AGENDA

IDAHO WATER RESOURCE BOARD

Board Meeting No. 15-21
WORK SESSION
Thursday, November 18, 2021
Executive Session 8:00 a.m. (MT)
Open Meeting 9:30 a.m. (MT)
Water Center
Conference Rooms 602 B, C & D / Zoom Online
322 E. Front St.
BOISE
Click here to join our Zoom Meeting
Dial in Option: 1(253) 215-8782 Meeting ID: 886 3389 9518 Passcode: 574002

Brad Little
Governor

Jeff Raybould
Chairman
St. Anthony
At Large

Roger W. Chase
Vice-Chairman
Pocatello
District 4

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Secretary
Lewiston
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Dale Van Stone
Hope
District 1

Albert Barker
Boise
District 2

Dean Stevenson
Paul
District 3

Peter Van Der Meulen
Hailey
At Large

Brian Olmstead
Twin Falls
At Large

1. Roll Call
2. Executive Session: Board will meet pursuant to Idaho Code § 74-206(1) subsection (f) to communicate with legal counsel regarding legal ramifications of and legal options for pending litigation, or controversies not yet being litigated but imminently likely to be litigated. Topics: WR 74-16187, Recharge Water Rights, & Priest Lake. Closed to the public; no actions taken during executive session.
3. Lemhi Basin Settlement Working Group Update
4. Anderson Ranch Dam Raise Update
5. Administrative Rules Update
6. Priest Lake Water Management Project Update
7. Elmore County Water Supply Issues
8. Loan Program
    a. Point Springs Grazing Association Loan Modification
    b. Program Interest Rate Proposal
    c. King Hill Irrigation District Loan Application
    d. Blaine County Canal Company Loan Application
    e. Lakeview Estates Subdivision HOA Loan Application
9. Cloud Seeding Program
    - Operations & Maintenance Budget
    - Research & Development
    - Program Update
10. Regional Manager's Report
11. Non-Action Items for Discussion
12. Adjourn

Aquifer Stabilization Committee Meeting No. 2-21
Upon completion of Work Session

1. Introductions and Attendance
2. ESPA Recharge Update
3. Standards & Procedures
4. Other Items
5. Adjourn

The board will break for lunch at approximately noon.

* Action Item: A vote regarding this item may be made this meeting. Identifying an item as an action item on the agenda does not require a vote to be taken on the item. **Americans with Disabilities**: If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email: jennifer.strange@idwr.idaho.gov or by phone at (208) 287-4800.

Memorandum

To: Idaho Water Resource Board

From: Wesley Hipke

Date: November 8, 2021

Re: ESPA Managed Recharge Program Status Report

REQUIRED ACTION: No action is required.

I. IWRB Managed Recharge Summary

IWRB Natural Flow Managed Recharge

The IWRB recharge water rights came into priority October 20th. Irrigation deliveries stopped for the season on October 15th. The Milner Pool is typically drawn down for inspections at the end of the irrigation season, however, this year draw down occurred during the irrigation season. The water associated with the drawdown of the pool was diverted for irrigation (technically using Milner Storage water). The Milner Pool storage right had priority, therefore, IWRB's water right didn't come into priority below Minidoka Dam until the Pool was filled at a winter operating level of approximately 10 ft.

A current summary of recharge activities is provided in Table 1. The US Bureau of Reclamation's releases from Minidoka Dam have been averaging 408 cfs at the time of this report. The volume of water available for recharge is a product of outflow from Minidoka Dam plus reach gains between the dam and the Milner Pool. Currently the only way to estimate the reach gains is by factoring in the releases from Minidoka and Milner Dams, any diversion from the Milner Pool, and the level of the Milner Pool. The releases and diversion are relatively straight forward. The level of the Milner Pool, however, is impacted by numerous factors including a lag time between releases from the Minidoka Dam to flow reaching Milner Dam along with the measurement of the pool level, which can be significantly impacted by wind conditions. Estimates of reach gains fluctuate between 50 to 100 cfs. If the USBR maintains current winter-time release rates for the remainder of the recharge season, the volume of water available for recharge is estimated to be between 400 to 450 cfs.

Table 1. IWRB Managed Recharge 2020/2021 Summary

Water Source	Area	Start	# Days	Current Rate (cfs)	Median Rate (cfs)	Total Recharged (Acre-feet)*
Snake River	Lower Valley	Oct. 20	19	420	406	14,432

* As of November 7, 2021 – Reported recharge volumes are preliminary and subject to change.

II. ESPA Recharge Program Projects and Buildout Activities

The IWRB has expanded the managed recharge capabilities since the start of the full-scale Program in 2014. Over the past seven years the IWRB has added approximately 2,400 cfs of managed recharge capacity, the majority being in the Lower Valley (2,100 cfs). Investigation of cost-effective recharge capacity projects will continue to improve the program's ability to meet the long-term goals, especially during periods of drought. The following tables provide a summary and status of current ESPA recharge capacity projects (Table 2) and Program operations (Table 3).

Table 2. IWRB ESPA Managed Recharge Capacity/Site Projects

IWRB Partner	Project Name	Project Type	Status	IWRB Funds	Scheduled Completion	Description / Key Items
TFCC	TFCC Injection Wells	Construction	Active	$178,000	Fall 2022	**Construction of recharge wells** • TFCC is currently reviewing the project to determine the best path forward.
AFRD2	MP 31 BLM Embankment	Construction / Maintenance	Active	$320,000	Complete	**Construction of Embankment to protect BLM road** • Substantial Construction Complete – May 2020 • Final Construction Cost – $164,361 • BLM assessing if movement of current fencing is required.
Fremont-Madison ID	Egin Lakes Phase II	Construction	Active	$580,000	Complete	**Construction of recharge capacity expansion** • Construction Complete – May 2020 • Final Cost – $559,054
Butte Market Lake Co.	Injection Well Test	Testing / Construction	Active	$110,000	Spring 2021	**Construction of recharge site** • Construction of infrastructure & well – Winter-Spring 2021 • Test well – Spring 2021 • Final Cost – $110,000
IWRB	Upper Valley – Large Scale Recharge Project	Study	Planning	$99,500	Jan 2022	**Potential large scale managed recharge projects** • Feasibility investigation of 3 potential areas – Nov 2020 • High level review of 3 sites w/ delivery corridors, data needs, and potential constraints – Spring-Summer 2021 • Collect & analyze data – Summer-Fall 2021 • Conceptual designs, cost & permitting requirements – Fall-Winter 2021
Enterprize Canal Co.	Willow Creek/Swan Hwy Recharge Site	Cost / Design	Planning	$70,000	Summer 2022	**Evaluation, design, & cost -potential recharge project** • Complete preliminary design – June 2020 (final cost-$63,794) • Contracted to assist with final Cost/Design/Bid Docs –Sept. 2021 • 50% design – Fall 2021

Table 3. IWRB ESPA Managed Recharge Program Projects

Project	Purpose	Stage(s)	Status(s)	IWRB Funds	Scheduled Completion	**Description /** Key Items
Recharge Program Website	Public Outreach & Data Accessibility	Development	Active	--	Phase 1 - Winter 2021	**Development of IWRB Recharge Program Website** • Development of basic content – Spring/Winter 2020 • Complete initial draft of priority topics – Spring 2021 • Deployment of high priority topics to public – Fall/Winter 2021 • Link website to WISKI db – Winter 2021
Recharge Program Database	Data Storage, Analysis, & Accessibility (website)	Data Preparation & Design	Active	--	Spring 2022	**Development of Program Database for Recharge water level, flow, water quality, & dye-testing data** • Basic training – Kisters-WISKI – Summer2020 • Coordination w/ Hydrology & data prep – Spring 2021 • Upload of historic data – Fall/Winter 2021 • Develop report templates – Fall 2021/Spring 2022 • Integration with Recharge website – Winter 2021
Program Standards & Procedures	Standardizing Processes and IWRB recharge requirements	Development	Active	--	Spring 2022	**Development of Program Standards & Procedures** • Reintroduced key topics Aq. Stabilization committee – Aug 2021 • Development of supporting material – Fall 2021/Spring 2022
Program Analysis	Assist in policy development & demonstration of Program effectiveness	Development & Presentation of Results	Active	--	Ongoing	**Development & Update of Analysis for Planning** • ESPA potential IWRB recharge capacity analysis – Complete/Update as required • Recharge site particle travel time – Summer 2021 • ESPA animated water level change map – Update Summer 2021 • ESPA Recharge WQ summary/analysis – Winter 2021 • ESPA Recharge benefit analysis – Preliminary results - Summer 2021 • Incorporate RiverWare Model for ESPA Recharge forecasting and planning – Winter 2021

Memorandum

To: IWRB Aquifer Stabilization Committee

From: Cooper Fritz & Wesley Hipke

Date: November 8, 2021

Re: Methodology for Determination of Historical Incidental Recharge - ESPA Managed Recharge Program Standard and Procedures

Standard and Procedure – IWRB MAR Operations I.8 – Determination of Historical System Operation Dates

Purpose

To ensure that new water is added to the aquifer by providing a method to differentiate between managed aquifer recharge and historical incidental recharge resulting from routine irrigation system operations.

Overview

The goal of the IWRB Managed Aquifer Recharge ("MAR") program ("program") is to add new water to the aquifer, thereby increasing aquifer storage. The program typically partners with entities who own water irrigation delivery systems ("systems") to conduct MAR. These systems provide incidental aquifer recharge during their normal operations as a result of delivery conveyance losses, or "sub" out of canals and laterals, which recharges the aquifer below. When the systems are not conducting irrigation deliveries, they can be used to conduct recharge for the program. The issue for the program has been determining when the systems would normally start or stop irrigation deliveries.

The purpose of this procedure's proposal is to determine the dates when, in a typical year, irrigation delivery operations are performed within a system ("system operation dates"). Recharge performed outside of the bounds of the calculated system's irrigation operation dates should then be considered new water added to the aquifer, or, MAR. The proposed method provides a standardized, transparent methodology that can be applied to all program partners conducting IWRB recharge. The methodology is based on historic practices of the system. Using the proposed method, an analysis of systems utilized by the program above American Falls Reservoir noted median system operation dates lasting from April 25 through October 17. The earliest irrigation start date was calculated as April 11 for one system, while several systems had a median operation end date of October 31.

Background

Whenever a system diverts water for any beneficial use, incidental aquifer recharge occurs as a byproduct. Incidental recharge therefore occurs during the entirety of systems' typical operation dates. This incidental recharge is recognized as a public benefit (e.g. Idaho Code 42-234), but is not considered MAR. MAR is additional, or "new," water added to the aquifer.

In order to effectively perform MAR, the program will strive to utilize system conveyance losses outside of the bounds of a system's typical operation dates. This memo proposes a standard procedure for determining each system's historical operation dates. Water recharged from the system to the aquifer outside of the bounds of the calculated system operation dates should be considered new water added to the aquifer, or, MAR.

Overview of Procedure to Determine New Water Added to the Aquifer

The procedure to determine system operation dates, included separately as Attachment 1, proposes to examine median diversion time-periods in each calendar year from 1990 through 2015, inclusive. This time period is recent enough to take into account large-scale conversion from flood to sprinkler irrigation. The time period occurred after the construction of the reservoirs on the Snake River in the 1960s, but before MAR operations began in earnest in 2017. The time period is also broad enough to include wet periods (e.g. 1995 - 1999) and dry cycles (e.g. 1990 – 1992, 2001 – 2004). Use of the median value assists in smoothing out anomalous data to determine a long-term representative value.

The proposed methodology provides a standardized method for determining when IWRB recharge could be conducted above "normal" system operations. Basic assumptions:

- The 26 years proposed for examination are representative of current operations and provide enough data to discern patterns.

- Only official, finalized data from the relevant diversion-reporting entity (e.g. USGS, Water District 1, etc) will be utilized.

- Collaboration with partners/operators and adaptive management will be essential. The goal is to add new water to the aquifer.

Attachment 1

Procedure to Determine Historical System Operation Dates

The program proposes the following methodology to determine historical system operation dates:

1. Obtain the historical diversion data for the system of interest, typically via authoritative sources (e.g. Water District 1, USGS, etc). The data is provided in the "Flow (CFS)," also known as the "Sum of Flow (cfs)," through the system's headgate (example of the data shown in Figure 1).

2. The reviewer would record the first and last date of diversion into each system's headgate during each calendar year (example shown in Figure 2).

    a. Some discretion by the reviewer will be necessary. In Figure 2, the system continues to divert a small amount of water from October 29 – 31. This diversion rate is clearly distinct from the system's delivery operations that ended on October 28, and likely represents a small amount of unintended, de minimus leakage through the headgate.

    b. If a system "pauses" during the normal delivery season, and then resumes a subsequent delivery operation, the date of the end of the final delivery operation would be used. These pauses are generally towards the end of the irrigation season and occur either due to lack of demand and/or junior water rights or lack of storage water.

    c. If a system participated in MAR operations during the historic time period analyzed those deliveries will be excluded.

3. The historical system operation dates will then be the median calendar date of the 26 (1990-2015) analyzed first and last dates of diversion (example shown in Figure 3).

4. Once the calculations are complete the results will be sent to the recharge partner for their review and feedback before being applied.

The following should also be considered when calculating system operation dates:

1. All diversions that drain to a common end, or otherwise serve the same general area, should be considered as a single system containing multiple points of diversion. The earliest first and latest last dates should be applied across all points of diversion.

    For example: Two separate canals drain to a single endpoint. One canal has historical system operation dates of April 1 through October 31, and the other only the month of July. The system operation dates for both points of diversion would be April 1 through October 31. Both canals could be used for MAR outside of the bounds of those dates.

2. IWRB staff, in consultation with the recharge partner, will have discretion to adaptively manage any unforeseen circumstances not covered by the method described above, with the primary goal of adding new water to the aquifer.

Figure 1. Sample of Water District 01 (WD-01) system diversion data.

SiteID	SiteType	Flow (CFS)	Gage Height (Feet)	HSTDate	Irrigation Year
XXXXXXX	D	0	0	5/4/1991	1991
XXXXXXX	D	0	0	5/5/1991	1991
XXXXXXX	D	86	1.19	5/6/1991	1991
XXXXXXX	D	137	1.51	5/7/1991	1991
XXXXXXX	D	227	1.96	5/8/1991	1991
XXXXXXX	D	267	2.13	5/9/1991	1991
XXXXXXX	D	311	2.31	5/10/1991	1991
XXXXXXX	D	309	2.3	5/11/1991	1991
XXXXXXX	D	340	2.42	5/12/1991	1991
XXXXXXX	D	371	2.53	5/13/1991	1991
XXXXXXX	D	351	2.46	5/14/1991	1991
XXXXXXX	D	353	2.47	5/15/1991	1991
XXXXXXX	D	366	2.52	5/16/1991	1991
XXXXXXX	D	385	2.59	5/17/1991	1991
XXXXXXX	D	353	2.48	5/18/1991	1991
XXXXXXX	D	328	2.39	5/19/1991	1991
XXXXXXX	D	328	2.39	5/20/1991	1991
XXXXXXX	D	332	2.41	5/21/1991	1991
XXXXXXX	D	351	2.48	5/22/1991	1991
XXXXXXX	D	392	2.63	5/23/1991	1991

Figure 2. Sample of determining end and start dates for “normal” operational deliveries in a given year.

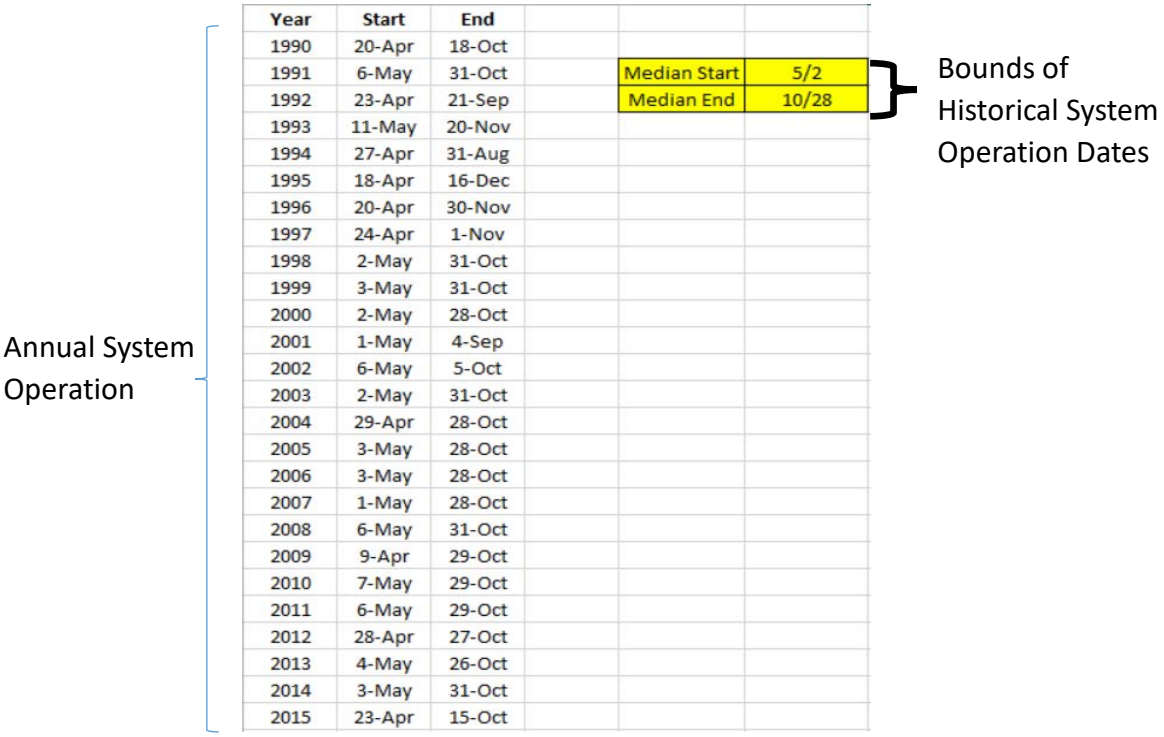
	A	B
1	Date	Sum of Flow (CFS)
71	21-Oct	372
72	22-Oct	372
73	23-Oct	375
74	24-Oct	375
75	25-Oct	375
76	26-Oct	375
77	27-Oct	375
78	28-Oct	180
79	29-Oct	21
80	30-Oct	22
81	31-Oct	22
82	2001	
83	May	
84	1-May	240
85	2-May	443
86	3-May	678
87	4-May	777
88	5-May	801
89	6-May	805
90	7-May	809

End of Irrigation

No readings for diversions in April

Start of Irrigation

Figure 3. Sample of determining end and start dates for “normal” operational deliveries for a system.



Memorandum

To: IWRB Aquifer Stabilization Committee

From: Cooper Fritz & Wesley Hipke

Date: November 8, 2021

Re: Methodology for Determination of Historical Incidental Recharge - ESPA Managed Recharge Program Standard and Procedures

Standard and Procedure – IWRB MAR Operations I.8 – Determination of Historical Diversion Rates of Non-irrigation Water

Purpose

To ensure that new water is added to the aquifer by providing a method to differentiate between managed aquifer recharge and historical incidental recharge resulting from routine non-irrigation operations.

Overview

The goal of the IWRB Managed Aquifer Recharge ("MAR") program ("program") is to add new water to the aquifer, thereby increasing aquifer storage. The program typically partners with entities who own water delivery systems ("systems") to conduct MAR. Some of these systems have historically operated during the non-irrigation season, with uses such as stockwater, subirrigation, and flow maintenance. These routine operations have provided incidental recharge to the aquifer as a byproduct. A cursory examination of a few of these diversions indicated that daily rates could range from a few cubic-feet per second (cfs) to hundreds of cfs.

This memo proposes a method to calculate historical incidental recharge rates resulting from a system's routine non-irrigation operations. Any additional rate resulting from the program's operations could be considered managed aquifer recharge, ensuring that new water is added to the aquifer.

Background

Typically, a significant portion of a system's capacity is used during irrigation operations, and it is common for some water to be returned to the river ("return flows"). However, when systems are used for routine non-irrigation purposes, only a fraction of system capacity is utilized and it is common for there to be no return flows. This means that all water diverted during routine non-irrigation operations seeps into the aquifer and, as a byproduct, provides incidental aquifer recharge. Therefore, median rates during the non-irrigation season provide an accurate measure of historical incidental recharge rates. The lack of return flows also indicates there is additional room in the systems for MAR.

Some systems divert non-irrigation water consistently. Others only divert non-irrigation water during typical (i.e. non-drought) years, under water rights that are senior to the IWRB recharge rights. During these drought years it is unlikely that IWRB recharge operations would occur under the Board's current recharge diversion procedures.

A cursory review of historical non-irrigation diversion rates shows a significant amount of annual variability within in most systems. This variability results from dynamic combinations of water availability, weather conditions, canal operations, and demand. Nevertheless, to provide new water to the aquifer it is necessary to determine incidental recharge that has historically occurred. Any rate over the historical incidental recharge rate resulting from the program's operations would be considered "new" water, which in turn results in increased aquifer storage.

Overview of Procedure to Determine New Water Added to the Aquifer

The procedure to determine historical incidental recharge rates, included separately as Attachment 1, proposes to examine median monthly diversion rates during the non-irrigation season from calendar years 1990 through 2015. This time period is recent enough to take into account large-scale conversion from flood to sprinkler irrigation. The time period also occurs after the construction of the reservoirs on the Snake River in the 1960s, but before MAR operations began in earnest in 2017. The time period is also broad enough to include wet periods (e.g. 1995 - 1999) and dry cycles (e.g. 1990 – 1992, 2001 – 2004). Use of the median value assists in smoothing out anomalous data to determine a long-term representative value.

Basic assumptions:

- The 26 years proposed for examination are representative of current operations and provide enough data to discern patterns.
- Only official, finalized data from the relevant diversion-reporting entity (e.g. USGS, Water District 1, etc) will be utilized.
- New water added to the aquifer is any additional water added above the amount provided by historical incidental recharge.
- Only years in which diversions occurred will be used in the determinations. Years in which diversions did not occur would have been too dry for IWRB managed aquifer recharge operations, as explained above.
- Any water recharged in systems above their historical incidental recharge rate will be considered new water added to the aquifer, and therefore to be managed aquifer recharge.
- Any water leaving the system would be deducted from the managed aquifer recharge volume.
- Cooperation with partners/operators and adaptive management will be essential. The goal is to add new water to the aquifer.

Attachment 1

Procedure to Determine Historical Incidental Recharge Rates

The Program proposes the following methodology to determine historical incidental recharge rates:

1. Obtain the historical diversion data for the system of interest, typically via Water District 1, USGS, or other authoritative sources. The data is provided in the "Flow (CFS)," also known as the "Sum of Flow (cfs)," through the system's headgate (example of the data shown in Figure 1).

2. The Daily cfs from step 1 is used to determine a "Monthly Sum" cfs through the headgate for each Irrigation year from 1990 – 2015 (Figure 2). This analysis will generally focus on the non-irrigation season, in most cases from November through March, inclusive.

    a. Months in which a system participated in a managed recharge operation will be excluded as not indicative of a normal base flow.

    b. Months in which a system did not divert water will be excluded from the calculation as not representative of conditions that IWRB recharge water would normally be available.

3. The daily "Historical Incidental Recharge Rate" per month is determined by the following steps (Figure 3):

    a. A "Monthly Median Sum" (cfs) is calculated by determining the median of the 26 (1990-2015) Monthly Sums.

    b. The median of the Monthly Median Sum is then divided by the number of days for that month to ascertain the historical daily median baseflow (cfs).

    Staff will verify the Historical Incidental Recharge Rate calculations with the recharge partner for their review and feedback before being applied.

    For recharge to be counted as part of the IWRB program the daily amount of water diverted for managed recharge would be subtracted by the Historical Incidental Recharge Rate (for that month) and any return flows for that day.

Other factors to be considered when calculating the historical incidental recharge rate:

1. All diversions that drain to a common end should be considered as a single system containing multiple points of diversion. The baseflow should be applied across all points of diversion.

    For example: Two separate canals drain to a single endpoint, or otherwise serve the same general area. One canal has a Historical Incidental Recharge Rate of 100 cfs whereas the other has 0 cfs. The total Historic Incidental Recharge Rate for both points

of diversion would be 100 cfs. Therefore, a combined diversion of 101 cfs from both canals would result in 1 cfs of IWRB recharge.

2. Both irrigation and non-irrigation operations may occur during "shoulder months" at the beginning and end of the irrigation season (e.g. April and October). The Historical Operation Dates will be calculated as detailed in the Determination of Historical System Operation Dates memo. For the remainder of the shoulder month, the baseflow from the previous month will be utilized prior the start date, and the following month's baseflow will be utilized after the season's end date.

   For example: A system's historical incidental recharge rate for November is 20 cfs, as calculated under this memo's procedures. The system's switch from irrigation to non-irrigation operations occurs on October 20, as calculated under the Determination of Historical System Operation Dates memo's procedures. A historical incidental recharge rate of 20 cfs would be applied from October 21 through November 30.

3. IWRB staff, in consultation with the recharge partner, will have discretion to adaptively manage any unforeseen circumstances not covered by the method described above, with the primary goal of adding new water to the aquifer.

Figure 1. Sample of Water District 01 (WD-01) system diversion data.

Figure 2. Sample of determining a system's "normal" diversion rate during non-irrigation operations.

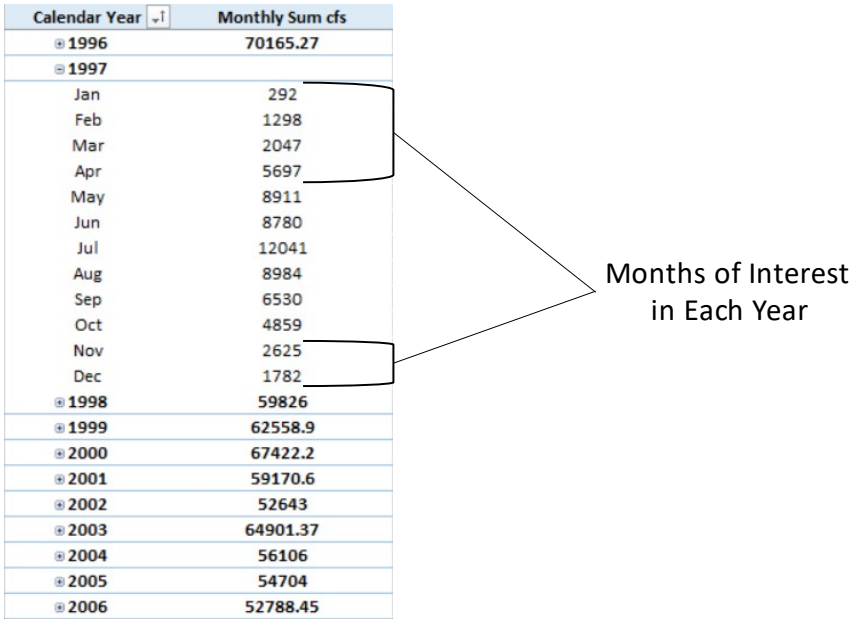
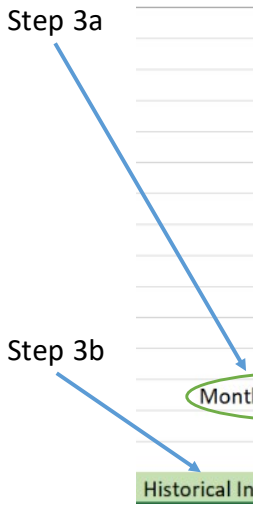


Figure 3. Sample of determining end and start dates for “normal” operational deliveries for a system.



	Sum of Total cfs Through Headgate Per Month				
Irrigation Year	November	December	January	Februrary	March
2005					
2006					63
2007	170.55				1718
2008					86.1
2009	4465.64	1450.19	3.1	2.8	1466
2010	1544.24				3472
2011	2537.38	84			1353
2012	1520.28	275.76	167	159	2415
2013					519.2
2014	220.11				1943
2015	395			898.75	3241
Monthly Median Sum of cfs	1381	1450.19	1612	1410	2048
Historical Incidental Recharge Rate (cfs)	46.03	46.78	52.00	49.91	66.07

Any rate above that in the green row would be considered new water added to the aquifer.