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IN THE MATTER OF THE DISTRIBUTION OF WATER TO VARIOUS WATER RIGHTS HELD BY AND FOR THE BENEFIT OF A&B IRRIGATION DISTRICT, AMERICAN FALLS RESERVOIR DISTRICT #2, BURLEY IRRIGATION DISTRICT, MILNER IRRIGATION DISTRICT, MINIDOKA IRRIGATION DISTRICT, NORTH SIDE CANAL COMPANY, AND TWIN FALLS CANAL COMPANY

Docket No. CM-DC-2010-001

DECLARATION OF GREGORY K. SULLIVAN, P.E.

I, Gregory K. Sullivan, P.E., being duly sworn do depose and state:

1. I make this declaration based upon personal knowledge and expertise, in support of the Ground Water Users' May 5, 2023, *Motion for Reconsideration* regarding the irrigated acres of Twin Falls Canal Company ("TFCC").

2. My professional resume is provided as **Attachment A** to this Declaration.

3. In late 2022, I actively participated in several meetings of the Technical Working Group ("TWG") that was convened by the Idaho Department of Water Resources ("IDWR") to consider potential changes to the *Fourth Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season*

Demand and Reasonable Carryover ("Fourth Methodology Order"). In the *Final Order Regarding April 2016 Forecast Supply (Methodology Steps 1-3)* that applied the Fourth Methodology Order, the irrigated acres for TFCC were calculated as 194,732 acres.

4. On April 21, 2023, the Director issued his *Fifth Amended Final Order Regarding Methodology for Determining Material Injury to Reasonable In-Season Demand* ("Fifth Methodology Order") and *Reasonable Carryover* and *Final Order Regarding April 2023 Forecast Supply (Methodology Steps 1-3)* ("As-Applied Order"). The Fifth Methodology Order and As-Applied Order specify that TFCC is irrigating **194,732 acres**. *Fifth Methodology Order* at 10; *As-Applied Order* at 2.

5. During the 2008 IDWR hearing concerning the SWC Delivery Call that was filed in 2005, SPF Water Engineering, LLC ("SPF"), experts for the Idaho Ground Water Appropriators, Inc. ("IGWA"), submitted a March 20, 2007, expert report entitled *Estimate of Non-Irrigated Acres within the Twin Falls Canal Company Service Area* (Exhibit 4310). In that report, SPF found that of the total 198,632 acres that were adjudicated, 15,043 acres were not irrigated, leaving **183,589 acres** that were irrigated.

6. IDWR used **183,589 acres** as the irrigated area for TFCC for purposes of its reasonable in-season demand ("RISD") calculations in the 2013 and 2014 Methodology Orders. I have been unable to confirm the acreage figures that were used in 2010 – 2012, but I believe them to be the same 183,589 acres based on the following table pasted from the most recent RISD spreadsheet (DS RISD Calculator_2022_August 15.xlsx):

Summary of Irrigated Acres Utilized in Protocol Calculations

Year	Member ID	Area of Surface Water Irr (ac)	Year Acreage Established	Reference Document
2000-2014	AFRD2	62,361	5/11/2006	Director's Report
2000-2014	A&B*	15,924	5/11/2006	Director's Report
2000-2014	Milner	13,335	5/11/2006	Director's Report
2000-2014	Minidoka	70,144	12/29/2005	Exhibit 4300 Claimed POU Analysis (BID, TFCC, NSCC),Table 6 [15], SPF - 12/29/05
2000-2014	BID	44,715	12/29/2005	Exhibit 4300 Claimed POU Analysis (BID, TFCC, NSCC),Table 6 [15], SPF - 12/29/05
2000-2014	TFCC	183,589	3/20/2007	Exhibit 4310 Estimate of Non-irrigated acres w/in the TFCC Service Area, Table 10 [25], SPF - 3/20/07
2000-2014	NSCC	154,067	5/11/2006	Director's Report

7. During early 2015, IDWR convened another TWG to discuss modifications to the SWC Methodology. The irrigated area for the SWC members was among the topics discussed at these meetings. The table on the following page of acres was contained in a presentation given to the TWG on February 19, 2015, by Matt Anders of IDWR:

SWC Member	2005-2007 SPF	2012 Partial Decrees	2013 SWC Submitted Shapefiles	2013 RISD
A&B		14,637 (2006 PD = 15,924)		15,924
AFRD2		62,361		62,361
Burley	44,715	47,643	46,084	44,715
Milner		13,335		13,335
Minidoka	70,144	75,093	74,112	70,144
NSCC		154,067		154,067
TFCC	183,589	196,162	194,778	183,589

8. Travis Thompson, attorney for several of the SWC members, including TFCC, sent a letter to IDWR Director Spackman on April 8, 2015, requesting that the Director use the "authorized acres" for his client's natural flow water right for purposes of water rights administration. Mr. Thompson's letter states in part:

> With respect to the Step 1 requirement to confirm irrigated acreage for the year, our clients adopt and resubmit the letter that was delivered to you last year for purposes of 2014 administration. As noted last year, all of our clients' decreed natural flow water rights identify the number of authorized acres to irrigate within their respective project boundaries. Accordingly, the Director is required to use the elements of the partial decrees for purposes of water right administration. I.C. §§ 42-607; 1417.
>
> Moreover, all clients have confirmed that the expected irrigated area within each project this year has not varied by more than 5% from the existing information (electronic shape files) that have been submitted to you in prior years.
>
> The number of irrigated acres identified by existing shape files on file with the SRBA Court or as submitted to you in prior years is as follows: A&B - 15,924; BID -46,083; Milner-13,335; NSCC- 154,067; **TFCC - 194,778**.

Emphasis added.

9. Mr. Thompson had sent a similar letter to Director Spackman in 2014 with the same request to use a figure of 194,778 acres for the TFCC. However, IDWR continued to use the lower SPF figure of 183,589 acres in the 2014 SWC Methodology orders.

10. Beginning in 2015 and continuing through 2022, IDWR used **194,732 acres** as the irrigated area for the TFCC for purposes of the RISD calculations in the SWC Methodology Orders. This is 46 acres less than the TFCC acreage figure that was in Mr. Thompson's 2014 and 2015 letters. The reason for this slight difference is unknown.

11. In the TWG meetings that were convened by IDWR in late 2022, irrigated area was among the potential changes to the SWC Methodology that were discussed.

12. On December 1, 2023, a presentation was given by IDWR staff (Ethan Geisler, Kara Ferguson, & Matt Anders) entitled, *Proposed Modification to Method for Determining Reasonable In-Season Demand for the Surface Water Coalition: Use of the Near Real Time METRIC.* The presentation included the following slide listing the irrigated acres for the SWC members from various sources.

IDAHO Department of Water Resources

SWC Irrigated Acres

SWC Member	Created by SWC or IDWR PPU	Date of Shapefile	Shapefile Acres	If Remove Non-Irrigated Acres with 2011 Irrigated lands Dataset	If Remove Non-Irrigated Acres with 2017 Irrigated lands Dataset	Methodology Acres
A&B	PPU	2010	21,976	21,585	21,634	15,924
AFRD2	PPU	2010	69,279	68,368	66,606	62,361
Burley	SWC	2013	46,035	44,113	44,168	46,035
Milner	PPU	2010	14,844	13,239	13,202	13,335
Minidoka	SWC	2022	75,340	71,295	72,016	75,340
NSCC	PPU	2010	224,463	220,953	218,498	154,067
TFCC	SWC	2013	194,732	179,486	180,956	194,732

The table confirms that the **194,732 acres** used in recent SWC Methodology orders was from the 2013 SWC shapefile submitted by the SWC in 2013. Also of interest are the values determined by IDWR for the TFCC based on IDWR's 2011 and 2017 Irrigated Lands Datasets when the non-irrigated acres are removed. The resulting values are **179,486 acres** for 2011 and **180,956 acres** for 2017.

13. The irrigated acreage figures determined by IDWR for 2011 (179,486 acres) and 2017 (180,956 acres) are several thousand acres less than the value presented in the 2007 SPF report (183,589 acres) that IDWR used in the SWC Methodology Orders prior to 2015. The decline in acres is reasonable given the continued urbanization of parts of the TFCC service area.

14. In my comments submitted to the IDWR and TWG on January 16, 2023, I indicated that the irrigated acres in the shapefiles submitted by the SWC members should be verified to reasonably match the actual irrigated lands determined from aerial imaging, field verification, and/or remote sensing.

15. IGWA expert, Sophia Sigstedt, made more extensive observations about the TFCC irrigated area in her comments to IDWR and the TWG, also submitted on January 16, 2023:

> The IDWR staff presentation regarding near-real-time METRIC application identified a significant shortcoming in the current method for calculating CWN as the fact that the most up-to-date crop data is from the previous year and that SWC irrigated acre datasets sometimes represent service areas, not the actual irrigated land. Non-irrigated acres should not be considered in determining the irrigation supply necessary for SWC members. The METRIC data could first be used to create a standard review process for the Methodology Order Step 1 submittal of irrigated acres by the SWC entities. IDWR staff should use a precise determination of irrigated acreage irrespective of whether it uses METRIC in the calculation of CWN. With IDWR staff only checking against the total acres for the decreed place of use, there is little to no incentive to keep the spatial data for the irrigated acres up to date. The METRIC data would be available for the current irrigation season and can be used to assess actual irrigated land. Some of the preliminary analysis by IDWR staff using METRIC data illustrated that through processing they were able to identify about 15,000 acres within the TFCC irrigated acres dataset that should not qualify as irrigated. The mischaracterized acres were all minor areal corrections but over a large service area such as TFCC added up to a significant amount of erroneous total acres. This just highlights the importance of spending the time to get an accurate picture of irrigated acres for an accurate RISD calculation. As previously noted in Lynker's 2015 comment letter the 5% change standard for SWC submittals should be reconsidered in light of large districts like TFCC where a 5% error in the irrigated acres can result in calculation of tens of thousands of acre-feet of erroneous mitigation obligation. Liz Cresto an IDWR staff member on the TWG in 2015 also made a similar recommendation in her comment letter attached to the staff memorandum.

16. Based on the information presented by IDWR during the TWG meetings and the comments submitted by myself and Ms. Sigstedt on January 16, 2023, I expected the Director would use the irrigated acres for the TFCC that were discussed in the TWG meetings for purposes computing the RISD for the TFCC in 2023. However, the Fifth Methodology Order and the As-Applied Order continue to specify that TFCC is irrigating **194,732 acres**.

17. On May 5, 2023, the Director took official notice of the records of the TWG in his *Notice of Materials Department Witnesses May Rely upon at Hearing and Intent to Take Official Notice*.

18. The 2017 irrigated area determined by IDWR for the TFCC (180,956 acres) is **13,776 acres** less than the value proposed for 2023 (194,732 acres).

19. I computed the reduction in the annual TFCC demand that would occur if the TFCC acres were reduced by 13,776 acres using the average crop irrigation requirement for the TFCC for 2000-2021 (2.2 AF/ac) from the IDWR backup materials for the 2022 SWC Methodology and the average monthly Project Efficiency values from the Fifth Methodology Order (35%) as shown below:

TFCC Acres	
Methodology:	194,732 acres (Fifth Methodology Order at 10)
NRT Metric:	180,956 acres (12/1/2022 IDWR Presentation to TWG at 19)
Difference:	13,776 acres
TFCC Avg CIR:	2.2 AF/ac (DS RISD Calculator_2022_August 15.xslx)
TFCC Average PE:	35% (Fifth Methodology Order at 14)
Demand Reduction =	(13,776 acres x 2.2 AF/ac) / 0.35
Demand Reduction =	**86,600 AF**

20. The 86,600 AF reduction in the TFCC annual diversion demand that results from using the actual irrigated area for the TFCC in 2017 demonstrates the significance of the irrigated area input to the SWC Methodology. The **86,600 AF** reduction in annual TFCC diversion demand is less than the **75,000 AF** of shortage that is predicted for the TFCC in the April 2023 As-Applied Order.

I certify under penalty of perjury pursuant to the law of the State of Idaho that the foregoing is true and correct.

DATED this 7th day of May 2023.

Gregory K. Sullivan, P.E.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 7th day of May, 2023, the above and foregoing, was served by the method indicated below, and addressed to the following:

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/s/ *Chris M. Bromley*
Chris M. Bromley

ATTACHMENT A

Attachment A

Gregory K. Sullivan, P.E.

President and Senior Water Resources Engineer

Education: M.S., Civil Engineering, 1990, University of Colorado - Denver
B.S., Civil Engineering, 1985, Colorado State University

Professional Registration: Professional Engineer in Colorado, Idaho, and New Mexico

Professional Experience:

1990 - Present: ***Spronk Water Engineers, Inc., President and Senior Water Resources Engineer***

Mr. Sullivan has over thirty-five years of experience completing a wide variety of water resources engineering projects. Mr. Sullivan has extensive experience performing historical consumptive use analyses, stream depletions analyses, and reservoir operations studies. Mr. Sullivan serves as the primary consultant to numerous water providers for water supply planning and water rights engineering. In that role, he has been responsible for technical analyses in supporting applications for adjudication of water rights, changes of water rights, exchanges, augmentation plans, and other water right matters. He has led the development of complex surface water operations models that simulate municipal water demands and how those demands maybe met by available water supplies and water rights. Mr. Sullivan has served on the Eastern Snake Hydrologic Modeling Committee that guides the development and use of a regional ground water model of the Eastern Snake River Plain Aquifer since 1996. Mr. Sullivan has provided expert testimony in the U.S. Supreme Court, Colorado Water Courts, Snake River Basin Adjudication Court (Idaho), and in administrative hearings before the Idaho Department of Water Resources.

Representative Projects:

Water Supply Modeling - Texas v. New Mexico and Colorado – Rio Grande Basin

Mr. Sullivan is the lead modeling expert for the State of New Mexico in an active lawsuit filed by the State of Texas in the U.S. Supreme Court concerning alleged violations of the 1938 Rio Grande Compact. Mr. Sullivan is leading a multidisciplinary team of renowned experts from across the country that is analyzing and modeling the historical operation of the Rio Grande Project and the effects of alleged compact violations asserted in the

claims and counterclaims of the parties. The ongoing work includes compilation and analysis of historical data from before the time of the compact to the present, and development of farm budget models of large irrigation systems in New Mexico, Texas, and Mexico. In addition, Mr. Sullivan is coordinating development and use of a linked surface water (RiverWare) and ground water (MODFLOW) models of the Lower Rio Grande area from Elephant Butte Reservoir in New Mexico to Fort Quitman, Texas. The Integrated Lower Rio Grande Model simulates the essential hydrologic and institutional/management processes associated with irrigation and municipal water systems in the study area, including the allocation, operation, and accounting mechanisms of the Rio Grande Project.

Water Supply Modeling - Kansas v. Colorado – Arkansas River Basin

Mr. Sullivan was involved in the refinement and use of the H-I Model of the Arkansas River system in Colorado that was developed to support claims by the State of Kansas that Colorado was violating the terms of the 1948 Arkansas River Compact. The model simulates daily operation of irrigation water uses under approximately two dozen canal systems along the Arkansas River in Colorado between the City of Pueblo and the Colorado-Kansas from 1950 to the present. In addition, the model simulates the operation of sole-source and supplemental irrigation wells, and the impact of those wells on the flow of the Arkansas River. Mr. Sullivan provided expert testimony before a Special Master appointed by the U.S. Supreme Court regarding the use of the H-I Model to evaluate the effects on state line flows resulting from post-compact well development in Colorado.

Injury Analysis - Kansas v. Colorado – Arkansas River Basin

Mr. Sullivan developed a model that was used as part of an analysis to compute the economic impacts and monetary damages to Kansas resulting from the compact violations by Colorado that were determined in the Kansas v. Colorado lawsuit. The model was used to translate monthly depletions to usable stateline flows over a 45-year period into impacts to (a) surface water users in Kansas, (b) to supplemental pumping demands in Kansas and (c) to recharge of the regional ground water system. Mr. Sullivan testified before the Special Master regarding the model development, operation, and results.

Analysis of Replacement Plans - Kansas v. Colorado – Arkansas River Basin

To continue use of post-compact Arkansas River alluvial wells, the well owners in Colorado were required to develop Replacement Plans to offset the impacts of pumping on senior surface water rights in Colorado and on usable stateline flows to Kansas. Mr. Sullivan analyzed the adequacy of these replacement plans through preparation of historical use analyses, water budgets, and other analyses. In addition, Mr. Sullivan used the H-I Model to simulate the effectiveness of the replacement plans in meeting Colorado's delivery obligations under the Arkansas River Compact. Mr. Sullivan provided expert testimony before the Special Master concerning his analyses of the Colorado Replacement Plans.

Change of Water Rights - City of Loveland, Colorado

Mr. Sullivan was the principal investigator for ditch-wide historical use analyses of the major Big Thompson River irrigation ditches that serve lands in and around the City of Loveland. These analyses served as the basis for successful changes of water rights that were approved by the Division 1 Water Court to allow the City to divert its ditch shares at the City's municipal water intakes to help meet its water supply needs. He also guided development of detailed water rights accounting for the City to Mr. Sullivan provided expert testimony in support of the changes of water rights in a contested trial.

Water Supply Yield Modeling - City of Loveland, Colorado

Mr. Sullivan led the development of a model to simulate the daily water supply and demand of the City of Loveland over a study period from 1950 - 2017. The water supplies that are simulated in the model include the ditch shares that have been changed to municipal use, Colorado-Big Thompson Project units, Windy Gap Project units, and the operation of the City's Green Ridge Glade Reservoir. The model is used by the City to evaluate the firm yield of its water supply, and how that yield can be increased through acquisition of additional supplies, development of additional storage, changes in water supply operations and other actions.

Water Supply Planning – ACWWA, Colorado

Mr. Sullivan has provided water resources and water rights consulting for the Arapahoe County Water and Wastewater Authority for over 30 years. ACWWA serves lands in the Cherry Creek basin south of Denver through a

combination of shallow alluvial wells and deep nontributary Denver Basin wells. Water use from these sources is integrated and optimized through operation of a complex plan for augmentation that provides for replacement of out-of-priority depletions to Cherry Creek to protect downstream senior water users. Mr. Sullivan has performed numerous analyses to evaluate the yield of ACWWA's water supplies, including completion of a raw water master plan in 2018.

Plan for Augmentation - Upper Cherry Creek Water Association, Colorado

Mr. Sullivan was instrumental in the development of an umbrella plan for augmentation for five major water users in the Cherry Creek Basin upstream of Cherry Creek Reservoir. The members have pooled their augmentation sources to replace the combined out-of-priority depletions resulting from alluvial well pumping and out-of-priority storage in Cherry Creek Reservoir. The plan includes an innovative method of computing depletions that considers times when Cherry Creek is dry in the vicinity of the member wells.

Cherry Creek Aquifer Modeling Project – Colorado

Mr. Sullivan led the development of a basin-wide simulation model of the hydrology and water use in the Cherry Creek basin upstream of Cherry Creek Reservoir. The model simulates the water supplies and water rights of all municipal water providers in the study area and optimizes the alluvial pumping of the water users and the use of Denver Basin ground water replacement supplies. The model also simulates the operation of Cherry Creek Reservoir and Rueter-Hess Reservoir. The model is used by the study participants to evaluate changes in water supply operations and acquisition of new water supplies.

Snake River Basin Adjudication - Idaho

Mr. Sullivan assisted the City of Pocatello in filing claims to adjudicate water rights as part of the SRBA. This work included historical research of facilities and water uses to document historical flow rates, volumes, and priority dates to assign to the claimed water rights. Mr. Sullivan provided expert testimony before the SRBA Court to help defend the City's claims that were disputed by others.

Snake River Delivery Calls - Idaho

Mr. Sullivan has provided technical analysis and expert testimony to the City of Pocatello in their participation in complex litigation involving water right delivery calls by senior surface water users on the Snake River in Idaho. Pocatello's water supply is derived primarily from junior priority wells that are tributary to the Snake River, and its water supply is threatened by the delivery calls. Mr. Sullivan analyzed the historical operation of seven major irrigation districts that placed the delivery calls to assess the extent of their claimed irrigation water shortages. The irrigation districts serve a combined area of 560,000 acres with annual diversions averaging 3.2 million acre-feet per year. Mr. Sullivan provide expert testimony is several hearings before the hearing officers in Idaho Depart of Water Resources.

ESPA Cities Mitigation Plan – Snake River Basin, Idaho

Mr. provided technical expertise and analysis in development of a mitigation plan for Pocatello, Idaho Falls, and more than a dozen other cities to mitigate the impacts of municipal groundwater pumping from the Eastern Snake Plain Aquifer in Idaho. The plan relies largely on aquifer recharge to mitigate the impacts of aquifer depletions from pumping that is projected to increase from about 60,000 acre-feet per year to over 120,000 acre-feet per year over the next 50 years.

Division 3 Rules Case - Rio Grande Basin, Colorado

Mr. Sullivan represented a group of surface water right owners that opposed the enactment of administrative rules governing the withdrawal and use of ground water in the Rio Grande Basin in Colorado (Water Division 3). The primary basis for their opposition was that the rules did not provide for mitigation of impacts to a large spring that was the source of their surface water rights and which dried up in conjunction with the large-scale development of ground water irrigation in the area. Mr. Sullivan's work included analysis of the historical irrigation water use by his clients, review of hydrologic data and records, and review of a ground water modeling of the San Luis Valley performed by the State of Colorado. Mr. Sullivan provided expert testimony on behalf of his clients in a trial before the Division 3 Water Court.

Ground Water Administrative Proceeding – Wood River Basin, Idaho

Mr. Sullivan represents the Sun Valley Company and the Cities of Ketchum, Hailey, and Bellevue in an administrative proceeding in the Wood River Valley in Idaho. Holders of senior surface water rights are seeking curtailment of junior ground water rights based on allegations of injury being suffered by the seniors, and the Idaho Department of Water Resources is proposing to implement conjunctive administration of groundwater rights and surface water rights to address the injury claims. A groundwater model of the Wood River Valley developed by IDWR with input from stakeholders is being used in the dispute to assess impacts from pumping on surface water supplies. Mr. Sullivan provided expert testimony on behalf of SVC and the Cities in a contested administrative hearing before the IDWR Director. Mr. Sullivan is also a member of a technical working group that has been assembled to develop a groundwater management plan that is hoped to settle the ongoing dispute.

1985 – 1990: ***J. W. Patterson & Associates, Inc., Water Resources Engineer***

Performed water supply, hydraulic and hydrologic analyses for agricultural, industrial, commercial, and municipal developments. Managed yield and impact analyses of water rights adjudications, transfers, exchanges and plans for augmentation. Conducted ground water studies including aquifer testing, project dewatering and water well design and construction monitoring.

Continuing Education:

Applied Ground-Water Flow Modeling. International Ground Water Modeling Center, Colorado School of Mines, Golden, CO. March 1993.

Introduction to Simulation Training in RiverWare, Center for Advanced Decision Support for Water and Environmental Systems, University of Colorado, May 2016.