however, the conversations were relatively informal: "is it as bad down there as it is here? You know, and how wet is it? That type thing. And then I'd tell them how bad it is up here." *Id.* at 959:9-16.

Based on Mr. Moy's trial testimony, I am convinced that he informed Wyoming in all three years that Montana was short of water to meet its pre-1950 rights. Mr. Moy was a credible witness. Mr. Moy is no longer employed by Montana. He was willing to speak against Montana's interests when he felt Montana was wrong. While he clearly was hostile to Wyoming, his hostility appeared to stem from his belief, right or

wrong, that Wyoming had not worked in good faith with Montana to improve Compact implementation.

Mr. Moy, however, was not able to say *when* he gave notice to Wyoming in the late 1980s or even if the notice in those years was during the irrigation season when Wyoming was using or storing water under post-1950 rights.²² As noted earlier, it is impossible to determine whether Wyoming violated the Compact without evidence that Wyoming received notice at a time when it could have reduced post-1950 storage or use. I therefore conclude that Montana has failed to prove liability for these three years.

(4) 2000-2003

Three Montana officials—Jack Stults, Richard Moy, and Keith Kerbel—testified to conversations they had with Wyoming officials from 2000 to 2003. The early 2000s saw one of the longest and most severe droughts in the history of the Tongue River watershed in both Montana and Wyoming. 2001, 2002, and 2003 were all dry years, with 2001 and 2002 being the driest years on record at the time. *See* W-2, p. 3 (Fritz expert report).

Mr. Stults replaced Mr. Fritz as the head of Montana's Water Resources Division in 1997 and served in this role until 2006. Mr. Stults testified that he told Wyoming officials in 2001, 2002, and 2003 that Montana's pre-1950 rights were not receiving sufficient water and needed additional water. *See*,

²² Montana argues that Mr. Moy testified that he informed Wyoming during the irrigation season. However, none of the testimony that Montana cites refers specifically to the late 1980s. The most relevant testimony states that "there were probably calls made during the irrigation season" during the 28-year period between the years 1981 and 2008. 12 Tr. 2709:1-17 (Moy).

e.g., 3 Tr. 684:5-20, 691:2-6; 4 Tr. 778:23-779:5, 869:3-7, 886:13-23. According to Mr. Stults, he made Montana's needs known to various people, including Pat Tyrrell, the Wyoming State Engineer; Sue Lowry, the Administrator of the Interstate Streams Division of the Wyoming State Engineer's Office; and Mike Whitaker, the Wyoming division supervisor with direct responsibility for the Tongue River. 3 Tr. 691:17-23. Mr. Stults also testified that he alerted Wyoming officials that post-1950 uses in Wyoming were causing the pre-1950 shortages in Montana. *See, e.g.*, 4 Tr. 869:8-11, 870:6-10.

Mr. Stults, however, was not able to provide particular dates or occasions for these communications. According to Mr. Stults, his conversations regarding Montana's shortages took place "at different times in different – at different occasions." 3 Tr. 691:22-23. Many of the communications occurred after the irrigation season, when Wyoming would not have been able to remedy the shortage. 4 Tr. 781:11-17.

Mr. Moy testified that he had multiple conversations in the early 2000s with Wyoming officials, including Sue Lowry and Jeff Fassett, regarding pre-1950 shortages in Montana and the need to shut down post-1950 uses in Wyoming. *See, e.g.*, 12 Tr. 2547:5-2548:10, 2576:4-23. Mr. Moy testified that some of the communications were in the spring or irrigation season, at a time when he believed Wyoming could have reduced post-1950 uses. *Id.* at 2548:22-2549:8. Mr. Moy seemed quite confident that communications took place during the irrigation season. As he testified, he is "not a shy person" and would not have hesitated to bring shortages to the attention of Wyoming officials whenever Montana was suffering a

severe drought. *Id.* at 2709:11-17; *see also id.* at 2710:7-10. Mr. Moy “guess[ed] that the discussions actually occurred when we had meetings, technical meetings or commissions meetings,” which occurred at various times, including April, the summertime, and November. *Id.* at 2657:8-13. According to Mr. Moy, he raised the issue “in most meetings and most times during drought conditions when we had the opportunity.” *Id.* at 2666:18-20. Ultimately, however, Mr. Moy could not recall specifics as to when the meetings were actually held. *Id.* at 2549:1-2; *see also id.* at 2657:1-5, 2666:16-20.

By 2000, Mr. Kerbel’s responsibilities had expanded to include the Tongue River in Montana. According to both Mr. Stults and Mr. Kerbel, Mr. Kerbel had the authority to seek water from Wyoming. 3 Tr. 680:14-16 (Stults); 954:13-20 (Kerbel). Mr. Kerbel testified that between 2000 and 2003, he told Mike Whitaker about shortages in Montana and asked if there was any “excess water” in Wyoming that could be sent to Montana. *Id.* at 951:9-14, 960:2-17. However, like Mr. Stults and Mr. Moy, Mr. Kerbel was unable to give particular dates for his conversations with Wyoming officials, although he recalled that he had “these kinds of conversations at the compact meetings.” *Id.* at 953:1-11. Mr. Kerbel did not even specify the years of his conversations, other than to say that he made his calls “in the drier years pretty much.” *Id.* at 952:11-13.

Montana officials never demanded or “called” for additional water from Wyoming. *See, e.g., id.* at 780:14-781:4 (Jack Stults) (never “explicitly said Montana is calling for water” or “demanding” that Wyoming curtail diversions), 960:12-17 (Keith Kerbel) (“I wasn’t making a call on behalf of anything. It was

a request.”). Indeed, Mr. Stults worried that a formal call might send everyone “down the litigation road,” which he considered a “dead end.” *Id.* at 888:23-889:5. Nonetheless, Mr. Stults talked to Wyoming officials because he wanted more water for Montana. *Id.* at 903:18-904:4. And he believed that the Wyoming officials understood that he was requesting action to get more water to Montana. *Id.* at 908:22-909:19 (“I couldn’t imagine any water professional not understanding what I was meaning. I think you would be deluded if you didn’t understand that.”).

Wyoming officials acknowledged that Montana told them that they were not able to fill all of their senior rights during the drought period that began in 2000. *See, e.g.*, 21 Tr. 4965:9-18, 5063:22-5065:8 (Sue Lowry). *See also* 8 Tr. 1796:1-6 (Michael Whitaker) (talked about shortages with Montana officials). Like Montana witnesses, the Wyoming officials did not recall exactly when they were told. *See, e.g.*, 21 Tr. 4965:15-18 (Sue Lowry). In at least some cases, conversations apparently took place outside the irrigation season. *See, e.g., id.* at 4972:16-4974:7 (Sue Lowry) (Jan. 2002 meeting).

In summary, Montana presented significant testimony that its officials provided notice each year from 2000 through 2003. Some, but not all, of these conversations, moreover, appear to have occurred during the irrigation season. However, none of Montana’s witnesses were able to recall exactly when they notified Wyoming officials, and there are no documents that can help pinpoint the dates. Although some of the conversations occurred during the irrigation season, it is impossible to determine whether, in any given year, Wyoming received notice at a time when it could have reduced post-1950 uses or storage.

The testimony therefore is insufficient to support a finding that Wyoming violated Article V(A) at any point from 2000 through 2003.

Montana urges that various letters in May 2002 prove that Wyoming was aware of Montana shortages no later than May 29 in that year. In early May, Art Hayes, the President of the TRWUA, wrote Mr. Stults to express concern that Wyoming farmers appeared to be expanding their irrigation. Ex. M-142. On May 29, 2002, Mr. Stults replied to Mr. Hayes, noting that Montana officials had “met with Wyoming in an attempt to informally manage water supply in this year of continuing drought.” Ex. W-67, p. 1. According to Mr. Stults, that “meeting did not result in a plan to manage this year’s short supply to maximum advantage to all users in the Tongue River basin, regardless of the political boundary at the state line.” *Id.* Mr. Stults testified at trial that this was an example of his “discussions with Wyoming asking for more water” and that “Wyoming rejected [his] request for more water.” 3 Tr. 700:4-11.

This evidence clearly shows that, at some point prior to May 29, 2002, Montana talked to Wyoming about an informal “plan” to address the continuing drought in both states. The meeting may have occurred in January.²³ Mr. Stult’s reference to a plan would appear to be to a “hydrologic approach” that Mr. Stults advocated in the early 2000s. Under this approach, the two States would have looked for ways to move more water to Montana through “sharing” and a “more

²³ The only specific reference in the record to a meeting in the first five months of 2002 is to a meeting in January 2002 that was attended by various Montana and Wyoming officials. See 21 Tr. 4972:16-20 (Sue Lowry).

sophisticated” hydrologic-based allocation system without enforcing formal priorities. 4 Tr. 872:5-875:15 (Stults). Mr. Stults wanted to avoid a formal call under the Compact and thought that a hydrologic approach was the best way to do so. *Id.* at 888:1-889:5 (Stults wanted to avoid the “litigation road . . . which historically had been a dead end”). Mr. Stults did not believe that the Compact mandated a hydrologic approach, and he was not demanding that Wyoming take action under the Compact. *Id.* at 783:8-12. However, Mr. Stults believed that the States could adopt a hydrologic approach under the Compact. *Id.* at 874:25-875:4.

There is no evidence, however, that the meeting referenced in Mr. Stults’ letter occurred at a time when Montana needed more water and that Montana informed Wyoming of this need. The Compact required Montana to notify Wyoming, even if only informally, when it needed additional water at the Stateline to enjoy its pre-1950 rights, and nothing in the record establishes that Montana did that on any discernible date in 2002. Mr. Stults tried to avoid having to formally enforce Montana’s rights under Article V(A). When Wyoming rejected Mr. Stult’s alternative approach, however, Montana needed to let Wyoming know *when* it was suffering a shortage and therefore needed more water. Neither the May letters nor any other evidence in the record establishes that Mr. Stults or any other Montana official alerted Wyoming prior to the end of May 2002 that Montana needed more water. Without such notice Wyoming could not have known when it needed to shut off post-1950 storage or diversions.

(5) 2004

Both Montana and Wyoming agree that Montana provided written notice on May 18, 2004. In a letter that day from Jack Stults to the Wyoming State Engineer, Patrick T. Tyrell, Mr. Stults informed Mr. Tyrell that there was a serious shortage of water in Montana on the Tongue River. Ex. J-64. According to the letter, the Tongue River flow was insufficient to satisfy pre-1950 rights in Montana. *Id.*, p. 1. Indeed, only two rights, dating back to 1886, were receiving any water, and those rights were only partially satisfied. *Id.*

Mr. Stults therefore officially “called” the Tongue River “under the terms of the Compact” for the express benefit of Montana’s pre-1950 water rights. *Id.*, p. 2. Mr. Stults asked Wyoming to take two actions. First, he asked that Wyoming regulate *junior pre-1950* rights in Wyoming for the benefit of *senior pre-1950* rights in Montana. *Id.* Second, he asked Wyoming to release all waters that had been stored in Wyoming reservoirs under post-1950 rights. *Id.* Mr. Stults also emphasized the urgency of the call. He requested “an immediate meeting of the technical committee to supervise the release and delivery” of the post-1950 storage. *Id.* He also asked that the technical committee “develop a process for continued delivery of water to satisfy senior users throughout the summer.” *Id.* According to Mr. Stults, it was “essential that [Montana and Wyoming] work quickly and appropriately” to address the problem. *Id.*

Mr. Tyrrell responded six days later. In a letter dated May 24, 2004, Mr. Tyrrell announced that the Compact “makes no provision for any state to make a call on a river.” Ex. J-65, p. 2. According to Mr. Tyrrell, the “Compact does not apportion direct flow at

the state line, nor does it establish or direct the establishment of an interstate priority system.” *Id.* Mr. Tyrrell also stated Wyoming’s view, rejected in *Montana v. Wyoming, supra*, that Article V(A) does not apportion water but “simply expresses that the status quo of January 1, 1950 within each state is protected.” *Id.* Finally, Mr. Tyrrell rejected Montana’s two specific requests. According to Mr. Tyrrell, the Compact does not provide for priority regulation *among* pre-1950 rights. *Id.* He also noted that Wyoming had stored post-1950 water only when it had a right to do so and therefore did not need to release it. *Id.*

Wyoming argues that the May 18, 2004 call letter did not trigger any obligation under the Compact because the letter demanded the wrong relief. Under this Court’s opinion in *Montana v. Wyoming, supra*, Montana could have asked Wyoming to cease all future post-1950 diversions and storage. Instead, however, the letter demanded that Wyoming regulate all *pre-1950* junior water and release all water stored under post-1950 priorities, even if that water was stored in priority earlier in the year. Ex. J-64, p. 2. According to Wyoming, it “was not obligated to take either of these actions, and it was not obligated to take a different action that Montana had not requested.” Wyoming’s Post-Trial Brief, *supra*, at 50.

Wyoming is correct that Montana asked for the wrong relief in its May 18, 2004 call letter. As my First Interim Report discussed, the Compact does not provide for either form of relief, and neither party currently contends that the Compact does. See First Interim Report, *supra*, at 42-43 (parties agree that water stored in priority need not be released), 56-58 (Compact does not apportion pre-1950 rights). As

discussed earlier, however, the Compact required Montana only to notify Wyoming that it needed more water to meet its post-1950 appropriative rights. Montana's May 18, 2004 call letter did this. Once Wyoming knew Montana needed additional water, Article V(A) required Wyoming to regulate any post-1950 uses or storage to ensure that Montana could enjoy its post-1950 appropriative rights. Wyoming should not escape liability because Montana mistakenly asked for the wrong relief in its letter.²⁴ I therefore conclude that Montana's letter constituted adequate notice under the Compact.

I also find that Montana alerted Wyoming of its need for additional water even before its letter. According to Jack Stults, he called Wyoming's State Engineer prior to the letter and told him that the river needed to be administered. 3 Tr. 717:1-6. The letter itself references an earlier phone call between Mr. Stults and Mr. Tyrrell "regarding the current need for

²⁴ There is some evidence in the record that Montana may also have explicitly asked Wyoming to reduce post-1950 uses. According to the minutes of the 2004 Compact Commission meeting, Montana "felt that water rights in both States senior to 1950 should be filled before water rights junior to 1950 are filled." Ex. J-54, p. VIII. But *see id.* ("Montana specifically requested that Wyoming release post-1950 stored water"). According to Richard Moy, moreover, Montana made it clear to Wyoming in conversations surrounding the May 18, 2004 letter that Montana was asking for the curtailment of post-1950 rights. 12 Tr. 2636:13-17. Mr. Moy, however, did not say to whom such information was provided or when. Moreover, Mr. Moy's testimony on this point is inconsistent with the written response from Mr. Tyrrell, which reads Montana's letter as asking only for regulation of junior pre-1950 rights. *See* Ex. J-65. For the reasons discussed in the text, the Court need not decide whether Montana clarified that it also was requesting curtailment of post-1950 uses.

administration of the Compact.” Ex. J-64, p.1. Mr. Stults testified that he was not sure when he placed the call, but other evidence suggests that it was within a week of the letter. See Ex W-71 (summary of internal Montana meeting on May 12 noting that Mr. Stults would need to telephone Mr. Tyrell to inform him that Montana would be sending the letter); 22 Tr. 5176:18-23 (Patrick Tyrrell) (Montana’s phone call was within a week of letter).

Several witnesses, moreover, testified that Montana informed Wyoming even earlier, at a meeting of the Compact Commission on April 15, 2004. Mr. Stults’ May 18 letter refers to a conversation at that meeting in which Mr. Stults “agreed to send [Mr. Tyrrell] a letter stating our concerns *and needs*.” Ex. J-64, p.1 (emphasis added). Mr. Stults testified that he talked to Mr. Tyrrell at the meeting “about the fact that we thought that there was a problem and that we weren’t getting our supply of water.” 3 Tr. 717:7-718:5, 4 Tr. 887:8-19. According to Mr. Tyrrell, he was “informed that Montana was going to be short on water generally for sure.” 22 Tr. 5281:11-17.

The evidence also shows that Montana informed Wyoming of shortage concerns a day earlier, at an April 14, 2004 meeting of the Yellowstone River Compact Commission Technical Committee (“Technical Committee”), attended by Mr. Kerbel from Montana and several Wyoming water officials, including Sue Lowry. See Ex. M-207 (minutes of the committee meeting). At the April 14 meeting, Mr. Kerbel noted that filling percentages for the Tongue River Reservoir were “extremely low.” *Id.*, p.3. Mr. Kerbel also “raised the issue of how the Compact could be administered if Montana made a call for the [post-1950 storage water] ... if Montana could not fill

Tongue River Reservoir this spring.” *Id.* According to the meeting notes, the participants understood that runoff “may be sufficient to fill the original water right in the reservoir, but may not fully fill the enlargement.” *Id.* Ms. Lowry testified that she was aware no later than this meeting that the Reservoir was unlikely to fill, although there was some thought that it might fill to the original capacity. 21 Tr. 4987:2-15, 5092:2-9.

I find that Wyoming was on notice no later than April 14, 2004 that Montana needed additional water to enjoy its pre-1950 rights. On that day, Montana informed Wyoming that the amount of water in the Tongue River Reservoir was “extremely low” and that the Reservoir might not even fill to its original water capacity. Montana, moreover, told Wyoming that it was unlikely to fill the enlargement and, as explained below, Montana was entitled under the Compact to fill at least part of the enlargement in 2004. *See* pp. 129-162 *infra*. A day later, Montana repeated its concerns at the April 15 meeting of the Compact Commission. Montana was worried for good reason about its Tongue River Reservoir rights; the Reservoir never came close to filling in 2004, even to its original level.

Montana did not formally demand any water on either April 14 or 15. Indeed, Montana asked on April 15 what would happen if it subsequently issued a formal call for all post-1950 storage water if the reservoir did not end up filling. The conversations on both dates, however, placed Wyoming on adequate notice of Montana’s shortage. As explained above, the Compact requires only that Montana notify Wyoming of its shortage; that is also what Montana agreed to do in both 1982 and 1983. Once Wyoming was aware of the shortage, the Compact required it to reduce or

eliminate post-1950 storage and uses. Nothing in the Compact or in the rationale for requiring a call mandated that Montana do more.

Montana argues that, although it first notified Wyoming of its shortage on April 14, Wyoming should be liable for post-1950 storage starting on April 1. April was the beginning of the Tongue River Reservoir's fill season. 6 Tr. 1185:6-10 (Kevin Smith). There is also testimony that April 1 was the date of the first reliable forecast of water availability. See 9 Tr. 1834:9-11 (Gordon Aycock) ("April 1st forecast is about the first time you can really treat it as a reliable forecast"). Montana argues that it acted diligently in notifying Wyoming of its projected shortage just two weeks later at the April 14 meeting of the Technical Committee. That meeting provided Montana and Wyoming officials with an opportunity to meet with representatives of both the U.S. Natural Resource Conservation Service ("NRCS") and the National Weather Service ("NWS") and to share information on how the water year was shaping up. Both the NRCS and the NWS confirmed that 2004 was likely to be an extremely dry year. Ex. M-207, pp. 2-3 (minutes of April 14 meeting) (highlighting "[b]leak outlook for snowpack and precipitation"). Montana, however, has failed to show that it could not have notified Wyoming earlier. Montana presented no testimony or evidence showing when it first determined that the Reservoir was unlikely to fill or why Montana did not notify Wyoming earlier. Under the appropriation doctrine, the date of notice normally determines when a junior appropriator must reduce or cease its use, and Montana has provided no justification for following a different rule in 2004.

(6) 2006

Montana and Wyoming agree that Montana provided adequate written notice to Wyoming on July 28, 2006. In the 2006 call letter, Montana informed Wyoming that it was short of water for its pre-1950 appropriations and asked Wyoming to curtail its post-1950 diversions pursuant to Article V(A) of the Compact. Ex. J-68. Unlike in 2004, Montana did not put Wyoming on notice of a shortage prior to sending its 2006 letter.

Montana argues that it is entitled to establish liability prior to July 28, 2006, despite the lack of notice, because Wyoming's rejection of Montana's 2004 "call" letter made it futile to provide future calls. As Montana notes, Wyoming's May 24, 2004 response emphatically denied that Wyoming had any responsibility, even with appropriate notice, to provide water for Montana's pre-1950 rights. See 4 Tr. 890:9-891:2 (John Stults) (Wyoming had denied Montana's right to call). In that letter, Mr. Tyrrell clearly stated that the "Compact does not apportion direct flow at the state line." Ex. J-65, p. 2. Under the circumstances, Montana argues that a new call would have been futile and it therefore was not required to provide future notices to Wyoming. See Montana's Post-Trial Brief, *supra*, at 83-85.

Indeed, Wyoming again denied any responsibility under the Compact in its 2006 reply letter. According to Wyoming, the Compact made no provision for the protection of pre-1950 rights. Ex. J-69, p. 2 (Aug. 9, 2006 letter from Patricia Tyrrell to Rich Moy). As Wyoming noted, it had rejected that view consistently for over two years: "Montana continues to assert as fact an interpretation of the Compact we have taken great exception to *for over two years now*. An interstate

delivery schedule for pre-1950 rights is not now, and never was, a provision of this Compact.” *Id* (emphasis added). Wyoming also again rejected the view that the Compact provided for an interstate call. *Id*.

In ruling on Wyoming’s motion for partial summary judgment on the notice requirement, I suggested that, for all of these reasons, Montana might be able to establish liability prior to the 2006 call letter on the ground of futility. Memorandum Opinion on Wyoming’s Motion for Partial Summary Judgment (Notice Requirement for Damages), Dec. 20, 2011, Docket No. 120, at 8-9. I conclude, nonetheless, that the futility requirement does not apply to the facts of this case. There is no evidence that Montana chose not to notify Wyoming because Montana believed it would be futile to do so. Indeed, Montana ultimately sent a call letter to Wyoming.

Montana might have had a good argument for applying the futility doctrine if it had failed to notify Wyoming because it believed that any notice would have been useless. However, Montana failed to provide notice prior to July 28, 2006, because it did not want more water. Montana believed that the Tongue River Reservoir would fill and that a call was unnecessary. As Montana notes in its post-trial brief, Montana was carefully monitoring water conditions in the Tongue River Basin. Montana’s Post-Trial Brief, *supra*, at 30, ¶ 104. Montana entered the 2006 water year with more water in carryover than it had enjoyed since 1991; indeed, it was the second largest carryover in the history of the Reservoir.²⁵

²⁵ The end-of-year storage in the Tongue River Reservoir on September 31, 2005 was 44,470 af. Ex. M-5, p. 30 tbl. 4-A. In the five prior years, the carryover had ranged from 17,210 (in

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.

The call doctrine played exactly the role that it was supposed to play in 2006 by advising Wyoming when Montana needed more water. Montana did not make a call before July 28 because water was sufficient to satisfy its pre-1950 rights. During the period before the call, Wyoming therefore appropriately used water for post-1950 purposes. If Wyoming had not used the water, that water might have gone to waste. When Montana realized that it needed additional water, it sent a call letter to Wyoming. Unfortunately, as discussed later, there was little that Wyoming could do to make more water available to Montana under the terms of the Compact this late in the irrigation season, even if Wyoming had wanted to help.

Montana argues that it also should be able to claim liability for all of 2006 because it diligently provided notice as soon as it could. Montana's Post-Trial Brief, *supra*, at 94-95. Montana may be correct that it notified Wyoming as soon as it realized it had a

September 2001) to 39,760 (in 2003). *Id.* The highest carryover on record had been 52,223 af in September 1990. *Id.* at 29 tbl. 4-A.

shortage. (If Montana in fact needed more water before July 28, it should have notified Wyoming, and there is no evidence showing that it could not have done so.) The goal of notice, however, is to ensure that the junior appropriator knows when it can and when it cannot use water. Montana is not entitled to water for periods when it did not need water, and Wyoming should not be penalized because it used water for post-1950 purposes at a time when Montana did not want more water. Montana appears to be complaining that conditions suddenly changed in late July, leading it to need more water than it had thought it would need. Such uncertainty, however, is inevitable under the prior appropriation system and does not justify holding Wyoming liable retroactively for uses that it made at a time when Montana neither wanted more water nor had notified Wyoming that it needed more water.

3. Conclusions.

Based on the evidence produced in response to Wyoming's motion for partial summary judgment, I recommend that the Supreme Court grant summary judgment to Wyoming for 1982, 1985, 1992, 1994, and 1998. Montana failed to provide specific facts raising a genuine dispute as to whether it notified Wyoming of shortages in those years.

Based on the evidence at trial, I recommend that the Supreme Court find that:

- Montana notified Wyoming of pre-1950 water shortages in 1987, 1988, 1989, 2000, 2001, 2002, and 2003. Montana, however, has not proven when any of the notices occurred and whether, in any year, they occurred when Wyoming could have

reduced post-1950 water use and made more water available to Montana. Montana therefore has failed to prove that Wyoming is liable in those years for failing to furnish water to Montana under Article V(A) of the Compact.²⁶

- In 1981, Montana notified Wyoming on or about April 30, 1981 that it needed additional water to fill the Tongue River Reservoir. Wyoming should have reduced its post-1950 uses in response. However, because the Reservoir ultimately filled, Montana was not injured, and Wyoming is not liable for damages under the Compact for 1981.
- In 2004, Montana provided Wyoming with notice that it needed additional water for its pre-1950 rights on at least three occasions: the April 14 meeting of the Yellowstone River Compact Commission Technical Committee, the April 15 meeting of the Yellowstone River Compact Commission, and Montana's May 18 call letter to Wyoming. Montana is therefore entitled to show that it was injured by post-1950 storage or diversions in

²⁶ Even if Montana were entitled to seek damages for periods prior to its notice in 2004 and 2006, Wyoming would not be liable for any post-1950 uses that occurred prior to April 1. Under the operating plan for the Tongue River Reservoir, the managers of the Reservoir would not have been able to store any additional water during the winter months. Ex. M-7, p. 18 (expert rebuttal report of Gordon Aycock). As a result, any post-1950 uses in the winter months of 2004 did not reduce storage in the Tongue River Reservoir. *Id.*

Wyoming after April 14. Any storage or use of post-1950 water prior to that date in Wyoming took place “in priority” and did not violate Article V(A) of the Compact.

- In 2006, Montana notified Wyoming that it needed additional water in its July 28 call letter. Montana is therefore entitled to show that it was injured by post-1950 storage or diversions in Wyoming after July 28. Any storage or use of post-1950 water prior to that date in Wyoming took place “in priority” and did not violate Article V(A) of the Compact.

The remainder of this report examines whether Montana has proven that it was injured by Wyoming’s actions under Article V(A) of the Compact during the periods in 2004 and 2006 following Montana’s notices to Wyoming. For ease of reference, the report often refers to these periods as the “notice periods.”

D. Shortages of Water for Pre-1950 Rights in Montana

The next question is whether Montana suffered shortages to its pre-1950 water rights during the notice periods in 2004 and 2006. Montana holds two different types of pre-1950 rights—storage rights, and direct-flow rights. Montana can prove injury by showing that it suffered water shortages for either type of right. As explained below, I find that Montana suffered shortages for both.

1. Tongue River Reservoir storage rights.

The Tongue River Reservoir is the major defining feature of the Tongue River basin in Montana. How to

account for the Reservoir under Article V is therefore of major importance to both Montana and Wyoming. Unfortunately, the states fundamentally disagree on the rights that the Reservoir enjoys under the Compact, in part because the two states follow very different storage laws. Both agree that Article V(A) protects the right to store water in the Reservoir, but that is where agreement ends. Montana argues that it has a right to fill the Reservoir to capacity every year. Wyoming contends that Montana's right is to a much smaller amount of storage.

Of all the legal issues raised by Montana's suit against Wyoming, the extent of Montana's right to fill the Tongue River Reservoir is perhaps the most complex. Storage rights are complicated under prior appropriation law in general, and western states vary tremendously in how they define and administer storage rights. Various changes over time in the capacity and operation of the Reservoir further complicate the task of determining Montana's storage rights under the Compact.

a) Factual timeline.

Although the legal issues are complex, the facts surrounding the Tongue River Reservoir are relatively simple and straight-forward:

- **1937:** Pursuant to state law, the Montana Conservation Board files a Declaration of Intention to Store, Control and Divert River Water ("Storage Declaration") on April 21, 1937. Ex. M-558A.²⁷ The

²⁷ Under Montana law, the Conservation Board was authorized to "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,

Conservation Board declares its intent to store, control and divert "all unappropriated waters" of the Tongue River and tributaries, "together with the return flow of all waters furnished or supplied." *Id.* The Conservation Board initially lists the purposes of the storage to be irrigation, domestic, and stock water. *Id.* Amended storage declarations subsequently change the purpose to irrigation and "other useful and beneficial purposes" and specify that the place of use for the stored water is along the entire watershed of the Tongue River and 150 miles downstream along the watershed of the Yellowstone. *See* Exs. M-558B (January 1938 amended declaration), M-558C (February 1938 amended declaration).

- **1937:** Three months after filing its Storage Declaration, and prior to construction of the Reservoir, the Conservation Board enters into a contract with the Tongue River Water Users' Association ("TRWUA") to market water from the Reservoir. Ex. M-529A. Under that contract, all "right, title, and interest" in the waters stored in the Reservoir remain with the Conservation Board. *Id.* § 5. The Conservation Board agrees to furnish to

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." Rev. Code Mont. 89-121 (1947) (since repealed).

TRWUA “the total available yield of storage water” from the Reservoir, which the board estimates will be 32,000 af during the irrigation season. *Id.* §1. The TRWUA, in turn, commits to sell 32,000 af annually to its members. *Id.* § 4. If the available annual yield of the Reservoir turns out to be more than 32,000 af, the TRWUA agrees to promptly enter into more contracts for the remaining water. *Id.* The explicit goal of the contract is to market all the available water. *See* Mont. Rev. Code § 89-121 (1947) (since repealed); 7 Tr. 1377:12-16 (Kevin Smith).²⁸

- **1939:** The Conservation Board completes construction of the dam and Reservoir. 5 Tr. 1055:16-17 (Smith). The original capacity of the Tongue River Reservoir is 72,510 af. Ex. M-557E, p. 3 (1949 Sedimentation Survey of the U.S. Bureau of Reclamation).²⁹

²⁸ The federal Public Works Administration subsequently demands that Montana sell another 3,000 af of water. *See* M-280, p. 15 (1961 report of the Conservation Board). It is unclear how much of the 35,000 af was ever marketed and used; later documents suggest that the amount of water actually sold was less than 32,000 af. *See id.*; Ex. M-529-C, p. 3 (1969 marketing contract between Montana and the TRWUA).

²⁹ The original size of the Reservoir was contested at trial. Some documents suggest that the Reservoir’s capacity may have been as much as 1,500 af larger or 3,000 af smaller than its apparent volume. *See, e.g.*, M-280, p. 14 (1961 report of the Conservation Board) (listing the size as 73,950 af). The larger estimates appear to have been errors. 7 Tr. 1564:2-9 (Gordon Aycock). The smaller estimates appear to reflect later measurements after sedimentation reduced the storage capacity of the

- **1940-1950:** The Reservoir begins to store water in March 1940. 5 Tr. 1055:20-22 (Smith); Ex. M-5, p. 29 (Book expert report). In the Reservoir's ten years of operation before the Compact, the peak quantity of water stored each year averages slightly less than 48,500 af. *See* Ex. M-5, p. 29 tbl. 4-A. In most years, peak storage does not exceed about 40,000 af. *Id.* Peak storage, however, varies significantly—from a low of 36,390 af in July 1950 to a maximum of 75,760 af in June 1944. *Id.* The Conservation Board perfects its water right by filling the Reservoir. 5 Tr. 1057:25-1058:8 (Smith).
- **1950:** Montana, North Dakota, and Wyoming ratify the Compact. Sedimentation has reduced the capacity of the Reservoir to 69,400 af. *Id.* at 1034:17-1035:7 (Smith).
- **1969:** In anticipation of a possible enlargement of the Reservoir and the marketing of water for municipal and industrial purposes, the Conservation Board enters into an amended marketing contract with the TRWUA. Ex. M-529C (March 1969 Marketing Contract). The new agreement provides for the sale of 40,000 af of water, which the agreement states is the "approximate firm yield" of

Reservoir. *See* 8 Tr. 1808:1-1816:8 (Aycock). Mr. Aycock testified that he believed that the correct capacity was 72,500 af (*id.* at 1809:12-18). Based on all the evidence presented, I agree that this is the best estimate of the Reservoir's original capacity.

the Reservoir. *Id.* § 1. Under the agreement, all new purchasers have to be members of the TRWUA and must put the water to “beneficial use with diligence.” *Id.* § 2. The agreement notes that the TRWUA has never been able to market the entire 32,000 af contemplated by the original agreement, but that the parties believe that the TRWUA might be able to market 40,000 af if “allowed a three-year period in which to devote its efforts to the marketing” of the water. *Id.*, p. 3. Under the new agreement, the TRWUA does not differentiate between pre-1969 and post-1969 contracts; instead, all contract rights are treated the same. 7 Tr. 1503:22-1504:4 (Art Hayes).

- **1978:** In May 1978, a flood damages the Tongue River Reservoir and causes significant property loss downstream. 6 Tr. 1132:2-1134:7 (Kevin Smith). As the Tongue River swells with water, the Reservoir fills in just one or two days and quickly begins to spill. *Id.* Following the flood, Montana considers the dam unsafe. *Id.* at 1137:14-16 (Smith). The flood also points out “the serious deficiencies in the capacity and capabilities” of the dam and Reservoir “to handle what should have been a run-of-the-mill flood event in that basin.” *Id.* at 1133:17-20 (Smith).
- **1991:** Montana and the Northern Cheyenne Indian Tribe (the “Tribe”) agree on the compact settling the Tribe’s federal Indian reserved water rights. Northern

Cheyenne Compact, *supra*. (For more details on the Northern Cheyenne Compact, see pages 22-24 *supra*.) Under this compact, the Tribe has a right to up to 20,000 af per year of Tongue River Reservoir storage water. Northern Cheyenne Compact, *supra*, art. II(A)(2)(b). The priority date for this right is "equal to the senior-most right for stored water in the Tongue River Reservoir," which is April 21, 1937. *In the Matter of the Adjudication of Existing and Reserved Rights of the Northern Cheyenne Tribe*, Case No. WC-93-1, Order & Decree, p. 5 (Mont. Water Ct., Sept. 26, 1995) (introduced at trial as Ex. M-362A). The Tribe's and the State's rights in the Reservoir are "commingled and administered conjunctively." 3 Tr. 507:14-508:12 (Timothy Davis); Ex. M-4, p. 6 (Smith rebuttal expert report). The Tribe also has a separate contract right for 7,500 af per year with the TRWUA and Montana, dated March 15, 1938, and the Northern Cheyenne Compact specifies that it does not affect that right. Northern Cheyenne Compact, *supra*, art. II(A)(2)(e).

- **1999:** Montana completes an expansion and rehabilitation of the Tongue River Reservoir, with financial assistance from the United States, under the Northern Cheyenne Indian Reserved Water Rights Settlement Act of 1992, 196 Stat. 1186. See Ex. M-5, p. 8 (Book expert report). As a result of the enlargement, the capacity of the Tongue River Reservoir is now

79,071 af (Ex. M-3, p. 4 (Smith expert report)), which is about 6,500 af more than the Reservoir's original capacity and almost 10,000 af more than its capacity at the time of the Compact. Believing that its existing water right covers the expansion, the Montana State Water Projects Bureau does not file for a new water right for the expanded capacity. 7 Tr. 1397:20-1398:2 (Smith).

- **2004:** The Tongue River Reservoir does not fill. 1 Tr. 115:20-23 (Book). End-of-the-month storage in the Reservoir peaks at 49,680 af and declines after that. Ex. M-5, at 30 (Book expert report).
- **2006:** The Tongue River Reservoir again does not fill. 1 Tr. 115:20-23 (Book). Storage peaks in June at 73,400 af, after which it declines. 6 Tr. 1310:9-24 (Kevin Smith).
- **2012:** As part of the State's adjudication of all water rights to the Tongue River, Montana enters an Amended Stipulation in Montana Water Court to resolve all objections to the water right for the Tongue River Reservoir. The Montana DNRC Adjudication Bureau originally determined that the "volume guideline" for the Tongue River Reservoir should be 127,324 af, which would cover "one complete fill, [a] partial refill for carryover storage, and evaporative losses." Ex. M-526, p. 4, ¶8 (Amended Stipulation). After the United States Bureau of

Reclamation disagrees, all parties, including the United States, stipulate that the storage right for the Tongue River Reservoir

is not administered according to any specific numerical volume defining or limiting the amount of water that can be diverted into storage in a year. Volumes of water diverted into storage, released, and carried over in any particular year are determined according to the operation plan for [the] Tongue River Reservoir developed pursuant to the Compact [with the Tribe]. The reservoir is filled and refilled and water carried over from year to year in order to reliably provide up to a maximum of 40,000 acre-feet per year to the TRWUA and 20,000 acre-feet per year to the [Tribe] under the Compact. These amounts do not define the amount of water that can be diverted into storage in any year or carried over for release and use in following years, but do define the amounts to be delivered in any one year.

Id., ¶ 12, at 4. A proposed abstract of the Tongue River Reservoir water right, attached to the Amended Stipulation, incorporates these provisions. *Id.*, ex. A.³⁰

³⁰ The Montana Water Court has not yet entered a final adjudication of the Tongue River Reservoir's water rights. According to the Amended Stipulation, the stipulation is

b) Relevant Compact provisions.

Both Montana and Wyoming agree that Article V(A) of the Compact protects storage rights, although they disagree on the nature and size of those rights. See Montana's Post-Trial Brief, *supra*, at 95 (the Compact protects storage rights in the Tongue River Reservoir); Wyoming's Post-Trial Brief, *supra*, at 14 (the Compact negotiators intended to protect "existing uses in existing reservoirs"). Article V(A) protects "[a]ppropriative rights," and both Montana and Wyoming recognize storage rights under their appropriation doctrines. See Mont. Code Ann. § 85-2-305 (appropriation permits for reservoirs); Wyoming State Bd. of Control, Regulations & Instructions, ch. I (Introduction to Wyoming Water Administration), § 4(c), at 1-2 to 1-3 (types of water rights) (hereinafter "Intro to Wyoming Water"). While Article V(A) does not explicitly mention storage rights, other sections of Article V do, confirming that the Compact intended to protect storage rights under its three-tier allocation system. See Compact, *supra*, arts. V(C)(2), V(C)(3). The Compact's protection of storage rights is not surprising. The authors of the Compact wanted to promote storage projects, and it is unimaginable that they would have protected direct diversions but not storage rights. See, e.g., S. Rep. No. 883, 82d Cong., 1st Sess. 10 (1951) (introduced at trial as Ex. J-72, at 12, 21) (noting the long recognition that the "fuller use of the water resources of the Yellowstone River Basin

"conditioned upon the Water Court accepting the terms of the Stipulation In the event the Water Court does not do so, this Stipulation will be rendered null and void." Ex. M-526, ¶ 15, at 5.

... is dependent entirely upon the construction and operation of storage reservoirs”).

Article V(A)’s protection of storage rights, however, is limited. First, Article V(A) does not protect storage of water in reservoirs “completed subsequent to January 1, 1950.” Compact, *supra*, art. V(C)(2). Under Articles V(B) and (C) of the Compact, such storage falls into the third, or lowest, tier of protection—and is treated like a post-1950 direct diversion of water.³¹ *Id.*

Second, Article V(A) does not protect water that is stored in reservoirs that predate January 1, 1950 if the water “is used for irrigation, municipal, and industrial purposes developed after January 1, 1950.” *Id.*, art. V(C)(3). Like water stored in post-1950 reservoirs, such water falls into the lowest tier of protection and is again treated like a post-1950 direct diversion. *Id.*

³¹ As described earlier, Article V allocates available water first to pre-1950 rights (Article V(A)), then to “supplemental water supplies” (i.e., additional water supplied to holders of pre-1950 rights) (Article V(B)), and finally to all other water users (Article V(B)(1)-(4)). Compact, *supra*, arts. V(A), V(B). According to Article V(C), the final, lowest tier consists of:

“1. The total diversions, in acre-feet . . . for irrigation, municipal, and industrial uses in Wyoming and Montana developed after January 1, 1950 . . . ;

“2. The net change in storage, in acre-feet, in all reservoirs in Wyoming and Montana . . . completed subsequent to January 1, 1950 . . . ;

“3. The net change in storage, in acre-feet, in existing reservoirs in Wyoming and Montana . . . , which is used for irrigation, municipal, and industrial purposes developed after January 1, 1950”

Id., art. V(C)(1)-(3).

Finally, Article V(A) protects storage rights only to the degree that the water is stored for a “beneficial use.” Under the prior appropriation system, the storage of water by itself has not typically been considered a beneficial use of water. See 1 Wells A. Hutchins, *Water Rights in the Nineteen Western States* 349-350 (1971); Tarlock, *supra*, § 5:37, at 5-625. As a result, the appropriation system protects storage only when the water is stored for a beneficial use such as irrigation or municipal or industrial supply. Article V(A) similarly protects only “[a]ppropriative rights to the beneficial uses of the water of the Yellowstone River System,” which 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.” See also *Montana v. Wyoming*, *supra*, 131 S. Ct. at 1778 (“‘beneficial use’ within the meaning of the Compact . . . is a *type* of use that depletes the water supply”) (emphasis in original).

The beneficial use limitation in Article V(A) does not mean that the Compact protects only that amount of storage that is actually delivered and used in a given year. In both Montana and Wyoming, the holders of reservoir rights often use less than the full amount of water stored in the reservoir in a given year and carry over water for use in a future year. Indeed, the record is replete with evidence of reservoirs in both Montana and Wyoming ending the year with significant carryover storage. See, e.g., Ex. M-5, pp. 29-30 (Book expert report) (Tongue River Reservoir has ended every year since completion with carryover, ranging from 140 af to 52,223 af); Ex. J-56, p. 22 (majority of Wyoming Compact Reservoirs started 2006 water year with carryover, ranging from 474 af to 4,684 af). Throughout the West, storage of “water in one year for use in a later year is common practice.” 1 Wells A.

Hutchins, *Water Rights Laws in the Nineteen Western States*, *supra*, at 363. Article V(A) protects storage rights, however, only where the water will be put to a beneficial use *at some future point*. For example, the Compact would not protect water stored purely for hydroelectric or fish purposes, neither of which would deplete water “by the activities of man.”

c) Relevant appropriation law.

While Article V(A) protects storage rights, it does not directly address many of the specific issues raised by the Tongue River Reservoir in this case. Instead, it simply provides that storage and other rights pre-dating 1950 “shall continue to be enjoyed in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.” Compact, *supra*, art. V(A). To resolve this case, one therefore must understand how storage rights are defined and administered in both Montana and Wyoming—as well as under prior appropriation law generally. Unfortunately, the law of storage rights varies tremendously among states. As discussed below, this is particularly true of storage law in Montana and Wyoming.

There are a few common denominators in the law of storage among appropriation states:

- First, all states agree that the public has a strong interest in promoting water storage in the water-scarce regions of the western United States. *See, e.g., Donich v. Johnson*, 250 P. 963, 965 (Mont. 1926). As a 1968 law review note on reservoir rights in prior-appropriation states explains:

The appropriation doctrine of water law is based on the economic principle of maximization of use of the natural resource for the maximum public benefit. Under this doctrine, the reservoir serves as an integral part in the human effort to distribute water to use as efficiently as possible. The appeal of a reservoir lies in its function—storage of water from which a constant, reliable supply can be made available to the beneficial user, relieving that user of the need to rely on the natural stream for a direct, and more precarious supply. The user controls his source to meet his demands, rather than adapting his schedule to the character of the source.

Brian T. McCauley, *The Nature of a Reservoir Right*, 3 *Land & Water L. Rev.* 443, 443 (1968). *See also* 1 Hutchins, *Water Rights Laws in the Nineteen Western States*, *supra*, at 349 (“Encouragement of reservoir construction in the West is a matter of public policy”).

- For this reason, all states allow water users to appropriate water for storage in a reservoir. *See, e.g.*, Mont. Code Ann. § 85-2-305; *Federal Land Bank v. Morris*, 116 P.2d 1007, 1012 (Mont. 1941); Intro to Wyoming Water, *supra*, § 4(c), at 1-2 to 1-3; 1 Hutchins, *Water Rights Laws in the Nineteen Western States*, *supra*, at 349.
- A storage right receives a priority date just like that of a direct-diversion right

(although states differ in how they determine the priority date). If the holder of a storage right in a reservoir is not receiving the water needed to fill the reservoir, the holder can typically call the river and request that junior appropriators cease diverting water for direct use or storage until the senior reservoir is filled. See 1 Hutchins, *Water Rights Laws in the Nineteen Western States*, *supra*, at 354.

- Water that is stored “in priority” can be used at any time, even if senior rights have called the river. For example, if a reservoir with a 1930 right stores water when there is no call on the river, the water in the reservoir can be used at any subsequent point—even if senior right holders have called the river. See First Interim Report, *supra*, at 42-43; *Federal Land Bank v. Morris*, *supra*, 116 P.2d at 1011-1012; *Kearney Lake Land & Reservoir Co. v. Lake DeSmet Reservoir Co.*, 475 P.2d 548, 551 (Wyo. 1970).
- As just explained, storage by itself is generally not a beneficial use. Reservoir owners typically can appropriate water for storage only when the water is to be used for a beneficial use. See 3 Tr. 586:10-12 (Timothy Davis) (“There is not a water right just for storage in Montana law. You have to store it for a beneficial use”); *id.* at 565:2-6 (Davis) (storage rights are limited to what can be beneficially used); *id.* at 622:18-25 (Millicent Heffner) (“In and of itself, storage is not a beneficial use”).

In various other respects discussed below, storage rights in the two states differ dramatically. Even on the basic question of whether storage is a beneficial use in and of itself, a Montana water master has ruled that the storage of water in a set of reservoirs, including the Tongue River Reservoir, built by Montana in the 1930s in response to the Great Depression has a “life of its own’ as a separate and distinct beneficial use of water.” *In the Matter of the Adjudication of the Jefferson River Drainage Area*, Case No. 41G-109, p. 5 (Mt. Water Ct., Aug. 13, 1993) (introduced at trial as Ex. M-539). See pp. 126-127 *infra*.

(1) *Wyoming storage law*

In Wyoming, the State Engineer’s office issues permits for reservoir storage just as they issue permits for direct diversions. Intro to Wyoming Water, *supra*, § 4(c), at 1-2. Since early in Wyoming’s history, anyone interested in storing water has had to obtain a permit. Storage rights are measured by the volume of water to be stored in the reservoir. *Id.* § 4(c), at 1-3.

Wyoming also normally follows a “One-Fill Rule.” Under this rule, reservoirs can fill only once each year (unless excess water is available beyond the water needed to meet all appropriative rights).³² *Id.* § 7(a), at 1-5; Ex. W-2, p. 10 (Fritz expert report). For example, if a reservoir has a permitted volume of 30,000 af, it cannot store 30,000 af, distribute that water for use, and then store another 30,000 af in the same year. Once the reservoir has filled to its

³² If there is water available in excess of that needed to satisfy all appropriative rights (a condition known as a “free river”), a reservoir can store water in addition to its permitted volume. 8 Tr. 1771:10-17 (Whitaker).

permitted volume, it cannot store additional water that year.

If any water remains at the end of a water year, it can be retained as “carryover storage,” but that storage is counted toward the following year’s fill. Intro to Wyoming Water, *supra*, § 7a, at 1-5; Ex. W-2, p. 10. Using the same example, if the reservoir retains 10,000 af in storage at the end of a water year, it can store only 20,000 af in the following water year.

Wyoming, moreover, generally requires users to store water starting on October 1, the beginning of the water year, under what I will call an “Early-In Rule.” Under state law, each local commissioner has the authority to control when a reservoir fills. Wyo. Stat. Ann. § 41-3-603. Because water is far more plentiful before the irrigation season when farmers need the water for their crops, commissioners generally issue orders requiring reservoirs to fill as soon as the water year begins on October 1. Using the same example again, if a reservoir does not start filling until November 1 and could have captured 2,000 af during October, the reservoir is permitted to store only 28,000 af. The Early-In Rule ensures that reservoirs are filled when they are least likely to interfere with direct diversions, maximizing the use of the state’s limited water supply. Intro to Wyoming Water, *supra*, § 7(b), at 1-5.³³

³³ Gordon Aycock, who oversaw federal reclamation reservoirs in Wyoming from 1981 to 2012, testified that he never saw an order from Wyoming before 1990 requiring that a reclamation reservoir begin storage at a particular time. 9 Tr. 1856:19-24. Montana, however, does not dispute that today Wyoming normally follows both a One-Fill Rule and Early-In Rule.

As a corollary to the "Early-In Rule," Wyoming also penalizes a reservoir for any water that it permits to flow downstream while it is filling, under what I will call a "Store-It-or-Lose-It Rule." If a reservoir lets any water "spill" or flow through or over its dam while it is filling, the amount of water spilled generally counts against the reservoir's storage right. *Id.* § 7(b), at 1-6. Returning once again to the example, if the reservoir lets 1,000 af flow downstream for fish or other purposes while the reservoir is filling, the reservoir is entitled to store only 29,000 af.

(2) Montana storage law

Montana storage law is dramatically different from that of Wyoming. As noted earlier, Montana did not create a permit system until 1973. Prior to 1973, anyone wishing to store water could obtain a storage right under Montana law by storing and beneficially using the water or by following the recordation requirements in effect at the time. The Montana Water Court is currently adjudicating storage rights of reservoirs as part of Montana's statewide adjudication process.

The status of the One-Fill Rule in Montana is unclear and ultimately need not be decided by the Court. Because it was a major issue at trial, however, a brief overview of the issue is useful. Wyoming contends that the Montana Supreme Court adopted the One-Fill Rule in *Federal Land Bank v. Morris*, *supra*. In *Morris*, two reservoirs could store more water than the quantity of water to which they held appropriative rights, and the question was whether they could use the extra reservoir capacity to store water in wet years for use in dry years. The Montana Supreme Court held that they could, emphasizing the importance of storage in arid lands. 116 P.2d at 1011.

The court, however, went on to discuss in favorable terms the principal case in Colorado adopting the One-Fill Rule:

We like the language used in *Windsor Reservoir & Canal Co. v. Lake Supply Ditch Co.*, 44 Colo. 214, 98 P. 729, 733, in referring to the Colorado statute on the reservoir appropriations: "These provisions mean that to each reservoir shall be decreed its respective priority, and this priority entitles the owner to fill the same once during any one year, up to its capacity, and restricts the right upon one appropriation, to a single filling for any one year. A double filling in effect would give two priorities of the same date and of the same capacity to the same reservoir, on the same single appropriation, which is impossible in fact and in law, and, if allowed, would violate the fundamental doctrine of the law of appropriation—he who is first in time is first in right—by making a junior superior to a senior reservoir appropriator. Necessarily the capacity of a reservoir, which the statute expressly says is the extent of its appropriation, is what the reservoir will hold at one time, not what can be stored by it by successive fillings; otherwise the capacity would vary, depending not on what the reservoir will hold, but on how many times it can be filled in one year. When we speak of the capacity of a barrel or bottle, we mean the number of gallons or ounces it will hold when filled once, not many times."

Id. The Montana Supreme Court then proceeded to single out and quote two sentences from *Windsor*

Reservoir & Canal Co. expressly setting out the One-Fill Rule: "The appropriation for a reservoir, in the nature of things, is measured by the quantity of water which it will hold at one filling. A reservoir appropriation, like that for a canal, cannot be made to do double duty." *Id.*, quoting 98 P. at 734.

Montana argues that this language is dictum and that the Montana Supreme Court subsequently took a different position in *Bagnell v. Lemery*, 657 P.2d 608 (Mont. 1983). *Bagnell*, however, does not appear to reject a One-Fill Rule. In *Bagnell*, the holders of a 1917 appropriative right to divert 100 gallons per minute on their property built a dam in 1958 to store some of this water and to operate a commercial fish farm. Because the appropriation right was large enough to fill and refill the reservoir multiple times during a year, a junior appropriator challenged the defendants' right as "excessive" and as improperly entitling the defendants to engage in multiple fillings. The Montana Supreme Court disagreed, but on purely factual grounds:

We disagree [with the plaintiff]. 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. at 612 (emphasis added). Thus, rather than rejecting the junior appropriator's premise that reservoir holders cannot engage in multiple fillings, the Montana Supreme Court concluded that the defendants were not engaged in double filling because they were simply taking their original water right and storing a portion of it.

However one interprets *Morris* and *Bagnell*, Montana water officials and courts do not appear to follow a One-Fill Rule today.³⁴ For example, the Montana Water Right Claim Examination Rules ("Examination Rules"), as amended by the Montana Supreme Court, govern the statewide adjudication of water rights currently taking place and explicitly contemplate the possibility of multiple fillings of a reservoir. In collecting information as part of the adjudication of a reservoir right, claims examiners are to collect information, not only on the size and capacity of the reservoir, but also on the "number of fills per year." Examination Rule 10(b)(4)(x).³⁵ In the "Summary Report" provided to the Water Court, the claims examiner is to list remarks on "unresolved issues or questions about the claimed volume, such as the following situations . . . (ii) when a claimed volume

³⁴ Among western states, Colorado and Wyoming are the only states today that clearly follow a One-Fill Rule. See Tarlock, *Law of Water Rights*, *supra*, § 5:39, at 5-63 (also criticizing the rule). According to Professor Tarlock, "There is some suggestion in Montana that the state follows the one fill rule," citing *Morris*, "but the [DNRC] has held that the reasonableness of a diversion scheme should not be determined by a mechanistic application of the rule." *Id.* § 5:39, at 5-63 n.3, citing *In the Matter of the Application for Beneficial Use of Water Permit No. 12016-s41G* (1984).

³⁵ Copies of the rules can be found at http://courts.mt.gov/content/water/rules/claim_exam_rules.pdf.

to be decreed is greater than *two times* the capacity of the reservoir or exceeds a *reasonable* number of fills.” *Id.* 15(h)(5) (emphasis added). According to Timothy Davis, who is Montana’s lead water official, the volume of a reservoir is generally not identified as an issue unless, as noted in the Examination Rules, it exceeds twice the capacity of the reservoir. 3 Tr. 538:15-19.

The three Montana water officials with the greatest responsibility concerning the adjudication of reservoir rights also testified that Montana does not follow a One-Fill Rule. According to Timothy Davis, Montana’s lead water official, it is “very common” to have reservoir rights with volumes that exceed the capacity of the reservoir. *Id.* 538:8-11. According to Kevin Smith, who heads the State Water Project Bureau with responsibility for 21 state-owned water projects, none of the state projects are limited to a single fill. 6 Tr. 1261:20-23. Instead, the reservoirs typically provide for anywhere from 1.3 to two fills per year. *Id.* at 1261:24-1262:3. “Typically, the volumes were calculated by doing a full fill, a partial refill, and evaporative losses.” *Id.* at 1261:3-5. Finally, Millie Heffner, who heads the Montana Water Rights Bureau, testified that Montana has nothing resembling a one-fill rule. 3 Tr. 624:5-7. Instead, according to Ms. Heffner, Montana law permits a storage volume greater than capacity where there is a beneficial use for the capacity. *Id.* at 613:10-22. See also Ex. M-7, p. 17 (Aycock expert rebuttal report) (Montana does not follow the One-Fill Rule).

The water-right abstracts for several of the reservoirs undergoing current adjudication list storage rights that are greater than their storage capacity. See, e.g., *In the Matter of the Adjudication*

of the Bitterroot River Drainage Area, Case No. 76HE-166, p. 12 (Mont. Water Ct., March 9, 2000) (introduced as Ex. M-319) (storage appropriation of 45,720 af, compared to capacity of only 31,706 af). As noted earlier, the Montana DNRC Adjudication Bureau originally listed “volume guidelines” for the Tongue River Reservoir water right that also were in excess of the Reservoir’s capacity. See Ex. M-526, § 8, at 4; p. 106 *supra*. And the Amended Stipulation in the Montana Water Court designed to resolve all objections to the Reservoir’s water right notes that the Reservoir is “filled and refilled” and is “not administered according to any specific numerical volume defining or limiting the amount of water that can be diverted into storage in a year.” See Ex. M-526, p. 4, § 12; pp. 106-107 *supra*.

What the Montana Supreme Court would rule if the One-Fill Rule came before it today is uncertain. The court might conclude that *Morris* did not adopt the One-Fill Rule, or that the relevant language in *Morris* was dictum. Alternatively, the court might conclude that the One-Fill Rule no longer applies in the wake of the comprehensive change in Montana water law in 1973. Or despite the current practice of Montana water officials and its own Examination Rules, the court might hold that Montana follows the One-Fill Rule. Thankfully, as discussed below, this Court can decide the instant case without resolving the state-law question of whether the One-Fill Rule currently governs reservoirs in Montana.

Whether or not the One-Fill Rule applies in Montana, there is no evidence that Montana has ever followed Wyoming’s rule that carryover storage counts against the amount of water that a reservoir can store in the following year. To the contrary, Montana

officials testified that holders of storage rights can divert the amount of water to which they are entitled each year without regard to how much water they have in carryover storage. *See, e.g.*, 3 Tr. 565:12-17 (Timothy Davis) (the Tongue River Reservoir water right “does not limit the ability to carry water over in order to ensure a firm yield of that water right and delivery in any given year”); *id.* at 644:24-645:15 (Millicent Heffner). In explaining Montana water law only seven years after the Compact, Wells Hutchins, a major water law expert of the time, observed that certain reservoirs in Montana “had been constructed and maintained with the intention of holding more water than required for irrigation in any one year, for the obvious purpose of storing an *extra supply* during wet years for use in dry years.” Hutchins, *The Montana Law of Water Rights* 69 (1958) (emphasis added). Moreover, as Hutchins noted in the same book, the Montana Supreme Court expressly held in *Morris* that the holder of a reservoir right has the right “to store for use in that *or succeeding years* what he has a right to use, and also any additional amounts that others would not have the right to use, and that otherwise would go to waste.” *Federal Land Bank v. Morris, supra*, 116 P.2d at 1012 (emphasis added).

Montana’s approach to carryover storage, moreover, is not unique. According to Gordon Aycock, a former official of the United States Bureau of Reclamation and an expert witness for Montana, reservoirs frequently are built with additional storage “designed into the reservoir to protect against consecutive years of drought.” Ex. M-7, p. 9 (Aycock rebuttal expert report).

Montana also does not follow Wyoming’s Early-In Rule or Store-It-or-Lose-It Rule. Montana, unlike

Wyoming, does not have a statute that allows state officials to require water to be stored during a particular time period, which forms the legal basis for Wyoming's Early-In and Store-It-or-Lose-It Rules. In Montana, you can store at any time during the period of diversion listed on your water right. 3 Tr. 633:14-15 (Millicent Heffner).³⁶ If the water right does not specify a period of diversion, a reservoir can fill at any time during the year up to its beneficial needs. *Id.* at 644:17-23 (Heffner). *See also* Ex. M-7, p. 8 (Aycok rebuttal expert report) (Montana does not require reservoirs to start filling at the start of a water year); 6 Tr. 1262:6-1263:3 (Kevin Smith) (describing winter flows of other Montana state water projects).

The Montana Supreme Court's Examination Rules for water right adjudications confirm that Montana does not require all reservoirs to fill at the beginning of a water year, on penalty of losing the right to store water later in the year. For example, the rules provide that claims examiners should determine the "period of diversion into storage" for a reservoir—i.e., the period when "water is diverted, impounded or withdrawn from the source." Examination Rules 2(a)(50), 10(b)(4)(vi). Claims examinations would not need to make that determination if all reservoirs must fill at the beginning of the irrigation season.

³⁶ Holders of storage rights can even change the period in which they fill, so long as the change in timing does not have an adverse effect on other water users. 3 Tr. 633:16-23 (Heffner) (okay to change storage from January and February to March and April unless "that change in pattern results in an adverse effect to other users").

(3) *The Montana State Water Project*

The Tongue River Reservoir is one of 141 state storage projects that apparently enjoy broader authority under state law than private reservoirs. The Montana Conservation Board built these projects in the 1930s in response to the Great Depression to supply water for over 400,000 acres of land. Ex. M-280, p. 6 (Conservation Board Summary of Activities, 1934-80). The Montana State Water Project, part of the Montana DNRC, currently manages the reservoirs on behalf of the State.

According to the Montana Water Court, these state storage projects “occupy a unique place in Montana water law.” *In the Matter of the Adjudication of the Bitterroot River Drainage Area*, Case No. 76HE-166 (Mont. Water Ct., March 9, 2000) (introduced at trial as Ex. M-319) (hereinafter “*Painted Rocks Reservoir*”).³⁷ Montana built the reservoirs to “stimulate the economy, provide jobs, and create stable and consistent water supplies for future development.” *Id.* at 3. The authorizing legislation declared that “the public interest, welfare, convenience and necessity” required the “construction of a system of works ... for the conservation, development, storage, distribution, and utilization of water.” Rev. Code Mont. § 89-101 (1947).

The legislation authorized the Conservation Board to store water for sale to others. The State retained ownership of the water right for each project (*see*

³⁷ *Painted Rocks Reservoir* was a decision and opinion of a water master appointed by the Montana Water Court. The Water Court subsequently adopted the water master’s report. 7 Tr. 1382:24-1383:1 (Kevin Smith).

Painted Rocks Reservoir, supra, at 9), but marketed the water through local water users' associations for sale to local water users. See Ex. M-3, p. 7 (Smith expert report). The Tongue River Reservoir illustrates this approach. As explained earlier, Montana holds the storage water right for the Reservoir, but markets the water for use in the Tongue River watershed through the TRWUA.

The Conservation Board initiated the process of obtaining a storage right for state projects by filing a storage Declaration. See Rev. Code Mont. § 89-121 (1947) (appropriation of water can be initiated "by executing a declaration in writing of the intention to store, divert or control the unappropriated waters of a particular body, stream or source"). Rather than specifying a particular volume of storage, as Wyoming law requires, the declaration could state an intention to appropriate and store all the unappropriated water of a river.

In alignment with the goals of the state water project, the purpose of the underlying water rights is broad and flexible: it is to sell water. In the case of the Painted Rocks Reservoir, the General Abstract from the state water adjudication simply lists "SALE" as the "purpose" of the reservoir's water right. *Painted Rocks Reservoir, supra*, at 7, attachment. As the opinion notes, this purpose is expansive and flexible. While the state "contemplated that the use of water from this project would be largely agricultural in nature," the "use of Painted Rocks stored water was never limited to a specific purpose." *Id.* at 4. The state enabling legislation (Rev. Code Mont. §§ 89-101 et seq. (1947) (since repealed)) "was broad enough to meet the changing needs of the area." *Id.* This "legislative intent was reflected" in the project's original and

amended storage declarations, which provided for the sale of water for irrigation and "other useful and beneficial purposes." *Id.* at 4 & n.2.

The purpose of the Tongue River Reservoir, like the Painted Rocks Reservoir, is to market water to downstream users. 5 Tr. 1022:23-25 (Smith). The Storage Declarations for the Tongue River Reservoir, like those for Painted Rocks, state that the Reservoir's purpose is the sale of water for irrigation and "other useful and beneficial purposes." Exs. M-558A (original declaration), M-558B (January 1938 amended declaration), M-558C (February 1938 amended declaration). The proposed abstract of the Tongue River Reservoir's water right, like that for Painted Rocks, list its purpose as "SALE."

Yet another decision by a Montana water master dealing with a state water project concluded that the Montana statute authorizing the construction of projects like the Tongue River Reservoir eliminated the need for an independent beneficial use. *In the Matter of the Adjudication of the Jefferson River Drainage Area*, Case No. 41G-109 (Mt. Water Ct., Aug. 13, 1993) (introduced at trial as Ex. M-539) ("*Case No. 41G-109*").³⁸ As noted above, storage by itself is generally not a beneficial use, so appropriative rights for storage require that stored water be used for a beneficial use. See pp. 110, 113 *supra*. According to *Case No. 41G-109*, however, the Montana legislature

apparently gave storage a 'life of its own' as a separate and distinct beneficial use of water. The [State Water Conservation] Board's

³⁸ The Montana Water Court subsequently entered an order adopting the water master's report. 7 Tr. 1380:16-19 (Kevin Smith).

statutory mission was conservation, development, storage, distribution, and utilization of water. Under these statutes, it appears that the Board was entitled to store water simply for the sake of storing it. The board could then later put the water so appropriated to any beneficial use it saw fit, regardless of whether a specific use was contemplated when the declaration was filed.

Id. at 5.³⁹ According to Kevin Smith, Chief of Montana's State Water Project Bureau, *Case No. 41G-109* is consistent with his understanding of how state water projects operate under Montana water law. 7 Tr. 1381:15-18.

The *Painted Rocks Reservoir* opinion also emphasized that the storage rights of a state water project are superior to the water rights of junior appropriators. Junior appropriators have an "expectation" only that

senior right owners do nothing to increase the burden on the source to the juniors' detriment. *Thompson v. Harvey*, 164 Mont. 133, 136, 519 P.2d 963 (1974). The most significant factor for junior right owners is the volume of the project claim. They can only call on this source ahead of the project when

³⁹ The water master relied, in part, on Rev. Code Mont. § 89-121 (1947) (now repealed) that provided that, in developing reservoir storage projects, the Montana Water Conservation Board was not limited to the terms of the statutes governing Montana water rights, 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" *Case No. 41G-109, supra*, at 4.

the reservoir has met its volume cap for that year. Because the project is using stored water, the place of use and purpose are still not significant factors. The use of stored water means the project cannot increase the burden on the source beyond its claimed volume.

Painted Rocks Reservoir, supra, at 8.⁴⁰ As noted earlier, the Amended Stipulation for the Tongue River Reservoir in the adjudication currently taking place in the Montana Water Court states that the Reservoir does not have a “specific numerical volume defining or limiting the amount of water that can be diverted into storage in a year.” Ex. 526, ¶ 12 at 4. Instead, the volume to be stored in any year is “determined according to the operation plan” for the Reservoir, described earlier at page 24.

Both *Painted Rocks Reservoir* and *Case No. 41G-109* involved reviews and approvals of stipulated settlements by water masters. The parties therefore were no longer fighting over the volume of the right. *See* 7 Tr. 1400:11-13 (Kevin Smith). And the decisions did not reflect analyses of the Water Court itself. How the Montana Supreme Court might ultimately rule on the legal issues raised by the cases is an open issue. Both cases, however, provide the best guidance currently available on Montana water law regarding the Tongue River Reservoir, and Montana follows them in its operation of the state water project.

⁴⁰ In a footnote, the opinion emphasized that there were “no objections to the volume quantification for this claim” and that the parties had represented that “this volume reflects the historical use of project water.” *Painted Rocks Reservoir, supra*, at 8 n.4.

d) Analysis.

Whether Montana received sufficient water to enjoy its pre-1950 storage rights in 2004 and 2006 involves four questions. First, how much water is Montana entitled to store in the Tongue River Reservoir under Article V(A)? Second, is Montana entitled under Article V(A) to store any of that water in the portion of the Reservoir's capacity added in the late 1990s? Third, did Montana lose its right to store any of the water in 2004 and 2006 because it failed to maximize water storage in the winter months? Finally, did the Northern Cheyenne Compact affect the amount of water that Montana can store under Article V(A) in 2004 or 2006?

(1) Montana's storage right under the Compact

At a minimum, Article V(A) of the Compact protects Montana's storage of *at least* 32,000 af of water each year in the Tongue River Reservoir for delivery to the TRWUA and sale to the association's members. As discussed earlier, Article V(A) protects pre-1950 storage rights when the water is stored for a subsequent beneficial use. *See* pp. 108-111 *supra*. When the Compact was signed, the Montana Conservation Board had contracted to provide the TRWUA with at least 32,000 af each year "for the purpose of irrigation, watering of stock, domestic and municipal uses and for other purposes."⁴¹ Ex. M-529A,

⁴¹ According to the preamble to the water marketing contract, the Tongue River Reservoir project would "have an estimated live capacity of at least 32,000 acre feet of water annually, and it is agreed by the parties hereto that the total waters to which the Board is entitled will at least be sufficient to permit the operation of said project at its full capacity so that 32,000 acre feet of

§ 1 (1937 water marketing contract). The TRWUA, in turn, agreed to sell at least 32,000 af per year to its members for use on their lands. *Id.* § 4. The TRWUA also agreed to put the water “to beneficial use, with diligence and in accordance with law.” *Id.* § 1. Article V(A) of the Compact therefore protects Montana’s right to store at least 32,000 af.

Any storage water carried over in the Reservoir at the end of a water year, moreover, does not affect Montana’s right to store at least 32,000 af more in the next water year, up to the Reservoir’s capacity.⁴² Thus, if the Tongue River Reservoir holds 20,000 af of carryover at the beginning of a water year, Montana is entitled to add another 32,000 af, bringing the total amount of stored water to 52,000 af. This is the law in both Montana and many other appropriation states. As discussed earlier, Montana does not count carryover toward the amount of water that can be stored in a subsequent year. *See* pp. 121-122 *supra*. And the Montana Supreme Court has recognized the rights of the owner of a reservoir to fill the reservoir “up to its capacity.” *Federal Land Bank v. Morris*, 116 P.2d at 1011, quoting *Windsor Reservoir & Canal Co. v. Lake Supply Ditch Co.*, 98 P. 729, 733 (Colo. 1908). No provision of the Compact contradicts Montana’s rule, or imposes Wyoming’s rule instead, for carryover in the Tongue River Reservoir.

The Court need not decide whether Article V(A) would entitle Montana to fill the Reservoir to capacity more than once during a water year. As discussed

water can be made available annually during the irrigation season” Ex. M-529A, p. 1.

⁴² The next section addresses the amount of the reservoir’s capacity protected by Article V(A). *See* pp. 141-144 *infra*.

earlier, the issue is not clear cut. While Montana does not currently follow the One-Fill Rule, the Montana Supreme Court's earlier decision in *Morris* appeared to endorse the rule.⁴³ And while Wyoming now follows the One-Fill Rule, Wyoming law was far less clear when the Compact was written. See McCauley, *supra*, at 461-462.⁴⁴ Whether the authors of the Compact would have thought that their general adoption of the "doctrine of appropriation" in Article V(A) incorporated a One-Fill Rule is thus uncertain. Although the parties have devoted much ink to the issue, however, resolution of the question is unnecessary in this case. Montana did not attempt to

⁴³ A law review note published in 1968 suggested that Montana followed the One-Fill Rule. See McCauley, *supra*, at 460-461 (reservoir owners wishing to fill twice in the same year "will be frustrated in . . . Montana").

⁴⁴ Several Wyoming Supreme Court cases in the mid-20th century appeared inconsistent with the One-Fill Rule. In a Wyoming Supreme Court decision dealing with the similar, but not identical question of whether an irrigator can claim an appropriation right to more water than the capacity of his or her ditch, the court concluded that the measure of an appropriative right is beneficial use, even if greater than the capacity of the ditch. "Limitation to capacity of ditch seems to have been the general rule, when appropriations commenced for mining purposes. . . . But, when the principles of appropriation were extended to irrigation, a different rule grew up, since it was frequently impracticable for a land owner to construct his diversion works, and therefore make beneficial use of the water, all at once." *Van Tassel Real Estate & Livestock Co. v. City of Cheyenne*, 54 P.2d 906, 913 (1939). In another decision, the Wyoming Supreme Court approved an appropriation right that was greater than the effective capacity of the reservoir, thus factually sanctioning a double fill, but no party raised the question of whether this violated Wyoming law, nor did the court address the question. See *Laramie Rivers Co. v. LeVasseur*, 202 P.2d 680 (1949).

double-fill the Reservoir in either 2004 or 2006, nor does Montana currently seek to fill the Reservoir more than once to capacity during the water year under Article V(A) of the Compact.

Montana's operation of the Tongue River Reservoir both before and immediately after the Compact's adoption was consistent with a right to store at least 32,000 af each year up to the capacity of the Reservoir. In the decade between the Reservoir's completion and the Compact's adoption, the Montana Conservation Board stored slightly more than 37,000 af on average during the spring. *See* Ex. M-5, p. 30, tbl. 4-A (Book expert report).⁴⁵ While Montana generally did not fill the Tongue River Reservoir near to capacity in many of the years prior to and immediately after adoption of the Compact, the Reservoir filled to capacity in 1944. *Id.* at 29, tbl. 4-A. The Reservoir also filled near to its capacity in 1941 (when it filled to 58,000 af at the end of May) and 1942 (65,500 af), the years "when the water right was being perfected." Ex. M-7, pp. 16-17, citing Ex. M-5, p. 29, tbl. 4-A. In the decade following adoption of the Compact, the Reservoir filled near to

⁴⁵ Exhibit M-5 shows that, in the pre-1950 period, Montana tended to release water from the Tongue River Reservoir from October through January and then store water from February through June (and sometimes into the early summer). Most of the storage occurred in April, May, and June. Average storage at the beginning of the water year was 30,521 af. By the end of January, the average storage level had dropped to 7,077 af. By the end of June, the average storage level had risen to 44,736 af. From February through June, therefore, the Reservoir stored over 37,000 af on average. Ex. M-5, p. 30, tbl. 4-A. Storage during the spring and early summer varied significantly from year to year, but virtually always exceeded 32,000 af. *Id.* at 29, tbl. 4-A. (Because Exhibit M-5 reports only end-of-the-month storage, these numbers may understate the actual amounts stored.)

capacity in 1959. See Ex. M-5, p. 29, tbl. 4-A (62,680 af at the end of June).

(a) Is Montana limited to the volume of stored water that was actually marketed to individual users in 1950?

Wyoming argues that Montana's storage right under the Compact might be smaller than 32,000 af, pointing to several documents that suggest the TRWUA was never able to market 32,000 af prior to 1969. See Wyoming's Post-Trial Brief, *supra*, at 17. The 1969 contract with the TRWUA, which enlarged the amount to be supplied to 40,000 af, explicitly states that the TRWUA was never able to market all of the original 32,000 af. Ex. M-529C, p. 3. A 1961 report of the Montana Conservation Board also states that only 11,638 af of water contracts were then outstanding for the Tongue River Reservoir. Ex. M-280, p. 15. In Wyoming's view, Montana is only entitled to the amount of storage water actually put to "existing uses as of 1950." Wyoming's Post-Trial Brief, *supra*, at 17 & n.5.

The amount of water actually marketed by the TRWUA to its members prior to the Compact, however, did not define Montana's storage rights. At a minimum, the Conservation Board had a right to store the amount of water that it had contracted to provide to the TRWUA for beneficial use. Under the 1937 Water Marketing Contract with the TRWUA, the Conservation Board agreed to furnish the TRWUA with the "total available yield of storage water," which it estimated to be 32,000 af, and to "use all available means to guard against water shortage." Ex. M-529A,

§ 1. As described, Montana held a valid state appropriative right to store at least this amount. In compliance with this agreement, the Conservation Board actively stored more than 32,000 af every year during the spring runoff. *See* p. 132 *supra*. Even if the TRWUA was not able to use all of the water each year for which it had contracted, this did not undermine the storage right of the Conservation Board. As discussed earlier, reservoir storage rights often exceed the amount of water irrigators may in actuality use in any year. *See* pp. 110-111 *supra*.

As the Montana Supreme Court recognized in an early case, moreover, the appropriative right of a public water supplier should not be defined by the amount of water it is able to initially sell. In *Bailey v. Tintinger*, 122 P. 575 (Mont. 1912), a company constructed a canal that could deliver more than it initially was able to sell, but with the intent to sell the canal's full capacity. The question was whether the company could claim an appropriative right to the full capacity. According to the Montana court, an "appropriation must be for some useful or beneficial purpose; but the use to which the water is to be applied need not be immediate, but may be prospective or contemplated." *Id.* at 582. If a canal company has the intention to apply all of the water to a beneficial use, it gains an appropriative right to the canal's full capacity when it completes the canal, "is ready and willing to deliver water to users upon demand, and offers to do so." *Id.* at 583. As the court noted, any other rule would make large irrigation projects infeasible:

Assume that a corporation which does not own, control, or possess any land is organized for the purpose of selling or renting water to

settlers to irrigate arid lands; that it proceeds under the statute to make its appropriation and fully complies with all the statutory requirements, completes its distributing system, and is ready and offers to supply water to settlers upon demand. Now, if the corporation can ever make an appropriation, it has done so, for it has performed every act which it can perform. It cannot use the water itself, for it has no land or other means of use. Any further acts must be performed by its customers who are to be the users. . . . If the appropriation is not completed until the water is actually used, it is apparent at once that the corporation's right, if any it has, is so intangible and uncertain as to be of no value, whatever amount of money may have been expended on the work. . . .

To deny the right of a public service corporation to make an appropriation independently of its present or future customers, and to have a definite time fixed at which its right attaches, would be to discourage the formation of such corporations and greatly retard the reclamation of arid lands in localities where the magnitude of the undertaking is too great for individual enterprise, if, indeed, it would not defeat the object and purpose of the United States in its great reclamation projects

Id. at 582-583.

Wyoming argues that any storage today in excess of the amount of water actually marketed *and placed to beneficial use by actual irrigators* prior to the Compact is not protected by Article V(A). Wyoming's Post-Trial

Brief, *supra*, at 13-15. Wyoming points to Article V(C)(3) of the Compact that, as noted earlier, relegates water that is stored and “used for irrigation, municipal, and industrial purposes developed after January 1, 1950” into the third-tier of protection under Article V(B), even when stored in a pre-1950 reservoir. *See* p. 109 *supra*. According to Wyoming, any water stored and used today in excess of 11,638 af is “for irrigation, municipal, and industrial purposes developed after January 1, 1950” and therefore outside the protection of Article V(A). Wyoming’s Post-Trial Brief, *supra*, at 14 (“only those portions of existing reservoirs put to beneficial use as of 1950 are protected under Article V(A)”).

It is difficult to imagine that Montana intended that the Compact would limit its right to store at least 32,000 af. When the Compact was adopted, Montana was storing 32,000 af or more each year and had entered into a contract with the TRWUA to provide them with at least 32,000 af every year. The TRWUA, in turn, agreed to pay a fixed sum for the water, even if shortages prevented full delivery of the 32,000 af. *See* Ex. M-529A, §§ 2-4, at 2-3 (1937 water marketing contract). The Tongue River Reservoir, moreover, was an integral part of a Depression-era storage initiative designed to “stimulate the economy, provide jobs, and create stable and consistent water supplies for future development.” *See Painted Rocks Reservoir, supra*, at 3. Under these circumstances, it is highly unlikely that Montana would have agreed to a compact that protected only a third of the amount that it had committed to provide the TRWUA and was storing on a yearly basis.

Under the Compact, Montana can store at least 32,000 af in the Reservoir under the protection of

Article V(A) so long as the water is not used for new “purposes.” Prior to the Compact, the Conservation Board stored at least 32,000 af each year for the “purposes of irrigation, water of stock, and domestic uses” by members of the TRWUA. Ex. M-529A, § 1, p. 2 (1937 water marketing contract). Any water that Montana now stores in the Reservoir under its contract with the TRWUA is for the same overall purposes. See Ex. M-529C, p. 1 (1969 amended water marketing contract). Montana is not storing the water for “irrigation, municipal, and industrial purposes developed after January 1, 1950.” Montana is storing the water for purposes formulated prior to the Compact and embodied in the Conservation Board’s contract with the TRWUA. As a result, the storage falls under Article V(A), not Article V(C)(3).

Article V(C)(3) explicitly covers only water that is stored and used for new “purposes,” in contrast to other sections of the Compact that address new water “uses.” The third tier of protection, for example, includes diversions for post-1950 “uses” (Compact, *supra*, art. V(C)(1)), but includes storage only where the water is stored in new reservoirs (*id.*, art. V(C)(2)) or is used for post-1950 “purposes” (*id.*, art. V(C)(3)). Although it is possible that the authors of the Compact did not intend any substantive distinction between “use” and “purpose,” the difference in wording suggests that the authors intended exactly what the Compact says: Article V(A) protects storage in pre-1950 reservoirs unless the stored water is used for new purposes. “Purpose” and “use” have very different meanings. “Purpose” is a “goal” or “aim,” while “use” is the “application of something for some purpose.” The American Heritage Dictionary of the English Language 1062, 1410 (1981). The purpose, goal, or aim of Montana’s storage in the Tongue River

Reservoir for the TRWUA today is the same as when the Compact was negotiated. As a result, Article V(A) entitles Montana to store at least 32,000 af.

(b) Can Montana store more than 32,000 af in a water year?

Montana argues that it is entitled under Article V(A) to fill the Tongue River Reservoir to capacity without any yearly volumetric limit. See Montana's Post-Trial Brief, *supra*, at 99. The Montana Conservation Board stated in its original Storage Declaration that it planned to store "all unappropriated waters," without any volumetric cap. Ex. M-558A. According to the Amended Stipulation filed in Montana Water Court, moreover, the Tongue River Reservoir has no "specific numerical volume defining or limiting the amount of water that can be diverted into storage in a year." Ex. M526, ¶ 12, at 4. The volume listed in the agreement with the TRWUA merely "define[s] the amount[] to be delivered in any one year." *Id.*

Moreover, the Montana Supreme Court's decision in *Federal Land Bank v. Morris*, *supra*, suggests that Montana might have the right to fill the Reservoir each year to capacity, no matter how much water Montana contracted with the TRWUA to deliver. As noted earlier, *Morris* states that the "appropriation for a reservoir . . . is measured by the quantity of water which it will hold in one filling." 116 P.2d at 1011, quoting *Windsor Reservoir & Canal Co.*, *supra*, 98 p. at 734.

Montana's argument raises multiple issues, including Montana's pre-Compact intent and practice. The Montana Conservation Board apparently anticipated that the live capacity of the Tongue River

Reservoir would be only 32,000 af, which is why its contract with the TRWUA provided for the sale of that amount for beneficial use by local farmers. Ex. M-529A, p. 1 (1937 water marketing contract). A contemporaneous report by the U.S. Bureau of Reclamation also suggests that Montana used the capacity of the Reservoir beyond 32,000 af for flood control purposes, not irrigation storage. According to the Bureau's August 1949 sedimentation survey, the "dam, in addition to providing water for irrigation, is also used for flood control; *the upper 7 feet of the reservoir from the spillway down is allocated for this purpose.* The present flood control storage capacity as determined by this investigation is 21,089 acre-feet." Ex. M-557E, p. 2 (emphasis added).

If Montana did not have an intention to store more than 32,000 af in the Tongue River Reservoir for delivery to and beneficial use by the TRWUA, Article V(A) arguably does not protect storage of a greater amount. Prior appropriation law generally does not recognize rights beyond the original intent of the appropriator. See, e.g., *Bailey v. Tintinger*, 122 P. 575, 583 (Mont. 1912) (appropriator must have intention to apply the water to a useful or beneficial purpose at time of appropriation).

Other evidence, however, indicates that Montana may have intended to store more than 32,000 af for beneficial use. The Montana Conservation Board's 1937 contract with the TRWUA estimated that the available yield for delivery to the association would be "at least 32,000 acre feet of water annually," and the TRWUA sought to acquire "all of the water to be impounded in the project." Ex. M-529A, pp. 1-2 (emphasis added). The board agreed to furnish to the TRWUA the "total available yield of storage water," no

matter what the promised amount. *Id.* §1. If the yield turned out to be more than 32,000 af, the TRWUA agreed to promptly enter into more contracts for the additional water. *Id.* § 4. As for the Bureau of Reclamation document suggesting that Montana used the top portion of the Reservoir for flood control, Mr. Aycock testified that Montana probably intended the top 20,000 af or so of storage capacity to be used *jointly* for flood control and storage, rather than solely for flood control. 9 Tr. 1914:1-2. The Montana Conservation Board's contract with the TRWUA is consistent with that view.

Ultimately, the Court need not resolve this question as part of this proceeding. Montana stored only about 10,000 af in the Tongue River Reservoir in 2004. *See* Ex. M-5, p. 30 tbl. 4-A (Book expert report). In 2006, Montana stored less than 32,000 af. *Id.*⁴⁶ Because Montana was not able to store even 32,000 af in either year, it is inconsequential to this case whether it was entitled under Article V(A) to store more.

For the same reason, the Court need not decide whether the 1969 contract between Montana and the TRWUA, which expanded deliveries of stored water from 32,000 af to 40,000 af, also expanded Montana's rights under Article V(A) of the Compact. Assuming

⁴⁶ In 2004, the Reservoir started with 39,760 af of carryover. Ex. M-5, p. 30 tbl. 4-A. End-of-month storage peaked at only 49,680 af, or slightly less than 10,000 af more than the carryover. *Id.* In 2006, the Reservoir started with carryover of 44,470 af. *Id.* Releases in November and December brought storage down to 41,870 af by the end of December. *Id.* Storage peaked at 73,400 af. 6 Tr. 1310: 9-24 (Kevin Smith). In 2006, Montana thus stored about 29,000 af more than the carryover from the prior water year and about 31,500 more than its lowest storage on December 31.

Article V(A) originally protected only 32,000 af of storage, an open issue is how the Compact treats the 8,000 af added in the 1969 contract. Because Montana was unable to store 32,000 af in 2004 and 2006, however, the status of the additional water is irrelevant. Nor does the Court need to decide whether Montana is entitled to store more than 32,000 af in order to ensure that 32,000 af can be delivered to the users. See 3 Tr. 587:7-10 (Timothy Davis) (have to store more water to deliver the contract amount).

(2) Impact of the 1999 Reservoir expansion

A second question is whether Article V(A) protects Montana's right to store water in reservoir capacity added in 1969. As described above, the Reservoir originally had a capacity of 72,500 af. By the date of the Compact, capacity had shrunk to 69,400 af due to sedimentation. In 1999, Montana expanded the Reservoir's capacity to 79,071 af. See pp. 105 *supra*. Montana argues that Article V(A) protects the entire capacity of the Reservoir today. I conclude that Article V(A) protects only 72,500 af of capacity, but that Montana can still claim Article V(A) protection for the entire capacity of the Reservoir when it starts the year with over 6,571 af of carryover. The reason, as explained below, lies in the way in which appropriation states manage reservoirs that have mixed priorities.

While the capacity of the Tongue River Reservoir shrank from 72,500 af to only 69,400 af by the time of the Compact, prior appropriation law permits reservoir owners to restore lost capacity without affecting priority. In *Laramie Rivers Co. v. LeVasseur*, 202 P.2d 680 (Wyo. 1949), for example, a reservoir held about 99,000 af of water. Because the bottom of the

reservoir was uneven, there were two pools that did not drain, robbing the reservoir of between 21,000 and 28,000 af of storage capacity. While the reservoir thus had an effective capacity of only 70,000 to 80,000 af, the Wyoming Supreme Court allowed the reservoir owner to cut channels to make the two pools usable and rejected claims that the lost capacity had been abandoned. *Id.* at 692-694. The Montana Supreme Court also has held that the owner of a canal that is carrying less than its original capacity can “make repairs, so that his canal will perform the full service which it was intended to perform.” *Bailey v. Tintinger*, *supra*, 122 P. at 578. *See also Donich v. Johnson*, *supra*, 250 P. at 972-973 (repairs to reservoir, no matter how substantial, not considered a new appropriation so long as the original capacity of the reservoir is not exceeded). Article V(A) therefore protects Montana’s right to store water up to the full original capacity of the Tongue River Reservoir of 72,500 af.⁴⁷

Article V(A) does not protect storage capacity beyond 72,500 af. Under the Compact, water stored in new reservoirs is relegated to the third tier of protection under Article V(B). *See Compact, supra*, art. V(C)(2) (third tier includes “net change in storage . . . in all reservoirs . . . completed subsequent to January 1, 1950”). Although the Compact does not

⁴⁷ As Wyoming brought out at trial, reports available to the authors of the Compact consistently reported that the capacity of the Tongue River Reservoir was 69,400 acre feet. *See* 9 Tr. 1912:18-21 (Aycock). The reported capacity, however, is not relevant to Montana’s rights under the Compact. Instead, the question is whether the doctrine of appropriation permits reservoir owners to restore storage capacity lost to sedimentation and other factors.

explicitly address reservoir expansions, there is no reason to treat expansions differently from new reservoirs. Both cases involve the expansion of total capacity available for storage. Of the 79,071 af of current storage capacity, 72,500 af is therefore pre-1950 capacity protected by Article V(A), while the remaining 6,571 af is post-1950 capacity covered by Article V(B).

If the Tongue River Reservoir begins the year with over 6,571 af of water, however, Article V(A) protects Montana's right to fill the dam to the top (subject to the 32,000 af limit on yearly additions discussed in the last section). Reservoir rights with different priorities are generally administered from the "top down" in both Montana and Wyoming. Lower priority water is assumed to sit at the bottom of the reservoir, with higher priority water on top. See 1 Tr. 145:12-23 (Dale Book); 9 Tr. 1891:7-1893:20 (Gordon Aycock); 22 Tr. 5286:16-5288:16 (Patrick Tyrrell). Under the "top down" rule, post-1950 storage is therefore at the bottom of the Tongue River Reservoir, with the pre-1950 storage on top. In both 2004 and 2006, the Tongue River Reservoir began the water year with over 40,000 af of carryover—far more than the 6,571 af of post-1950 storage capacity. Because the carryover fully used all of the post-1950 storage capacity, any additional storage was pre-1950 storage protected by Article V(A).

To illustrate this point, assume that Montana had built a new, reservoir with 6,571 acre feet of capacity, rather than expanding the capacity of the existing reservoir by that amount. Although the new reservoir would have a post-1950 priority, the original reservoir would still be fully protected under Article V(A) as a pre-1950 reservoir. If Montana filled the new

reservoir to capacity at a time when there was post-1950 water available, the water in that reservoir would not change the pre-1950 priority of the original reservoir. The expansion of the Tongue River Reservoir is no different, except that the two reservoirs are on top of each other, with the junior reservoir beneath the senior reservoir.

(3) The Tongue River Reservoir operating rules

Wyoming complains that Montana allows significant amounts of water to pass through the Tongue River Reservoir uncaptured during the winter months. See, e.g., 2 Tr. 335:10-21 (Dale Book) (winter outflows between 2000 and 2006 averaged 124 cfs). As noted earlier, the Tongue River Reservoir is an on-stream reservoir, so water that is not stored passes through downstream. From October 2003 through March 2004, Montana bypassed some 42,000 af of water. 2 Tr. 342:2-11 (Book); Ex. M-5, p. 34 tbl. 4-E (Book expert report). From October 2005 through March 2006, Montana bypassed 54,000 af. 2 Tr. 342:12-16 (Book); Ex. M-5, p. 34 tbl. 4-E (Book expert report). In both years, this amount exceeded, by orders of magnitude, the amounts of water that Montana claims Wyoming owed it under Article V(A). See 2 Tr. 342:17-22 (Book). In both years, moreover, lower bypasses would have allowed the Reservoir to fill to its current capacity. 24 Tr. 5732:4-20 (Bern Hinckley); Ex. W-3, fig. 5a (Hinckley expert report).

Montana stores water in the Tongue River Reservoir primarily during the spring months of April, May, June, and sometimes July. 6 Tr. 1152:16-21, 1185:6-10 (Kevin Smith). Formal operating rules for the Tongue River Reservoir determine how much, if any, storage occurs during the winter months. Under the

Northern Cheyenne Compact, a five-member Advisory Committee has established an "Operating Plan for the Tongue River Reservoir" ("Operating Plan").⁴⁸ Northern Cheyenne Compact, *supra*, art. III(D)(1); *see* Ex. M-3, pp. 10-11 (Smith expert report); p. 24 *supra*. The goals of the plan are to meet the requirements of both the Northern Cheyenne Compact and the water contract with the TRWUA, "ensure that the Reservoir is operated in a safe, efficient, and environmentally sound manner" to the "greatest extent possible," and provide for "fish and wildlife purposes, depending on water availability." Operating Plan § I(A) (attached to Ex. M-3, at A2). Based on the Operating Plan, the State Water Projects Bureau has developed an Operations and Maintenance Manual ("O&M Manual") to guide the Reservoir's storage, drawdown, and other operations. Ex. M-3, p. 10. The TRWUA runs the dam on a day-to-day basis in compliance with the Operating Plan, the OM&M Manual, and contractual obligations. *Id.* at 13.⁴⁹

Montana allows outflows from the Tongue River Reservoir during the winter months for two operational reasons. First, Montana tries to maintain winter outflows adequate to "meet [downstream winter] stock watering needs while minimizing ice

⁴⁸ The Advisory Committee consists of representatives of Montana, the TRWUA, the Northern Cheyenne Tribe, and the United States, along with a fifth member chosen by the other four. Northern Cheyenne Compact, *supra*, art. III(D)(1); *see* Ex. M-3, pp. 10-11 (Smith); p. 24 *supra*.

⁴⁹ In connection with the 1999 rehabilitation and expansion of the Tongue River Reservoir, the Montana DNRC and the United States Bureau of Reclamation also prepared an environmental impact statement, which helped inform the Operating Plan and the O&M Manual. Ex. M-3, pp. 11-12.

damages.” *Id.* at 16; see Operating Plan, *supra*, §§ II(A)(9)-(10), at A4.⁵⁰ To achieve this goal, the Operating Plan establishes a guideline for minimum outflows during the winter months:

The minimum outflow of the Reservoir during the winter low flow period, from Oct. 1 to Mar. 1, will generally be the inflow or 175 cfs, whichever is less. Cutting outflows to below the minimum will be allowed only as needed to accommodate necessary dam safety inspections, maintenance, dam safety, or other emergency purposes.

Operating Plan, *supra*, § II(B)(11), at A6.

Second, Montana tries to maintain a maximum reservoir level during the winter months to help prevent structural damage to the riprap and embankment of the dam. Absent a maximum level, wind-driven waves and ice can damage these structures, and the bottom of the Reservoir’s concrete walls can suffer “freeze-thaw damage.” O&M Manual, p. 21 (introduced as Attachment 1 to Ex. M-3);

⁵⁰ According to the Operating Plan, another goal in the regulation of reservoir levels and outflows is to provide “water for Reservoir and downstream fish and wildlife when available.” Operating Plan, *supra*, § II(A)(8), at A4. However, the Operating Plan makes clear that water can be released for fish and wildlife purposes only when surplus water is available. *Id.*, § II(B)(12), at A6. The Operating Plan “shall not create an operational preference for fish and wildlife purposes relative to other project purposes.” *Id.* See also Northern Cheyenne Compact, *supra*, art. III(D)(2) (requiring that the Operating Plan provide for fish and wildlife purposes “depending on the availability of water on an annual basis” but specifying that the compact does not create an “operational preference for fish and wildlife purposes relative to other project purposes”).

Operating Plan, *supra*, § II(B)(9), at A6. The Operating Plan therefore provides that the “Advisory Committee recommends that the maximum preferred carry-over be 45,000 AF (elevation 3417.5 feet).” Operating Plan, *supra*, § II(B)(9), at A6. And the O&M Manual provides that the “maximum reservoir elevation for winter storage is (elevation) 3,417.5 feet with 45,000 acre-feet of storage.” O&M Manual, *supra*, at 21. When storage exceeds this level, the Operating Plan and O&M Manual call for releasing water from the Reservoir.⁵¹

Wyoming argues that Montana must capture all available water for storage during the winter months, except where outflows are needed downstream by senior appropriators, and that Wyoming is not liable under the Compact for any resulting shortfall if Montana does not. See Wyoming’s Post-Trial Brief, *supra*, at 18-28. In Wyoming’s view, the “burden of Montana’s discretionary operational decisions falls on Montana.” *Id.* at 27. Montana is free to let water flow unstored through the Tongue River Reservoir during the winter months, but if it does, Montana should not be able to complain if it is not able to fill the Reservoir later in the year.

In essence, Wyoming is arguing that the Compact adopts the Early-Fill Rule and the Store-It-or-Lose-It Rule followed by Wyoming law. See Wyoming’s Post-Trial Brief, *supra*, pp. 23-24. As noted earlier, however, there is no precedent in Montana law for either rule, nor do prior-appropriation states as a whole commonly employ either rule. Indeed, only two

⁵¹ The Reservoir also must ensure that it maintains enough storage space to provide sufficient flood control during the spring runoff. See 9 Tr. 1833:2-9 (Gordon Aycock).

states – Colorado and Wyoming – currently follow the two rules. *See also* M-7, p. 19 (Aycok expert report) (“Based on my experience, in Montana, as well as a number of other western states, water rights are not required to be exercised constantly throughout an identified use period”).

As discussed earlier, the Court has been reticent to conclude that an interstate compact constrains how a state can use its water without clear language limiting that use. Even if more states followed Wyoming’s Early-Fill Rule and Store-It-Or-Lose-It Rule, the Compact’s broad reference to the “doctrine of appropriation” is too weak a reed on which to impose Wyoming’s storage rules on Montana. Montana courts have never endorsed either rule, nor has the State followed the rules in its reservoir operations. *See* pp. 122-123 *supra*. There is no evidence that Montana meant to give up its historic storage practices by agreeing to protect pre-1950 rights “in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.” Nor is it reasonable to conclude that Montana gave up its historic practices by agreeing to this language.

To support its argument, Wyoming also emphasizes that Article V(A) protects appropriative rights only for “beneficial uses.” *See* Wyoming’s Post-Trial Brief, *supra*, at 21-23. As Wyoming notes, many of the purposes of the winter outflows are not beneficial uses as defined by the Compact. For example, the maintenance of winter river flows to “minimize ice damages” (Ex. M-3, p. 16 (Smith expert report)) is not a “use by which the water supply of a drainage basin is depleted when usefully employed by the activities of man” (Compact, *supra*, art. II(H)). For this reason,

Montana probably could not demand that Wyoming curtail post-1950 water use during the winter months in order to furnish water to Montana for de-icing purposes. In that situation, Montana arguably would be demanding water under Article V(A) for a non-beneficial use.

Montana, however, is not demanding water during the winter months for this purpose. Instead, Montana is seeking to store water during the spring months for legitimate beneficial uses such as irrigation. Wyoming wants to force Montana to store more water during the winter months, when significant water currently passes the Stateline into Montana, in order to reduce the amount of water that Montana needs in the spring, when Wyoming has significant post-1950 needs. While Wyoming might or might not be correct that its approach would permit Montana to store its water with less impact on post-1950 users in Wyoming, nothing in the Compact requires Montana to store its water when Wyoming wishes it to do so.

Montana's right to establish outflows is not unlimited. First, Montana must avoid wasting water by following good engineering practices in its operation of the Tongue River Reservoir. A central tenet of appropriation law is that water users cannot waste water. *See, e.g., State Dept. of Ecology v. Grimes, supra*, 852 P.2d at 1051; *Erickson v. Queen Valley Ranch Co.*, 99 Cal. Rptr. 446, 450 (Cal. App. 1971). If Montana failed to follow good engineering practices and permitted excessive amounts of water to escape the Tongue River Reservoir during winter months without legitimate reason, Montana would be wasting water and could not demand that Wyoming make up for Montana's waste by curtailing its post-1950 uses later in the year.

Wyoming concedes that it has the burden of showing that Montana has wasted water. See Wyoming's Final Pretrial Memorandum, Sept. 23, 2013, Docket No. 386, at 5 n.3. Wyoming's principal expert witness regarding Montana's reservoir operations was Bern Hinckley, a registered professional geologist and water consultant. Mr. Hinckley challenged the minimum winter flow guideline of 175 cfs established by the Operating Rules (pp. 145-146 *supra*). According to Mr. Hinckley's expert report, several governmental documents in the 1980s and 1990s reported that releases of no more than 75 cfs were necessary to allow stock watering and prevent ice jams. Ex. W-3, pp. 8-9. Mr. Hinckley also noted that Montana has sometimes reduced winter bypasses to 75 cfs in the years since the Reservoir was renovated in 1999, verifying to him "the discretionary nature of larger bypasses." *Id.*, p. 9. However, Mr. Hinckley's testimony did not establish that larger bypasses were inappropriate or wasteful. In particular, Montana's ability to reduce winter bypasses in some years does not mean that higher bypasses are not prudent and reasonable. River conditions vary from year to year, and lower flows can carry greater risks.

Montana, by contrast, presented significant evidence in support of its operating rules. The most valuable testimony came from Gordon Aycock, a registered professional engineer who spent four decades with the United States Bureau of Reclamation and testified as a rebuttal expert for Montana. Ex. M-7, p. 1 (Aycock rebuttal expert report). For twenty of his years with the Bureau, Mr. Aycock served as a Specialist for Reservoir Operations and Water Rights and oversaw the operations of 80 reservoirs in nine states, including Montana and Wyoming. *Id.* He also spent nine years as Manager of the Reservoir

Regulation Branch in Billings, Montana, where he was directly responsible for developing annual operating plans for 25 reservoirs in Montana, North Dakota, and Wyoming. *Id.*, pp. 1-2.

Mr. Aycock reviewed the Operating Plan and the O&M Manual for the Tongue River Reservoir and found “both documents to be an acceptable plan and manual for operation and maintenance of [the] Tongue River Dam and Reservoir.” *Id.*, p. 10. He also concluded “overall that the Reservoir had been managed in a very practical, reasonable manner.” 9 Tr. 1848:10-11. Montana’s State Water Projects Bureau Chief, testifying as an expert, agreed. *See, e.g.*, 6 Tr. 1236: 16-21 (Kevin Smith) (operations in 2004 and 2006 were reasonable).

Turning to specific operating practices, Mr. Aycock found “strong support for recognizing winter flow of *at least* 75 cfs in the Tongue River below the dam.” Ex. M-7, p. 16 (emphasis added). According to Mr. Aycock, a 75-cfs winter flow is “the *minimum* bypass flow required through [the] Tongue River Reservoir.” *Id.*, p. 18 (emphasis added). *See also* 9 Tr. 1870:13-14 (50 cfs is not enough). In his oral testimony, Mr. Aycock further amplified that 75 cfs “should be the absolute minimum. You should never go below 75, even if your inflows drop below 75, you should be able to maintain that 75.” *Id.* at 1920:5-8.⁵²

⁵² According to the final environmental impact statement for the 1999 rehabilitation and enlargement of the Reservoir, 75 cfs “represents a minimum winter flow that is considered necessary to maintain the river fishery. This flow also helps keep the river free of ice and allows for stock watering.” Ex. M-335, p. MT-05161. The final environmental impact statement also recommended a flow of 150 cfs. 6 Tr. 1341: 12-13 (Kevin Book).

As emphasized, 75 cfs is the minimum. According to Mr. Aycock, the reasonable range for winter outflows from the Reservoir is between 75 cfs and 175 cfs:

But to provide for managing ice on the river, specifically a flow above that, based on the documents I see, you can go back to some of those old documents that reference 167. But it's always the inflows passed through up to 167. *So it's a value somewhere between 75 and 175 is what you want to have.* It provides a better river that will keep it open and prevent a freeze-up.

Id. at 1920:9-16 (emphasis added). According to Mr. Aycock, a 175-cfs winter flow therefore also is supported. *Id.* at 1922:3-9. Such winter flow releases are necessary because of (1) year-round water rights for domestic and stock water downstream of the Reservoir, (2) the need for "carriage flows" that will ensure that water that is released from the dam will make it to the intended points of use,"⁵³ and (3) the importance of avoiding river icing and ice jams downstream of the Reservoir.⁵⁴ Ex. M-7, pp. 12-14 (Aycock rebuttal expert report). *See also* 6 Tr. 1116:6-8 (Kevin Smith) (167 cfs wintertime flow is necessary).

⁵³ As Mr. Aycock noted, "cold temperatures can result in a significant loss of flow as water is converted to ice and the formation of ice limits access to the water." Ex. M-7, p. 12.

⁵⁴ As Mr. Aycock emphasized, "ice jams are a serious problem on the Tongue River," where winter low temperatures can drop well below -30 degrees Fahrenheit. Ex. M-7, pp. 13-14. In March 1944, an ice jam "caused 300 to 500 people to be evacuated from their homes," and the state had to call on local pilots to "drop fused dynamite explosive charges onto the ice jam." 9 Tr. 1879:8-12 (Aycock), quoting Ex. M-360 (ice-engineering report by the U.S. Army Corps of Engineers).

Mr. Aycock also testified that the Reservoir's maximum winter storage limit of 45,000 af is a reasonable restriction based on his experience with reservoirs operated by the U.S. Bureau of Reclamation. 9 Tr. 1869:20-22. According to Mr. Aycock, there are a number of reclamation reservoirs that have similar restrictions so that the winter water "doesn't get up onto the concrete and other parts of the dam that can be damaged by ice." *Id.* at 1869:22-24. Although Mr. Aycock did not have first-hand knowledge of what would happen above 45,000 af (*id.* at 1869:18-20), Kevin Smith testified convincingly of the reasons for the choice (6 Tr. 1186:18-1188:11).⁵⁵

Montana sometimes has stored more than 45,000 af during the winter. Mr. Hayes, who actually operates the Reservoir, testified that the water users' board has recommended trying to move to a maximum winter storage of 55,000 af in order to better hedge against low flows later in the spring. *See* 7 Tr. 1474:15-23. The water users, however, are risking damage to the dam structure by storing more water in the winter and will have to pay to repair the damage if any occurs. *Id.* at 1474:17-19. Mr. Hayes still believes that 45,000 acre feet is the "ideal," and "if the snowpack and everything looks good, we would like to keep it at 45,000 during the winter." *Id.* at 1474:15-23.

In summary, Montana has established that the reasonable range for winter outflows from the Reservoir is 75 cfs to 175 cfs. The appropriate outflow at any particular point of time varies within this

⁵⁵ Winter operation of the Reservoir also is affected by the dam's classification as "high hazard." 6 Tr. 1135:15-1137:7 (Kevin Smith). The high-hazard classification means that "should that project fail, there would be loss of life downstream." *Id.* at 1134:23-25 (Smith).

range and depends on the specific conditions, including the needs of downstream water rights and risks such as ice jams and flooding. Given the multiple considerations and the flexibility needed in the operation of reservoirs, Montana should be given significant discretion in how it sets its winter outflows. While Montana cannot set outflows at levels that are unreasonable and wasteful given the specific circumstances, Wyoming has not proven that the particular levels chosen in 2004 and 2006 were unreasonable. Wyoming also has not established that setting the maximum storage level during the winter at 45,000 af is unreasonable. Montana and Wyoming might agree, or Montana might decide on its own, to set lower winter outflows or larger winter storage limits in order to store more water in the Reservoir during the winter, but the Compact does not require lower outflows or smaller storage levels absent proof that the outflows or storage levels are otherwise wasteful.

Second, Montana must operate the Tongue River Reservoir in a fashion that is generally consistent with the appropriation laws and rules that govern similar reservoir operations elsewhere in the State. Montana cannot, consistent with the Compact's requirement that pre-1950 rights be administered under the "the laws governing the acquisition and use of water under the doctrine of appropriation," follow one set of laws for most of the state and a totally different set of laws for the Tongue River Reservoir. Nothing in the evidence, however, suggests that Montana is violating this principle. To the contrary, Montana appears to govern the Tongue River Reservoir much as it does all of its other reservoirs.

Third, Montana cannot substantially change its operating procedures in a way that causes injury to

Wyoming's upstream post-1950 rights. According to Montana's governmental witnesses, reservoirs must be operated in a way that is consistent with the reservoir's "historical pattern" because that pattern "defines your water right as well." 5 Tr. 1018:8-16 (Kevin Smith). *See also* 3 Tr. 633:16-23 (Millicent Heffner). Montana need not limit its winter outflows to the exact amounts that were released during the years prior to the Compact. Some degree of flexibility "is essential to effectively deal with constantly changing runoff and water demand." Ex. M-7, p. 10 (Aycock rebuttal expert report). *See also* 5 Tr. 1019:14-16 (Smith) (some level of flexibility is necessary in operating a reservoir). Under the appropriation doctrine, however, Montana cannot change its outflows in a way that substantially increases the burden on Wyoming by changing the amount or pattern of its demand.

The evidence establishes that Montana's current operations are reasonably consistent with its historic operations. According to the expert report of Kevin Smith, the Chief of the Montana State Water Projects Bureau, data from the USGS show that the 175-cfs winter-release guideline is "consistent with historical operations of the Project at the time of the Yellowstone River Compact and thereafter." Ex. M-3, p. 16. *See* 6 Tr. 1218:6-20 (Smith) (current operations consistent with historic operations). In particular, the daily mean outflows during winter months have averaged less in recent years than in the years prior to the Compact. *See* Ex. M-4, pp. 22-24 figs. 1-3 (Smith rebuttal expert report). *See also* 7 Tr. 1478:8-19 (Art Hayes) ("our outflows in the wintertime are pretty much the same or less than what we had before"). According to Mr. Aycock, winter releases prior to the Compact "were typically 150 cfs or higher," although

in drought years such as 1942, "when the water supply was short, reservoir bypass flows were as low as 75 cfs."⁵⁶ Ex. M-7, p. 13. *See also* 1 Tr. 119:6-10, 16-19 (Dale Book) (comparable winter bypasses); 2 Tr. 281:5-16 (Book) (same).

Mr. Aycock similarly testified that the current winter storage limit of 45,000 af is consistent with historical practice. According to Mr. Aycock's rebuttal report, the "pre-1950 operating records for [the] Tongue River Reservoir show that the Reservoir was consistently operated below a storage level of 45,000 acre-feet during the October through March season. This level was also below an elevation of 3417.5 feet." Ex. M-7, p. 11, citing to information in Ex. M-5, tbl. 4A (Book expert report).

Wyoming worries that, unless the Court forces Montana to store as much water as possible in the winter months, Montana will be tempted to "waste" water in the winter and then increase its storage in the spring to the detriment of Wyoming post-1950 water users. Montana, however, has a strong interest in maximizing its storage opportunity during the winter. Montana cannot assume that there will be enough water in drought years to fill the Tongue River Reservoir even if Wyoming curtails post-1950 uses in the spring. As Montana has discovered in recent years, it risks not being able to fill the Tongue River Reservoir if it does not tightly operate the Reservoir. If Montana does engage in wasteful practices,

⁵⁶ Occasionally, releases were even lower than 75 cfs. For example, for a week in March 1944, Montana reduced releases "from about 120 cfs to a low of around 55-60 cfs," likely because of an extensive ice jam downstream on the Tongue River and the need to relieve "high back water and significant overbank flooding." Ex. M-7, pp. 12-13 (Aycock expert report).

moreover, Wyoming is free to challenge those practices with specific evidence.

In summary, the evidence in this case supports Montana's operational practice of generally maintaining (1) a minimum winter flow of 175 cfs or less (with the specific flow level depending on conditions), and (2) a maximum storage level of 45,000 af from October through March. In 2004, Montana released flows of between 100 and 150 cfs during the winter months. Ex. W-3, p. 9 & fig. 4 (Hinckley expert report). In 2006, Montana again released less than 175 cfs during most of the winter months. *Id.*, fig. 4. Montana's practices in both years were consistent with historical practices. Wyoming, moreover, has failed to prove that they were wasteful.

(4) Storage rights of the Northern Cheyenne Indian Tribe.

Montana and Wyoming also disagree on the impact of the Northern Cheyenne Compact, which gives the Northern Cheyenne Indian Tribe the right to 20,000 af of stored water each year from the Tongue River Reservoir. This right is "commingled and administered with the DNRC water right," and Montana and the Tribe share shortages "on a pro-rata basis." Ex. M-4, p. 6 (Smith rebuttal expert report). In Montana's view, the Northern Cheyenne Compact does not affect Montana's storage rights under the Yellowstone River Compact. In Wyoming's view, Montana cannot give 20,000 af of storage capacity to the Tribe and then seek more water from Wyoming when Montana turns up short. Wyoming, in short, worries that Montana, having given away 20,000 af of storage, is now seeking to make up for it by asking Wyoming to curtail its post-1950 rights under the Yellowstone River Compact.

Montana and Wyoming disagree significantly on how the Yellowstone River Compact treats the Tribe's storage rights. Montana argues that the Tribe's rights under the Northern Cheyenne Compact enjoy a pre-1950 priority and, like Montana's rights in the Reservoir, are protected under Article V(A). See Montana's Post-Trial Brief, *supra*, at 100-104. As Montana notes, the rights are in settlement of the Tribe's claims to federal reserved water rights under *Winters v. United States*, 207 U.S. 564 (1908). The federal reserved water rights predated the Yellowstone River Compact and potentially enjoyed a priority as early as 1881, when the United States first withdrew lands along the Tongue River for use of the Tribe. 8 Tr. 1600:9-20 (Christian Tweeten). Under the terms of the Northern Cheyenne Compact, moreover, the Tribe's 20,000 af storage right enjoys a priority date "equal to the senior-most right for stored water in the Tongue River Reservoir," which is April 21, 1937. *In the Matter of the Adjudication of Existing and Reserved Rights of the Northern Cheyenne Tribe*, *supra*, at 5-6. Wyoming, by contrast, argues that the parties to the Yellowstone River Compact intended that any waters for Indian lands come out of the share of the state in which the lands are found. See Wyoming's Post-Trial Brief, *supra*, at 11-13. According to Wyoming, Article V(B) rather than Article V(A) therefore governs the Tribe's storage rights, and the Tribe's rights are counted toward Montana's share of the third tier of Tongue River water. *Id.*⁵⁷

⁵⁷ Wyoming argues that this approach also comports with the United States Supreme Court's decision in *Arizona v. California*, 373 U.S. 546, 601 (1963), which charges Indian use of mainstem Colorado River water against the state in which the tribal

This case is neither an appropriate nor permissible vehicle for deciding the nature of the Tribe's water rights or the status of its rights under the Yellowstone River Compact. Neither the Tribe nor the United States is a party to this case, nor have they waived their sovereign immunity. As a result, the Court lacks jurisdiction to determine the Tribe's rights under the Yellowstone River Compact in this lawsuit. *See Texas v. New Mexico*, 352 U.S. 991 (1957) (dismissing bill of complaint "because of the absence of the United States as an indispensable party"); *Idaho v. Oregon*, 444 U.S. 380, 391 (1980) (noting that the bill of complaint in *Texas v. New Mexico* was dismissed because the decree would have "necessarily [affected] adversely and immediately the United States' in its fiduciary capacity"), quoting Report of the Special Master, *Texas v. New Mexico*, No. 9, Orig., p. 41; *Michigan v. Bay Mills Indian Community*, 134 S. Ct. 2024 (2014) (reaffirming tribal sovereign immunity in a case involving a compact between a state and an Indian tribe). The Tribe explicitly objects to Wyoming's position that tribal rights fall within the third tier of the Compact, because this would relegate Indian rights that historically have enjoyed very senior priorities to junior water rights under the Compact and thereby increase the risk that the Tribe's rights might not be fulfilled in future drought years.

reservation is located. *Arizona v. California*, however, does not establish a general rule for how Indian water rights should be allocated among states that have entered into an interstate compact. Although the Supreme Court's opinion does not explain the basis for its ruling, the special master's report bases the rule on the provisions of both the 1928 Boulder Canyon Project Act, 43 U.S.C. §§ 617 et seq., and the federal contracts for delivery of Colorado River water to the states. Report of the Special Master, *Arizona v. California*, Oct. Term 1960, pp. 247-248 (Dec. 5, 1960).

See Amicus Brief of the Northern Cheyenne Tribe, April 25, 2014, Docket No. 458, pp. 2-5.

Thankfully, it is ultimately unnecessary to decide how the Compact treats Indian rights in order to resolve the current dispute between Montana and Wyoming. Montana is not suing Wyoming for interference with the rights of the Northern Cheyenne Tribe. Instead, it is suing for interference with its own rights. As noted, Montana enjoys the right to store at least 32,000 af each year in the Tongue River Reservoir, in addition to the water that it has carried over from prior years. If Wyoming fails to reduce its post-1950 diversions and storage when Montana is entitled to water for the Tongue River Reservoir, Montana is entitled to damages for any resulting deficiency, no matter how the Compact treats the Tribe's storage rights.

Montana's settlement with the Northern Cheyenne Tribe, moreover, apparently did not affect how much water Montana actually sought to store in 2004 and 2006. According to testimony at trial, the Tribe did not draw to any significant degree on its storage right in the period in question. See 7 Tr. 1502:14-20 (Art Hayes) (the Tribe has not used any of its rights under the Northern Cheyenne Compact since 1999, but instead has used its 7,500-af contract right with the TRWUA); *id.* at 1390:4-6 (Kevin Smith). As a result, there is no evidence that Montana needed to store more water in 2004 and 2006.⁵⁸

⁵⁸ In its motion for summary judgment before trial, Wyoming also argued that a 1992 agreement between the governors and water officials of Montana and Wyoming regarding the Northern Cheyenne Compact precludes Montana from (1) claiming a right to water used by post-1950, pre-1980 appropriators in Wyoming, and (2) instating a winter pass-through of more than 75 cfs and a

e) Conclusions.

In both 2004 and 2006, Montana was entitled under Article V(A) of the Compact to store at least 32,000 af of water in the Tongue River Reservoir, in addition to any carryover with which it entered the water year. In 2004, however, Montana was able to store only about 10,000 af. *See* Ex. M-5, p. 30 tbl. 4-A (Book expert report). Storage peaked at only 49,680 af of water, easily within the original capacity of the Reservoir. *Id.* Montana operated the Reservoir during the winter months in a fashion that was reasonable and consistent with its historical practice.

In 2006, Montana entered the water year with 44,470 af of water. *Id.* It was entitled to store an additional 32,000 af, which could have brought total storage in the Reservoir up to 76,470 af. Although this would have exceeded the Reservoir's original capacity, the carryover fully consumed the post-1950 storage capacity, so the entire 32,000 af of new storage would have been pre-1950 storage. In 2006, however, Montana was able to store less than 32,000 af. *See id.* As in 2004, Montana operated the Reservoir during the winter months in a fashion that was reasonable and consistent with its historical practice.

Montana thus has carried its burden of showing that it was unable to enjoy its full pre-1950 storage rights in both 2004 and 2006, despite managing the

maximum winter carryover. *See* Wyoming's Memorandum in Support of Motion for Summary Judgment, July 3, 2013, Docket No. 333, at 31. I denied Wyoming's motion, rejecting its interpretation of the 1992 agreement. Memorandum Opinion of the Special Master on Wyoming's Motion for Summary Judgment, Sept. 16, 2013, Docket No. 380, at 2-14. Wyoming did not pursue the issue or introduce the 1992 agreement at trial.

Reservoir in a fashion that was reasonable and consistent with the historical management of the Reservoir. Montana, moreover, stood ready to store any additional water that became available after it notified Wyoming of its water shortage in both years.

2. Direct-flow rights.

Water users in Montana also hold pre-1950 appropriative rights to divert water directly from the Tongue River for agricultural and other purposes (“direct-flow rights”). Montana contends that, after it notified Wyoming of water shortages, Montana received insufficient water to satisfy its direct-flow rights in both 2004 and 2006. If the Court agrees that Montana was unable to enjoy its full pre-1950 storage rights in 2004 and 2006, whether Montana received sufficient water to enjoy its pre-1950 direct-flow rights is irrelevant. The Court would not need to address direct-flow rights, which are legally more straightforward than storage rights, but factually less clear. In case the Court concludes that Montana’s storage rights under Article V(A) were uninjured in 2004 and 2006, however, this section of my report evaluates Montana’s direct-flow claims.

In order to show injury to its pre-1950 direct-flow rights, Montana must show that the holders of pre-1950 direct-flow appropriative rights not only received less water than the amounts to which they held rights, but needed additional water. Article V(A) of the Compact does not guarantee Montana any set flow of water at the Stateline. *See Montana v. Wyoming, supra*, 131 S. Ct. at 1779. Instead, it guarantees the continued enjoyment of pre-1950 appropriative rights “in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.” The question therefore is whether sufficient water

crossed the Stateline to allow for the continued enjoyment of pre-1950 direct-flow rights. A fundamental principle of appropriation law, moreover, is that senior water users cannot complain of upstream junior diversions if they do not need additional water for a beneficial use. As the Montana Supreme Court emphasized twenty years before the Compact was ratified, if the senior appropriators “have no use for the water, or are not making use of it for a useful and beneficial purpose, it is the right of the [junior appropriator] to use the same by virtue of his junior appropriation.” *Quigley v. McIntosh*, 290 P. 266, 268 (Mont. 1930).

a) Montana’s evidence.

In an ideal world, Montana would have presented direct evidence that holders of pre-1950 direct-flow rights in Montana needed more water than they received during the 2004 and 2006 notice periods. Little documentary evidence, however, exists today regarding water use and needs in Montana in these two years. The Montana district court appointed water commissioners in both years to oversee water use on the Tongue River. *See* 15 Tr. 3307:13-23 (Charles Kepper). The commissioners checked flow levels at several points on the river on a daily basis and determined how much water was available to meet direct-flow rights and storage rights. *See, e.g., id.* at 3358:21-3359:11 (Kepper); 16 Tr. 3538:1-20, 3566:23-3567:22 (Charles Gephart); *id.* at 3598:5-17 (Alan Fjell). Some of the commissioners’ hand-written notes and tables from 2004 and 2006 still exist, showing flow levels at various gauges and including random notations of particular water-right holders’ uses (*see, e.g.,* Exs. M-381, M-390, M-395, M-400). Unfortunately, the commissioners did not save most of

their measurements and notes. 15 Tr. 3334:4-3335:4, 3382:15-25 (Kepper); 16 Tr. 3589:20-24 (Fjell). The local district court required the commissioners only to file bi-monthly reports of *cumulative* use of *stored* water. *See, e.g.*, 15 Tr. 3373:10-3374:12 (Kepper) (judge required cumulative records, but not daily notes); Exs. M-382, M-383, M-386, M-399 (examples of the bi-monthly reports). As Wyoming observes, moreover, the notes and calculations of the Montana commissioners do not appear to be highly reliable. *See, e.g.*, 16 Tr. 3559:15-3563:5 (Charles Gephart) (discussing sizable discrepancy in the recorded use of stored water by the T&Y Canal); *id.* at 3619:18-3620:8 (Alan Fjell) (same).

(1) The Book demand model

To prove injury to its pre-1950 direct-flow rights, Montana therefore asked its principal expert witness, Dale Book, to estimate how much water pre-1950 appropriators would have needed at the Stateline during the periods in question to meet their water demand. *See* Ex. M-5, pp. 9-11 (Book expert report); 1 Tr. 120:2-5 (Book). Mr. Book relied on four sources of information for his “demand model”: (1) the 1914 Miles City decree, (2) county surveys of irrigation from the late 1940s, (3) actual diversions of water by the T&Y Canal as measured by its diversion gauge, and (4) estimates of return flow and stream gain.

Mr. Book first estimated how much water pre-1950 appropriators in Montana would use if they irrigated all of their land. Mr. Book’s estimate consisted of two parts: the water demand of the T&Y Canal, and the water demand of all other pre-1950 appropriators. Mr. Book assumed that the T&Y would use the amount of water to which it is entitled under the Miles City decree—187.5 cfs. 1 Tr. 120:12-17, 128:2-6 (Book). To

estimate the demand of the other pre-1950 appropriators, Mr. Book assumed that they are irrigating the same amount of land today as they did in the late 1940s. According to county surveys at the time, appropriators were irrigating 9,908 acres. See Ex. M-5, p. 10; Ex. M-6, p. 16. To convert acreage irrigated to water needs, Mr. Book assumed that they need 1 cfs for each 40 acres, the flow rate used to determine water rights in the Miles City Decree. See Ex. M-5, p. 10.

Pre-1950 water users, however, do not use the same amount of water throughout the irrigation season. In particular, irrigators in the Tongue River basin use less water in May, June, and September due to better weather conditions. *Id.*, pp. 10-11. Mr. Book assumed that irrigators would use all of their water in the peak irrigation months of July and August. 1 Tr. 128:20-21. In other months, however, he assumed that they would use only a fraction of this amount. To determine the fraction, he looked at how much water the T&Y Canal used in each month as a percentage of its July and August use. He then applied these fractions to the other pre-1950 appropriators. *Id.* at 127:22-130:15; see Ex. M-5, app. E-13.

Finally, Mr. Book determined how much water needed to cross the border at the Stateline to meet the pre-1950 needs that he calculated. As part of this calculation, he adjusted both for stream gain and return flows. Ex. M-5, p. 10. In estimating return flows, he considered the distance of the fields from the river and the time it would take return flows to reach the Tongue River. *Id.*; 1 Tr. 122:25-125:2 (Book).

Based on his model, Mr. Book estimated that, to meet Montana pre-1950 direct-flow demand, Stateline flows need to be 195 cfs in May, 325 cfs in June, 350

cfs in July, 335 cfs in August, and 280 cfs in September. Ex. M-5, p. 11. According to records of the Stateline gauge, flows in 2004 failed to reach Mr. Book's estimated need for half of May and all of June, July, August, and September. See Ex. M-6, p. 114 (Book rebuttal expert report). In 2006, the Stateline flows exceeded estimated need until the latter half of June, when flows dropped significantly and remained below the estimated need for the remainder of the summer. *Id.* at 116.

As Wyoming has emphasized, there are various deficiencies in Mr. Book's demand model. As a consequence, Mr. Book's estimates should not be compared to the stream flows at the Stateline without accounting for these deficiencies. Bern Hinckley testified as an expert witness for Wyoming on what he perceived to be the deficiencies in Mr. Book's model. See Ex. W-3, pp. 13-27. Three of these perceived deficiencies are potentially significant and deserve discussion.

First, although Mr. Book assumed that all acres irrigated in the late 1940's with pre-1950 rights are still irrigated today, current records and evidence indicate that fewer acres are irrigated. Ex. M-5, pp. 18-19. To determine the potential error from his assumption, Mr. Book in his rebuttal report examined aerial photographs of Montana farms for 2005, 2009, and 2011. See Ex. M-6, pp. 14-16. Mr. Book found that the amount of pre-1950 acres irrigated in recent years in Montana, excluding the T&Y Canal, ranged from 8,300 acres in 2009 (or 84% of the acreage used by Mr. Book in his original estimate) to 9,500 acres in 2011 (96%). In 2005, 8,600 acres were irrigated (or 87% of the acreage used by Mr. Book). Based on this evidence, Mr. Book's model would appear to

overestimate the acreage irrigated by as much as about 15 percent, leading to a similar overstatement of the resulting demand.

Second, available data suggest that pre-1950 appropriators do not use their full water rights in the peak-irrigation months of July and August, as Mr. Book assumed in his model. *See* Ex. W-3, pp. 13-17 (Hinckley expert report); 2 Tr. 313:9-317:3 (Book). For example, the T&Y Canal in 2005 used only 147 cfs of water, on average, in July and 165 cfs in August—79 and 88 percent, respectively, of the 187.5 cfs of water to which they are entitled under the Miles City Decree and that Mr. Book assumed they would use. Ex. W-3, pp. 16 tbl. 2, 17 tbl. 4 (Hinckley expert report); 2 Tr. 316:2-317:3 (Book). Total flow in the Tongue River, however, fell below 200 cfs for parts of July and much of August in 2005, potentially constraining the T&Y's diversions.⁵⁹ *See* M-6, p. 115. Looking at a broader set of “normal” water years (1997-2000, 2003, and 2005), Mr. Hinckley's report shows that the T&Y Canal diverted on average 92 percent of its right in July and 96 percent in August. *See* Ex. W-3, as modified at 24 Tr. 5662:22-5663:2. These averages suggest that Mr. Book's demand estimates may further overstate typical demand by a small but significant percentage.

Third, Mr. Book used return flows that are slower than those used by other researchers and those used by Mr. Book when estimating return flows in

⁵⁹ Mr. Hinckley suggests that Stateline flows should not have constrained how much the T&Y Canal used because the T&Y Canal could have called for stored water. Ex. W-3, p. 15. However, the T&Y Canal often tried to stretch its stored water and therefore might not have taken 187.5 cfs even though it could have used that water. *See* 7 Tr. 1437:15-17 (Arthur Hayes); 17 Tr. 3905:13-3906:6, (Muggli).

Wyoming. *See* Ex. W-3, pp. 19-21 (Hinckley expert report); 2 Tr. 320:6-322:16 (Book). Although Mr. Hinckley opined that a much faster return flow should be used (Ex. W-3, p. 20), Mr. Book provided a convincing justification for his assumptions regarding return flow. *See* Ex. M-6, pp. 17-18 (Book rebuttal expert report); 2 Tr. 241:11-242:6 (Book). Having reviewed both reports, I conclude that Mr. Book's estimates are reasonable. As Mr. Book found, moreover, his estimates of pre-1950 appropriative demand are relatively insensitive to changes in the return flow; assuming that a third of all runoff from gravity irrigation systems returns to the river by surface runoff, Mr. Book's demand estimates fall by percentages ranging from only three percent in August to eight percent in May. *See* Ex. M-6, p. 18; 2 Tr. 242:7-247:22 (Book).⁶⁰

Because of the deficiencies described above, one cannot conclude that Tongue River flows were insufficient to satisfy pre-1950 appropriative rights in Montana simply because they were less than Mr. Book's estimates of demand. Differences of about 25% percent or less may well be attributable to Mr. Books overestimation of irrigated acreage and overestimation of the average percentage of water rights used during irrigation months. Mr. Book's model, moreover, assumes that the amount of water

⁶⁰ In some other aspects, Mr. Book's estimate of demand by pre-1950 Montana appropriators may be conservative. For example, Mr. Book assumed that irrigators need 1 cfs for every 40 acres. The Montana Water Court is currently estimating that irrigators need approximately 1 cfs for every 26 acres of land, which would lead to a higher estimate of demand. *See* 3 Tr. 486:15-24 (Timothy Davis). *See also* 2 Tr. 273:8-23 (Dale Book) (current composite flow standard is higher than 1 cfs for 40 acres).

that pre-1950 appropriators in Montana use each month is the same every year, while monthly use varies from year to year depending on precipitation, temperature, crop mix, hay harvesting time, and other factors. See Ex. W-3, pp. 17-18, 22-23 (Hinckley expert report); Ex. M-6, p. 17 (Book rebuttal expert report); 2 Tr. 317:16-319:1 (Book). As Mr. Book testified, his model is designed simply to "estimate the flow rate below which shortages are *likely* to be expected when users have a need for water." Ex. M-6, p. 17 (emphasis added). Small differences between actual flows and Mr. Book's estimates in a particular year might merely be the result of variances in weather or agricultural conditions from one year to the next.

Where flows in 2004 and 2006 were substantially less than Mr. Book's demand estimates, however, it is more likely than not that pre-1950 irrigators in Montana did not have enough flow to meet their direct-flow needs. As noted, the flaws in Mr. Book's model led to overestimates by only about 25 percent or less. There is no evidence, moreover, that the determinants of demand during the notice periods of 2004 and 2006 would have led to significantly lower-than-normal demand by Montana appropriators in those years.

In May 2004, flows were sufficiently high that, although they fell below Mr. Book's estimate of demand for about half of the month, the differences were significant only for the first six days of the month. Ex. M-6, p. 114 (Book rebuttal expert report). Because Mr. Book averaged his estimates by month, moreover, his May estimate may overestimate the amount of water needed at the beginning of May (since the irrigation season was just beginning and irrigation

needs presumably were larger at the end of the month than at the beginning). One therefore cannot conclude, based only on Mr. Book's model, that pre-1950 appropriators in Montana suffered shortages in May 2004.

Starting in June, however, the mean Stateline flow fell significantly below Mr. Book's estimates of demand. In June and July, mean flows were only 55 and 43 percent, respectively, of Mr. Book's estimates of irrigation needs. *Id.* While flows rose closer to estimated demand on June 12-13 and July 7-8, they remained significantly lower than estimated demand on all other days. *Id.* In August, mean flows were only 19 percent of Mr. Book's estimated needs. *Id.* In September, they were only 37 percent of estimated demand. *Id.* It is more likely than not that these low flows prevented Montana appropriators from enjoying their pre-1950 direct-flow rights.⁶¹

In 2006, daily flows at Stateline were exceptionally low from July 28, when Montana notified Montana of its shortage, through the middle of September. *Id.* at 116. Flows were less than 20 cfs on many days and did not exceed 50 cfs until September 16. *Id.* From July 28 through the end of July, flows averaged only four percent of Mr. Book's demand estimate. *Id.* In August, they rose to just six percent. In September, flows were 10 percent. *Id.* While flows rose noticeably in the second half of September, they exceeded 75 percent of Mr. Book's demand estimate on only one day—September 24, 2006. It is therefore more likely than not that Montana appropriators were unable to enjoy their pre-1950 direct-flow rights in 2006 from

⁶¹ Mr. Book did not provide estimates of demand for October in either 2004 or 2006.

July 25 through the end of September (with the possible exception of a single day).

(2) Call letters

Montana's call letters in 2004 and 2006 shed further light on whether pre-1950 direct-flow rights in Montana received sufficient water. Both letters included affidavits of Art Hayes, President of the TRWUA, describing the contemporaneous condition of the Tongue River at the time of the calls.

In a May 15, 2004 affidavit accompanying the 2004 call letter, Mr. Hayes noted that he had not been able to fully meet a call on April 29 by the T&Y Canal, even though it is the second most senior right on the river. Ex. J-64, ¶ 11, at WY031306. Mr. Hayes also noted that "Montana water rights with perfected prior appropriative dates before 1950 are not being satisfied at this time in the Tongue River Drainage." *Id.*, ¶ 12. Mr. Hayes predicted that, without "significant additional inflows," all but the most senior rights would go unfilled during the irrigation season. *Id.*

Mr. Hayes' 2004 affidavit supports Montana's claims in two respects. First, it suggests the general reasonableness of Mr. Books' demand estimates. Stateline flow on May 15, the date of Mr. Hayes' affidavit, was 188 cfs, only slightly less than the 195 cfs of water that Mr. Book's demand model estimates would have been needed at the time. See Ex. M-6, p. 114 (Book rebuttal expert report). Yet according to Mr. Hayes, pre-1950 Montana rights were "not being satisfied." Second, it provides direct evidence regarding pre-1950 direct-flow shortages in late April and early May. Mr. Book's demand model did not address April, and as noted above, it is impossible to conclude that Montana suffered pre-1950 shortages

in early May based solely on the demand model. However, according to Mr. Hayes, pre-1950 appropriators suffered shortages on April 29, when the Stateline flow was 132 cfs. *See id.* Stateline flows remained in the same vicinity through May 6. *Id.*

In a July 21, 2006 affidavit accompanying Montana's 2006 call letter, Mr. Hayes stated that June 17 was "the last day that the river contained sufficient water to satisfy the 1914 decreed rights in the Tongue River. By July 15, 2006 the river had dropped to a flow sufficient to satisfy only the first water right on the Tongue River." Ex. J-68, ¶ 14, at WY027312. The "first water right" was that of Mr. Nance, for only 10.48 cfs of water.

Mr. Hayes' 2006 affidavit again matches well with Mr. Book's demand model. On June 17, flows at the Stateline gauge were 300 cfs, slightly less than Mr. Book's estimated June need of 325 cfs. Ex. M-6, p. 116. On June 18, Stateline flows dropped to 267 cfs and never recovered. *Id.* By July 15, flows were only 32 cfs, compared to Mr. Book's estimated July demand of 350 cfs, and remained in double digits through mid-September. *Id.*

(3) Storage releases

The release of water from the Tongue River Reservoir during the notice periods also provides some evidence of pre-1950 direct-flow shortages. As several witnesses testified, the TRWUA begins to release stored water to Montana irrigators when there is insufficient water in the river to meet the irrigators' direct-flow rights. *See* 1 Tr. 135:15-21 (Dale Book); 7 Tr. 1438:17-1439:25 (Art Hayes). Indeed, there is no reason for an irrigator to turn to stored water when direct flow is available. *See* 2 Tr. 319:2-320:5 (Dale

Book) (storage releases more accurate indication of unmet demand than model). Release of stored water to pre-1950 appropriators is thus evidence of pre-1950 shortages. Records, although incomplete, show releases of stored water to pre-1950 appropriators from approximately May 1 through August 15, 2004 and from June 21 through September 30, 2006. *See* Ex. M-386 (commissioner summaries of 2004 storage releases); Ex. M-394 (commissioner summaries of 2006 storage releases); Ex. M-399 (same); Ex. M-404 (same). *See also* 7 Tr. 1516:15-18 (Hayes) (most irrigators used all of their storage rights in 2004 and 2006).

While the storage releases provide additional support for Mr. Book's demand model and Mr. Hayes' affidavits, they have limited import for two reasons. First, there is some suggestion that the TRWUA might automatically switch all but the two most senior users to stored water when Stateline flow drops below 200 cfs (a rule of thumb that might not accurately reflect actual shortages). 7 Tr. 1505:3-15 (Art Hayes). Second, the existing records do not show exactly when pre-1950 users switched to storage and therefore when they may have been suffering shortages. Instead, the existing records show only cumulative releases.

(4) Testimony of water users

Various holders of pre-1950 direct-flow rights in Montana, including Mr. Hayes, testified that they suffered shortages during the 2004 and 2006 irrigation seasons. *See, e.g.*, 7 Tr. 1487:19-22 (Art Hayes); 16 Tr. 3653:19-24 (John Hamilton); *id.* at 3691:7-14 (Les Hirsch); 17 Tr. 3861:5-18 (Roger Muggli). This testimony clearly establishes that appropriators were unable to enjoy their pre-1950 direct-flow rights during significant portions of the 2004 and 2006 notice

periods. None of the witnesses were specific as to the dates on which they suffered shortages. However, their testimony generally collaborates the conclusion reached from Mr. Book's demand model, Mr. Hayes' contemporaneous affidavits, and the release of stored water, that shortages were extensive.

(5) Testimony of Montana's principal water managers

Several state and TRWUA officials also testified that there is insufficient water to satisfy pre-1950 rights whenever the flow at the Stateline drops below 200 cfs. *See* Montana's Post-Trial Brief, *supra*, at 130-131. For example, Mr. Hayes, President of the TRWUA, testified that his rule of thumb is that, if the flow at the Stateline falls below 200 cfs, all water users other than the two most senior right holders must switch to storage. 7 Tr. 1438:17-24. According to Mr. Kepper, one of the Tongue River water commissioners, the amount of water needed to make sure that the two senior rights are met is 200 cfs. 15 Tr. 3330:14-18. As Montana notes, Stateline flows were less than 200 cfs for significant portions of both the 2004 and 2006 irrigation seasons.

This testimony, however, merely confirms that the two most senior Montana appropriators have direct-flow rights totalling approximately 200 cfs. The testimony does not prove that there were pre-1950 shortages in Montana. While the two most senior appropriators have rights to 200 cfs, they might not need this much due to weather, haying, or other factors. As described above, the T&Y Canal often does not use its full direct-flow right. *See* Ex. W-3, p. 15 (Hinckley expert report). Indeed, Mr. Book's demand model estimates that *all* pre-1950 appropriators

generally need less than 200 cfs during May. See Ex. M-5, p. 11 (Book expert report).

b) Conclusions.

There is little direct and contemporaneous evidence of direct-flow shortages in 2004 and 2006. This evidence includes Mr. Hayes' affidavits, which cover only the period immediately surrounding Montana's written notices, and the commissioners' records of storage releases, which provide limited evidence of direct-flow shortages. Montana's principal proof of shortages is Mr. Book's demand model. While the model overstates actual demand, it nonetheless can be used to determine when Montana was more likely than not to be suffering direct-flow shortages. Flows were far below Mr. Book's demand estimates during much of the 2004 and 2006 notice periods, providing strong evidence of shortages. Looking at the evidence as a whole, I recommend that the Court find:

- During 2004, flows at the Stateline gauge were insufficient to enjoy pre-1950 direct-flow rights from April 29 through May 6. Flows were also insufficient throughout the months of June, July, August, and September.⁶² Montana has failed to prove that flows were insufficient during the remainder of the 2004 notice period.
- During 2006, flows were insufficient to enjoy pre-1950 direct-flow rights from July 28, the date of Montana's call letter,

⁶² While flows rose on two days in June and again on two days in July, these four days were outliers.

through the end of September.⁶³ Montana has failed to prove that flows were insufficient after September.

E. Post-1950 Uses in Wyoming

The next question is whether Montana made post-1950 uses of water in 2004 and 2006 while Montana was suffering pre-1950 shortages and after Montana had notified Wyoming of those shortages. Montana presented expert testimony on post-1950 water uses in Wyoming for four of the years originally at issue: 2001, 2002, 2004, and 2006.⁶⁴ Ex. M-5, p. 43 (Book expert report). Montana presented no estimates for 1981 or the other years in which Montana contends it was injured. Given my conclusion that Montana has failed to show that it provided adequate notice on specific dates in 2001 and 2002, the following analysis deals only with 2004 and 2006. My overall analysis and conclusions, however, would be largely the same for 2001 and 2002.

Montana has the burden of showing, by a preponderance of the evidence, the extent to which Wyoming stored or used post-1950 Montana water during the 2004 and 2006 notice periods. *See* pp. 35, 40-43 *supra*. Although the evidence clearly establishes that post-1950 storage and use took place during the notice periods, the exact amount is difficult if not impossible to determine. Written records of post-1950 uses in Wyoming are incomplete at best.

⁶³ September 4, when water levels briefly rose, was again an outlier.

⁶⁴ Estimates of actual direct diversions for post-1950 use were made only for 2004 and 2006. For 2001 and 2002, Montana's principal expert, Dale Book, used the average of the 2004 and 2006 numbers. Ex. M-5, p. 43.

Wyoming officials do not even monitor reservoir storage during the winter when high snow levels make it difficult to get to the reservoirs. *See* 2 Tr. 286:2-19 (Dale Book) (cannot directly determine when storage occurs prior to May 1). Montana therefore is at a disadvantage in showing the exact quantum of post-1950 storage and use.

In similar settings, where courts seek to determine damages that are reasonably certain but inescapably uncertain in amount, this Court has indicated that the “law will make the best appraisal that it can, summoning to its service whatever aids it can command.” *Sinclair Refining Co. v. Jenkins Petroleum Process Co.*, 289 U.S. 689, 697 (1933). Damages cannot rest on “mere speculation or guess.” *Story Parchment Co. v. Paterson Parchment Paper Co.*, 282 U.S. 555, 563 (1931). But it is permissible to “show the extent of the damages as a matter of just and reasonable inference, although the result be only approximate.” *Id.* “All that can be done is to place before the court such facts and circumstances as are available to enable an estimate to be made based upon judgment and not guesswork.” *Palmer v. Connecticut Ry. & Lighting Co.*, 311 U.S. 544, 559 (1941). Requiring any higher standard “would bar a recovery for an actual injury suffered,” *id.*, and “relieve the wrongdoer from making any amend for his acts,” *Story Parchment, supra*, at 563. *See also J. Truett Payne Co. v. Chrysler Motors Corp.*, 451 U.S. 557, 565-66 (1981) (court will accept a “just and reasonable inference” of damages); *Eastman Kodak Co. v. Southern Photo Materials, Co.*, 273 U.S. 359, 370 (1927) (damages “not rendered uncertain because they cannot be calculated with absolute exactness”). I conclude that the evidence and expert testimony in this case permit a fair and reasonable estimate of the extent of post-1950 storage

and use that took place in Wyoming during the 2004 and 2006 notice periods and caused injury to Montana.

Montana contends that three types of post-1950 water uses in Wyoming reduced the amount of water available for pre-1950 uses in Montana in violation of the Compact: (1) direct diversions of water for post-1950 uses, (2) post-1950 storage of water, and (3) withdrawals of hydrologically connected groundwater during CBM production. As discussed below, the evidence shows that Wyoming directly diverted and stored water under post-1950 rights in both 2004 and 2006. Montana, however, has not proven that CBM withdrawals reduced Tongue River flows.

1. Direct diversions of water for post-1950 uses.

Direct post-1950 water uses in Wyoming are unlikely to significantly impact pre-1950 Montana water users in a typical year for several reasons. First, post-1950 direct-flow rights are only a small portion of the total Wyoming water rights on the Tongue River. Ex. W-2, p. 14 (Fritz expert report). Second, Wyoming typically regulates post-1950 direct-flow rights when water becomes scarce in response to calls from more senior downstream Wyoming water users. Wyoming carefully regulates its water rights system to ensure that senior Wyoming water users receive the amounts of water to which they are entitled. See Ex. M-5, p. 4 (Book expert report). When river flow drops, Wyoming requires junior right holders to reduce or halt their diversions as needed to meet the water rights of more senior appropriators in Wyoming. As a result, by the time water flow drops sufficiently to threaten the rights of pre-1950 users in Montana, Wyoming regulators are likely already to have shut off post-1950

water users in Wyoming. Finally, post-1950 appropriators along some of the Tongue River tributaries in Wyoming often find it difficult to divert water as water runs short in the Tongue River, because the flows in their tributaries either dry up or are too low to physically divert.

In some areas on the Tongue River and its tributaries, however, Wyoming authorities historically have not regulated post-1950 users during periods of low flow. The primary example is the main stem of the Tongue River upstream of the Stateline between Montana and Wyoming. *See id.* Wyoming regulators do not need to regulate post-1950 users along this reach of the river because there is generally sufficient flow to satisfy all Wyoming water rights, even during dry periods. *Id.* Because there is no regulation, however, post-1950 users on the main stem can divert water even when insufficient water crosses the Stateline to meet the needs of pre-1950 appropriators in Montana.

Wyoming also does not regulate water users along Prairie Dog Creek. *Id.*, p. 5. Much of the water supply for Prairie Dog Creek comes from Piney Creek and the Kearney Reservoir, which are located in the upper Powder River Basin. *Id.* As on the main stem of the Tongue, therefore, water users along Prairie Dog Creek may be able to exercise post-1950 rights when insufficient water is passing the Stateline to meet the needs of Montana pre-1950 rights.

a) Use of post-1950 water in 2004 and 2006.

Retrospectively determining whether holders of post-1950 rights in Wyoming diverted water in 2004 and 2006 is not an easy task. Wyoming provided

Montana with a tabulation of adjudicated post-1950 water rights in the Tongue River basin. *Id.*, p. 5. Unfortunately, Wyoming does not maintain comprehensive records of the amounts of water diverted by all water users in any given year. *Id.*, p. 4. For example, Wyoming has not typically measured most ditch diversions on the main stem of the Tongue River. *Id.*, p. 5. Wyoming similarly does not maintain diversion records for portions of Prairie Dog Creek. *Id.*

To estimate the amounts of water used by post-1950 appropriators in Wyoming during 2004 and 2006, Montana began by trying to reconstruct which post-1950 acreage was irrigated in those years. Dale Book, Montana's principal expert on Wyoming water use, used four sources of information to estimate the acreage. First, Mr. Book examined aerial photographs for 2006 to determine whether lands that held post-1950 water rights appeared to have been irrigated. *Id.*, p. 6; 1 Tr. 168:12-19 (Dale Book). Second, he reviewed the results of a METRIC analysis conducted by Dr. Richard Allen. METRIC, developed by Dr. Allen and others at the University of Idaho, uses satellite imagery to calculate the evapotranspiration (ET) rate from agricultural fields.⁶⁵ Irrigated fields will show an ET rate that is higher than background ET levels. Ex. M-5, pp. 6-7; 1 Tr. 103:11-110:6 (Book). Third, Mr. Book consulted official maps of the permitted acreage contained in the Wyoming Basin Plan. Ex. M-6, p. 6 (Book rebuttal expert report).

⁶⁵ "Evapotranspiration (ET) is the combined process of evaporation from bare soil (E) and transpiration from vegetation (T). ET is the process by which precipitation and irrigation water are lost to the atmosphere." Ex. M-8, p. 3 (Allen expert report).

Finally, Mr. Book considered the permits themselves to see what acreage was permitted. *Id.*

Once Mr. Book determined the post-1950 acreage that he believed had been irrigated, he estimated the amount of water that the acreage would have used in 2004 and 2006. He again used two approaches. The first approach was the Hargreaves method, which uses daily temperature and crop coefficients to estimate the amount of water that a well-watered crop would use if its supply of water is not limited. Ex. M-5, p. 6. He then backed out the amount of water that farmers would have received directly from precipitation to estimate "consumptive irrigation requirements" per acre—i.e., the amount of water that farmers would have had to divert from the river. *Id.*, pp. 6-7. The second method was again METRIC, which provided estimates of both the actual ET on irrigated parcels and background ET. *Id.*, p.7.

In his original expert report for Montana, Mr. Book estimated that, in 2004 and 2006, 379 acres of post-1950 land were actively irrigated along the main stem of the Tongue and 362 acres were irrigated along lower Prairie Dog Creek and several tributaries. Ex. M-5, pp. 18, 41-42. Based on this acreage, Mr. Book concluded that Wyoming appropriators used 676 af of post-1950 water during 2004 and 991 af in 2006. *Id.*, pp. 41-42, tbls. 11-A, 11-B.

Doyle Fritz, one of Wyoming's expert witnesses, challenged Mr. Book's calculations on one or both of two grounds. See Ex. W-2, pp. 70-88 (Fritz expert report). First, Mr. Fritz concluded that some of the land was not actually irrigated. In determining what land was irrigated, Mr. Fritz not only looked at the information that Mr. Book used, but in some cases talked to the property owners themselves or others

familiar with the use of water on the lands in question. Second, Mr. Fritz concluded that some of the land used water sources that did not violate the Compact. For example, in an effort to get rid of their CBM production water, some CBM producers in the watershed, including Storm Cat Energy (USA), began in the early and mid-2000s to supply farmers in the Tongue River watershed of Wyoming with CBM water for irrigation. *See, e.g.*, 19 Tr. 4576:9-4583:16 (Maurice Felton) (describing use of CBM water on his farm in 2004 and 2006); *id.* at 4534:9-4538:7 (John Stier) (describing Storm Cat's practice of using CBM water to irrigate); Ex. W-2, pp. 71-73 (Fritz expert report). Mr. Fritz used a map and "shape file" provided by Storm Cat to determine which areas received CBM water; in some cases, he also talked to the land owner. Ex. W-2, pp. 71-73. Some holders of post-1950 rights also had storage water available that did not violate the Compact, and these land owners sometimes used or exchanged that water during the years in question. *See id.*, pp. 85-87. To determine when other water was used, Mr. Fritz consulted the Wyoming hydrographers' reports and often talked to the land owners. *Id.*, p. 71.

Based on his analysis, Mr. Fritz concluded that a much smaller amount of post-1950 lands was irrigated in 2004 and 2006—only 107 acres of post-1950 land along the main stem of the Tongue and its tributaries and 17 acres along Prairie Dog Creek. *See id.*, figs. 11-A, 11-B. Total post-1950 consumption of water, according to Mr. Fritz, was only 118 acre feet in 2004 and 201 acre feet in 2006 (compared to Mr. Book's original estimates of 676 and 991 acre feet respectively). *Id.*

In his rebuttal report, Mr. Book reviewed the criticisms of Mr. Fritz and revised his estimates. Ex. M-6, pp. 5-12. In many cases, Mr. Book agreed with Mr. Fritz that land either had not been irrigated or used water sources that did not violate the Compact. In about a dozen cases, however, Mr. Book disagreed with Mr. Fritz. In these cases, he either reaffirmed his original estimates or revised his estimates based on new information brought to light by Mr. Fritz or by his own reexamination of the original documents. *Id.*

For all the properties in dispute, I have reviewed the expert reports, as well as the testimony at trial of both the experts and those property owners who appeared, to determine how much post-1950 water was used. Appendix D contains a detailed analysis of each of the properties. Table D-1 at p. D-10 shows my conclusions, based on that analysis, of (1) how many acres were irrigated in 2004 and 2006 with post-1950 water and (2) the total amount of post-1950 water applied in each year. As seen, the total amounts of acreage and water are not large. I conclude that 212 acres were irrigated in 2004 and 2006 with post-1950 water rights. To irrigate this land, farmers used 204 acre feet of post-1950 water in 2004 and 325 acre feet in 2006.

b) Post-1950 water use during the notice period.

These figures are not necessarily the amounts of post-1950 water used by Wyoming irrigators in 2004 and 2006 in violation of the Compact. As discussed earlier, any post-1950 uses prior to Montana's notice to Wyoming did not violate the Compact. Wyoming is therefore liable only for post-1950 use after the date of notice.

Determining the amount of post-1950 use that occurred after the date of notice in 2004 is not difficult. As discussed above, Montana first provided Wyoming with notice on April 14, when it informed Wyoming that it might not be able to fill the Tongue River Reservoir. As a result of this early notice, all or virtually all of the post-1950 irrigation use would have occurred after Montana's notice. According to Mr. Fritz, the growing season in Wyoming "is relatively short, generally May through September." Ex. W-2, p. 9. No evidence suggested that the irrigation season in 2004 began before the normal growing season. Because Wyoming was notified of the impending shortage to the Tongue River Reservoir at or before the start of the irrigation season, I conclude that the entire 204 acre feet of post-1950 water diverted and used in 2004 violated the Compact.

2006 poses more of a problem because, as discussed earlier, notice was not delivered to Wyoming until July 28, 2006. Because this was in the middle of the irrigation season, Wyoming is not liable for the portion of post-1950 water used prior to July 28. Unfortunately, none of the evidence or testimony provides direct estimates of how much water post-1950 irrigators in Wyoming used after this date. While METRIC produced monthly estimates of ET, Mr. Book relied on and provided only the yearly estimates. See Ex. M-5, pp. 7, 18, 41-42 tbls. 11A & 11B (Book expert report). Monthly estimates were not introduced. The photographs on which Mr. Book relied can show only whether significant water was applied to land prior to the date of the photographs. The photographs used by Mr. Book and Mr. Fritz were taken in July 2006 and do not indicate what was irrigated thereafter. See W-2, p. 71 (Fritz expert report) (noting July date for photographs). As a result,

they do not prove whether and how much water was taken after Montana's July 28 notice.

Wyoming argues that the evidence cannot be used to establish the amounts of post-1950 diversions after Montana's July 28, 2006 call letter and that no liability should be assessed for 2006. *See* Wyoming's Post-Trial Brief, *supra*, p. 58. However, despite the lack of direct information regarding post-notice water use, the amount of post-1950 water used in Wyoming after the July 28 notice can be reasonably estimated. In making this estimate, I have relied on four major findings:

- Because Wyoming did not regulate post-1950 water in response to Montana's notice, water use that was occurring prior to the notice would have continued thereafter absent some other intervening factor. *See* 21 Tr. 5026:14-21 (Sue Lowry) (no regulation).
- According to testimony at trial, there was insufficient water at the Interstate Ditch by August of 2006 to provide post-1950 water to users of that ditch. *See* 10 Tr. 2161:10-2162:5 (William Knapp) (visited main stem of the Tongue after 2006 and did not see sufficient water to provide post-1950 water); 12 Tr. 2729:2-25 (John Engels) (normally insufficient water by August to meet all water rights).
- Although there was conflicting evidence at trial, I find that the preponderance of the evidence indicates that Wyoming regulated the South Side Ditch for the first time in 2006, although exactly when

in 2006 is uncertain. *See* Ex. M-449, p. 3 (report on Padlock Ranch and its irrigation water in 2006) (noting reduced use when the “South Side Ditch was called into compliance”); 15 Tr. 3502:6-9 (Greg Benzell) (South Side Ditch was regulated by Wyoming in 2006).⁶⁶ Because Montana has the burden of proving post-1950 water use in Wyoming after July 28, 2006, it is appropriate to assume that the South Side Ditch was regulated on or before the call letter. Three of the properties received their water from the South Side Ditch: Barbula, White, and the School District.

- In the case of other water rights, it is reasonable to conclude that approximately half of the post-1950 water use occurred in August, September, and October. The only evidence in the record showing the use of water by month is for the T&Y Canal in Montana for the years 1997 through 2005. *See* Ex. M-5, p. 277, app. E-10 (Book expert report); Ex. W-3, p. 16 tbl. 3 (Hinckley expert report); 24 Tr. 5658:11-5660:2 (Bern Hinckley) (correcting numbers from the tables). This evidence shows that, on average, the T&Y Canal

⁶⁶ Michael Whitaker, who was the superintendent for the water region from 1987 through 2009, did not recall any calls being placed on the main stem of the Tongue River, except at one point in 2004. 8 Tr. 1721:13-25. I find that the report prepared on the Padlock Ranch, as confirmed by Mr. Benzell, the Padlock Ranch farm manager, is the more reliable evidence on this issue. *See also* 10 Tr. 2159:17-20 (William Knapp) (discussing administration of the main stem in 2006).

used roughly half of its total irrigation water after July 28 in these years.

Of the 325 af of post-1950 water used by Wyoming farmers in the Tongue River watershed during 2006, 202 af should be excluded because the properties were supplied from either the Interstate Ditch or the South Side Ditch and, as discussed above, must be assumed not to have received post-1950 water after Montana's notice. Of the remaining 123 af, approximately 50 percent, or 62 acre feet, is more likely than not to have occurred during the period of time after Wyoming received Montana's July 28, 2006 call letter. Appendix D contains a more detailed parcel-by-parcel analysis of how much water should be attributed to the period after July 28, 2006.

c) Conclusions.

In conclusion, I recommend that the Court find that Wyoming directly diverted and used at least 204 acre feet of water after receiving notice in 2004 and at least 62 acre feet of water after receiving notice in 2006.

2. Post-1950 Storage.

Both sides presented significant percipient and expert testimony regarding what, if any, post-1950 storage occurred in Wyoming after Montana's notices in 2004 and 2006. For purposes of its analysis, Montana divided post-1950 reservoirs into three categories: (1) the 11 "Compact Reservoirs" for which Wyoming maintains records of use, (2) three reservoirs (Fivemile, Wagner, and Padlock) that supply water for the Padlock Ranch and for which the ranch's manager provided information, and (3) 19 smaller reservoirs for which detailed records are available. See Ex. M-6, pp. 8-16 (Book rebuttal expert report).

Water that is stored "in priority" (i.e., when there is no call by a senior appropriator) has been legally stored and can be subsequently used at any point, even if it is used when senior appropriators need water. *See, e.g., Federal Land Bank v. Morris, supra*, 116 P.2d at 1011-1012; *Kearney Lake Land & Reservoir Co. v. Lake DeSmet Reservoir Co., supra*, 475 P.2d at 551. Montana has previously conceded that, under this rule, Wyoming is entitled to post-1950 water stored in priority and does not need to release that water to Montana. *See First Interim Report, supra*, at 43. Wyoming therefore is liable to Montana under Article V(A) of the Compact only if it stores post-1950 water after Montana has provided notice that it is short of water.

Because of the physical difficulty of getting to many of Wyoming's reservoirs during the winter when they are surrounded by snow, reservoirs in Wyoming sometimes fill out of priority. An on-stream reservoir upstream of another reservoir, for example, might fill first, even though that reservoir is junior to the downstream reservoir. By agreement between the reservoirs, which are often owned by the same entities, the reservoirs nonetheless maintain their relative priorities to the stored water. *See* 8 Tr. 1767:7-16 (Michael Whitaker) ("owners work it out"); 10 Tr. 2212:25-2213:12 (William Knapp) (maintenance of priorities is by agreement of owners, some of whom operate multiple reservoirs). If there is not enough water in a season to fill both reservoirs, the upstream reservoir will at a later date either (1) physically release water to the downstream reservoir to account for the out-of-priority filling, or (2) deliver the water on request to the users of the water in the lower reservoir just as if the water had actually been stored in that reservoir. *See* 8 Tr. 1739:3-1740:4,

1741:17-1742:4, 1767:2-16, 1776:6-1778:5 (Michael Whitaker); 10 Tr. 2212:25-2213:12 (William Knapp). This practice is known as "highority."

Because the Tongue River Reservoir is downstream, Montana suggests that upstream reservoirs in Wyoming that store post-1950 water during the winter should release that water later in the year, under the practice of highority, if the Tongue River Reservoir needs additional water under its pre-1950 water right. This might be a reasonable way for the two states to agree to account for reservoir water rights. However, highority is not embodied in the prior appropriation doctrine and is not to be found in the language of the Compact. Montana therefore cannot take advantage of it to claim post-1950 water stored in Wyoming prior to effective notice.

Post-1950 storage, like direct diversions, is unlikely in most years to impact Montana's pre-1950 rights by large amounts. There are at least two reasons. First, because Wyoming reservoirs start storing water in the winter, significant storage is likely to occur before Montana begins storing water in the Tongue River Reservoir and before Montana pre-1950 appropriators begin significant diversions. Even if Montana notifies Wyoming early in the spring that it is short of water, owners of post-1950 storage capacity in Wyoming may already have stored significant amounts of water. Second, as water becomes scarce, senior appropriators in Wyoming again may call the river, leading Wyoming water commissioners to curtail new post-1950 storage.

a) Compact Reservoirs.

As part of its annual report to the Compact Commission, Wyoming reports information on eleven

reservoirs (the "Compact Reservoirs"). Of these, six have post-1950 rights to store water each year. Four of these reservoirs have a combination of pre-1950 and post-1950 rights: Big Horn (2,748 af of pre-1950 rights, and 1,876 af of post-1950 rights), Dome Lake (183 af of pre-1950 rights, 188 af post-1950), Park (7,350 af pre-1950, 3,020 af post-1950), and Twin Lakes (1,180 af pre-1950, 2,217 af post-1950). The other two reservoirs have only post-1950 storage rights: Cross Creek (798 af) and Sawmill (1,275 af). See Ex. M-5, p. 36 tbl. 6 (Book expert report). In total, these Compact Reservoirs hold over 9,000 af of post-1950 storage rights.

To determine how much post-1950 water Wyoming stores in a particular year, it is important to understand storage accounting. Where a reservoir has multiple storage rights with different priorities, Montana and Wyoming effectively use a first-in-first-out (FIFO) methodology to allocate storage between the senior and junior rights. The reservoir fills its more senior storage rights first and then, once it fills its senior capacity, fills its more junior rights. For example, if a reservoir has 7,000 af of senior rights and 3,000 af of junior rights and starts the year with no carryover, the reservoir will start by filling its 7,000 af of senior rights. If the reservoir fills only partially, say to 8,000 af, 7,000 af of that storage will be senior storage and the remaining 1,000 af will be junior. If the reservoir fills only to 4,000 af, all of the water will be senior. Once the reservoir begins to release water for use, the assumption is that the reservoir releases its senior water first (thus freeing up its senior space).

If a reservoir fills, releases some of its water, and then carries over the remaining water into the following water year, the assumption is that the

carryover water is junior water first and senior water only to the extent that the carryover exceeds the reservoir's junior rights. This follows from the assumption that senior water is released first, thus leaving the junior water as carryover. If the reservoir in the earlier example starts the year with 2,500 af of water, all of that water is assumed to be junior. If the reservoir has 4,000 af of carryover water, 3,000 af will be junior and only 1,000 af senior. Any water stored in the new water year will be senior (because the junior capacity is full).

(1) 2004 post-1950 storage

In 2004, the Compact Reservoirs stored 1,447 af of water under post-1950 rights. None of the four mixed-priority reservoirs stored any post-1950 water. Because of the low water availability, these reservoirs were not able to fill even their pre-1950 storage rights. See Ex. M-5, p. 37 tbl. 7 (Book expert report). However, both of the two purely post-1950 storage reservoirs stored water. Cross Creek stored 172 af, while Sawmill stored 1,275 af. For a detailed description of storage in the Compact Reservoirs during 2004, see Appendix E.

Not all of the 1,447 af of post-1950 storage, however, violated the Compact. As emphasized earlier, Wyoming was free to store post-1950 water in its reservoirs up to April 14, when Montana first informed Wyoming of its need for additional water. Cross Creek and Sawmill, in compliance with Wyoming's Early-In Rule, began storing at the start of the 2004 water year, long before Montana notified Wyoming of its need for additional water and at a time when Montana was not actively storing water in the Tongue River Reservoir. Any post-1950 storage between October 1, 2003 and April 14, 2004 was legal under the Compact.

The question therefore is how much of the post-1950 storage occurred after April 14. Because a Wyoming hydrographer checked storage levels at Sawmill on May 19, we know that the Sawmill Reservoir stored 500 af of water between May 19 and when it filled in mid- to late-June. See p. E-4 to E-5 *infra*. However, because there were no measurements of storage levels before May 19, it is necessary to estimate how much water was stored in Sawmill between April 15 and May 19. Gordon Aycock, one of Montana's expert witnesses and a former reservoir official for the U.S. Bureau of Reclamation, developed a method for estimating storage over time based on monthly flows of Goose Creek near Acme, Wyoming. See Ex. M-7, pp. 19-20, 29-32. Mr. Aycock's estimates were reasonable and were not seriously challenged at trial. As discussed in Appendix E, his estimates for Sawmill storage after May 19 also appear to be quite accurate when compared with actual storage. See p. E-5 *infra*. Using Mr. Aycock's approach (and assuming that storage took place evenly over each month), I find that Wyoming stored 337 af of water in Sawmill between April 15 and May 19. In total, therefore, Sawmill stored 837 af during the 2004 notice period.

Cross Creek Reservoir filled on or about May 24. Because there is no direct evidence of when storage took place prior to May 24, it is again necessary to use Mr. Aycock's model to estimate how much storage occurred after April 14. Because Mr. Aycock assumed that Cross Creek continued to store water until the end of June (see Ex. M-7, p. 30), I revised his numbers to reflect the earlier fill date. In doing so, I used all of Mr. Aycock's assumptions and data. Based on Mr. Aycock's approach (and again assuming that storage took place evenly over each month), I find that Wyoming stored 81 af in Cross Creek between April 15

and May 24. In total, therefore, Wyoming stored 918 af in both Cross Creek and Sawmill combined during the 2004 notice period.

(2) 2006 post-1950 storage

In 2006, three of the Compact Reservoirs stored post-1950 water: Cross Creek (which stored a total of 324 acre feet of post-1950 water), Big Horn (1,210 af), and Sawmill (455 af). Ex. M-5, p. 37 tbl. 7 (Book expert report). None of these reservoirs, however, stored any water after July 28, 2006 when Montana sent Wyoming its call letter. All of the reservoirs filled during the spring runoff and, far from storing water, were actually releasing water to their users by the July 28 letter. See Ex. W-41 (Knapp notes regarding 2006 reservoir orders); Ex. J-62, p. 107 (2006 Wyoming Hydrographers' Annual Report) (Cross Creek filled "during spring runoff"); *id.*, p. 110 (Big Horn filled in June); *id.*, p. 122 (Sawmill filled "during spring runoff"). Big Horn began to release water on June 21, Sawmill on June 28, and Cross Creek on July 12. See Ex. W-41 (Knapp notes); Ex. J-62, pp. 107, 110, 122 (2006 Hydrographers' Annual Report). See also 10 Tr. 2102:18-2103:5 (William Knapp) (no storage was occurring by July 28, 2006). Because all post-1950 storage in 2006 occurred before Montana's call letter, none of the post-1950 storage in 2006 violated Article V(A) of the Compact.

b) Fivemile, Wagner, and Padlock Recovery Reservoirs.

Over 20 smaller reservoirs in Wyoming have post-1950 storage rights to more than 20 af of water and store water pursuant to those rights in a typical year. See Ex. M-5, pp. 14, 39 tbl. 9 (Book expert report). Because of their size, Wyoming does not maintain

records for these reservoirs as it does for the Compact reservoirs. *Id.*, p. 14.

In his expert report, Mr. Book estimated the amount of post-1950 water stored during 2004 and 2006 in three reservoirs that furnish water to the Padlock Ranch in Wyoming: Fivemile, Wagner, and Padlock Recovery (hereinafter jointly referred to as the "Padlock Ranch Reservoirs"). *Id.*, pp. 14-15, 43 tbl. 12. Mr. Book concluded that, in 2004, 720 af of post-1950 water was stored in the Padlock Ranch Reservoirs. *Id.*, p. 43 tbl. 12. In 2006, 990 acre feet of post-1950 water was stored. *Id.*

Mr. Book's calculations of post-1950 storage in the Padlock Ranch Reservoirs hold up well to scrutiny.⁶⁷ Once again, however, only storage that occurred during the notice periods could have violated the Compact. There is very little information in the record as to when the Padlock Ranch Reservoirs filled. According to Gregory Benzel, the farm manager for the Padlock Ranch, the "reservoirs are filled each year beginning in October with water diverted through the Wyoming and Fivemile Ditch. Fivemile Reservoir is filled first until March, and then water is stored in Wagner Reservoir until the irrigation season begins." *Id.*, p. 15. According to Mr. Book, the irrigation season for the Padlock Ranch begins in May. 2 Tr. 290:2-6.

While this information is relatively scant, it permits a reasonable estimate of the amount of post-1950

⁶⁷ Although 127 af of water rights associated with the Wagner Reservoir are pre-1950 rights (Ex. W-2, p. 66 (Fritz expert report)), Mr. Book took the pre-1950 storage rights into consideration in his original estimates. See Ex. M-6, p. 4 (Book rebuttal expert report).

water that the Padlock Ranch would have stored in 2004 during the notice period:

- By the time Montana notified Wyoming on April 14, Fivemile Reservoir would have already filled.
- Wagner Reservoir would have been in the middle of filling. According to Mr. Book, Wagner Reservoir stored 330 af in 2004. Ex. M-5, p. 15. Without more information, it is impossible to know the exact amount of post-1950 water that Wagner Reservoir stored after April 14. A conservative estimate can be made by assuming that (1) storage began in Wagner Reservoir on March 1 and finished on May 1 (see above), and (2) storage was uniform across this period. On these assumptions, 25 percent of the water stored in Wagner Reservoir, or 83 af, was stored after notice was provided in 2004.
- Padlock Recovery Reservoir has approximately 51 af of storage capacity and fills twice a year. See Ex. M-451, p. 10 (technical report by Aqua Tera Consultants); 15 Tr. 3480:9-12 (Gregory Benzel). Because the reservoir would not have released its first fill until the irrigation season began, at least one of the fills would have occurred after Montana provided notice to Wyoming. The Padlock Recovery Reservoir therefore stored at least 51 acre feet of post-1950 water after Montana's notice in 2004.

In 2004, therefore the Padlock Ranch Reservoirs stored a total of at least 134 af of water after Montana notified Wyoming. As noted, this is a conservative estimate that favors Wyoming.

In 2006, Fivemile and Wagner Reservoirs would almost certainly have filled prior to July 28. While the Padlock Recovery Reservoir filled a second time each irrigation season, it is impossible to determine whether it would have filled before or after July 28. Montana, which has the burden on this issue, therefore has failed to prove that the Padlock Recovery Reservoir filled for the second time after Montana's notice.

c) Other Wyoming reservoirs.

Mr. Book was unable to directly determine the amount of water stored in the other 19 reservoirs with over 20 af of post-1950 storage rights in Wyoming. Ex. M-5, pp. 15-16 (Book expert report). He therefore made a conservative estimate of the total amount of storage by assuming that, every year, each reservoir stores at least the amount of water that has evaporated from the reservoir during the year. *Id.*, p. 16. As Mr. Book noted, to the degree that a reservoir releases any water for irrigation, the reservoir would thereafter try to refill the volume of the release. *Id.* So Mr. Book's estimate provides merely a "lower limit on the amount of water consumed by the water right." *Id.* Because Mr. Book based his estimate on the total reservoir acreage and pan evaporation data at Sheridan, Wyoming, the estimate of evaporation loss did not vary by year. *See id.* at 43 tbl. 12.

Mr. Book and Wyoming's principal reservoir expert, Mr. Doyl Fritz, disagreed on the exact amount of evaporation that would have occurred. *See* Ex. W-2,

pp. 68-70 (Fritz expert report); Ex. M-6, p. 5 (Book rebuttal expert report). The principal source of disagreement was how much, if any, evaporation to attribute to reservoirs built in the stream valleys where the ET levels may have been high prior to the construction of the reservoir. Ex. W-2, p. 69. While Mr. Book originally estimated that the evaporation storage was 376 af, Mr. Fritz calculated that it was only 256 af. *Compare* Ex. M-5, pp. 16, 43 tbl. 12 (Book expert report) *with* Ex. W-2, p. 70. In response to Mr. Fritz's criticisms, Mr. Book reevaluated the reservoirs that were in question and reduced his estimate of evaporation to 313 af. Ex. M-6, pp. 5, 24 tbl. 1. I find that Mr. Book's revised estimate is both reasonable and accurate. The revised estimate fully and appropriately responds to Mr. Fritz's criticisms.

Once again, the challenge is determining whether any of Mr. Book's revised estimate occurred after Montana notified Wyoming of its shortage in 2004 and 2006. The only testimony at trial regarding the timing of storage involved the Windy Draw Reservoir, which is 19 acres in size and has the largest capacity of any of the reservoirs (533 af). According to the farm manager of the Padlock Ranch, Windy Draw Reservoir fills continuously throughout the year, rather than just once. 15 Tr. 3494:12-19 (Greg Benzel). As Mr. Book noted in his expert report, reservoirs in active management areas presumably filled when storage did not interfere with senior downstream rights; other reservoirs would have filled when water was available during the runoff season. Ex. M-5, p. 16.

Lacking direct evidence of when the reservoirs filled, Mr. Aycock's methodology for estimating monthly storage in the Compact Reservoirs can again provide a reasonable estimate of storage after

Montana's notice. See Ex. M-7, pp. 30, 32 (Aycock rebuttal expert report). Assuming that a Wyoming reservoir fills from October through June, Mr. Aycock estimates that approximately 66 percent of the reservoir's storage would occur from April 15 through the end of June. *Id.* at 32.⁶⁸ None of the storage would occur after July 28. The best estimate of the evaporation storage from the other reservoirs in 2004 therefore would be 66 percent of 313 af—or 208 af. The best estimate of the evaporation storage in 2006 would be zero.

Montana argues that the reservoirs stored a slightly higher volume of water, 233 af, in 2004 and stored 82 af in 2006. Montana bases this argument on a separate estimate that Mr. Aycock prepared of the amount of the evaporation that occurred each month in 2004. According to his estimate, 233 af of water would have evaporated from April 15 through the end of September. Ex. M-7, p. 27.⁶⁹ When evaporation occurred, however, says little about when storage occurred. Mr. Book looked to evaporation only as a

⁶⁸ Mr. Aycock's estimates that 31.1 percent of storage would occur in May and 28.5 percent in June. Ex. M-7, p. 32. Mr. Aycock estimates that 12.8 percent of storage would occur in April. *Id.* Prorating the April storage evenly across the 30 days in the month, 6.8 percent of storage would occur from April 15 to 30. Storage from April 15 through the end of June therefore would total 66.4 percent (6.8 + 31.1 + 28.5).

⁶⁹ Mr. Aycock estimates that 245 af evaporated from April through September. Ex. M-7, p. 12. To calculate the amount of evaporation after Montana's notice in 2004, Montana subtracts 12 af – the portion of the April evaporation that occurred in the first 14 days of the month. To calculate the amount of evaporation after Montana's notice in 2006, Montana adds Mr. Aycock's estimates of evaporation in August (51.8 af) and September (30.2 af). *Id.*

measure of the minimum volume of water the reservoirs would have stored. As he noted, storage would have occurred during the runoff season. The best estimate of how much of the evaporation loss would have been stored during the notice period of 2004, therefore, is 208 af, not 233 af.

d) Conclusions.

Based on the above analysis, I recommend that the Supreme Court find that Wyoming stored at least 2,480 af under post-1950 rights in 2004. Of this amount, Wyoming stored 1,260 af after Montana first provided it with notice on April 14. In particular:

- Wyoming stored 1,447 af in Compact Reservoirs, 918 af of which was stored after notice.
- Wyoming stored at least 720 af in the Padlock Ranch Reservoirs, 134 af of which was stored after notice.
- Wyoming stored at least 313 af in the other reservoirs with at least 20 af of capacity. 208 af was stored after notice.

I also recommend that the Court find that Montana has not carried its burden to prove that any post-1950 storage in 2006 occurred after its July 28 call letter to Wyoming.

It is important to emphasize that the amount of post-1950 storage in Wyoming in 2004 was almost certainly greater than 1,260 af. Moreover, there may have been post-1950 storage in Wyoming after July 28, 2006, although the amount would almost certainly have been relatively small. Given the records that exist, however, the best estimate of the amount of water stored after notice in 2004 is 1,260 af, and it is

impossible to say that it is more likely than not that any post-1950 storage occurred after notice in 2006.

3. CBM-related groundwater extraction.

Montana finally urges that groundwater extraction in connection with the production of coal-bed methane ("CBM") in Wyoming reduced the flow of the Tongue River at the Stateline in both 2004 and 2006 in violation of Article V(A) of the Compact. According to Montana's expert witnesses, groundwater extraction as part of CBM production in Wyoming reduced the Tongue River flow at the Stateline with Montana by 413 af in 2004 and 666 af in 2006. Ex. M-6, p. 27 tbl 3 (Book rebuttal expert report).

Montana's allegation raises three questions. First, can CBM-related groundwater extraction violate the Compact? Second, if it can, what must be shown to establish that groundwater extraction in 2004 and 2006 violated the Compact? Finally, has Montana established that it was injured in 2004 or 2006 as a result of CBM-related groundwater extraction in Wyoming?

CBM gas is trapped in coal pores by hydrostatic pressure. To release this pressure and produce gas from a coal-bed field, producers pump groundwater from the field. The pumping reduces the hydrostatic pressure and allows the gas to migrate to fractures in the coal. Production wells can then transport the methane to the surface. Because of the production process, CBM facilities produce significant quantities of groundwater. The groundwater production, in turn, can affect both neighboring groundwater production and hydrologically connected surface waters. See Ex. M-38, pp. 1-1 to 1-3.

CBM production began in the Tongue River basin of Wyoming in the late 1990s. The number of wells peaked in the late 2000s, and the annual production of CBM-groundwater peaked in 2008. Ex. M-9, p. 6, tbl. 2 (Larson expert report).⁷⁰ In 2004, CBM production in the Tongue River basin generated almost 8,000 af of groundwater. *Id.* At its peak in 2008, CBM production in the basin generated over 13,000 af. *Id.* While CBM production peaked in 2008, the impact of CBM pumping on the Tongue River may continue for a “very, very long time” even after groundwater production has stopped. 13 Tr. 2767:16-19 (Larson). The question in this case is whether that CBM production reduced the flow of water in the Tongue River at the Stateline available for Montana’s use in 2004 and 2006 and, if so, whether that reduction violated Article V(A) of the Compact.

a) Can CBM-related groundwater extraction violate the Compact?

In my First Interim Report to this Court, I concluded that 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.” First Interim Report, *supra*, at 90. Neither Montana nor Wyoming took an exception to this conclusion. In the same report, however, I also concluded that the question of the “exact circumstances under which groundwater pumping violates Article V(A) is appropriately left to

⁷⁰ Production of CBM and CBM-related groundwater underwent a very similar history in the Powder River basin, except at an even larger scale. Ex. M-9, p. 5, tbl. 1.

subsequent proceedings in this case” (*id.*), a question to which I now turn.

In addressing that question, it is worth reviewing and highlighting the reasons why I concluded in the First Interim Report that the Compact covers hydrologically connected groundwater in some settings. At least three (and perhaps four) elements of the Compact’s language establish the Compact’s applicability to at least some groundwater.

First and foremost, “Article V(A) provides without any limitation that pre-1950 rights ‘shall continue to be enjoyed.’ Article V(A) does not protect pre-1950 rights only from surface diversions or storage; instead, it provides broadly for the continued enjoyment of such rights.” *Id.* at 44. In this respect, the Yellowstone River Compact is similar to other compacts that this Court has found to cover groundwater. *See Kansas v. Colorado*, 543 U.S. 86, 91 (2004) (1949 Arkansas River Compact); *Kansas v. Nebraska*, 530 U.S. 1272 (2000) (1942 Republican River Compact). As the special master in *Kansas v. Nebraska* observed, the Republican River Compact protects streamflow, which “comes from both surface runoff and groundwater discharge. . . . Interception of either of those stream flow sources can cause a State to receive more than its Compact allocation and violate the Compact.” First Report of the Special Master, *Kansas v. Nebraska*, No. 126, Orig., p. 22 (Jan. 28, 2000). In a like manner, pumping of hydrologically connected groundwater in this case can prevent Montana from “enjoying” its pre-1950 rights.

Second, Article V(A) protects pre-1950 rights in the “Yellowstone River System,” and the definition of the “Yellowstone River System” in Article II(D) of the Compact reflects an intent to cover all waters

including groundwater. First Interim Report, *supra*, at 45-46. Thus the Compact defines "Yellowstone River System" to mean "the Yellowstone River and all of its tributaries, *including springs and swamps*, from their *sources* to the mouth of the Yellowstone River." Compact, *supra*, art. II(D) (emphasis added). Scientists and courts recognized long before the Compact that groundwater is often a significant source of water for rivers. See, e.g., *Snake Creek Mining & Tunnel Co. v. Midway Irrigation Co.*, 260 U.S. 596, 598 (1923). A "spring," furthermore, is a "location where groundwater naturally emerges from the Earth's subsurface" and frequently discharges water "directly into the beds of rivers or streams." Water Encyclopedia: Science and Issues 38. And a "swamp" is an older name for a "wetland," which is merely an "area that is periodically or permanently saturated or covered by surface water or groundwater." *Id.*

Third, the law of prior appropriation, which Article V(A) explicitly adopts, has long recognized the need to integrate surface water with at least some forms of groundwater. See First Interim Report, *supra*, at 446-51. This Court recognized the interconnection of groundwater and surface water in its first equitable apportionment case at the turn of the last century. See *Kansas v. Colorado*, 206 U.S. 46 (1907); see also *Snake Creek Mining & Tunnel Co.*, *supra*, at 606. Montana has long integrated at least some types of groundwater with surface rights and, when it adopted a permit system in 1973, specifically applied the permit system on a unitary basis to both surface and groundwater. See Mont. Code Ann. § 85-2-360; First Interim Report, *supra*, at 49-50. Wyoming law was less clear at the time of the Compact, but in 1957, Wyoming explicitly provided for the legal integration of groundwater and

surface water where they are “so interconnected as to constitute in fact one source of supply.” First Interim Report, *supra*, at 50-51, quoting Wyo. Stat. Ann. § 41-3-916.

Finally, the Compact’s definition of “diversion” in Article II(G) provides support for the Compact’s intent to regulate at least some forms of interconnected groundwater. Article V(B) provides that “diversions” of water for “beneficial use on new lands” must come from “unused and unappropriated” waters—i.e., such diversions cannot come from the waters needed to satisfy pre-1950 appropriative rights protected by Article V(A). Article II(G), in turn, defines “diversion” as the “taking or removing of water from the Yellowstone River or any tributary thereof” The pumping of groundwater that is hydrologically interconnected to the surface channel of the Tongue River would appear to quite literally “take” or “remove” water from the Tongue.⁷¹

In its summary judgment motion before trial, Wyoming argued that Montana cannot establish a violation for CBM groundwater production in Wyoming because “both States have implicitly and explicitly determined that the connection between CBM groundwater production and the surface waters

⁷¹ I also suggested that, in ruling on the groundwater question, the Court should, if possible, avoid relying on the definition of Article II(G). As I noted, the “meaning of the term ‘diversion,’ which is used in Articles V(B) and V(C) but not Article V(A), has implications for the application of the Compact that go beyond protecting pre-1950 appropriations.” First Interim Report, *supra*, at 52. The first three arguments for including at least some interconnected groundwater in the protections of Article V(A) are less far reaching and therefore are less likely to have unintentional implications. *Id.*, at 52-53.

is too tenuous to warrant regulation under the doctrine of appropriation.” Wyoming’s Memorandum in Support of Motion for Summary Judgment, July 3, 2013, Docket No. 335, pp. 34-37. Anadarko Petroleum supported Wyoming’s motion on similar grounds. See Memorandum of *Amicus Curiae* Anadarko Petroleum Corporation in Support of Wyoming’s Motion for Summary Judgment, Aug. 2, 2013, Docket No. 351, p. 16. Wyoming and Anadarko raise the same argument in their post-trial briefs. See Wyoming’s Post-Trial Brief, *supra*, at 61-64 (Montana and Wyoming have “determined that the connection between CBM groundwater production and the surface waters is too tenuous to warrant intrastate regulation” and the Court should not “upset these determinations”); Memorandum of *Amicus Curiae* Anadarko Petroleum Corporation in Support of Wyoming’s Post-Trial Brief, April 24, 2014, Docket No. 459, pp. 4-11. Both Wyoming and Anadarko, in short, argue that Montana and Wyoming have decided not to regulate CBM groundwater production because the hydrologic connection with surface water is too tenuous and therefore the Compact does not govern such production either.

This argument suffers from several errors. First, Montana and Wyoming law is informative, but not determinative, of when groundwater production in Wyoming violates Article V(A) of the Compact. In *Kansas v. Nebraska*, 538 U.S. 720 (2003), the Supreme Court approved a settlement that provided for the governance of groundwater under the Republican River Compact even though (1) the compact never mentions the term “groundwater” and (2) none of the states who are parties to that compact regulated groundwater for the protection of surface water at the time the compact was negotiated. Even if neither

Montana nor Wyoming regulated any groundwater pumping, the withdrawal of hydrologically interconnected groundwater could still jeopardize the continued enjoyment of pre-1950 appropriative rights in Montana. The question in this case is ultimately the meaning of the Compact and not the intrastate practices of the parties to the Compact.

Second, the two states' current treatment of CBM production does not suggest that such groundwater production should be exempt from the Compact. Both states protect holders of surface water rights who can demonstrate that CBM groundwater production is interfering with their surface rights. In Wyoming, CBM producers must get an appropriation permit in order to extract groundwater as part of their operation. Any surface-water user who believes that the CBM production will interfere with his or her surface-water right can file a complaint with the State Engineer, who then must investigate the alleged interference and can recommend "various means of stopping, rectifying or ameliorating the interference." Wyo. Stat. Ann. § 41-3-916(b). As Wyoming notes, its State Engineer has never regulated a CBM well for the benefit of a surface water user. 22 Tr. 5145:11-13 (Patrick Tyrrell). Nor has the State Engineer determined that the Tongue River and nearby CBM wells constitute a single source of supply such that they must be regulated together in priority. *Id.* at 5147:19-5148:2 (Tyrrell) (also opining that such a connection "would be quite difficult to show"). At the same time, the State Engineer has never determined that CBM production is inherently exempt from regulation under § 41-3-916(b). The State Engineer has never needed to make a determination one way or the other because no surface appropriator in Wyoming has

raised and pursued the issue. *See* 22 Tr. 5145:5-10 (Patrick Tyrell).

In Montana, CBM producers do not need to get an appropriation permit. Montana does not consider the production of groundwater as part of CBM operations to be a beneficial use of water, and therefore (somewhat oddly) does not require an appropriation permit unless the water is also used for another purpose (such as irrigation). *See* Mont. Code Ann. § 85-2-102(a)(1). As a result, Montana water commissioners are not empowered to regulate CBM wells in priority with decreed water rights. Montana, however, provides surface water users who believe that CBM water production is interfering with their water rights alternative protection under the Montana Coal Bed Methane Protection Act of 2001. Mont. Code Ann. §§ 76-15-901 et seq. Under that act, a surface-water user who can “demonstrate . . . a reduction in the quantity” of water available can seek compensation under a local coal bed methane protection program. *Id.* § 76-15-905(b). The law of neither state, in short, ignores real and injurious interference if and when it can be shown.

Nor is there anything in the abstract about CBM production that would exclude it from coverage under the Yellowstone River Compact. As noted earlier, the language of the Compact is broad and, at least in theory, could readily encompass at least some cases of CBM groundwater production where it reduces surface flows. Whether the Compact covers particular CBM operations is a mixed question of law and fact rather than a purely legal issue.

In summary, although Wyoming contends that “both States have determined that the connection between CBM groundwater production and the

surface waters is too tenuous to warrant intrastate regulation under the doctrine of appropriation,” Wyoming’s Post-Trial Brief, *supra*, at 61, neither state has come to this conclusion, let alone conducted a factual analysis to determine whether it is true. Even if state officials had conducted such a study and made such a factual determination, moreover, this Court is the ultimate arbiter of the connection between CBM groundwater production and surface flows for purposes of determining whether there has been a violation of the Yellowstone River Compact in this case.

b) The Compact’s requirements.

Because CBM groundwater production is not automatically exempt from the Compact, the next question is the appropriate standard for determining when such production violates Article V(A). The language of an interstate compact generally determines the appropriate test under that compact. For example, in *Kansas v. Colorado*, 514 U.S. 673 (1995), Article IV(D) of the 1949 Arkansas River Compact, 63 Stat. 145, provided that the waters of the Arkansas River “shall not be materially depleted in usable quantity or availability.” This language, including its focus on materiality and “usable” quantities, provided the test for determining whether groundwater pumping violated the compact. According to the Court, the question was whether groundwater development in Colorado had “resulted in material depletions of ‘usable’ river flow.” 514 U.S. at 685.

Here, Article V(A) of the Yellowstone River Compact guarantees that pre-1950 appropriative rights “shall continue to be enjoyed.” As in *Kansas v. Colorado*, this language provides the basic test for determining when

Wyoming must regulate CBM groundwater pumping for the benefit of pre-1950 surface appropriators in Montana. CBM groundwater pumping violates the Compact when it interferes with the enjoyment of pre-1950 appropriative rights in Montana. Unlike Article IV(D) of the Arkansas River Compact, the Yellowstone River Compact does not speak of “material” depletion or depletion of “usable” river flows. Instead, Article V(A) of the Yellowstone River Compact focuses strictly on the impact of groundwater pumping on pre-1950 surface appropriators in Montana.

The Compact’s reference to the “appropriation doctrine” adds little to this basic test. Unlike for other issues, there is no uniform approach in appropriation states to the task of determining when to regulate groundwater for the sake of surface users. Some states establish rules and presumptions that are strongly protective of surface rights. Colorado, for example, provides that groundwater is tributary to surface water and governed by the same priority system if the withdrawal of groundwater would “within one hundred years, deplete the flow of a natural stream . . . at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal.” Colo. Rev. Stat. § 37-90-103(10.5). Colorado also presumes that all groundwater is connected, forcing groundwater users who disagree to rebut the presumption. See *Simpson v. Bijou Irrigation Co.*, 69 P.3d 50, 57 n.7 (Colo. 2003) (“Absent a showing to the contrary, Colorado law presumes that (1) ground water is tributary to the stream, and (2) that where surface water is over-appropriated, groundwater depletions through well pumping causes material injury to senior appropriators”).

Other states have adopted materiality tests that leave greater discretion to the state water agency in determining whether to regulate groundwater diversions that may impact surface water rights. In Wyoming, for example, the State Engineer must regulate groundwater and surface water on a unitary basis where “underground waters and the waters of surface streams are so interconnected as to constitute in fact one source of supply.” Wyo. Stat. Ann. § 41-3-916. There is no “written standard” for applying this standard. 22 Tr. 5343:6 (Patrick Tyrrell). In the North Platte Basin, the State Engineer has looked for a “material effect.” *Id.* at 5343:4-5. In part, the question is a policy judgment. *Id.* at 5352:16-25. In Montana, an applicant for a new groundwater permit must establish that existing surface rights will not be “adversely affected.” See Mont. Code Ann. § 85-2-311(b).

States, moreover, often apply different rules to different basins. Special rules and procedures often apply to basins that are over-appropriated. In Montana, for example, applicants for groundwater rights in certain over-appropriated basins must submit a hydrogeologic report and mitigate for surface impacts if their pumping will result in a “net depletion of surface water” and have an “adverse effect” on senior appropriators. *Id.* § 85-2-360. See generally *Bostwick Properties, Inc. v. Montana Dept. of Natural Resources & Conservation*, 296 P.3d 1154 (Mont. 2013).

In summary, the appropriation doctrine does not take a uniform approach to groundwater-surface water conflicts and thus provides little guidance on how to resolve conflicts under Article V(A) of the Compact between pre-1950 surface rights in Montana

and post-1950 groundwater pumping in Wyoming. Instead, the best guidance is the actionable language of the Compact itself. Under Article V(A) of the Compact, Wyoming must ensure that post-1950 groundwater pumping does not interfere with the continued enjoyment of pre-1950 surface rights in Montana. If Montana shows that CBM groundwater pumping in Wyoming has depleted Stateline flows at a time when the water was needed for pre-1950 appropriative rights in Montana, Montana has established a violation of the Compact.

c) Analysis of the evidence and expert testimony.

As this case demonstrates, determining whether groundwater pumping interferes with the continued enjoyment of surface rights is often difficult. When a farmer diverts water from a stream, the impact of the diversion is typically obvious. Factual issues are generally minimal. The connection between groundwater pumping and surface flow, however, is not obvious to the naked eye. Instead, scientific modelling is required, and experts often disagree on the appropriate approach. Although hydrologic models are increasingly sophisticated, uncertainties regarding the connections between groundwater withdrawals and surface-water availability can still be significant. The relationship between groundwater pumping and surface flow, moreover, is often attenuated. The pumping of one acre foot of water from a groundwater aquifer may reduce surface flow by only a fraction of that amount, and the effect might not appear for months or years.

Montana's principal groundwater expert, Mr. Steven Larson, used a MODFLOW groundwater

model developed for a BLM study of CBM groundwater production in the Powder River basin, to estimate the impact of CBM groundwater production on the Tongue River flow at the the Stateline. Ex. M-9, p. 7 (Larson expert report). Based on the model, he estimated that CBM groundwater production depleted the Tongue River flow at the Stateline by 413 acre feet in 2004 and by 666 acre feet in 2006. Ex. M-6, p. 27 tbl. 3 (Book rebuttal expert report).

Wyoming's principal groundwater expert, Dr. Willem Schreüder, argued that Mr. Larson's analysis was faulty and therefore not reliable. Of Dr. Schreüder's criticisms, three of them are particular relevant to a consideration of the evidence. First, Dr. Schreüder criticized Mr. Larson's choice of the BLM model. Mr. Larson chose the BLM model because "a lot of effort went into the development of that model" (including detailed mapping and evaluations) and the BLM was a disinterested party, giving the model "some credibility." 13 Tr. 2768:15-25 (Steven Larson). He also believed that the model had the "appropriate structural features" needed to make reasonable calculations. *Id.* at 2797:12-17 (Larson).

As Dr. Schreüder pointed out, however, the BLM model was developed for a regional analysis of the impact of CBM groundwater production in the overall Powder River basin. Ex. W-15, p. 4 (Schreüder expert report). Indeed, the model covered about 8,000 square miles (13 Tr. 2770:6-8 (Larson)), and the report on the model never even mentions the Tongue River (*see* Ex. W-15, p. 4). *See also* 13 Tr. 2937:15-20 (Schreüder) (effect on Tongue River did not appear to be a concern for BLM modelers). More troubling, the report on the BLM model notes limitations in the data available in

the eastern portion of the basin where the Tongue River is located:

There are a lack of data for observation wells, production, and geology for the Wasatch Formation away from established areas of development in the eastern portion of the basin. The model is limited and potentially skewed by the data that are available. Model results from areas of the basin that lack adequate calibration data should be considered only as a general indicator of potential impacts.

Ex. M-38, p. 4-37 (groundwater modeling report).

The report emphasizes the importance of doing sub-regional or local area models when evaluating impacts at a scale smaller than the region as a whole. *Id.* at 4-36 (“sub-regional or local area model should be used to help evaluate impacts on a smaller scale”). The report includes two examples of these types of sub-regional modeling efforts: a sub-area model for Caballo Creek (*id.* at 8-1 to 8-8) and a sub-area model for the LX Bar (*id.* at 9-1 to 9-13). In Dr. Schreüder’s expert opinion, it was inappropriate to use the BLM model to calculate local effects. 13 Tr. 2926:2-111 (Schreüder). To determine the impact of CBM groundwater pumping on the Tongue River, Dr. Schreüder believed that it was important to develop a local model like those for Caballo Creek and the LX Bar. *Id.* at 2935:2-2937:14.

Second, Dr. Schreüder argued that the model should have taken into account changes in the evapotranspiration rate from reduced groundwater levels. Ex. W-15, pp. 6-9 (Schreüder expert report). As Dr. Schreüder explained, as CBM pumping lowers the groundwater table, this is likely to reduce the presence

of phreatophytes, which are water loving plants that “thrive in areas where the water table is shallow.” *Id.*, p. 7. This in turn is likely to reduce evapotranspiration (“ET”) from the phreatophytes, partially offsetting the loss of groundwater in what is sometimes called “ET salvage.” *Id.* As Montana points out, studies show considerable variation in the amount of ET salvage and suggest that the salvage effect may be smaller than Dr. Schreüder suggested it would be. See Ex. M-10, pp. 12-13 (Larson rebuttal expert report); 13 Tr. 2808:8-11, 2810:12-2811:9, 2872:2-12 (Larson). Vegetation, for example, might adapt to the new groundwater levels. 13 Tr. 2809:2-16 (Larson). None of the studies, however, suggest that there is no effect or that Mr. Larson was free to ignore the possibility in his analysis. As Dr. Schreüder testified, ET salvage is often part of major groundwater models (13 Tr. 2906:18-2913:7) and can be a “very important mechanism . . . to consider” (*id.* at 2961:16-21).

Third, Dr. Schreüder criticized the failure to calibrate the model to baseflows in the Tongue River. As he noted, the model was calibrated to “steady state heads, steady state baseflow on the Powder River, and transient head challenges in response to CBM pumping.” Ex. W-15, p. 9 (Schreüder expert report). Given that the purpose of Mr. Larson’s use of the model was to estimate depletions to the Tongue River, Dr. Schreüder argued that the model should have been calibrated to baseflow on the Tongue River. *Id.* Furthermore, he argued that matches to heads in the Tongue River basin were poor. Looking at four steady state calibration wells in the Tongue River area, he noted that

at the two wells along the Tongue River the Model simulates water levels that are 156.8

and 223.2 feet too high, while on Dutch Creek the Model simulates water levels 18 feet too high. Such large discrepancies between the simulated and observed heads are too large for the Model to be reliable for purposes of predicting stream depletions.

Id. at 10. Although Mr. Larson defended the lack of Tongue River calibration, he conceded that calibration would “help reduce the uncertainty in the model calculations.” 13 Tr. 2806:20-2807:3 (Larson).

The failure to calibrate to baseflows in the Tongue River shows one of the difficulties of modeling the relationship between groundwater pumping and surface flows. Calibration would have been difficult, if not impossible. 13 Tr. 2876:1-7 (Larson). Necessary calibration data for the Tongue River was not available. *Id.* at 2857:6-7, 2876:7-10 (Larson); 14 Tr. 2991:14-18 (Schreüder). Any effect of groundwater pumping on baseflows, moreover, would have been relatively small and thus difficult to measure given the inaccuracy of flow gauges. 13 Tr. 2876:10-15 (Larson); *id.* at 2965:15-2966:7 (Schreüder). According to Mr. Larson, a hydrologist can help make up for the lack of calibration by exercising “judgment about what the physical parameters should be.” 13 Tr. 2857:6-12. Particularly given the regional scale of the model, however, the lack of calibration to local baseflows raises serious questions regarding the reliability of the BLM model in calculating impacts of CBM groundwater pumping on the Tongue River. *See id.* at 2927:24-2928:6 (Schreüder) (“calibration data that we use . . . needs to be refined to those specific predictions that we need to make”).

Mr. Hinckley, another of Wyoming’s experts, also criticized Mr. Larson’s assumptions regarding how

much CBM groundwater production ultimately would return to the groundwater system. Mr. Larson assumed that 25 percent of the produced groundwater would return to the groundwater system and ran the model with this assumption. Ex. M-9, p. 11 (Larson expert report). The 2002 BLM model, however, assumed that “33 percent of the produced water would return to groundwater within the Tongue River watershed.” *Id.* at 10-11. Mr. Larson decided to use a lower number because he had received data from the Wyoming Department of Environmental Quality (WDEQ) indicating that “70 to 80 percent of the produced water in the Tongue River watershed was discharged to what were classified as ‘full containment’ impoundments.” *Id.* at 11; 13 Tr. 2781:17-22 (Larson). The correct level of groundwater recharge is important because return flow can have a faster effect on surface flow than groundwater pumping and also can impact a different area, leading to a net benefit rather than depletion during some time periods. 14 Tr. 2993:21-2994:25 (Schreüder).

According to Mr. Hinckley, Mr. Larson misinterpreted the available data. In the parlance of WDEQ, full-containment impoundments simply mean impoundments “designed to fully contain effluent plus a 50-year flood event without discharge to the surface downstream of the impoundment.” Ex. W-3, p. 29 (Hinckley expert report). Of importance to any calculation of the impact of CBM groundwater production on surface flow, there “are no WDEQ requirements to line CBM-discharge impoundments. Economic considerations suggest pond lining is limited to only those cases where necessary to avoid seepage to the surface (which is precluded by permit).” *Id.*

Several witnesses testified regarding whether the impoundments were or were not lined and whether they were or were not likely to lead to significant infiltration into the groundwater aquifer. One of Wyoming's current hydrographers, David Schroeder, who previously served as a CBM reservoir inspector for the State, testified that in his inspection of between 1,500 and 2,000 CBM impoundments in the Tongue and Powder River basins, he saw only about five percent of them that were lined. 10 Tr. 2267:9-2269:9. Mr. John Wheaton, a senior hydrologist with the Montana Bureau of Mines and Geology, testified that unlined impoundment ponds typically seal after a brief period of infiltration, due to flocculation. *See* 18 Tr. 4125:15-4126:15, 4129:6-4130:17, 4130:14-17, 4154:13-23; Ex. W-236 (information pamphlet from the Montana Bureau of Mines & Geology). An official from Storm Cat Energy, however, testified that his company's goal in using impoundments is to get rid of CBM water through infiltration and evaporation. 19 Tr. 4531:20-4532:15 (John Stier). If an impoundment provides only slow infiltration, Storm Cat Energy tries to switch to other ponds. *Id.* at 4532:16-25 (Stier) ("We need the ones that leak, that don't hold water").

Mr. Hinckley testified that the most appropriate range of recharge is from 43 percent to 60 percent, compared to Mr. Larson's 25 percent estimate. Ex. W-3, p. 30 (Hinckley expert report). According to Dr. Schreüder, more recent BLM models have used higher percentages. 14 Tr. 3000:10-18; *see* Ex. M-37 (2009 AECOM report); Ex. M-39 (2011 impoundment study). Other models also have estimated higher recharge rates. 14 Tr. 3001:2-13 (Schreüder). Higher rate would reduce, and perhaps reverse, the impact on stream flow

Mr. Larson's analysis also lacked a systematic sensitivity analysis. As Mr. Larson testified, he performed some sensitivity analysis "in a sense." 13 Tr. 2868:19-22. In particular, he looked to see how the model changed if he lowered the "storage coefficient." *Id.* at 2868:23-2869:2. He also looked at several estimates of return flow from impoundments. *Id.* at 2869:2-4. However, Mr. Larson did not look at the sensitivity of many of his assumptions, such as the lack of any ET salvage. *See id.* at 2871:6-11. The lack of a sensitivity analysis is particularly troubling given the significant questions raised by Dr. Schreüder. Without a sensitivity analysis, it is difficult to estimate the potential impact of the various assumptions that Mr. Larson makes and how his calculations would change with different assumptions. *See generally* Daniel F. Luecke, Hydrologic Models in the Courtroom Working Paper, 47 Idaho L. Rev. 113, 120 (2010) (explaining the importance of sensitivity analyses).

The criticisms raised by Dr. Schreüder raise significant concerns regarding the reliability of Mr. Larson's analysis in estimating the impact of CBM groundwater pumping on flows in the Tongue River. Similar criticisms have led other courts to reject specific applications of MODFLOW-based models. For example, in *City of Aurora v. Simpson*, 105 P.3d 595 (Colo. 2005), the Colorado Supreme Court upheld the lower court's conclusion that a groundwater model "failed to produce sufficiently reliable results to permit a reasonably accurate determination of the timing, amount, and location of depletions." *Id.* at 613. The lower court had rejected the modeling effort because, among other problems, the experts "failed to conduct a sensitivity analysis on the model, failed to properly calibrate the model, [and] failed to explain anomalous results and residual errors." *Id.* at 612-613.

Despite the problems in Mr. Larson's analysis, the expert testimony at trial established that there is a hydrologic connection between the groundwater being pumped by CBM operations in Wyoming and the flow of water in the Tongue River. While Dr. Schreüder challenged the reliability of Mr. Larson's model and calculations, he nonetheless conceded that it is "probable that CBM operations in Wyoming caused some impact to Tongue River flows during the years in question," although he considered the impact *de minimis* given the disposal of the groundwater in ways that could end up recharging the Tongue River. Ex. W-15, p. 2 (Schreüder expert report). *See also* Wyoming's Post-Trial Brief, *supra*, at 64 ("Both states recognize that this groundwater is connected to the surface to some degree").

Mr. Larson's analysis, however, is not sufficient to prove that Montana was injured by CBM groundwater production in 2004 or 2006, let alone injured by any specific amount. Looking at the evidence as a whole, Wyoming is persuasive that the rate of recharge of CBM groundwater is more likely to be in the range of 43 to 60 percent, as Mr. Fritz opines, than the 25-percent estimate used by Mr. Larson. Given the higher rate of recharge, the questionable appropriateness of using the BLM model to make Tongue River calculations, the lack of calibration, and the absence of a formal sensitivity analysis, I conclude that Montana has failed to prove that it was injured by CBM groundwater production in the years at issue. As Dr. Schreüder testified, the impact of CBM groundwater production on Tongue River flows in 2004 and 2006 could have been negative or positive (given the effect of the groundwater recharge). Ex. W-15, p. 19; 14 Tr. 3039:2-18 (Schreüder).

4. Summary.

Appendix D details the post-1950 diversions in Wyoming in 2004 and 2006. Appendix E discusses the post-1950 storage in 2004. Montana has proven that Wyoming stored or used 2,684 af of water under post-1950 rights in 2004. Of this amount, Montana has proven that Wyoming stored or used 1,464 af after Montana's April 14 notice. In 2006, Montana has proven that Wyoming used 325 af of water, 62 af of which was used after Montana's July 28 call letter.

These are minimum estimates of the post-1950 storage and use that occurred during the notice periods in 2004 and 2006 (although, given the late notice, post-1950 use was almost certainly relatively small in 2006). The absence of records on actual water storage and use in Wyoming, along with the inevitable loss of memory and records with the passage of time, have made it difficult for Montana to prove the actual post-1950 storage and use. Where there is significant uncertainty as to when particular post-1950 storage or use occurred, I have resolved that doubt against Montana, as the party with the burden of proof.

F. Impact at the Stateline

A final question is what impact Wyoming's post-notice diversions and storage had on the flow of water into Montana at the Stateline. As explained by Montana's principal expert, Dale Book, impacts must account for "transit losses" from the point of diversion or storage and the Stateline. Ex. M-5, p. 14 (Book expert report). Any additional water released upstream of the Stateline by Wyoming would have suffered a transit loss from bank storage, seepage, and evaporation. *Id.* In calculating impacts at the Stateline, Mr. Book assumed that transit losses were

10 percent, the percentage that Wyoming officials use when delivering water from storage to downstream ditches in the Goose Creek basin. *Id.* Mr. Book opined that this percentage probably overstates transit loss (thus underestimating impacts). *Id.*; 1 Tr. 183:1-4 (Book). Wyoming's experts did not challenge this figure.

Use of water from the Padlock Ranch reservoirs would have produced a small amount of return flow that would have been available to Montana during the irrigation season. This return flow should be credited to Wyoming in computing the impact of post-1950 storage on Stateline flows. Based on the expert reports, the amount of this return flow was 20 af. I have deducted this amount from the Padlock Ranch storage volume before reducing the net impact by ten percent to reflect transit losses.

I therefore recommend that the Court find that:

- The 1,464 af of water that Montana has proven Wyoming stored or used after April 14, 2004 would have reduced flows at the Stateline by 1,300 af.
- The 62 af of water that Montana has proven Wyoming used after July 28, 2006 would have reduced flows at the Stateline by 56 af.

G. Affirmative Defenses

Montana has shown, for both 2004 and 2006, that it notified Wyoming that it needed additional water for its pre-1950 rights under Article V(A) of the Compact. Montana also has shown that it was unable to fully enjoy its pre-1950 storage and direct-flow rights during the notice periods. Finally, Montana has

shown that Wyoming diverted or stored post-1950 water during the notice periods and that this post-1950 use depleted the amount of water at the Stateline with Montana. Montana therefore has proven the essential elements of its case under Article V(A) of the Compact for both 2004 and 2006: notice, pre-1950 shortages in Montana, post-1950 use or storage in Wyoming, and depletion of water flowing into Montana caused by Wyoming's post-1950 use or storage.

1. Intrastate regulation in Montana.

In my first report in this case, I suggested that, if “Montana can remedy the shortages of pre-1950 appropriators in Montana through purely intrastate means that do not prejudice its other rights under the Compact, an intrastate remedy is the appropriate solution.” First Interim Report, *supra*, at 27. I also concluded that the question of when an intrastate remedy might be adequate could wait for further proceedings. *Id.* at 28. Montana filed an objection to this portion of my report. Rather than addressing the issue, the Supreme Court recommitted the issue to me. *Montana v. Wyoming*, *supra*, 131 S. Ct. at 1771 n.2 (2011); *Montana v. Wyoming*, 562 U.S. ___, 131 S. Ct. 497 (2010). Invoking this principle, Wyoming argues that Montana has failed to prove that its administrative system was adequate to guard against internal post-1950 use. According to Wyoming, Montana must demonstrate that it is “reasonably certain that any water entering Montana as a result of regulation in Wyoming will not end up on lands irrigated under post-1950 rights.” Wyoming’s Post-Trial Brief, *supra*, at 38.

Assuming that Wyoming is not liable if Montana has a viable intrastate remedy, Wyoming has the burden

of proving that such a remedy existed. Article V(A) requires Wyoming to reduce or cease post-1950 water uses when Montana has insufficient water to enjoy its pre-1950 rights. As discussed earlier, Montana has shown that Wyoming continued to store and use post-1950 water when Montana was suffering pre-1950 shortages. Montana should not have to prove that there were no other means to rectify its shortage. If Wyoming believes that Montana had other means, including intrastate regulation of post-1950 users, to remedy its shortage, Wyoming has the burden of proving it. *See, e.g., In re General Adjudication of the Big Horn River System*, 48 P.3d 1040, 1056-57 (Wyo. 2002) (“well established that the burden of proof is on the party asserting the affirmative of any issue”). There is no evidence in the record, however, indicating that Montana could have remedied its shortage through purely intrastate regulation.

Montana, moreover, has shown that it had in place a system, albeit imperfect, to prevent junior appropriators from taking water out of priority in both 2004 and 2006. As noted earlier, water commissioners administered the Tongue River in both years. The commissioners had the responsibility to prevent junior appropriators from taking water to which they were not entitled. 15 Tr. 3316:15-25 (Charles Kepper). The water commissioners, moreover, testified that they used that authority to administer the priority system. *See, e.g., id.* at 3316:2-7 (Kepper). The water commissioners also testified that, where water users were taking water out of priority, they would shut down the junior appropriators. *See, e.g., id.* at 3317:1-14 (Kepper). *See also* 7 Tr. 1506:20-24 (Art Hayes) (commissioners kept track of post-1950 irrigation). Wyoming questions whether the commissioners sufficiently oversaw priorities, and

there is evidence that the commissioners were often sloppy in their work and record-keeping. Absent any evidence that Montana post-1950 appropriators made significant use of Tongue River water during the notice period, however, the testimony of Montana's water commissioners is sufficient to eliminate the possibility of post-1950 Montana use as an issue.

2. Injury to Montana appropriators.

Wyoming also argues that Montana must prove that "post-1950 diversions in Wyoming caused harm to Montana's pre-1950 appropriations." Wyoming's Post-Trial Brief, *supra*, at 67. In Wyoming's view, Montana must prove that any water that Wyoming provided at the Stateline would have made its way to and been available to the individual pre-1950 water users in the Tongue River valley who hold pre-1950 appropriative rights. As Wyoming notes, there was no testimony or evidence showing that additional water at the Stateline would have made its way to specific water users in Montana. As Mr. Book testified at trial, his opinions were "specific to the stateline." 2 Tr. 301:23. His expert report, moreover, did not "include quantification of damages to Montana water users," which would require further analysis. Ex. M-5, p. 1.

Montana has met its overall burden of proof, however, for at least two reasons. First, Wyoming effectively is arguing that providing additional water to the Stateline of Montana would have been "futile," because the water would not have made its way to and benefitted individual pre-1950 water users in Montana. Appropriation law has long recognized a "futile call" defense where water would not have made its way to a downstream junior making a call, although it is hard to find cases in which a court has actually applied it to excuse a junior

appropriator's out-of-priority diversions. See A. Dan Tarlock, *The Legacy of Schodde v. Twin Falls Land & Water Co.: The Evolving Reasonable Appropriation Principle*, 42 *Envtl. L.* 37, 58 n.170 (2012) (describing the futile call doctrine as "semi-mythical"). Under the futile call doctrine, a junior appropriator need not reduce its diversions, even when a downstream senior appropriator is short of water, if the water would not make it downstream to the senior appropriator. See, e.g., *State ex rel. Cary v. Cochran*, 292 N.W. 239, 249 (Neb. 1940); Tarlock, *Law of Water Rights*, *supra*, § 5:33, at 5-61. See also 22 Tr. 5326:14-24 (Patrick Tyrrell) (futile call doctrine applies only where water is totally lost).

The "futile call" doctrine, however, is an affirmative defense. As a result, the burden is on Wyoming to show that providing additional water would have been futile. See, e.g., *A&B Irrigation v. Spackman*, 315 P.3d 828, 835 (Idaho 2013) ("It is Idaho's longstanding rule that proof of 'no injury' by a junior appropriator in a water delivery call must be by clear and convincing evidence"); *Clear Springs Foods, Inc. v. Spackman*, 252 P.3d 71, 98 (Idaho 2011) (junior appropriator has the burden of proving that a call would be futile); *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").

Wyoming argues that the burden-of-proof rules under appropriation law do not apply in this case because this is effectively a contract dispute. See Wyoming's Post-Trial Reply Brief, April 25, 2014, Docket No. 457, pp. 4-5. According to Wyoming, basic contract law requires Montana to prove *all* elements of its injury. *Id.* Under Article V(A) of the Compact,

however, Montana is entitled to continue to enjoy its pre-1950 rights under the “laws governing the acquisition and use of water under the doctrine of appropriation.” Under those laws, Wyoming cannot divert or store water under post-1950 rights when Montana faces pre-1950 shortages unless Wyoming can show that it was futile to do so. Wyoming has not shown that. Under the doctrine of appropriation, Montana does not need to show that any water would have made it to individual farmers or fields. Once Montana is short of pre-1950 water and notifies Wyoming, Wyoming must not deplete the flow at the Stateline through post-1950 diversions or storage.

Wyoming’s argument confuses liability and damages. In arguing that Montana must prove that Wyoming’s actions actually injured pre-1950 water users in Montana, Wyoming cites to state contract cases for the proposition that a “party may not recover damages for breach of contract unless the party proves that the breach of contract proximately caused the damages, or that the damages likely resulted from the breach of contract.” Wyoming’s Post-Trial Reply Brief, *supra*, at 4, quoting *Tin Cup Cnty. Water and/or Sewer Dist. v. Garden City Plumbing & Heating Inc.*, 200 P.3d 60, 68 (Mont. 2008). While Wyoming may be correct that Montana ultimately must prove proximate causation between any damages that it seeks and Wyoming’s violation of the Compact, Montana has proven all of the elements necessary to establish a violation.

Second, even if Montana must show a linkage between depleted flow at the Stateline and injury to water rights in Montana, the evidence presented at trial is sufficient to establish causation between the depleted flow and loss of storage in the Tongue River Reservoir. The Tongue River Reservoir is only 15

miles downstream of the Stateline. See Ex. M-5, p. 1 (Book expert report). Although Wyoming argues that the Court “needs expert testimony” in order to determine causation in this case because “causation is sufficiently beyond the common experience of the trier of fact” (Wyoming’s Post-Trial Brief, *supra*, at 67, citing *Tin Cup Cnty. Water and/or Sewer Dist. v. Garden City Plumbing & Heating, Inc.*, *supra*, 200 P.3d at 68), expert testimony is not needed to find that reductions in flow at the Stateline would have reduced the amount of water available just 15 miles downstream. See also 2 Tr. 256:9-13 (Dale Book) (“additional water, if it had not been used by post 1950 uses in Wyoming, would have accrued to their reservoir to assist but not totally fill the reservoir”). The Court need not decide whether expert testimony is needed to show a causal link between Stateline flow and shortages up to 180 miles downstream, because linkage to Reservoir injury is sufficient. Given that downstream users receive storage water from the Reservoir, however, it is hard to imagine that added flow at the Stateline would not also have led to into added flow for the holders of direct-flow rights

VIII. FUTURE PROCEEDINGS AND MATERIALITY

This Court’s decision in this phase of the case, along with its prior decision in *Montana v. Wyoming*, *supra*, will resolve all issues of liability and address many of the important disagreements between Montana and Wyoming over the meaning of the Compact. The remedies phase of the case, however, may be far less important. Under my analysis, Wyoming’s liability is relatively small. Although Montana suffered shortages in multiple years, Montana has proven that it gave effective notice on specific dates only in 1981,

2004, and 2006. In 1981, there was no injury. In 2004 and 2006, Wyoming is liable for only 1,300 af and 56 af, respectively. Even if Wyoming were liable for *all* post-1950 storage and use in Wyoming in 2004 and 2006, not just storage and use that occurred after Montana's notice, Wyoming would be liable only for approximately 2,400 af in 2004 and 3,000 af in 2006. *See ex. M-6*, p. 27 tbl. 3 (Book rebuttal expert report). As Wyoming notes, "No matter how the Court does the math, there is a remarkably small amount of water at issue for an interstate dispute." Wyoming's Post-Trial Brief, *supra*, at 68. For this reason, Wyoming argues that the quantum of injury is insufficient to justify further proceedings in the case. *Id.* at 68-70.

In an early original jurisdiction case involving Connecticut's effort to enjoin Massachusetts from diverting water from the Connecticut River for use in Boston, this Court announced that it would "not exert its extraordinary power to control the conduct of one State at the suit of another, unless the threatened invasion of rights is of *serious magnitude* and established by clear and convincing evidence." *Connecticut v. Massachusetts*, *supra*, 282 U.S. at 669 (emphasis added). If this case proceeds to a remedy phase, the amount of damages is likely to be small. Although the current phase of the case did not concern the question of damages, one Montana irrigator testified that he was able to buy water from the Northern Cheyenne Tribe for about \$15 an af, plus a pumping charge, when he found himself short of water in the 2000s. *See* 16 Tr. 3661:25-3663:18 (John Hamilton). *See also* 8 Tr. 1666: 15-18 (Jason Whitemon) (Tribe leased water to TRWUA members for \$7-9/af). Damages therefore might be as low as five figures.

As for prospective relief, current Wyoming water officials testified at trial that they are now ready and willing to regulate post-1950 uses whenever Montana issues an appropriate call for more water under Article V(A). *See, e.g.*, 21 Tr. 4938:15-23 (Sue Lowry); 22 Tr. 5270:22-5271:5 (Patrick Tyrrell). While Wyoming has not rushed to help Montana in the past when Montana has needed water, Wyoming state officials have seemed genuine in their willingness to abide by the decisions of this Court. In resolving the liability phase of this case, the Court will have resolved many of the important points of contention between the parties. Particularly given the high standard for injunctive relief set out in *Connecticut v. Massachusetts*, Montana may not be able to justify such relief. *See also Madsen v. Women's Health Ctr.*, 512 U.S. 753, 765 n.3 (1994) (must show a "cognizable danger of recurrent violation"); *Weinberger v. Romero-Barcelo*, 456 U.S. 305, 311 (1982) (injunction is "not a remedy which issues as of course").

At the same time, Montana has proven that Wyoming violated Article V(A) of the Compact and thereby injured Montana. Montana now seeks a remedy for that injury. As Montana notes, the "judicial system is animated by the fundamental principle that for every wrong there should be a remedy." Montana's Post-Trial Brief, *supra*, at 175, citing *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"). While the quantum of injury might look small by comparison to cases such as *Arizona v. California*, *supra*, which involved the appropriate division of the 7.5 million af of water allocated to the lower basin states of the Colorado River by the Colorado River Compact of

1922, 70 Cong. Rec. 324 (1928), Montana has repeatedly asserted the importance of the amounts involved in this case to the water-poor region involved. See 1 Tr. 12:8-13:10 (opening argument of Montana Attorney General Tim Fox). Montana ranchers, moreover, testified that they suffered material injury as result of the shortages they faced. See 7 Tr. 1483:11-1484:16 (Art Hayes); 16 Tr. 3653:25-3654:25 (John Hamilton); 17 Tr. 3864:14-3866:17 (Roger Muggli).

This case, is also not unique in the annals of interstate water disputes for the quantum of water at issue. In *Colorado v. New Mexico*, 459 U.S. 176 (1982), a Colorado corporation obtained a conditional right to divert 75 cfs of water from the headwaters of the Vermejo River, leading to an interstate dispute between New Mexico (which argued that the river was fully appropriated) and Colorado. Following discovery and a trial on the merits, the Special Master recommended that Colorado be permitted a diversion of 4,000 af per year. *Id.* at 177. New Mexico objected, and this Court not only heard the objection, but remanded the case to the Special Master for specific factual findings, and then heard the case a second time.

I therefore recommend that, if the Court agrees with the above recommendations and finds that Montana has been injured, the Court remand for the determination of damages and other appropriate relief. Given the narrowed focus of the case, proceedings can and should be short.

IX. RECOMMENDATIONS

For the reasons discussed above, I recommend that:

1. The Court should grant Wyoming summary judgment for the years 1982, 1985, 1992, 1994, and 1998.

2. The Court should find that Wyoming is also not liable to Montana for the years 1981, 1987, 1988, 1989, 2000, 2001, 2002, and 2003.

3. The Court should find that Wyoming is liable to Montana in the amount of 1,300 af for 2004. This represents the impact of Wyoming's post-1950 uses and storage during the 2004 notice period on the flow of the Tongue River at the Stateline.

4. The Court should find that Wyoming is liable to Montana in the amount of 56 af for 2006. This represents the impact of Wyoming's post-1950 uses during the 2006 notice period on the flow of the Tongue River at the Stateline.

5. The Court should remand the case to determine damages and other appropriate relief.

Appendix A sets out a proposed order to this effect.

APPENDIX

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APPENDIX A

Proposed Order & Judgment

No. 137 Original

October Term, 2014

STATE OF MONTANA

v.

STATE OF WYOMING

and

STATE OF NORTH DAKOTA

ORDER AND JUDGMENT

The Court having exercised original jurisdiction over this controversy among sovereign States; the issues having been tried before the Special Master appointed by this Court; having considered the briefs and heard oral argument on the parties' exceptions to the Second Interim Report of the Special Master; and having issued an opinion on all issues; IT IS HEREBY ORDERED AND ADJUDGED AS FOLLOWS:

1. Wyoming' Motion for Partial Summary Judgment on the notice requirement for damages is granted for the years 1982, 1985, 1992, 1994, and 1998.

2. Wyoming also is not liable to Montana for the years 1981, 1987, 1988, 1989, 2000, 2001, 2002, and 2003.

3. Wyoming is liable to Montana for reducing the volume of water available in the Tongue River at the Stateline between Wyoming and Montana by 1,300 af in 2004.

4. Wyoming is liable to Montana for reducing the volume of water available in the Tongue River at the Stateline between Wyoming and Montana by 56 af in 2006.

5. The case is remanded to the Special Master for determination of damages and other appropriate relief.

APPENDIX B**Yellowstone River Compact**

Pub. L. No. 82-231, 65 Stat. 663 (1951)

The State of Montana, the State of North Dakota, and the State of Wyoming, being moved by consideration of interstate comity, and desiring to remove all causes of present and future controversy between said States and between persons in one and persons in another with respect to the waters of the Yellowstone River and its tributaries, other than waters within or waters which contribute to the flow of streams within the Yellowstone National Park, and desiring to provide for an equitable division and apportionment of such waters, and to encourage the beneficial development and use thereof, acknowledging that in future projects or programs for the regulation, control and use of water in the Yellowstone River Basin the great importance of water for irrigation in the signatory States shall be recognized, have resolved to conclude a Compact as authorized under the Act of Congress of the United States of America, approved June 2, 1949 (Public Law 83, 81st Congress, First Session), for the attainment of these purposes, and to that end, through their respective governments, have named as their respective Commissioners:

For the State of Montana:

Fred E. Buck	P. F. Leonard
A. W. Bradshaw	Walter M. McLaughlin
H. W. Bunston	Dave M. Manning
John Herzog	Joseph Muggli
John M. Jarussi	Chester E. Onstad
Ashton Jones	Ed F. Parriott

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Chris. Josephson	R. R. Renne
A. Wallace Kingsbury	Keith W. Trout

For the State of North Dakota:

I. A. Acker	Einar H. Dahl
J. J. Walsh	

For the State of Wyoming:

L. C. Bishop	N. V. Kurtz
Earl T. Rower	Harry L. Littlefield
J. Harold Cash	R. E. McNally
Ben F. Cochrane	Will G. Metz
Ernest J. Goppert	Mark N. Partridge
Richard L. Greene	Alonzo R. Shreve
E. C. Gwillim	Charles M. Smith
E. J. Johnson	Leonard F. Thornton
Lee E. Keith	M. B. Walker

who, after negotiations participated in by R. J. Newell, appointed as the representative of the United States of America, have agreed upon the following articles, to-wit:

ARTICLE I

A. Where the name of a State is used in this Compact, as a party thereto, it shall be construed to include the individuals, corporations, partnerships, associations, districts, administrative departments, bureaus, political subdivisions, agencies, persons, permittees, appropriators and all others using, claiming, or in any manner asserting any right to the

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use of the waters of the Yellowstone River System under the authority of said State.

B. 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. Where the singular is used in this article, it shall be construed to include the plural.

ARTICLE II

A. The State of Montana, the State of North Dakota, and the State of Wyoming are hereinafter designated as "Montana," "North Dakota," and "Wyoming," respectively.

B. The terms "Commission" and "Yellowstone River Compact Commission" mean the agency created as provided herein for the administration of this Compact.

C. The term "Yellowstone River Basin" means areas in Wyoming, Montana, and North Dakota drained by the Yellowstone River and its tributaries, and includes the area in Montana known as Lake Basin, but excludes those lands lying within Yellowstone National Park.

D. The term "Yellowstone River System" means the Yellowstone River and all of its tributaries, including springs and swamps, from their sources to the mouth of the Yellowstone River near Buford, North Dakota, except those portions thereof which are within or contribute to the flow of streams within the Yellowstone National Park.

E. The term "Tributary" means any stream which in a natural state contributes to the flow of the Yellowstone River, including interstate tributaries and tributaries thereof, but excluding those which are within or contribute to the flow of streams within the Yellowstone National Park.

F. The term "Interstate Tributaries" means the Clarks Fork, Yellowstone River; the Bighorn River (except the Little Bighorn River); the Tongue River; and the Powder River, whose confluences with the Yellowstone River are respectively at or near the city (or town) of Laurel, Big Horn, Miles City, and Terry, all in the State of Montana.

G. The terms "Divert" and "Diversion" mean the taking or removing of water from the Yellowstone River or any tributary thereof when the water so taken or removed is not returned directly into the channel of the Yellowstone River or of the tributary from which it is taken.

H. The term "Beneficial Use" is herein defined to be that use by which the water supply of a drainage basin is depleted when usefully employed by the activities of man.

I. The term "Domestic Use" shall mean the use of water by an individual, or by a family unit or household for drinking, cooking, laundering, sanitation and other personal comforts and necessities; and for the irrigation of a family garden or orchard not exceeding one-half acre in area.

J. The term "Stock Water Use" shall mean the use of water for livestock and poultry.

ARTICLE III

A. It is considered that no Commission or administrative body is necessary to administer this Compact or divide the waters of the Yellowstone River Basin as between the States of Montana and North Dakota. The provisions of this Compact, as between the States of Wyoming and Montana, shall be administered by a Commission composed of one representative from the State of Wyoming and one representative from the State of Montana, to be selected by the Governors of said States as such States may choose, and one representative selected by the Director of the United States Geological Survey or whatever Federal agency may succeed to the functions and duties of that agency, to be appointed by him at the request of the States to sit with the Commission and who shall, when present, act as Chairman of the Commission without vote, except as herein provided.

B. The salaries and necessary expenses of each State representative shall be paid by the respective State; all other expenses incident to the administration of this Compact not borne by the United States shall be allocated to and borne one-half by the State of Wyoming and one-half by the State of Montana.

C. In addition to other powers and duties herein conferred-upon the Commission and the members thereof, the jurisdiction of the Commission shall include the collection, correlation, and presentation of factual data, the maintenance of records having a bearing upon the administration of this Compact, and recommendations to such States upon matters connected with the administration of this Compact, and the Commission may employ such services and make such expenditures as reasonable and necessary within the limit of funds provided for that purpose by

the respective States, and shall compile a report for each year ending September 30 and transmit it to the Governors of the signatory States on or before December 31 of each year.

D. The Secretary of the Army; the Secretary of the Interior; the Secretary of Agriculture; the Chairman, Federal Power Commission; the Secretary of Commerce, or comparable officers of whatever Federal agencies may succeed to the functions and duties of these agencies, and such other Federal officers and officers of appropriate agencies, of the signatory States having services or data useful or necessary to the Compact Commission, shall cooperate, ex-officio, with the Commission in the execution of its duty in the collection, correlation, and publication of records and data necessary for the proper administration of the Compact; and these officers may perform such other services related to the Compact as may be mutually agreed upon with the Commission.

E. The Commission shall have power to formulate rules and regulations and to perform any act which they may find necessary to carry out the provisions of this Compact, and to amend such rules and regulations. All such rules and regulations shall be filed in the office of the State Engineer of each of the signatory States for public inspection.

F. In case of the failure of the representatives of Wyoming and Montana to unanimously agree on any matter necessary to the proper administration of this Compact, then the member selected by the Director of the United States Geological Survey shall have the right to vote upon the matters in disagreement and such points of disagreement shall then be decided by a majority vote of the representatives of the States of Wyoming and Montana and said member selected by

the Director of the United States Geological Survey, each being entitled to one vote.

G. The Commission herein authorized shall have power to sue and be sued in its official capacity in any Federal Court of the signatory States, and may adopt and use an official seal which shall be judicially noticed.

ARTICLE IV

The Commission shall itself, or in conjunction with other responsible agencies, cause to be established, maintained, and operated such suitable water gaging and evaporation stations as it finds necessary in connection with its duties.

ARTICLE V

A. Appropriative rights to the beneficial uses of the water of the Yellowstone River System existing in each signatory State as of January 1, 1950, shall continue to be enjoyed in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation.

B. Of the unused and unappropriated waters of the Interstate tributaries of the Yellowstone River as of January 1, 1950, there is allocated to each signatory State such quantity of that water as shall be necessary to provide supplemental water supplies for the rights described in paragraph A of this Article V, such supplemental rights to be acquired and enjoyed in accordance with the laws governing the acquisition and use of water under the doctrine of appropriation, and 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 as follows:

1. Clarks Fork, Yellowstone River
 - a. To Wyoming.....60%
To Montana40%
 - b. The point of measurement shall be below the last diversion from Clarks Fork above Rock Creek.
2. Bighorn River (Exclusive of Little Bighorn River)
 - a. To Wyoming.....80%
To Montana20%
 - b. The point of measurement shall be below the last diversion from the Bighorn River above its junction with the Yellowstone River, and the inflow of the Little Bighorn River shall be excluded from the quantity of water subject to allocation.
3. Tongue River
 - a. To Wyoming.....40%
To Montana60%
 - b. The point of measurement shall be below the last diversion from the Tongue River above its junction with the Yellowstone River.
4. Powder River (Including the Little Powder River)
 - a. To Wyoming.....42%
To Montana58%
 - b. The point of measurement shall be below the last diversion from the Powder River above its junction with the Yellowstone River.

C. The quantity of water subject to the percentage allocations, in Paragraph B 1, 2, 3, and 4 of this Article V, shall be determined on an annual water year basis measured from October 1st of any year through September 30th of the succeeding year. The quantity to which the percentage factors shall be applied through a given date in any water year shall be, in acre-feet, equal to the algebraic sum of:

1. The total diversions, in acre-feet, above the point of measurement, for irrigation, municipal, and industrial uses in Wyoming and Montana developed after January 1, 1950, during the period from October 1st to that given date;
2. The net change in storage, in acre-feet, in all reservoirs in Wyoming and Montana above the point of measurement completed subsequent to January 1, 1950, during the period from October 1st to that given date;
3. The net change in storage, in acre-feet, in existing reservoirs in Wyoming and Montana above the point of measurement, which is used for irrigation, municipal, and industrial purposes developed after January 1, 1950, during the period October 1st to that given date;
4. The quantity of water, in acre-feet, that passed the point of measurement in the stream during the period from October 1st to that given date.

D. All existing rights to the beneficial use of waters of the Yellowstone River in the States of Montana and North Dakota, below Intake, Montana, valid under the laws of these States as of January 1, 1950, are hereby recognized and shall be and remain unimpaired by this Compact. During the period May 1 to September 30, inclusive, of each year, lands within Montana and

North Dakota shall be entitled to the beneficial use of the flow of waters of the Yellowstone River below Intake, Montana, on a proportionate basis of acreage irrigated. Waters of tributary streams, having their origin in either Montana or North Dakota, situated entirely in said respective States and flowing into the Yellowstone River below Intake, Montana, are allotted to the respective States in which situated.

E. There are hereby excluded from the provisions of this Compact:

1. Existing and future domestic and stock water uses of water: Provided, That the capacity of any reservoir for stock water so excluded shall not exceed 20 acre-feet;
2. Devices and facilities for the control and regulation of surface waters.

F. From time to time the Commission shall re-examine the allocations herein made and upon unanimous agreement may recommend modifications therein as are fair, just, and equitable, giving consideration among other factors to:

Priorities of water rights;

Acreage irrigated;

Acreage irrigable under existing works; and

Potentially irrigable lands.

ARTICLE VI

Nothing 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.

ARTICLE VII

A. A lower signatory State shall have the right, by compliance with the laws of an upper signatory State, except as to legislative-consent, to file application for and receive permits to appropriate and use any waters in the Yellowstone River System not specifically apportioned to or appropriated by such upper State as provided in Article V; and to construct or participate in the construction and use of any dam, storage reservoir, or diversion works in such upper State for the purpose of conserving and regulating water that may be apportioned to or appropriated by the lower State: *Provided*, That such right is subject to the rights of the upper State to control, regulate, and use the water apportioned to and appropriated by it: *And, provided further*, That should an upper State elect, it may share in the use of any such facilities constructed by a lower State to the extent of its reasonable needs upon assuming or guaranteeing payment of its proportionate share of the cost of the construction, operation, and maintenance. This provision shall apply with equal force and effect to an upper State in the circumstance of the necessity of the acquisition of rights by an upper State in a lower State.

B. Each claim hereafter initiated for an appropriation of water in one signatory State for use in another signatory State shall be filed in the Office of the State Engineer of the signatory State in which the water is to be diverted, and a duplicate copy of the application or notice shall be filed in the office of the State Engineer of the signatory State in which the water is to be used.

C. Appropriations may hereafter be adjudicated in the State in which the water is diverted, and where a portion or all of the lands irrigated are in another

signatory State, such adjudications shall be confirmed in that State by the proper authority. Each adjudication is to conform with the laws of the State where the water is diverted and shall be recorded in the County and State where the water is used.

D. The use of water allocated under Article V of this Compact for projects constructed after the date of this Compact by the United States of America or any of its agencies or instrumentalities, shall be charged as a use by the State in which the use is made: *Provided*, That such use incident to the diversion, impounding, or conveyance of water in one State for use in another shall be charged to such latter State.

ARTICLE VIII

A lower signatory State shall have the right to acquire in an upper State by purchase, or through exercise of the power of eminent domain, such lands, easements, and rights-of-way for the construction, operation, and maintenance of pumping plants, storage reservoirs, canals, conduits, and appurtenant works as may be required for the enjoyment of the privileges granted herein to such lower State. This provision shall apply with equal force and effect to an upper State in the circumstance of the necessity of the acquisition of rights by an upper State in a lower State.

ARTICLE IX

Should any facilities be constructed by a lower signatory State in an upper signatory State under the provisions of Article VII, the construction, operation, repairs, and replacements of such facilities shall be subject to the laws of the upper State. This provision shall apply with equal force and effect to an upper State in the circumstance of the necessity of the

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acquisition of rights by an upper State in a lower State.

ARTICLE X

No water shall be diverted from the Yellowstone River Basin without the unanimous consent of all the signatory States. In the event water from another river basin shall be imported into the Yellowstone River Basin or transferred from one tributary basin to another by the United States of America, Montana, North Dakota, or Wyoming, or any of them jointly, the State having the right to the use of such water shall be given proper credit therefore in determining its share of the water apportioned in accordance with Article V herein.

ARTICLE XI

The provisions of this Compact shall remain in full force and effect until amended in the same manner as it is required to be ratified to become operative as provided in Article XV.

ARTICLE XII

This Compact may be terminated at any time by unanimous consent of the signatory States, and upon such termination all rights then established hereunder shall continue unimpaired.

ARTICLE XIII

Nothing in this Compact shall be construed to limit or prevent any State from instituting or maintaining any action or proceeding, legal or equitable, in any Federal Court or the United States Supreme Court, for the protection of any right under this Compact or the enforcement of any of its provisions.

ARTICLE XIV

The physical and other conditions characteristic of the Yellowstone River and peculiar to the territory drained and served thereby and to the development thereof, have actuated the signatory States in the consummation of this Compact, and none of them, nor the United States of America by its consent and approval, concedes thereby the establishment of any general principle or precedent with respect to other interstate streams.

ARTICLE XV

This Compact shall become operative when approved by the Legislature of each of the signatory States and consented to and approved by the Congress of the United States.

ARTICLE XVI

Nothing in this Compact shall be deemed:

(a) To impair or affect the sovereignty or jurisdiction of the United States of America in or over the area of waters affected by such compact, any rights or powers of the United States of America, its agencies, or instrumentalities, in and to the use of the waters of the Yellowstone River Basin nor its capacity to acquire rights in and to the use of said waters;

(b) To subject any property of the United States of America, its agencies, or instrumentalities to taxation by any State or subdivision thereof, nor to create an obligation on the part of the United States of America, its agencies, or instrumentalities, by reason of the acquisition, construction, or operation of any property or works of whatsoever kind, to make any payments to any State or political subdivision thereof, State

agency, municipality, or entity whatsoever in reimbursement for the loss of taxes;

(c) To subject any property of the United States of America, its agencies, or instrumentalities, to the laws of any State to an extent other than the extent to which these laws would apply without regard to the Compact.

ARTICLE XVII

Should a Court of competent jurisdiction hold any part of this Compact to be contrary to the constitution of any signatory State or of the United States of America, all other severable provisions of this Compact shall continue in full force and effect.

ARTICLE XVIII

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.

IN WITNESS WHEREOF, the Commissioners have signed this Compact in quadruplicate original, one of which shall be filed in the archives of the Department of State of the United States of America and shall be deemed the authoritative original, and of which a duly certified copy shall be forwarded to the Governor of each signatory State.

Done at the City of Billings in the State of Montana, this 8th day of December, in the year of our Lord, One Thousand Nine Hundred and Fifty.

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Commissioners for the State of Montana:

FRED E. BUCK	P. F. LEONARD
A. W. BRADSHAW	WALTER M. McLAUGHLIN
H. W. BUNSTON	DAVE M. MANNING
JOHN HERZOG	JOSEPH MUGGLI
JOHN M. JARUSSI	CHESTER E. ONSTAD
ASHTON JONES	ED F. PARRIOTT
CHRIS JOSEPHSON	R. R. RENNE
KEITH W. TROUT	A. WALLACE KINGSBURY

Commissioners for the State of North Dakota:

I. A. ACKER	J. J. WALSH
EINAR H. DAHL	

Commissioners for the State of Wyoming:

L. C. BISHOP	N. V. KURTZ
EARL T. BOWER	HARRY L. LITTLEFIELD
J. HAROLD CASH	R. E. McNALLY
BEN F. COCHRANE	WILL G. METZ
ERNEST J. GOPPERT	MARK N. PARTRIDGE
RICHARD L. GREENE	ALONZO R. SHREVE
E. C. GWILLIM	CHARLES M. SMITH
E. J. JOHNSON	LEONARD F. THORNTON
LEE E. KEITH	M.B. WALKER

I have participated in the negotiation of this Compact and intend to report favorably thereon to the Congress of the United States.

R. J. NEWELL

Representative of the United States of America

APPENDIX C

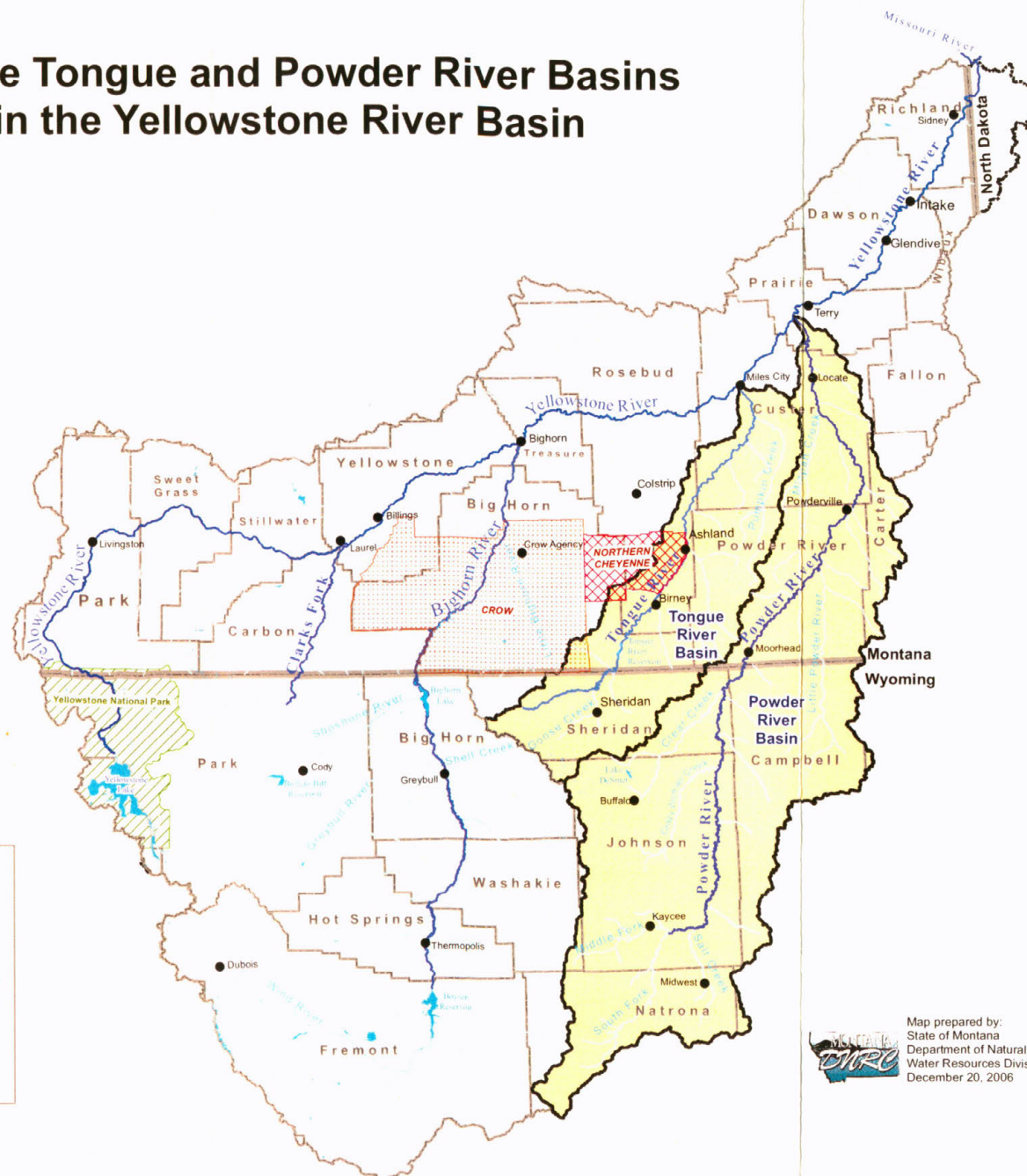
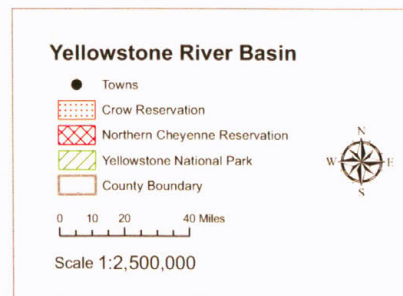
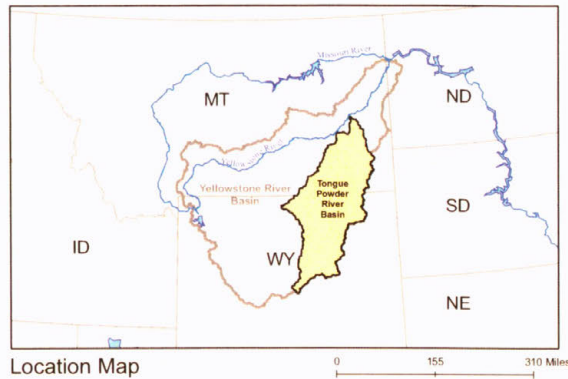
Maps of the Tongue River Watershed

Map C1 is a map of the entire Yellowstone River Basin, including the Tongue River Basin. The map is Exhibit M-1.

Map C2 is a map of the Tongue River Basin in Montana. The map is Figure 1 from Ex. M-5 (Book expert report).

Map C3 is a map of the Tongue River Basin in Wyoming. The map is Figure 2 from Ex. M-5 (Book expert report).

Map of the Tongue and Powder River Basins within the Yellowstone River Basin



Map prepared by:
State of Montana
Department of Natural Resources and Conservation
Water Resources Division
December 20, 2006



Figure 1
Vicinity Map, Tongue River Basin, Montana

Sources:
National Hydrography Dataset
(NHD) GIS data.
MT GIS data <<http://nris.mt.gov/gis/>>.

- Stream Gage
- Town
- Reachages
- TY Canal
- Streams
- County Line
- Tongue Reservoir
- Tongue River Basin



1/2/2013



Index Map

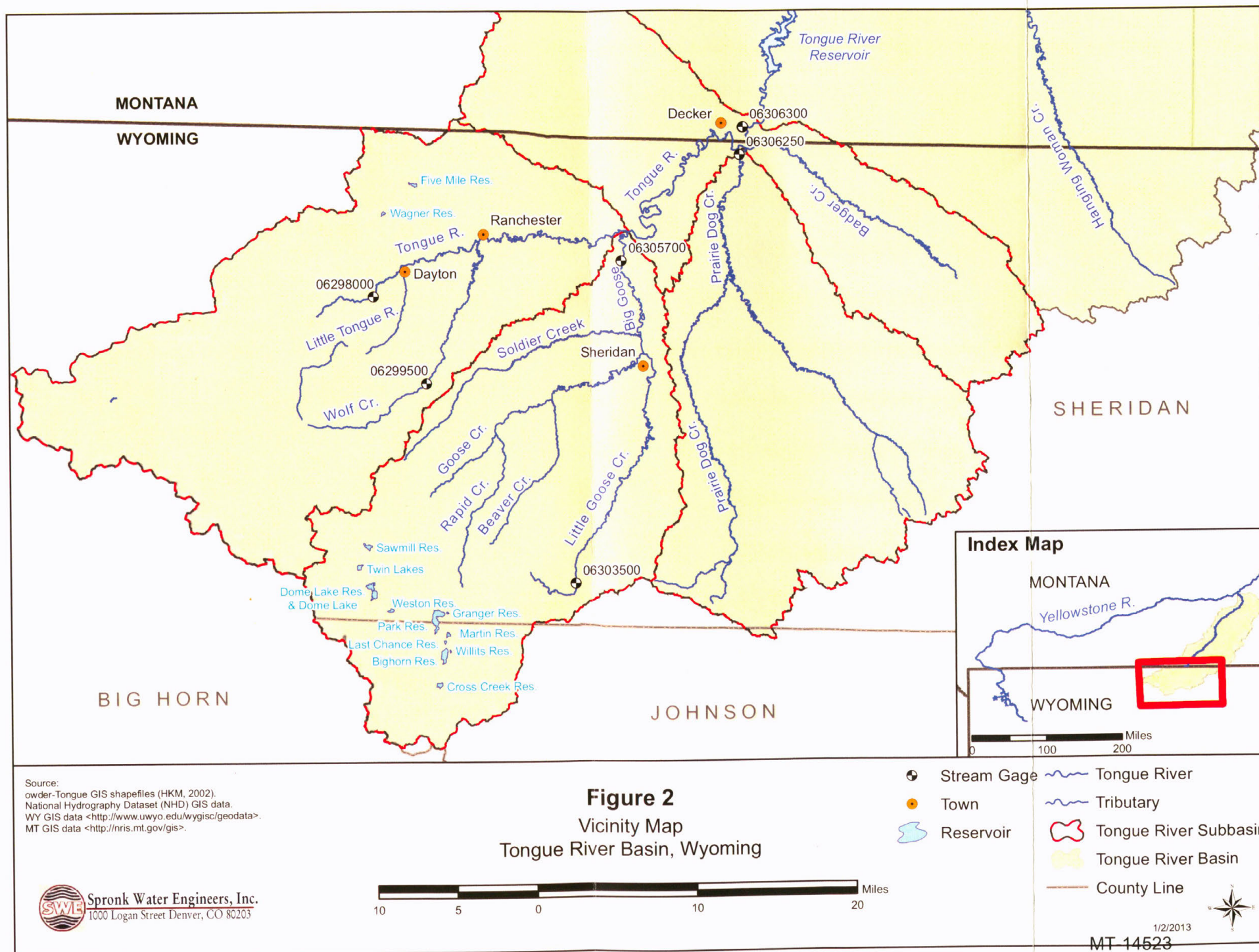
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Yellowstone R.

WYOMING
MT-14522





APPENDIX D

Post-1950 Water Consumption in Wyoming

This Appendix provides a detailed analysis of disagreements between Montana's expert witness, Dale Book, and Wyoming's expert, Gary Fritz, regarding acreage that Montana claims was irrigated in Wyoming under post-1950 permits in 2004 and 2006. The permits are listed alphabetically by the name of the original applicant for the permit, with the permit numbers listed in parentheses. Table D-1 at the end of this Appendix lists my findings regarding the acreage irrigated with post-1950 rights, including lands regarding which the experts do not disagree, and the associated af of use in 2004 and 2006.

Addleman (Permit 30385). Mr. Book and Mr. Fritz disagreed on the exact amount of acreage likely irrigated during 2004 and 2006 under the Addleman permit. The property has a post-1950 right to irrigate 17 acres of land. While Mr. Book believed that all acres had been irrigation, Mr. Fritz concluded that only four acres had been irrigated. *Compare* Ex. M-6, p. 7 (Book rebuttal expert report) *with* Ex. W-2, pp. 78-79 (Fritz expert report). Mr. Fritz believed that the photos showed only limited irrigation of the property, which he confirmed through conversations with the current owner, David Fisher. Mr. Fisher testified at trial and confirmed that, due to work responsibilities and health problems, only a small portion of his property was irrigated during 2004 and 2006. 20 Tr. 4689:9-11, 4701:18-4703:2. Based on the photographs and maps in the expert reports and the testimony of Mr. Fisher and the experts, I conclude that only four acres were irrigated in 2004 and 2006.

Barbula (Permit 5798). 56 acres of the Barbula property have a post-1950 water right on the Interstate Ditch. A portion of the Barbula property, however, also holds early "Territorial" water rights dating to 1884 and 1886 from Youngs Creek. Mr. Book and Mr. Fritz disagreed on whether this land was irrigated during the two years in question from the post-1950 water right or the early Territorial right. *Compare* Ex. M-6, p. 6 (Book rebuttal expert report) *with* Ex. W-2, pp. 73-74 (Fritz expert report). According to Mr. Book, "there are no records of supply being available to [the lands at issue] from the Youngs Creek rights." Ex. M-6, p. 6. Moreover, during the years at issue, it is questionable whether there was sufficient streamflow available in small tributaries such as Youngs Creek to irrigate the acres at issue. *Id.* Neither Mr. Book nor Mr. Fritz reported talking to anyone associated with the farming of the property in 2004 or 2006. Based on the expert reports, I conclude that 36 acres of land were irrigated with post-1950 Tongue River water in 2004 and 2006.¹

DeLapp (Permit 6226). The DeLapp property also holds a post-1950 water right on the Interstate Ditch. Photographs show a center-pivot irrigation system on the portion of the property holding a post-1950 water right. Based on this and the METRIC information, Mr. Book originally estimated that 35 acres of land were irrigated with this right in 2004 and 2006; he later revised the estimated irrigated acreage to 42 acres. Ex. M-6, pp. 6-7 (Book rebuttal expert report). Mr. Fritz, however, concluded that the land was irrigated in 2004 and 2006 with CBM water, based on

¹ Mr. Book originally estimated that 38 acres were irrigated, but decreased this number in his rebuttal expert report. Ex. M-6, p. 6.

conversations with the current landowner, Ms. Tana Ankney. Ex. W-2, p. 75 (Fritz expert report). Mr. Book did not disagree with Mr. Fritz. In his rebuttal report, however, Mr. Book did not remove this permit from his calculations because he concluded that he did not have enough information to determine whether the water supply came from CBM production as Mr. Fritz claimed. Ex. M-6, p. 6. Ms. Ankney testified at trial that the center pivot used CBM water in both 2004 and 2006. 20 Tr. 4655:17-4656:7, 4676:10-16. Based on the expert testimony and exhibits and on Ms. Ankney's testimony, I conclude that none of the DeLapp property was irrigated with post-1950 water rights in either 2004 or 2006.

Koltiska (Permits 23152-23157). Approximately 221 acres of the Koltiska property hold post-1950 water rights. Both Mr. Book and Mr. Fritz agreed that aerial photos and the METRIC analysis indicate that about 12 acres of this area were irrigated in 2006, while no acres were irrigated in 2004. Ex. W-2, p. 84 (Fritz expert report). Mr. Book and Mr. Fritz, however, disagreed on whether CBM-produced water, rather than post-1950 rights, was used to irrigate this acreage in 2006. Mr. Fritz relied on information from the current property owner, Gary Koltiska, who said that he used CBM water on this acreage. *Id.* Mr. Fritz also noted that the post-1950 rights were to a small tributary, known as Cat Creek, that is "an intermittent, possibly ephemeral, stream and by itself is an unreliable source of irrigation water." *Id.* Mr. Book decided nonetheless that the acres were irrigated with the post-1950 rights because a map included with Mr. Fritz's report and purporting to show where CBM water was used for irrigation (*see id.* at 72, fig. 4-1) appeared, in Mr. Book's view, to show that CBM water was not used on the property. Ex. M-6, pp. 8-9 (Book

rebuttal expert report). At trial, Thomas Koltiska, who is a cousin of Gary Koltiska, testified that the portion of Cat Creek south of Gary Koltiska's property is typically dry during the irrigation season. 11 Tr. 2502:8-2503:2. Based on the expert reports and the testimony of Thomas Koltiska, I conclude that Montana has not proven that the Koltiska property used post-1950 water in 2004 and 2006.

Koltiska/KN Pump (Permit 23805). A post-1950 water right in Cat Creek also covers 103 acres of the property of another Koltiska family member, Daniel Koltiska. Both Mr. Book and Mr. Fritz agreed that the property appeared to be irrigated in both 2004 and 2006, although they differed slightly regarding the total acreage irrigated. Mr. Book and Mr. Fritz, however, again differed as to the source of water used on this property. While Mr. Book believed that this acreage used post-1950 water in 2004 and 2006, Mr. Fritz decided that the property was irrigated with water from the Kearney Lake Reservoir. *Compare* Ex. M-6, p. 9 (Book rebuttal expert report) *with* Ex. W-2, p. 85 (Fritz expert report). Mr. Fritz based his conclusion on two facts: (1) Mr. Koltiska owned and used water from Kearney Lake in both years, and (2) Cat Creek, as noted, is normally dry during the irrigation season. Ex. W-2, p. 85. I conclude, based on the expert reports, that Montana has not proven that this acreage used post-1950 water in either 2004 or 2006 in violation of the Compact.

McTiernan (Permit 7267). This property has a post-1950 right for 12 acres in the Owens Ditch No. 1, which diverts from Smith Creek. The photographs and METRIC mapping assembled by Mr. Book indicates that there was limited irrigation on this property during 2004 and 2006. As Mr. Fritz noted,

however, "Smith Creek is one of the most heavily regulated streams" in the area and went into regulation on April 14 in 2004 and May 16 in 2006. Ex. W-2, p. 79 (Fritz expert report). Because the local hydrographer is in the area frequently, Mr. Fritz concluded that, if the permit had been used while the creek was in regulation, the hydrographer would have "readily note[d] if the ditch was diverting out of priority." *Id.* Even Mr. Book conceded that "the duration of the water supply in these years would have been short." Ex. M-6, p. 7 (Book rebuttal expert report). Based on both expert reports, I conclude that Montana has not proven that post-1950 water would have been used on the property to any measurable extent after the dates of the notices in 2004 or 2006.

McTiernan (Permit 32200). A separate permit on the McTiernan property has a post-1950 right for 12.9 acres. Ex. W-2, p. 80 (Fritz expert report). Mr. Book therefore counted the acreage as post-1950 use. The local hydrographer, however, reported to Mr. Fritz that the owner was "required to replace the water used on this permit [when post-1950 rights were in regulation] by releasing [an equivalent amount] of water from the Bear Claw Love No. 1 Reservoir." *Id.* Mr. Book did not disagree with this report. Because Bear Claw Love No. 1 holds a post-1950 right, however, Mr. Book concluded that "the irrigation would be effectively supplied from . . . post-1950 storage to the extent releases were actually made." M-6, pp. 8-9 (Book rebuttal expert report). Mr. Book therefore retained the acreage in his calculations. *Id.*, p. 9. As Mr. Book notes in his original report, there is no evidence as to when Bear Claw Love No. 1 Reservoir stored its water. M-5, pp. 15-16. Therefore this portion of the McTiernan property might have been irrigated, indirectly, from post-1950 water that

was stored when legal under the Compact. I therefore conclude that Montana has not proven that this portion of the McTiernan property was irrigated in violation of the Compact.

Pilch (Permits 21628-21630). Of all the properties with post-1950 water rights, the Pilch property presents one of the more complex sets of factual questions. Mr. Book and Mr. Fritz disagreed on several questions, starting with the total acreage irrigated during 2004 and 2006. While Mr. Book estimated that 159 acres were irrigated,² Mr. Fritz decided that only 114.5 acres were irrigated. Ex. M-6, p. 9 (Book rebuttal expert report). Based on the aerial photographs, the Basin Plan maps, and the METRIC maps, I agree with Mr. Book that 159 acres were irrigated in the years in question.

Mr. Book and Mr. Fritz also disagreed on the source of the irrigation water. Based on conversations with Joe Pilch, the property owner, Mr. Fritz concluded that all of the 114.5 acres that he believed had been irrigated used CBM water. Ex. W-2, p. 86 (Fritz expert report). Mr. Fritz also noted that the property owner used Lake DeSmet exchange water in both 2004 and 2006 (although less water was used in 2006), and that because Mr. Pilch had access to this water, he probably did not need to use his post-1950 rights. *Id.* After examining the CBM maps in Mr. Fritz's expert report, Mr. Book concluded that at least 41 acres were *not* irrigated with CBM water.³ Ex. M-6, p. 9 (Book

² He originally estimated that 222.5 acres were irrigated, but later reduced this estimate. M-6, p. 26, tbl. 2-B (Book rebuttal expert report).

³ Mr. Book did not come to a firm conclusion about the source of water for the remaining acres. In his table of post-1950 uses, he shows two totals—one that assumes Mr. Pilch used CBM

rebuttal expert report). As for these acres, Mr. Book concluded that the quantity of exchange water was probably too small to supply the non-CBM acreage with sufficient irrigation water and that the reservoir water was likely "added to the supply later in the season." *Id.*, p. 10.

Mr. Pilch testified at trial that he used CBM water on a portion of his property starting around 2002 or 2003. 19 Tr. 4570:8-11, 4570:22-25, 4578:7-4599:2. Mr. Pilch testified that he irrigated other lands with water from Prairie Dog Creek. *See, e.g., id.* at 4586:2-7, 4593:10-25. Mr. Pilch estimated that he irrigated somewhere between 70 and 100 acres of land without CBM water, although he was not sure. *Id.* at 4627:17-4628:6. Some of those rights were pre-1950, while others were post-1950. *See, e.g., id.* at 4602:21-4603:8. Mr. Pilch showed some confusion regarding which rights he used for the different portions of his property. *See, e.g., id.* at 4604:19-23. According to Mr. Pilch, he could not recall exactly what rights were used on what land. *Id.* at 4619:6-9. Mr. Pilch also did not recall whether he asked for Lake DeSmet water in 2004 and 2006, although he testified that he would have called for the water if he had needed it. *See, e.g., id.* at 4604:24-4606:11. He also testified that he had no way to know how much DeSmet water he actually used. *Id.* at 4622:21-24.

Based on the expert reports and the trial testimony of Mr. Pilch, I conclude that Montana has proven that at least 41 acres of the Pilch property were irrigated

water, and one that does not. Ex. M-6, p. 26, tbl 2-B (Book rebuttal expert report).

in 2004 and 2006 with post-1950 water in violation of the Compact.

Rose (Permit 23158). This property also presents complicated factual questions. Mr. Book originally estimated that 38 acres were irrigated during 2004 and 2006 with a post-1950 water right attached to this property. Ex. M-6, p. 26, tbl. 2-B (Book rebuttal expert report). Mr. Fritz, by contrast, concluded that only 33 acres are permitted under this water right and that the 2006 aerial photograph included with Mr. Book's original report showed only 29.5 acres were irrigated. Ex. W-2, p. 86 (Fritz expert report). Mr. Book subsequently "replotted the permit boundary," using the mapping and information available from both experts, and concluded again that 38 acres were irrigated. Ex. M-6, p. 10. Based on the expert reports, I conclude that Mr. Book's estimate of 38 acres of irrigated land is the more accurate estimate.

Mr. Fritz, however, also concluded that the land owner probably used Kearney Lake Reservoir water, rather than post-1950 water rights, to irrigate this land. According to Mr. Fritz, the hydrographers' reports for 2004 and 2006 showed that the land owner held storage rights in Kearney Lake and used 49.6 and 64 af, respectively, in 2004 and 2006; Ms. Ina Jean Peterson confirmed this information in a phone call.⁴ Ex. W-2, p. 87. Mr. Book nonetheless chose to include all the acreage in his calculation of acres irrigated with post-1950 water. As Mr. Book notes, there is no

⁴ Mr. Fritz did not give the relationship between Ms. Ina Jean Peterson and the property owner in 2004 and 2006 and therefore the basis for her knowledge. According to county records, the property is in the Peterson estate, suggesting that Ms. Peterson either was a partial owner in 2004 and 2006 or related to the owner. See W-2, p. 87.

documentation for when water may have been taken from Kearney Lake or for which of the Petersons' lands. Ex. M-6, p. 10.

I conclude that Montana has failed to prove that post-1950 water was used on this property during 2004 or 2006. It is more likely that the land owners used Kearney Lake water, as suggested by Mr. Fritz. The amounts of water used from Kearney Lake are very similar to the ET rates for the property calculated by the METRIC analysis for those two years. *See id.*, p. 26, Ex. 2-B.

Stroup (Permits 6550 & 22879). Both Mr. Book and Mr. Fritz agreed that part of the land was irrigated, but they differed on exactly how much was irrigated. Their disagreement was slight. Relying on the map included in the Wyoming Basin Plan, Mr. Book estimated a small five-acre tract of land was irrigated with post-1950 water. Ex. M-6, p. 7 (Book rebuttal expert report). Mr. Fritz estimated that only 3.6 acres were irrigated, based on an examination of the July 2006 aerial photograph included in the original Book report. Ex. W-2, p. 74 (Fritz expert report). Mr. Fritz notes that the "2004 and 2006 season METRIC maps generally support the delineation of this area to the extent that the 30-meter resolution of the METRIC maps will allow." *Id.* at 73-74. I conclude that the materials relied on by Mr. Fritz provide the more accurate estimate of the amount of land actually irrigated in 2004 and 2006 and that 3.6 acres were therefore irrigated in those years.

White (Permit 7322). Mr. Book estimated that 82 acres of this property were irrigated with post-1950

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water in 2004 and 2006.⁵ Ex. M-6, p. 25, tbl. 2-A (Book rebuttal expert report). Mr. Fritz agreed that the land was irrigated with post-1950 water, but reduced the quantity of land irrigated to 67.1 acres based on his review of the 2006 aerial photo and a conversation with the landowner, Bill White. In his rebuttal report, Mr. Book reviewed the evidence again and concluded that 78 acres were irrigated “based on information supplied from the owner.” Having reviewed both expert reports, I conclude that 78 acres of land were irrigated with post-1950 water rights in both 2004 and 2006.

TABLE D-1

Permit #	Applicant	Acreage Irrigated in 2004 and 2006	Acre Feet Depleted in 2004	Acre Feet Depleted in 2006
Tongue River				
5555	Verley	0	0	0
5798	Barbula	36	32	35
6206	Johnson et al.	0	0	0
6226	DeLapp	0	0	0
6498	School District	9	8	16
7322	White	78	69	151
21605	Perkins et al.	0	0	0
21719	Long et al.	0	0	0

⁵ The owner held a post-1950 right to 84 acres. Ex. M-6, p. 25, tbl. 2-A (Book rebuttal expert report).

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Permit #	Applicant	Acreage Irrigated in 2004 and 2006	Acre Feet Depleted in 2004	Acre Feet Depleted in 2006
22712	Wilson et al.	0	0	0
26502	Dayton	3	5	8
28382	Buyok	16	20	29
30385	Addleman	4	2	3
Tributaries				
6550, 22879	Stroup	4	2	3
7267	McTiernan	0	0	0
24259	Lomax	0	0	0
24730	Vannoy	0	0	0
27814	Cossitt	5	6	8
28734-28736	Schreibeis	0	0	0
32200-32202	McTiernan	0	0	0
32252	Taylor	0	0	0
Prairie Dog Creek				
23152-23157	Koltiska	0	0	0
23085	Koltiska/ KN Pump	0	0	0
21628-21630	Pilch	41	44	59
23158	Rose	0	0	0
23803	Trembath	16	16	13
TOTAL		212 acres	204 acre feet	325 acre feet

APPENDIX E**Post 1950 Storage in Wyoming During 2004****Big Horn Reservoir**

The Big Horn Reservoir began the 2004 water year with 1,034 af of carryover storage. Ex. J-61, p. 107 (2004 Hydrographers' Annual Report). It would have ceased storing water on or about May 24, when Wyoming began to regulate Cross Creek, the reservoir's feeder stream, in order to meet the call of a downstream senior right. See 10 Tr. 2120:20-2121:7, 2186:19-2188:14 (William Knapp). At that time, the reservoir had approximately 3,330 af of storage water. Ex. J-61, p. 107.

Big Horn therefore filled with 2,296 af of new storage water in 2004. Big Horn, however, holds 2,749 af of pre-1950 storage rights. All of the water that Big Horn stored in 2004 therefore was stored under a pre-1950 right; none was stored under a post-1950 right. Montana's principal expert witness, Mr. Book, did not list any Big Horn post-1950 water as having been stored in violation of the Compact. Ex. M-5, p. 37 tbl. 7 (Book expert report).

Cross Creek Reservoir

The Cross Creek Reservoir holds only a post-1950 water right. Cross Creek began the 2004 water year with 324 af of carryover water. Ex. W-175 (Knapp calculations). Like Big Horn, Cross Creek would have ceased storage on or about May 24, when Wyoming began to regulate Cross Creek. See 10 Tr. 2120:20-2121:7, 2186:19-2188:14 (William Knapp). At that time, the reservoir had approximately 496 af of storage

water to which it was entitled. Ex. J-61, p. 104 (2004 Hydrographers' Annual Report).¹

Cross Creek therefore stored 172 af of post-1950 water in 2004. The question is how much of this water was stored after April 14, when Wyoming learned that Montana needed additional water to ensure that the Tongue River Reservoir would fill. Because storage ceased on May 24, the more specific question is how much of the 172 af was stored between April 15 and May 24.

Unfortunately, there are no direct records of how much water was stored in Cross Creek during this period of time. The best available evidence of how much water was stored in each month in the 2004 water year is Gordon Aycock's expert report. Mr. Aycock used a reasonable approach in making monthly estimates. Mr. Aycock began by examining the monthly flows of water at Goose Creek near Acme, Wyoming. Ex. M-7, p. 19 (Aycock rebuttal expert report). Backing out irrigation and reservoir impacts, he estimated the "pre-development monthly flow pattern . . . as a percentage of the total October through June flow." *Id.* He then used these percentages to "allocate the annual reservoir storage amounts among each of the months, October through June." *Id.*

¹ There is some confusion in the record. Mr. Knapp's records indicate that Cross Creek Reservoir had filled to its capacity of 798 af as of May 19, 2004. See W-175 (2004 data on Wyoming reservoirs). Yet, as noted, the 2004 Hydrographers' Annual Report states that, when filling ceased, it was "determined that Cross Creek Reservoir could keep 495.8 A.F. of the water it had stored." The explanation of this apparent discrepancy is presumably that Cross Creek stored some water that in fact belonged to a downstream reservoir with a more senior storage right under the principle of "highority." See pp. 188-189 *supra*.

Mr. Aycock assumed that Cross Creek continued to fill through June, while as noted, Cross Creek ceased storing on or about May 24. To estimate Cross Creek storage after April 15, I therefore recalculated Mr. Aycock's numbers assuming the reservoir stored 172 af from October 1, 2003 to May 23, 2004.

Based on Mr. Aycock's adjusted estimates, I conclude that at least 18.4 acre feet of post-1950 water was stored in Cross Creek between April 14 and April 30 and that at least 62.4 af of post-1950 water was stored in Cross Creek between May 1 and May 23. Thus, at least 81 af of water was stored in Cross Creek in violation of the Compact after Montana notified Wyoming that it was in need of additional water to ensure that the Tongue River Reservoir filled.

Dome Lake Reservoirs

The Dome Lakes Reservoirs began the 2004 water year with a carryover of 1,525 af of water. Ex. W-175 (data on Wyoming reservoirs). Both of the Dome reservoirs filled during the water year. New storage was therefore 506 af of water. Because Dome's pre-1950 rights total 1,843 af, none of the water that was stored in 2004 was stored using post-1950 water rights. Montana's principal expert witness, Mr. Book, did not list any Dome post-1950 water as having been stored in violation of the Compact. Ex. M-5, p. 37 tbl. 7 (Book expert report).

Park Reservoir

Park Reservoir began the 2004 water year with 4,160 af of carryover storage. Ex. J-61, p. 110. Prior to ceasing storage because of a call by downstream seniors, Park had stored 7,350 af of water. Ex. W-175 (2004 data on Wyoming reservoirs). However, it appears that Park was also entitled to water that had

been stored in other reservoirs, because the 2004 Hydrographers' Annual Report states that, when Park ceased storage, the facility was "entitled" to total storage of 10,242 af of water. Even if the larger storage amount is used, all of the water stored during 2004 would have been chargeable to its pre-1950 water rights.² Montana's principal expert witness, Mr. Book, did not list any Park post-1950 water as having been stored in violation of the Compact. Ex. M-5, p. 37 tbl. 7 (Book expert report).

Sawmill Reservoir

Sawmill holds only post-1950 storage rights. Sawmill Reservoir began the 2004 water year with no carryover storage. Ex. W-175 (2004 data on Wyoming reservoirs). By May 19, 2004, Sawmill had stored a total of 775 af of water. *Id.* Sawmill then went on to fill at some point in time between June 10 and June 30. Ex. J-61, p. 118 (2004 Hydrographers' Annual Report). Sawmill's total capacity is 1,275 af. *Id.*

All of the water that Sawmill stored after May 19, or 500 af, is water that should have been released to Montana in response to its call. The water stored between April 14 and May 19 was also stored in violation of the Compact. The problem, as with Cross Creek, is determining how much of the 775 af of water stored through May 19 was stored during this approximately one month period of time.

² This is consistent with the language of the 2004 Hydrographers' Annual Report, which says that the facility "was entitled to its first six appropriations." Ex. J-61, p. 110. Park has a total of eight water rights; the first six are all pre-1950 storage rights. See Ex. M-5, p. 36 tbl. 6 (Book expert report).

The best available estimate of how much water was stored each month in Sawmill during the 2004 water year is once again that of Mr. Aycock. Unlike with the Cross Creek Reservoir, Mr. Aycock's estimate assumes that the storage period was approximately the same as the actual storage period—i.e., from the beginning of the water year through late June. Mr. Aycock's estimate for the amount of water that Sawmill would have stored from May 20 through the end of the filling period in June also aligns well with the actual amount of water that was stored during this period.³ Using Mr. Aycock's estimates, the total amount of post-1950 storage that occurred between Montana's initial notice and May 19 is (1) 89.1 af from April 15-30 and (2) 248.1 af from May 1-19—for a total of 337 af.⁴ I therefore conclude that Montana has shown that Wyoming stored 837 af of post-1950 water in the Sawmill Reservoir after receiving notice from Montana.

Twin Lakes Reservoir

Twin Lakes Reservoir began the 2004 water year with carryover storage of 2,606 af. Ex. W-175 (2004 data on Wyoming reservoirs). Twin Lakes filled on May 19 to its capacity of 3,397 af. Ex. J-61, p. 97 (2004

³ Mr. Aycock estimated that 397.1 af of water was stored in May and that 364.2 af of water was stored in June. Ex. M-7, p. 30 tbl. (Aycock rebuttal expert report) Prorating May storage evenly across the month for simplicity, Mr. Aycock's figures suggest that 150 af of water would have been stored from May 20 through the end of that month. Mr. Aycock's figures therefore estimate that total storage for the period from May 20 through the end of filling would have been 150 af plus 364 af, or 514 af of water—compared to the actual amount stored during this period of 500 af.

⁴ In calculating these figures, I have assumed that Mr. Aycock's numbers for each month can be prorated evenly across the month.

Hydrographers' Annual Report). Twin Lakes therefore stored 791 af of water during the 2004 water year. Ex. W-175. Because Twin Lakes holds pre-1950 water rights to 1,180 af of water, none of the water stored in 2004 can be attributed to post-1950 storage. Montana's principal expert witness, Mr. Book, did not list any Twin Lakes post-1950 water as having been stored in violation of the Compact. Ex. M-5, p. 37 tbl. 7 (Book expert report).

APPENDIX F

**Summary of Findings Regarding the
Impact of Wyoming Post-1950
Uses on Stateline Flows in 2004**

Direct Diversions	204	204	184
Storage			
Compact reservoirs	1447	918	826
Padlock Ranch reservoirs	720	134	103
Other reservoirs	313	208	187
Total storage	2,480	1,260	1,116
TOTAL	2,684	1,464	1,300

APPENDIX G

Key Water Terms*

<u>Term</u>	<u>Definition</u>
Cubic foot per second (cfs)	A common measure of the flow of water, often used to describe how much water is flowing in or being diverted from a river. One cfs is equivalent to 646,317 gallons per day. Over the course of a year, one cfs would produce 722.7 acre-feet of water.
Acre foot (af)	A common measure of the volume of water, often used to describe how much water is in a reservoir or the capacity of a reservoir. Also often used to describe the total volume of water that someone diverts or uses over a set period of time, such as a water year. One af is enough water to cover one acre of land to a depth of one foot, or 325,851 gallons. As a rough illustration of how much water is in an acre foot, many cities estimate that a typical family of five uses about one af per year (although this number varies tremendously from region to region and from city to city within each region).

* Some of these definitions are drawn from Barton H. Thompson, Jr., John D. Leshy, & Robert H. Abrams, *Legal Control of Water Resources* 26-27, 1197-1200 (5th ed. 2013).

<u>Term</u>	<u>Definition</u>
Aquifer	A porous water-bearing underground geologic formation.
Call	The action taken in most western states by a senior appropriator who wishes to curtail junior diversions in order to ensure that he can divert his full entitlement.
Groundwater basin	A physiographic or geologic unit containing at least one aquifer of significant extent.
Irrigation season	The period of the year during which active irrigation occurs, typically running from approximately May 1 through September 30 of each year.
METRIC	A satellite image processing model that estimates evapotranspiration.
MODFLOW	A modular groundwater model, originally developed by the United States Geological Survey in the early 1980s and used commonly by hydrologists today to simulate the flow of groundwater through aquifers.
Stateline	The dividing line of the Tongue River between Montana and Wyoming.

Term**Definition**

Water table

The highest elevation, at or below the surface of the earth, under which the ground is saturated with water. A well, for example, must be dug down to the water table in order to be able to pump water from the aquifer.

Water year

Both Wyoming and the Yellowstone River Compact define the water year as October 1 of one year through September 31 of the following year.

APPENDIX H

Trial Witnesses

Witnesses in bold testified for Montana.

Witnesses in italics testified for Wyoming.

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
Allen, Richard	Expert witness for Montana on issues regarding Wyoming water use. Professor of Water Resources Engineering, University of Idaho. Licensed professional engineer.	14 Tr. 3107
Ankney, Tana	Farmer and rancher on property along the lower Tongue River in Wyoming, with water rights in the Interstate Ditch Company.	20 Tr. 4644
Aycock, Gordon	Rebuttal expert for Montana on reservoir issues. Former employee of the U.S. Bureau of Reclamation (Specialist for Reservoir Operations & Water Rights, 1991-2012; Manager, Reservoir Regulation Branch, 1981-1990). Registered professional engineer.	7 Tr. 1531, 8 Tr. 1803

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
Benzel, Greg	Farm Manager, Padlock Ranch, Wyoming (since 1997).	15 Tr. 3445
Book, Dale	Primary expert witness for Montana. Principal Water Resources Engineer, Spronk Water Engineers, Inc. Registered professional engineer.	1 Tr. 56
<i>Boyd, Pat</i>	Hydrographer Commissioner, Division II, Wyoming State Engineer's Office.	10 Tr. 2220
<i>Carrell, William</i>	Farmer and rancher, Tongue River Valley in Montana. Holder of contract storage rights in the Tongue River Reservoir.	19 Tr. 4346
Compton, Art	Former Administrator, Planning Division, Montana Department of Environmental Quality.	14 Tr. 3177
Dalby, Charles	Expert witness for Montana. Hydrologist, Water Resources Division, Montana Department of Natural Resources & Conservation. Hydrologist & geomorphologist.	2 Tr. 375

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
Davis, Timothy	Administrator, Water Resources Division, Montana Department of Natural Resources & Conservation (since 2010). Montana Commissioner, Yellowstone River Compact Commission (since 2010).	2 Tr. 444
Engels, John	Ditch Rider, Interstate Ditch (since 2009).	12 Tr. 2714
<i>Fassett, Gordon</i>	Former Wyoming State Engineer (1987-2000). Wyoming Commissioner, Yellowstone River Compact Commission (1987-2000). Deputy State Engineer, Wyoming State Engineer's Office (1984-1987).	18 Tr. 4156
<i>Felton, Maurice</i>	Farmer and rancher, Tongue River Valley in Montana (since 1996). Owner of pre-1950 and post-1950 Montana water rights in the Tongue River. Holder of contract storage rights in the Tongue River Reservoir.	19 Tr. 4486

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
<i>Fisher, William</i>	Farmer and rancher along the Tongue River in Wyoming.	20 Tr. 4685
Fjell, Alan	Court-appointed Water Commisioner, Tongue River in Montana (2002)	16 Tr. 3574
<i>Fritz, Doyl</i>	Expert witness for Wyoming. Founding Principal & former President, WWC Engineering (formerly Western Water Consultants, Inc.). Licensed professional engineer.	23 Tr. 5369
Fritz, Gary	Former Administrator, Water Resources Division, Montana Department of Natural Resources & Conservation (1979-1996). Montana Commissioner, Yellowstone River Compact Commission (1979-1996). Currently a fly-fishing guide.	5 Tr. 1059
Gephart, Charles	Court-appointed Water Commissioner, Tongue River in Montana (2005-2006).	15 Tr. 3511

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
Hamilton, John	Farmer and rancher, Tongue River Valley in Montana (since 1992). Owner of pre-1950 Montana water right in the Tongue River; holder of contract storage rights in the Tongue River Reservoir.	16 Tr. 3624
<i>Harwood, Raymond</i>	Farmer and rancher, Tongue River Valley in Montana. Owner of both pre-1950 and post-1950 Montana water rights in the Tongue River; holder of contract storage rights in the Tongue River Reservoir.	19 Tr. 4414
Hayes, Art	Farmer and rancher, Tongue River Valley in Montana. Owner of pre-1950 Montana water rights in the Tongue River; holder of contract storage rights in the Tongue River Reservoir. President, Tongue River Valley Water Users Association.	7 Tr. 1403

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<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
Heffner, Millicent	Water Rights Bureau Chief, Water Resources Division, Montana Department of Natural Resources and Conservation (DNRC)	3 Tr. 591
<i>Hinckley, Bern</i>	Expert witness for Wyoming. Principal, Hinckley Consulting. Registered professional geologist.	24 Tr. 5612
Hirsch, Les	Farmer and rancher, Tongue River Valley in Montana. Owner of pre-1950 Montana water rights in the Tongue River; holder of contract storage rights in the Tongue River Reservoir.	16 Tr. 3678
Kepper, Charles	Court-appointed Water Commissioner, Tongue River in Montana (2001-2008).	15 Tr. 3306
Kerbel, Keith	Regional Manager, Billings Office, Water Resources Division, Montana Department of Natural Resources & Conservation (1981-2010). Water rights specialist, U.S. Bureau of Reclamation (since 2010)	4 Tr. 911

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
<i>Knapp, William</i>	Assistant Superintendent & Hydrographer Commissioner, Division II, Wyoming State Engineer's Office.	9 Tr. 2038
Koltiska, Thomas	Cattle rancher and farmer, Sheridan County, Wyoming. President, Kearney Lake Reservoir. President, Prairie Dog Ditch Company.	11 Tr. 2446
Larson, Steven	Expert witness for Montana on groundwater issues. Principal & Executive Vice President, S.S. Papadopoulos & Associates, Inc. (SSP&A). Professional Hydrologist/ Ground Water.	13 Tr. 2751
<i>Levens, Russell</i>	Supervisor, Hydrosciences Section & Water Management Bureau, Water Resources Division, Montana Department of Natural Resources & Conservation.	17 Tr. 4011

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
Littlefield, Douglas	Expert witness for Montana on the history of the Yellowstone River Compact. Owner, Littlefield Historical Research. Historian.	11 Tr. 2389
<i>Loguidice, Carmine</i>	Superintendent, Division II, Wyoming State Engineer's Office.	9 Tr. 1957
<i>Lowry, Sue</i>	Interstate Streams Administrator, Wyoming State Engineer's Office. Wyoming Commissioner, Yellowstone River Compact (since 2013).	20 Tr. 4815
Moy, Richard	Former Water Management Bureau Chief, Water Resources Division, Montana Department of Natural Resources & Conservation (1979-2008). Currently U.S. Commissioner, International Joint Commission.	12 Tr. 2532
Muggli, Roger	Farmer and rancher, Tongue River Valley in Montana. Member, Tongue River Reservoir Advisory Committee. Secretary, T&Y Canal Company.	17 Tr. 3833

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
Nance, Jay	Farmer and rancher, Tongue River Valley in Montana. Owner of pre-1950 Montana water rights in the Tongue River; holder of contract storage rights in the Tongue River Reservoir.	16 Tr. 3755
<i>Pilch, Joe</i>	Farmer and rancher, Sheridan, Wyoming. Owner of post-1950 Wyoming water rights in the Tongue River.	19 Tr. 4565
Roberts, Mike	Surface Water Hydrologist, Water Resources Bureau, Montana Department of Natural Resources & Conservation. Responsible for water commissioner training courses in Montana.	12 Tr. 2737, 15 Tr. 3223
<i>Schreüder, William</i>	Expert witness for Wyoming on groundwater issues. President & Principal Scientist, Principia Mathematica, Inc. Specialist in applied research and development activities in mathematical modeling and computational fluid mechanics, including groundwater modeling.	13 Tr. 2888

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
<i>Schroeder, David</i>	Hydrographer Commissioner, Division II, Wyoming State Engineer's Office. Former CBM reservoir inspector, Wyoming State Engineer's Office.	10 Tr. 2265
<i>Shaw, Kyle</i>	Farmer and rancher, Tongue River Valley in Montana. Holder of pre-1950 water rights in the Tongue River, as well as water rights in tributary creek. Holder of contract storage rights in the Tongue River Reservoir.	19 Tr. 4458
Smith, Kevin	Expert witness for Montana on reservoir issues. State Water Projects Bureau Chief, Water Resources Division, Montana Department of Natural Resources and Conservation (DNRC). Registered professional engineer.	5 Tr. 984, 5 Tr. 1090
Smith, Loren	Superintendent, Division III, Wyoming State Engineer's Office.	20 Tr. 4716

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
<i>Stier, John</i>	Production manager, Storm Cat Energy (since 2006). Supervisor, J.M. Huber (2003-2006).	19 Tr. 4510
Stults, John Edwin	Administrator, Water Resources Division, Montana Department of Natural Resources & Conservation (1997-2006). Montana Commissioner, Yellowstone River Compact Commission (1997-2006).	3 Tr. 653
Tubbs, John	Director, Montana Department of Natural Resources & Conservation.	1 Tr. 38
Tweeten, Christian	Member, Montana Reserved Water Rights Compact Commission (since 1984 – Chairman since mid-1990s). Attorney.	8 Tr. 1574
<i>Tyrrell, Patrick</i>	Wyoming State Engineer (since 2001). Wyoming Commissioner, Yellowstone River Compact Commission (2001-2012).	22 Tr. 5109

<u>Witness</u>	<u>Identification</u>	<u>First Page(s) of Testimony</u>
<i>Wheaton, John</i>	Senior Research Hydro- geologist, Montana Bu- reau of Mines & Geology. Manages Montana's Groundwater Investiga- tion Program.	18 Tr. 4073
Whitaker, Michael	Former Superintendent, Division II, Wyoming State Engineer's Office, and former Hydrographer Commissioner, Wyoming State Engineer's Office.	8 Tr. 1670
Whiteman, Jason	Former Water Resources Administrator, Northern Cheyenne Tribe. Former Director, Natural Re- sources Department, Northern Cheyenne Tribe.	8 Tr. 1626

APPENDIX I

The official docket sheet for this case, as maintained by the Clerk of the Supreme Court of the United States, is available online. The official docket sheet does not contain entries for papers filed directly with the Special Master. The Special Master's separate docket sheet, which includes all filings made with or by the Special Master, appears below.

Transcripts of trial proceedings, hearings, and status conferences are indicated by italics. Orders or memorandum opinions of the Special Master are indicated by bold.

DATE FILED	#	DOCKET DESCRIPTION
1/1/07	1	Motion for Leave to File Bill of Complaint, Bill of Complaint, and Brief in Support
4/1/07	2	Montana's Reply Brief on Motion for Leave to File Bill of Complaint
4/1/07	3	Wyoming's Brief in Opposition to Motion for Leave to File Bill of Complaint
1/1/08	4	Brief for the United States as <i>Amicus Curiae</i>
4/1/08	5	Wyoming's Motion to Dismiss Bill of Complaint
4/25/08	6	Motion of Anadarko Petroleum Corp. for Leave to File <i>Amicus Brief</i> and <i>Amicus Brief</i> in Support of Respondent State of Wyoming

DATE FILED	#	DOCKET DESCRIPTION
5/1/08	7	Brief for <i>Amicus Curiae</i> Northern Cheyenne Tribe in Support of Plaintiff State of Montana on Motion to Dismiss Bill of Complaint
5/1/08	8	Brief for the United States as <i>Amicus Curiae</i> in Opposition to the Motion to Dismiss
5/1/08	9	Montana's Brief in Response to Wyoming's Motion to Dismiss Bill of Complaint
5/1/08	10	Wyoming's Reply Brief In Support of Its Motion to Dismiss Bill of Complaint
11/25/08	11	Case Management Order ("CMO") No. 1
12/3/08	12	Request of Anadarko Petroleum Corporation for Modification of Case Management Order and for Divided Argument
12/3/08	13	State of Wyoming's Request for Modification of Case Management Order
12/4/08	14	Motion to Dismiss: Joint Appendix of the Parties & Table of Contents
12/4/08	15	Joint Appendix
12/10/08	16	MT Response to Anadarko's Motion for Divided Argument
12/12/08	17	Modification to Case Management Order No. 1

DATE FILED	#	DOCKET DESCRIPTION
12/12/08	18	Anadarko Petroleum Reply to Modification of CMO No. 1
12/16/08	19	WY Submittal of Cross Ref Table for Appendices to Its Motion to Dismiss Bill of Complaint
12/16/08	20	Cross Reference Table of Wyoming Appendix Motion to Dismiss
1/9/09	21	State of Montana Praecipe
2/3/09	22	<i>Transcript of Hearing on Wyoming's Motion to Dismiss</i>
6/1/09	23	<i>Transcript of Telephonic Hearing of June 1, 2009</i>
6/2/09	24	Memorandum Opinion of the Special Master on Wyoming's Motion To Dismiss Bill of Complaint
6/11/09	25	<i>Transcript of Telephonic Hearing of June 11, 2009</i>
6/12/09	26	Montana v Wyoming Case Management Order No. 2
6/23/09	27	Motion and Stipulation to Correct Transcript of Hearing on State of Wyoming's Motion to Dismiss
7/13/09	28	Montana v Wyoming Case Management Order No. 3
7/17/09	29	Wyoming's Letter Brief
7/17/09	30	Motion of Anadarko Petroleum Corporation for Leave to Intervene

DATE FILED	#	DOCKET DESCRIPTION
7/17/09	31	Montana's Letter on Motion to Dismiss
7/24/09	32	USDOJ Letter
8/03/09	33	WY Response to MT Letter Brief RE Memorandum Opinion on Motion to Dismiss
8/03/09	34	MT Reply Letter Brief
8/05/09	35	<i>Transcript of Telephonic Hearing of Aug 5, 2009</i>
9/04/09	36	Supplemental Opinion of the Special Master on WY Motion to Dismiss Bill of Complaint
9/04/09	37	Case Management Order No. 4
9/04/09	38	Answer of North Dakota to Bill of Complaint
9/08/09	39	Montana substitution of counsel
9/15/09	40	State of WY Answer to Bill of Complaint
9/15/09	41	State of Wyoming's Letter Brief in Response to Anadarko's Motion to Intervene
9/18/09	42	MT's Response in Opposition to Motion to Intervene
9/18/09	43	U.S Brief in Opposition to Motion to Intervene

DATE FILED	#	DOCKET DESCRIPTION
9/25/09	44	Reply of Anadarko Petroleum Corp to Oppositions to its Motion for Leave to Intervene
10/8/09	45	<i>Transcript Special Master Hearing</i>
10/8/09	46	<i>Transcript Status Conference</i>
10/16/09	47	Montana's Motion for Partial Summary Judgment
11/2/09	48	Wyoming's Brief in Opposition to Montana's Motion for Summary Judgment
11/2/09	49	Brief for the United States as <i>Amicus Curiae</i> in Partial Support of Montana's Motion for Summary Judgment
11/09/09	50	MT Reply in Support of Motion for Summary Judgment
11/17/09	51	<i>Transcript Special Master Hearing</i>
12/18/09	52	Memorandum Opinion of the Special Master on Montana's Motion for Summary Judgment on the Yellowstone River Compact's Application to Tributaries of the Tongue and Powder River
12/18/09	53	Memorandum Opinion of the Special Master on the Motion of Anadarko Petroleum Corporation for Leave to Intervene

DATE FILED	#	DOCKET DESCRIPTION
1/11/10	54	WY's Letter Brief Commenting on the Special Master's Circulated Draft of the First Interim Report of the Special Master
2/10/10	55	First Interim Report of the Special Master
5/13/10	56	Montana's Exception to Special Master's First Interim Report
5/19/10	57	<i>Transcript of Telephonic Proceedings on May 19, 2010</i>
5/20/10	58	Cheyenne Tribe's <i>Amicus Brief</i> in support of Montana's Exception
6/01/10	59	Wyoming's Reply to Montana's Exception
6/22/10	60	Brief for the United States as <i>Amicus Curiae</i> Opposing Plaintiff's Exception
6/22/10	61	Motion of the United States as <i>Amicus Curiae</i> for Divided Argument and to Participate in Oral Argument
7/15/10	62	Montana's Sur-Reply on Exceptions to the First Interim Report of the Special Master
7/19/10	63	<i>Transcript of Telephonic Proceedings</i>
7/20/10	64	Case Management Order No. 5
9/3/10	65	Letter to Special Master

DATE FILED	#	DOCKET DESCRIPTION
9/17/10	66	<i>Transcript of Telephonic Proceedings</i>
11/24/10	67	North Dakota document production
12/3/10	68	Draft Case Management Plan No.1
5/2/11	69	Supreme Court Decision
5/19/11	70	<i>Transcript of Telephonic Proceedings</i>
6/15/11	71	Case Management Order No. 6
6/20/11	72	MT Request for Modification of June 15, 2011 Case Management Order
6/21/11	73	Modifications to Case Management Order of June 15, 2011
6/28/11	74	Montana's Letter Brief Regarding Bifurcation
6/28/11	75	Wyoming's Letter Brief Under Case Management Order No. 6
7/1/11	76	<i>Transcript of Telephonic Proceedings</i>
7/6/11	77	Case Management Order No. 7
7/20/11	78	WY's List of Issues of Fact and Law
7/20/11	79	MT's List of Issues of Fact and Law
7/27/11	80	United States Letter Brief Regarding WY's Compact Obligation

DATE FILED	#	DOCKET DESCRIPTION
7/27/11	81	WY's Letter Brief on Preclusion of MT's State Line Delivery Argument
7/27/11	82	MT's Letter Brief Regarding WY's Compact Obligation
7/27/11	83	Proposed Case Management Plan No. 1
7/29/11	84	<i>Transcript of Telephonic Proceedings</i>
8/19/11	85	Case Management Order No. 8
8/26/11	86	Montana letter re CMO No. 8
9/12/11	87	WY's Motion for Partial Summary Judgment
9/12/11	88	WY's Brief in Support of Its Motion for Partial Summary Judgment
9/12/11	89	Bishop Affidavit
9/12/11	90	Fassett Affidavit
9/12/11	91	Pring Affidavit
9/12/11	92	Rechard Affidavit
9/12/11	93	Stockdale Affidavit
9/12/11	94	Tyrrell Affidavit
9/12/11	95	Montana's Article V(B) Brief and Statement
9/23/11	96	Wyoming's Brief in Opposition to Montana's Right to Raise Article V(B) Claims

DATE FILED	#	DOCKET DESCRIPTION
9/23/11	97	Anadarko's Letter Brief in Opposition to Montana's Right to Raise Article V(B) Claims
9/23/11	98	Montana's Brief in Opposition to Wyoming's Motion for Summary Judgment
9/23/11	99	Declaration of Douglas R. Littlefield, PhD
9/23/11	100	Declaration of Richard Moy
9/28/11	101	WY's Reply Brief in Support of Its Motion for Partial Summary Judgment
9/28/11	102	Montana's Reply Brief in Support of Its Article V(B) Claims
9/29/11	103	Case Mgmt Plan #1 Draft
9/30/11	104	<i>Hearing re: WY's Motion for Summary Judgment</i>
9/30/11	105	<i>Hearing re: MT's Right to V(B) Claims</i>
9/30/11	106	<i>Sept 30, 2011 Status Conference</i>
10/7/11	107	Wyoming's Rule 16 Letter Brief
10/7/11	108	Montana's Supplemental Statement of Article V(B) Issues
10/14/11	109	Montana's Letter Brief on Rule 16
11/03/11	110	<i>Transcript of Status Hearing</i>
11/7/11	111	Case Management Order No 9

DATE FILED	#	DOCKET DESCRIPTION
11/11/11	112	Clarification Letter to Special Master
11/11/11	113	Anadarko Comments on Draft Case Management Plan No. 1
11/11/11	114	Montana's Comments on Draft Opinions
11/22/11	115	MT Letter to Special Master
11/22/11	116	Joint Proposed Document Production Order
11/28/11	117	<i>Transcript of Status Hearing</i>
12/20/11	118	Final Case Management Plan No. 1
12/20/11	119	Joint Document Production Order
12/20/11	120	Memorandum Opinion on Wyoming's Motion for Partial Summary Judgment
12/20/11	121	Memorandum Opinion of the Special Master on Montana's Claims Under Article V(B)
1/17/12	122	WY Certificate of Service
1/17/12	123	MT Certificate of Service
2/1/12	124	Certificate of Service - Montana's Disclosures Pursuant to the Joint Document Production Order

DATE FILED	#	DOCKET DESCRIPTION
2/1/12	125	Certificate of Service - Wyoming's Initial Disclosures Pursuant to the Joint Document Production Order
2/3/12	126	Montana's Status Report No. 1
2/3/12	127	WY Certificate of Service ("COS") for its First Set of Interrogatories and Request for Production to MT
2/3/12	128	Wyoming's Status Report No. 1
2/13/12	129	WY COS for Response for MT's Request for Specific Documents
3/2/12	130	Wyoming's Status Report No. 2
3/2/12	131	Montana's Status Report No. 2
3/5/12	132	North Dakota Substitution of Counsel
3/5/12	133	COS for Montana's Objections to Defendant's First Interrogatories
3/16/12	134	COS for Wyoming's Production of Documents in Response to Montana Requests for Specific Documents
3/19/12	135	Certificate of Service for Montana's Responses to Wyoming's First Set of Interrogatories
4/5/12	136	Notice of Deposition Duces Tecum of Rich Moy
4/6/12	137	Wyoming's Status Report No. 3
4/6/12	138	Montana's Status Report No. 3

DATE FILED	#	DOCKET DESCRIPTION
4/6/12	139	MT's Response to Defendant's First Request for Production to Plaintiff
4/6/12	140	MT's Supplemental Disclosures Pursuant to the Joint Document Production Order
4/6/12	141	MT's Production Pursuant to the Joint Document Production Order
4/6/12	142	WY COS serving WY's Production
4/9/12	143	WY Notice of Issuance of Subpoena
4/9/12	144	WY Notice of Freedom of Information Act Request
4/9/12	145	WY Notice of Deposition of Keith Kerbel
4/10/12	146	MT's Expedited Motion for Extension of Case Management Deadlines
4/12/12	147	<i>Transcript of Status Hearing</i>
4/13/12	148	WY Notice of Deposition Duces Tecum of Gary Fritz
4/13/12	149	WY Notice of Deposition Duces Tecum of Jack Stults
4/13/12	150	WY Notice of Deposition Duces Tecum of Orrin Ferris

DATE FILED	#	DOCKET DESCRIPTION
4/13/12	151	MT's letter regarding the Expedited Motion to Extend Case Management Deadlines
4/17/12	152	Case Management Order No. 10
4/27/12	153	WY's COS serving WY's Production of Physical Documents Maintained by the WY State Engineer's Office, Water Division II
5/1/12	154	WY's COS serving WY's Production of Physical and Electronic Documents Unable to be Provided to MT's Scanning Vendor
5/2/12	155	WY's COS serving WY's Production of Electronic Documents Maintained by the State Engineer's Office Water Division II
5/2/12	156	WY's COS regarding WY's Production of Maps Maintained by the WY SEO, Water Division II
5/4/12	157	WY Status Report No. 4
5/4/12	158	MT Status Report No, 4
5/4/12	159	MT's First Set of Interrogatories, First Set of Requests for Production, and First Set of Requests for Admission to Wyoming

DATE FILED	#	DOCKET DESCRIPTION
5/4/12	160	MT's COS for First Supplemental Responses to WY First Set for Interrogatories
5/16/12	161	WY's Notice of Deposition Duces Tecum of Millie Heffner
5/16/12	162	WY's Notice of Deposition Duces Tecum of Terri McLaughlin
5/16/12	163	WY's Notice of Deposition Duces Tecum of Mike Roberts
5/16/12	164	WY's Notice of Deposition Duces Tecum of Marty VanCleave
6/1/12	165	MT's Status Report No. 5
6/1/12	166	WY's Status Report No. 5
6/4/12	167	WY's COS serving Wyoming's Objections to Montana's First Set of Interrogatories and First Set of Requests for Production to WY and WY's Answers to MT's First Set of Request for Admissions
6/7/12	168	WY's COS serving Production of Physical Documents Maintained by Five Wyoming State Agencies
6/14/12	169	WY's Exhibit A - MT's responses to WY's First Set of Interrogatories
6/14/12	170	WY's Exhibit B - Letter to Mike McGrath from Muggli

DATE FILED	#	DOCKET DESCRIPTION
6/14/12	171	WY's Exhibit C - Email from Rich Moy to Jack Stults
6/14/12	172	WY's Exhibit D - Draft Report: A Cooperative Plan to Administer the Yellowstone River Compact, Nov 1982
6/14/12	173	WY's Exhibit E - Memo to Gary Fritz from Rich Moy
6/14/12	174	WY's Exhibit F - MT's First Supplemental Responses to WY's First Set of Interrogatories
6/14/12	175	WY's Deposition Transcript for Gary Fritz
6/14/12	176	WY's Deposition Transcript for Keith Kerbel
6/14/12	177	WY's Deposition Transcript for Richard Moy
6/14/12	178	WY's Deposition Transcript for Jack Stults
6/15/12	179	WY's Renewed Motion for Partial Summary Judgment
6/15/12	180	WY's Brief in Support of its Renewed Motion for Partial Summary Judgment
6/15/12	181	WY's Motion for Leave to Amend its Answer to Include the Defenses of Laches and Mitigation of Damages

DATE FILED	#	DOCKET DESCRIPTION
6/18/12	182	WY's COS regarding Wyoming's Answers to Montana's First Set of Interrogatories
7/3/12	183	WY's COS serving WY's Answers to MT's First Set of Requests for Production
7/3/12	184	WY's COS serving Production of Physical Documents Maintained by the WY State Engineer's Office and Interstate Streams Division
7/6/12	185	WY's COS serving Notice of Issuance of Subpoena to Produce Documents of Art Hayes, Jr. in his Official Capacity as President of the Tonger River Water Users' Association
7/6/12	186	MT's Status Report No. 6
7/6/12	187	WY's Status Report No. 6
7/13/12	188	WY's Notice of Cancellation of Subpoena to Produce Documents of Art Hayes in his Official Capacity as President of the Tongue River Water Users' Association.
7/13/12	189	MT's Brief in Opposition to WY's Renewed Motion for Partial Summary Judgment

DATE FILED	#	DOCKET DESCRIPTION
7/17/12	190	Appendix A to MT's Brief in Opposition to WY's Renewed Motion for Partial Summary Judgment
7/19/12	191	WY's Entry of Appearance of James Kaste
7/23/12	192	Wyoming's Reply Brief in Support of Renewed Motion for Partial Summary Judgment
7/25/12	193	MT's Corrected Exhibit V
7/25/12	194	MT's Corrrcted Exhibit W
7/25/12	195	Montana's Response To Wyoming's Motion for Leave to Amend Its Answer to Include the Defenses of Laches and Mitigation of Damages
7/25/12	196	MT's Errata Notice Regarding Exhibits V & W to Its Brief in Opposition to WY's Renewed Motion for Partial Summary Judgment
7/27/12	197	<i>Transcript of Status Hearing</i>
7/27/12	198	Order Granting the State of Wyoming's Motion for Leave to Amend Its Answer to Include the Defenses of Latches and Mitigation of Damages

DATE FILED	#	DOCKET DESCRIPTION
7/30/12	199	Order Granting the State of Wyoming's Motion for Leave to Amend Its Answer to Include the Defenses of Laches and Mitigation of Damages
7/30/12	200	WY's Amended Answer to Bill of Complaint
7/31/12	201	WY's Letter to the Special Master re: WY Law Regarding Intrastate Requests for Regulation or Calls
8/3/12	202	WY's Status Report No. 7
8/3/12	203	MT's Status Report No. 7
8/9/12	204	USDOJ Withdrawal Letter
8/13/12	205	MT's Law regarding Intrastate Calls or Demands for Water Letter
8/17/12	206	MT's Letter Brief on Summary Judgment Case Citations
8/17/12	207	WY's Letter regarding Submission of Supplemental Authority on Summary Judgment Standard
8/21/12	208	MT's Follow-up Letter on Intra-state Calls
8/24/12	209	WY's Entry of Appearance for Christopher Brown
9/7/12	210	WY's Notice of Subpoena to Produce Documents of Art Hayes, President of Tongue River Water Users Assoc.

DATE FILED	#	DOCKET DESCRIPTION
9/7/12	211	WY's Status Report No. 8
9/9/12	212	MT's Status Report No. 8
9/18/12	213	WY's COS serving WY's 2nd Set of Interrogatories
9/28/12	214	Memorandum Opinion of the Special Master on WY's Motion for Partial Summary Judgment
10/1/12	215	WY's COS serving First Supplement to WY's Answers to MT's First Set of Requests for Production and Supplement to WY's Production of Physical Documents Maintained by the WY State Engineer's Office, Water Division II
10/3/12	216	WY's CD containing Documents WY received from Art Hayes
10/5/12	217	WY's Status Report No. 9
10/5/12	218	MT's Status Report No. 9
10/18/12	219	MT's COS for MT's Responses to WY's First Request for Admissions
10/18/12	220	MT's COS for MT's Objections to WY's Second Set of Interrogatories to MT and WY's First Requests for Admissions
10/25/12	221	<i>Transcript of Status Hearing</i>
10/26/12	222	MT's COS - Notice of Deposition - Bill Knapp

DATE FILED	#	DOCKET DESCRIPTION
10/26/12	223	MT's COS - Notice of Deposition - Michael Whitaker
10/26/12	224	MT's COS - Notice of Deposition - Carmine LoGuidice
11/2/12	225	WY's Status Report No. 10
11/2/12	226	MT's Status Report No. 10
11/2/12	227	MT's COS - MT's Responses to WY's 2nd set of Interrogatories
11/9/12	228	MT's COS - Notice of Depositions for Lamares, Reed, Shackelford, Boyd, Wantulok and Manolis
11/13/12	229	WY's Discovery Dispute
11/20/12	230	MT's COS - Notice of Depositions for Lowry, Stockdale, Tyrrell, Fassett, Barnes, Lindemann and Cunningham
11/21/12	231	MT's COS - First Supplemental Responses to WY's Second Set of Interrogatories
11/21/12	232	WY's COS - WY's First Supplemental Answers to MT's First Interrogatories
11/29/12	233	MT's Submittal re: Discovery Disputes
11/30/12	234	<i>Transcript of Status Hearing</i>
12/7/12	235	Wyoming's Status Report No. 11
12/7/12	236	Wyoming's Status Report No. 11

DATE FILED	#	DOCKET DESCRIPTION
12/7/12	237	Montana's Supplemental Evidence
12/10/12	238	MT's COS Notice of Deposition, Greg Benzel
12/10/12	239	MT's COS Notice of Deposition, John Engels
12/10/12	240	MT's COS Notice of Deposition, Kim French
12/13/12	241	<i>Transcript of Status Hearing</i>
12/13/12	242	MT's Letter to Special Master re: Second Declaration of Richard M. Moy
12/14/12	243	Supplemental Memorandum Opinion of the Special Master on WY's Renewed Motion for Partial Summary Judgment
12/17/12	244	WY's Notice of Objection and Request for Clarification
12/17/12	245	WY's Entry of Appearance of Matthias Sayer
12/19/12	246	MT's Response to WY's Request for Clarification
12/19/12	247	MT's Notice of Filing of Third Declaration
12/20/12	248	WY's Entry of Appearance for Andrew Kuhlmann

DATE FILED	#	DOCKET DESCRIPTION
12/22/12	249	Special Master's Memorandum Opinion regarding WY's Motion for Partial Summary Judgment (MT's Supplemental Evidence)
12/26/12	250	WY's Notice of Production and Issuance of Subpoenas
12/31/12	251	WY's Notice of Production and Issuance of Subpoenas
1/2/13	252	WY's Notice of Production and Issuance of Subpoenas
1/4/13	253	WY's Notice of Subpoenas
1/4/13	254	WY's Status Report No. 12
1/4/13	255	WY's Status Report No. 12
1/4/13	256	COS for Montana's Disclosure of Experts and Expert Exhibits
1/7/13	257	WY's Notice of Deposition, Tim Davis
1/7/13	258	WY's Notice of Deposition, Russ Levens
1/7/13	259	WY's Notice of Deposition, Jim Robinson
1/7/13	260	WY's Notice of Deposition, Mary Sexton
1/7/13	261	WY's Notice of Deposition, Kevin Smith
1/7/13	262	WY's Notice of Deposition, John Tubbs

DATE FILED	#	DOCKET DESCRIPTION
1/9/13	263	WY's Notice of Production and Issuance of Subpoenas
1/11/13	264	WY's Notice of Production and Issuance of Subpoenas
1/12/13	265	MT's Expedited Motion for Protective Order
1/14/13	266	COS for Montana's Notice of Posting of Expert Backup and Designation of Confidential Documents
1/14/13	267	<i>Transcript of Status Hearing</i>
1/14/13	268	WY's Letter to the Special Master
1/14/13	269	Special Master's Memorandum Opinion regarding MT's Expedition Motion for Protective Order
1/16/13	270	MT's Letter re: Joint Letter re: Extension of Deadlines
1/24/13	271	WY's COS serving Notice of Deposition, Hayes and Dalby
1/28/13	272	WY's COS serving WY's 2nd Req for Admissions, WY's 2nd Req for Prod of Documents and WY's 3rd Set of Interrogatories to MT
1/29/13	273	WY's COS serving Notice of Deposition, Larson and Book

DATE FILED	#	DOCKET DESCRIPTION
2/1/13	274	WY's COS serving Notice of Deposition, Fix, Muggli, Fjell, Kepper, and Gephart
2/1/13	275	WY's Staus Report No. 13
2/1/13	276	MT's Staus Report No. 13
2/11/13	277	WY's COS serving NOD Allen
2/25/13	278	<i>Transcript of Status Hearing</i>
2/25/13	279	MT's Notice of Substitution of Counsel
2/25/13	280	MT v WY scheduling discussion
2/27/13	281	WY's COS serving Notice of Issuance of Subpoenas to Testify at a Deposition in a Civil Action
2/27/13	282	WY's COS serving Notice of Issuance of Subpoenas to Testify at a Deposition in a Civil Action
2/27/13	283	MT's COS serving MT's Objections to WY's 3rd Set of Interrogatories
2/27/13	284	MT's COS serving MT's Responses to WY's 2nd Request for Admissions
2/28/13	285	WY's COS serving Notice of Issuance of Subpoenas to Testify at a Deposition in a Civil Action
3/1/13	286	WY's COS serving Notice of Issuance of Subpoenas to Testify at a Deposition in a Civil Action

DATE FILED	#	DOCKET DESCRIPTION
3/1/13	287	WY's Status Report No. 14
3/1/13	288	MT's Status Report No. 14
3/6/13	289	WY's COS serving Notice of Issuance of Subpoenas to Testify at a Deposition in a Civil Action
3/7/13	290	WY's COS serving Notice of Issuance of Subpoenas to Testify at a Deposition in a Civil Action
3/11/13	291	WY's COS serving Notice of Issuance of Subpoenas to Testify at a Deposition in a Civil Action
3/14/13	292	COS of MT's Responses to WY's 3rd Set of Interrogatories
3/29/13	293	COS of MT's Responses to WY's 2nd Set of Requests for Production
3/29/12	294	<i>Transcript of Status Hearing</i>
4/2/13	295	WY's Expert Designation
4/5/13	296	WY's Status Report No. 15
4/5/13	297	MT's Status Report No. 15
4/12/13	298	MT's Objections to WY's Expert Designation and Expedited Motion for Supplemental Depositions
4/15/13	299	Errata Notice for Pages 15 and 16 to MT's Objections

DATE FILED	#	DOCKET DESCRIPTION
4/17/13	300	Wyoming's Response to Montana's Objections to Wyoming's Expert Designation
4/18/13	301	<i>Reply in Support of Montana's Objections to Wyoming's Expert Designation and Expedited Motion for Supplemental Depositions</i>
4/18/13	302	<i>Transcript of Status Hearing</i>
4/18/13	303	MT COS - Notice of Deposition of Doyl Fritz
4/18/13	304	MT COS - Notice of Deposition of Bern Hinckley
4/18/13	305	MT COS - Notice of Deposition of Willem Schreuder
4/23/13	306	Order Regarding Expert Witness Designation
5/3/13	307	WY's Status Report No. 16
5/3/13	308	MT's Status Report No. 16
5/10/13	309	MT COS Privilege Log
5/17/13	310	MT Certificate of Service
5/24/13	311	<i>Transcript of Status Hearing</i>
5/28/13	312	WY COS Notice of Deposition, Whiteman and Clubfoot
6/4/13	313	MT Disclosure of Rebuttal Experts
6/7/13	314	WY's Status Report No. 17
6/7/13	315	MT's Status Report No. 17

DATE FILED	#	DOCKET DESCRIPTION
6/10/13	316	WY's Motion to Strike the Report and Exclude Testimony of Douglas R. Littlefield
6/10/13	317	WY's Proposed Motion to Compel
6/11/13	318	WY's Motion to Withdraw as Counsel
6/11/13	319	WY's Proposed Order Granting Motion to Withdraw as Counsel
6/11/13	320	WY's Notice of Issuance of Subpoena - Cheyenne Tribe
6/11/13	321	WY's Disclosure of Non-Expert Witnesses
6/11/13	322	MT's 2nd Set of Interrogatories and Request for Production
6/11/13	323	MT's Supplemental Disclosures of Potential Fact Witnesses
6/13/13	324	Order Granting Motion to Withdraw as Counsel
6/14/13	325	WY COS serving Notice of Deposition of Decker Coal Company
6/19/13	326	WY COS serving Notice of Deposition of John Wheaton
6/24/13	327	MT COS serving Notice of Deposition of Dave Pelloux
6/24/13	328	MT COS serving Notice of Deposition of David Schroeder

DATE FILED	#	DOCKET DESCRIPTION
6/26/13	329	MT Response to WY Proposed Motion to Compel
7/2/13	330	Stipulated Dismissal with Prejudice of Montana's Powder River Basin Claims
7/1/13	331	<i>Transcript of Status Hearing</i>
7/2/13	332	Decision and Order of the Special Master on Wyoming's Motion to Compel
7/3/13	333	Wyoming's Memorandum in Support of Motion for Summary Judgment
7/3/13	334	WY's Motion for Summary Judgment
7/3/13	335	MT's Motion for Summary Judgment on the Compact's Lack of Specific Intrastate Administration Requirements
7/5/13	336	MT's Status Report No. 18
7/5/13	337	WY's Status Report No. 18
7/9/13	338	Montana's Response to Motion to Strike the Report and Exclude the Testimony of Douglas R. Littlefield Ph.D.
7/10/13	339	WY's Certificate of Service for the Notice of Deposition of Steven P. Larson

DATE FILED	#	DOCKET DESCRIPTION
7/11/13	340	Certificate of Service of Wyoming's Objections to Montana's Second Set of Interrogatories and Requests for Production to Wyoming
7/12/13	341	WY's Certificate of Service for the Notice of Deposition of Kevin Smith, Gordon Aycock and Dale E, Book, P.E
7/12/13	342	Certificate of Service for Montana's First Supplemental Response to Wyoming's Third Set of Discovery
7/19/13	343	MT's COS – Notice of Deposition, Shawn Ankney
7/19/13	344	MT's COS - Notice of Deposition, Shawn Ankney
7/19/13	345	MT's COS - Notice of Deposition, Ross Peterson
7/19/13	346	MT's COS - Notice of Deposition, Bruce Sheeley
7/19/13	347	MT's COS - Notice of Deposition, Dan Koltiska
7/19/13	348	MT's COS - Notice of Deposition, Bruce Williams
7/19/13	349	MT's COS - Notice of Issuance to Testify at a Deposition
7/22/13	350	WY's Reply in Support of Motion to Strike the Report and Exclude the Testimony of Douglas R. Littlefield

DATE FILED	#	DOCKET DESCRIPTION
8/2/13	351	Memorandum of <i>Amicus Curiae</i> Anadarko Petroleum Corporation in Support of Wyoming's Motion for Summary Judgment
8/2/13	352	WY's Status Report No. 19
8/2/13	353	Motion to Withdrawal of Gregory A. Phillips and Proposed Order
8/2/13	354	WY's Brief in Opposition to Montana's Motion for Summary Judgment on the Compact's Lack of Specific Intrastate Administration Requirements
8/2/13	355	MT's Status Report No. 19
8/2/13	356	<i>Amicus</i> Brief of the Northern Cheyenne Tribe in Opposition to Wyoming's Motion for Summary Judgment
8/2/13	357	Northern Cheyenne Tribe Brief
8/2/13	358	Montana's Brief in Opposition to Wyoming's Motion for Summary Judgment
8/2/13	359	Montana's Motion to Strike a Portion of the Affidavit of Patrick T. Tyrrell
8/7/13	360	WY's Response to Montana's Motion to Strike a Portion of the Affidavit of Patrick T. Tyrrell

DATE FILED	#	DOCKET DESCRIPTION
8/12/13	361	WY's COS for WY's Responses to MT's Second Set of Requests for Production to Wyoming
8/14/13	362	<i>Transcript of Status Hearing</i>
8/16/13	363	WY's Reply in Support of Motion for Summary Judgment
8/16/13	364	WY's Affidavit Boyd
8/16/13	365	WY's Affidavit Knapp
8/16/13	366	WY's Affidavit Schroeder
8/16/13	367	WY's Transcript Allen
8/16/13	368	WY's Transcript Aycock
8/16/13	369	WY's Transcript Book
8/16/13	370	WY's Transcript Dalby
8/17/13	371	MT's Reply Brief on Intrastate Administration Requirements
8/19/13	372	MT's Reply to Anadarko Petroleum Corporation Memorandum on Summary Judgment
8/19/13	373	MT's Reply to Anadarko - Exhibit 1
8/19/13	374	MT's Reply to Anadarko - Exhibit 2
8/22/13	375	MT's Reply in Support of MT's Motion to Strike a Portion of the Affidavit of Patrick T. Tyrrell
8/29/13	376	<i>Transcript of Hearing on Dispositive Motions, Denver, CO</i>
9/5/13	377	<i>Transcript of Status Hearing</i>

DATE FILED	#	DOCKET DESCRIPTION
9/6/13	378	Case Management Order No. 11
9/6/13	379	WY's Status Report No. 20
9/16/13	380	Memorandum Opinion of the Special Master on WY's Motion for Summary Judgment
9/16/13	381	Memorandum Opinion of the Special Master on MT's Motion for SJ on the Compact's Lack of Specific Intrastate Administration Requirements
9/19/13	382	Case Management Order No. 12
9/20/13	383	MT's COS Notice of Deposition for Tom Koltiska
9/23/13	384	WY's Attachment A to WY's Final Pretrial Memorandum
9/23/13	385	WY's Exhibit List
9/23/13	386	WY's Final Pretrial Memorandum
9/23/13	387	MT's Final Pretrial Memorandum
9/23/13	388	MT's Trial Exhibit List
9/23/13	389	MT's Witness List
9/24/13	390	WY's Motion in Limine to Exclude the Report and Testimony of Douglas R. Littlefield, Ph.D.

DATE FILED	#	DOCKET DESCRIPTION
9/24/13	391	WY's Motion in Limine to Exclude Evidence or Argument that the 1999 Tongue River Reservoir Enlargement is Protected by Article V(A) of the Yellowstone River Compact
9/24/13	392	WY's Motion in Limine to Exclude Evidence of Operational Decisions at the Tongue River Reservoir for the Purpose of Determining Montana's Rights Under Article V(A)
9/26/13	393	MT's Motion in Limine to Limit the Presentation of Evidence in this Case to the Nine Years that Survived Wyoming's Initial Summary Judgment Motion
9/26/13	394	MT's Second Set of Interrogatories and Requests for Production
9/26/13	395	MT's Responses to WY's Second Set of Interrogatories
9/30/13	396	WY's Designation of Deposition Testimony to be Offered at Trial
9/30/13	397	WY's Motion in Limine to Exclude Affidavits Identified as Exhibits by Montana
9/30/13	398	WY's Motion in Limine to Exclude Scientific Literature Identified as Exhibits by Montana

DATE FILED	#	DOCKET DESCRIPTION
9/30/13	399	WY's Motion in Limine to Exclude Expert Testimony by Steven Larson
9/30/13	400	WY's Trial Memorandum Regarding the Treatment of Return Flows from Diversions of Water Stored in Tongue River Reservoir as Natural Flow
9/30/13	401	MT's Deposition Designation
9/30/13	402	Consolidated Exhibit List
10/4/13	403	Case Management Order No. 13
10/4/13	404	Response in Opposition to WY's Motion in Limine to Exclude the Report and Testimony of Douglas R. Littlefield PhD.
10/4/13	405	MT's Pretrial Brief
10/4/13	406	Response in Opposition to WY's Motion in Limine to Exclude Expert Testimony of Steven Larson
10/4/13	407	Response in Opposition to WY's Motion in Limine to Limit the Presentation of Evidence to Nine Years
10/4/13	408	Response in Opposition to WY's Motion in Limine to Exclude Evidence of Operational Decisions at Tongue River Reservoir

DATE FILED	#	DOCKET DESCRIPTION
10/7/13	409	Consolidated Response in Opposition to WY's Motion in Limine to Exclude Scientific Literature
10/7/13	410	MT's Response to WY's Motion in Limine to Exclude Evidence of Argument
10/7/13	411	<i>Transcript of Status Hearing</i>
10/8/13	412	WY Reply in Support of Motion in limine regarding Littlefield
10/8/13	413	WY Reply in Support of Motion in limine regarding Presentation 9 Years
10/8/13	414	WY Reply in Support of Motion in limine regarding Scientific Literature
10/9/13	415	MT's Supplemental Response in Opposition to WY's Motion in Limine to Exclude Evidence that the 1999 Tongue River Reservoir Enlargement is Protected by Article V(A) of the Yellowstone River Compact
10/9/13	416	WY's Reply in Support of Wyoming's Motion in Limine to Exclude Evidence of Operational Decisions at the Tongue River Reservoir for the Purpose of Determining Montana's Rights under Article V(A).

DATE FILED	#	DOCKET DESCRIPTION
10/10/13	417	WY's Notice of Issuance of Subpoenas to Testify at Trial
10/10/13	418	MT's Notice of Issuance of Subpoenas to Testify at Trial
10/10/13	419	WY's Reply in Support of Motion in Limine to Exclude Expert Testimony by Steven Larson
<i>10/11/13</i>	<i>420</i>	<i>Transcript of Status Hearing of October 11, 2013</i>
10/4/13	422	WY's Notice of Issuance of Subpoena
<i>10/15/13</i>	<i>423</i>	<i>Transcript of Final Pre-Trial Hearing</i>
10/16/13	424	<i>Transcript Volume 1</i>
10/17/13	425	<i>Transcript Volume 2 (1 of 2)</i>
10/17/13	426	<i>Transcript Volume 2 (2 of 2)</i>
10/21/13	427	<i>Transcript Volume 3</i>
10/22/13	428	<i>Transcript Volume 4</i>
10/23/13	429	<i>Transcript Volume 5</i>
10/24/13	430	<i>Transcript Volume 6</i>
10/25/13	431	<i>Transcript Volume 7</i>
10/28/13	432	<i>Transcript Volume 8</i>
10/29/13	433	<i>Transcript Volume 9</i>
10/30/13	434	<i>Transcript Volume 10</i>
10/30/13	435	Notice of Change of Address

DATE FILED	#	DOCKET DESCRIPTION
10/30/13	436	Notice of Change of Address
10/31/13	437	<i>Transcript Volume 11</i>
11/1/13	438	<i>Transcript Volume 12</i>
11/12/13	439	<i>Transcript Volume 13</i>
11/13/13	440	<i>Transcript Volume 14</i>
11/14/13	441	<i>Transcript Volume 15</i>
11/15/13	442	<i>Transcript Volume 16</i>
11/18/13	443	<i>Transcript Volume 17</i>
11/19/13	444	<i>Transcript Volume 18</i>
11/20/13	445	<i>Transcript Volume 19</i>
11/21/13	446	<i>Transcript Volume 20</i>
11/25/13	447	<i>Transcript Volume 21</i>
11/26/13	448	<i>Transcript Volume 22</i>
12/2/13	449	<i>Transcript Volume 23</i>
12/3/13	450	<i>Transcript Volume 24</i>
12/4/13	451	<i>Transcript Volume 25</i>
12/31/13	452	Case Management Order No. 14
2/21/14	453	Case Management Order No. 15
3/31/14	454	Wyoming's Post-Trial Brief
3/31/14	455	North Dakota's Post-Trial Brief
3/31/14	456	Montana's Post-Trial Brief
4/25/14	457	Wyoming's Post-Trial Reply Brief

DATE FILED	#	DOCKET DESCRIPTION
4/25/14	458	<i>Amicus</i> Brief of Northern Cheyenne Tribe
4/25/14	459	<i>Amicus</i> Brief of Anadarko Petroleum
4/25/14	460	Montana's Post-Trial Reply Brief
5/1/14	461	<i>Transcript of May 1, 2014 Post Trial Hearing</i>
5/9/14	462	WY's Additional Authority Following Post-Trial Arguments
5/9/14	463	MT's Additional Citations Responsive to Issues and Questions Raised During Closing Argument
8/19/14	464	<i>Transcript of August 19, 2014 Post Trial Hearing</i>

