Amended AGENDA

IDAHO WATER RESOURCE BOARD

Board Meeting No. 10-19
November 14, 2019
8:00 a.m.
Water Center
Conference Room 602 B, C & D
322 E. Front St.
BOISE

Brad Little
Governor

Roger W. Chase
Chairman
Pocatello
District 4

Jeff Raybould
Vice-Chairman
St. Anthony
At Large

Vince Alberdi
Secretary
Kimberly
At Large

Peter Van Der Meulen
Hailey
At Large

Albert Barker
Boise
District 2

John "Bert" Stevenson
Rupert
District 3

Dale Van Stone
Hope
District 1

Jo Ann Cole-Hansen
Lewiston
At Large

1. Roll Call
2. Executive Session – Board will meet pursuant to Idaho Code §74-206(1) subsection (d), for the purpose of considering records that are exempt from disclosure. Topic: Idaho Code §42-1737. Executive Session is closed to the public.

Following adjournment of Executive Session – meeting reopens to the public.

3. Agenda & Approval of Minutes 7-19, 8-19, 9-19*
4. Financial Report
5. Boise River Feasibility Study Update
6. Priest Lake Water Management Project
    a. Program Update
    b. Lakes Commission Comments
7. Palouse Basin Aquifer Committee Update
8. ESPA Recharge
    a. Program Update
    b. Upper Valley Large Recharge Project Presentation
    c. Dye Trace Presentation
9. Water Transactions*
10. Potential Legislation of Interest
11. Administrative Rules Process Update
12. Director's Report
13. 2020 Proposed Meeting Dates
14. Other Items for Discussion
15. Next Meeting & Adjourn

The Board will break for lunch at approximately 11:45 a.m.

* 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

The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. 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.

IDAHO WATER RESOURCE BOARD

Brad Little
Governor

Roger W. Chase
Chairman
Pocatello
District 4

Jeff Raybould
Vice-Chairman
St. Anthony
At Large

Vince Alberdi
Secretary
Kimberly
At Large

Peter Van Der Meulen
Hailey
At Large

Albert Barker
Boise
District 2

John "Bert" Stevenson
Rupert
District 3

Dale Van Stone
Hope
District 1

Jo Ann Cole-Hansen
Lewiston
At Large

MINUTES
MEETING NO. 7-19

SpringHill Suites
Conference Room
1177 S. Yellowstone Hwy
REXBURG

July 25, 2019
Work Session

Chairman Chase called the work session meeting to order at 8:00 a.m.
Roll Call: all Board members were present.

IDWR staff members present were: Brian Patton, Cynthia Clark Bridge, Neeley Miller, Wesley Hipke, Mathew Weaver, Matt Anders, and Mike McVay.

Guests present were: Michael Orr, Jerry Rigby, John Simpson, Roland Springer, Alan Jackson, Mel Kunkel, Shaun Parkinson, Lynn Tominaga, Scott Breeding, Randy Brown, Shaun Maupin, and Rex Wade.

During the Work Session the following items were discussed:

- The Board convened into Executive Session pursuant to Idaho Code §74-206(1) subsection (f) to discuss the topic of Lemhi River Water Right Applications. Mr. Alberdi moved that the Board resolve into executive session. Mr. Van Stone seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

At 8:50 a.m. Mr. Alberdi made a motion to resolve out of executive session. Chairman Chase seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

- A presentation by Jerry Rigby, John Simpson, and Alan Jackson from the Committee of Nine Tribal Rights Subcommittee.
- An update on the Boise River Feasibility Study by Cynthia Bridge Clark and Roland Springer.

- A presentation on the Cooperative Cloud Seeding Program was provided by Cynthia Bridge Clark, Matt Anders, and Mel Kunkel from Idaho Power.
- An update on Flood Management Grants by Neeley Miller.
- Information related to a loan request from Milner Irrigation District was provided by Rick Collingwood.
- A brief update on the Priest Lake Water Management Project by Neeley Miller.
- An update on Bear Lake by Vice Chair Raybould.
- A presentation on the North Fremont Canal System Project by Rick Collingwood, with comments from Shawn Maupin and Rex Wade.

No actions were taken by the Board during the Executive Session or the Work Session. The meeting adjourned at 11:45 a.m., after which, the Board broke for lunch and then went on a field trip to the North Fremont Canal System Project.

July 26, 2019
Board Meeting No. 7-19

At 8:00 a.m. Chairman Chase called the meeting to order. All members were present.

Agenda Item No. 1: Roll Call

Board Members Present

Roger Chase, Chairman	Jeff Raybould, Vice-Chairman
Vince Alberdi, Secretary	Pete Van Der Meulen
Bert Stevenson	Dale Van Stone
Jo Ann Cole-Hansen	Albert Barker

Staff Members Present

Mathew Weaver, Deputy Director	Brian Patton, Executive Officer
Cynthia Bridge Clark, Water Projects Section Manager	Neeley Miller, Senior Planner
Rick Collingwood, Water Projects Staff Engineer	Wesley Hipke, Recharge Project Mgr.

Guests Present

Representative Britt Raybould	John Williams, BPA
Lynn Tominaga IGWA	Shaun Parkinson, Idaho Power Company
Roland Springer, US Bureau of Reclamation	David Stephenson, BWCC
Megan Sloan, US Bureau of Reclamation	Travis Thompson, A&B Irrigation
Brian Yeager, City of Hailey Public Works	Paul Hansen, Island Park HOA

Agenda Item No. 2: Public Comment

Travis Thompson, representing A & B Irrigation and Twin Falls Canal Company, informed the Board that a funding request will be coming for recharge purposes in the Mid-Snake.

Brian Yeager from the City of Hailey expressed gratitude to the Board for the 2018 Flood Control Grants provided. He gave some information on the projects and presented a brief video.

John Williams provided an update on Bonneville Power Administration activities.
Lynn Tominaga of the Idaho Ground Water Association thanked the Board for the hearing held and the work involved, and that IGWA would be supportive of the Board's decisions.

Agenda Item No. 3: Agenda & Approval of Minutes

Mr. Barker moved to approve meeting minutes 5-19. Mr. Alberdi seconded. Voice vote. All in favor. Motion carried.

Agenda Item No. 4: Financial Report

Neeley Miller provided a financial report on the Board's funds. Mr. Patton stated the numbers were as of June 30, 2019.

Agenda Item No. 5: Lemhi River Basin

Mr. Patton reminded the Board that they received information on this agenda item in the previous day's meeting. There was a resolution presented for the Board's consideration.

The resolution would authorize staff and counsel to retain technical consultants and experts to support the Board's protests to applications for permits to divert from tributaries to the Upper Lemhi River. Mr. Barker made a motion to accept the resolution. Mr. Van Stone seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

Agenda Item No. 6: Flood Management Grants

Mr. Miller provided a brief recap of the current status of the Flood Management Grants program.

Before the Board was a resolution to award funds through the Flood Management Grants Program. Mr. Raybould moved to adopt the resolution with an attached table listing the 2019 projects and a note that item 3 information will be used in making land use planning decisions. Mr. Barker seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye—abstain with regard to Item 6, as it pertains to Board of Controls Irrigation; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

Agenda Item No. 7: Milner Irrigation District Loan Request

Mr. Patton and Mr. Collingwood provided a summary of the loan request by Milner Irrigation District.

Before the Board was a resolution to authorize funding to construct new main irrigation conveyance pipelines for the Milner Irrigation District. Mr. Alberdi moved to adopt the resolution. Mr. Stevenson seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, abstain; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 7 ayes, motion passed.

Agenda Item No. 8: Series 2005 Revenue Bonds

Mr. Patton provided history on the Bonds. New owners of some properties would like to enter into an agreement with the Board and the bond trustee. A resolution would authorize negotiations. Mr. Raybould asked if this action would affect the Board's future ability to issue revenue bonds. Mr. Patton affirmed that this action would not negatively impact the Board.. There was some discussion and clarification.

Mr. Raybould moved to adopt the resolution. Mr. Alberdi seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

Agenda Item No. 9: ESPA Managed Recharge

Mr. Hipke reminded the Board that a presentation related to this topic had been given at the recent committee meeting, and there was a resolution for consideration. Mr. Barker asked about a timeline for the resolution price structures. There was discussion about setting a time. Mr. Hipke suggested adding a line that these go for 5 years.

Mr. Alberdi moved to adopt the resolution with the added clarification of up to 5 years. Mr. Raybould seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, nay; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 7 ayes. 1 nay. Motion passed.

An Upper Valley resolution was provided to the Board. There was discussion on whether to table the resolution or just not act. Mr. Raybould said more information was needed and recommended that the current fee structure remain in place for the Upper Valley. Mr. Stevenson asked about the length of the contracts in the Upper Valley. Mr. Hipke confirmed that the contracts are for one year. Mr. Raybould advised that the memorandum of intent related to those contracts are longer term. Mr. Hipke added that term is 20 years. The Board moved on to the next agenda item without action.

Agenda Item No. 10: Cooperative Cloud Seeding Program

Ms. Clark summarized the resolution before the Board to commit additional funds for the Cooperative Cloud Seeding Program which was the topic of a lengthy discussion during the work session. She provided program budget information and Shaun Parkinson provided additional data. There was discussion about the commitment and the funding for the program.

Mr. Raybould moved to adopt the resolution to approve funds for the Cooperative Cloud Seeding Program on a year-to-year basis and a statement about benefits. Ms. Cole-Hansen seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

Agenda Item No. 11: Mountain Home AFB Sustainable Water Project Update

Mr. Patton updated the Board on the Mountain Home AFB Sustainable Water Project. Included in the board books were a memo, a letter, and a draft MOA received from the Federal government. He listed some of the concerns with the memorandum.

Agenda Item No. 12: Henry's Fork Stream Alteration Approval

Mr. Miller presented a resolution to grant a stream channel alteration permit application. IDWR stream channel alteration staff had reviewed the project and indicated that they would issue the permit, pending Board approval. Two members of the HOA who applied for the permit were in attendance. Dr. Paul Hansen appeared before the Board and provided more details for the requested permit. There was some discussion about private and public use.

Mr. Van Stone moved to adopt the resolution to approve stream alteration permit No. 21-20108. Mr. Barker seconded. Voice vote: all were in favor. Motion carried.

Agenda Item No. 13: IDWR Eastern Regional Manager Update

Mr. Cefalo provided an update in Eastern Regional activities. Bear Lake has become an increasingly busier area for new water right applications; flow meter installation for the ESPA groundwater agreement has kept Eastern staff busy; and transfer applications have increased for the region, resulting in an increase in application protests. Finally, he suggested that the Bear River needs to be adjudicated.

Agenda Item No. 14: Administrative Rules Process Update

Mat Weaver updated the Board on the administrative rules process and the Red Tape Reduction Act. He shared the public comments that had been received related to the proposed rules, which prompted the scheduling of three hearings. Public hearing requests were included in the book materials.. Board members had been invited to participate in the hearings.

Agenda Item No. 15: Director's Report

Deputy Director Mat Weaver provided an update on IDWR activities. He supported Mr. Cefalo's comments that staff across the state have been very busy. He discussed the fact that several retirements were pending, and he informed the Board of the Office of IT Services (OITS) plan to centralize IT across state agencies. There was discussion about potential problems and issues of uncertainty. Next, there was an update on the ESPA groundwater management order. He identified the three oppositional parties, to which the Director requested supporting briefs related to the opposition. Finally, there was an update on the Northern adjudication activities.

Agenda Item No. 16: Non-Action Items for Discussion

No items were presented.

Agenda Item No. 17: Next Meeting and Adjourn

The next scheduled meetings were September 19-20, 2019 and November 14-15, 2019. Mr. Stevenson moved to adjourn. Mr. Raybould seconded. Voice vote. All in favor. The meeting adjourned.

Respectfully submitted this _____ day of November, 2019.

_____

Vince Alberdi, *Secretary*

_____

Jennifer Strange, *Administrative Assistant II*

Board Actions:

1. Mr. Barker moved to approve meeting minutes 5-19. Mr. Alberdi seconded. Voice Vote. All in favor. Motion passed.

2. Mr. Barker moved to adopt Resolution #14-2019 approving funds up to $40,000 to retain technical consultants and experts to support the Board's protests. Mr. Van Stone seconded. Roll Call Vote. 8 Ayes. Motion carried.

3. Mr. Raybould moved to adopt Resolution #15-2019 to award Flood Management Grants. Mr. Barker seconded. Roll Call Vote. 8 Ayes, with an Abstention related to attached table item number 6. Motion carried.

4. Mr. Alberdi moved to adopt Resolution #16-2019 approving a loan up to $2,000,000 to Milner Irrigation District to construct new main irrigation conveyance pipelines. Mr. Stevenson seconded. Roll Call Vote. 7 Ayes. 1 Abstain. Motion carried.

5. Mr. Raybould moved to adopt Resolution #17-2019 to enter into an agreement to release certain development revenue bonds. Mr. Alberdi seconded. Roll Call Vote. 8 Ayes. Motion carried.

6. Mr. Alberdi moved to adopt Resolution #18-2019 approving ESPA managed recharge program standards and processes for the Lower Valley. Mr. Raybould seconded. Roll Call Vote. 7 Ayes. 1 Nay. Motion carried.

7. Mr. Raybould moved to adopt Resolution #19-2019 approving funds for the Cooperative Cloud Seeding Program in the Upper Snake, Wood and Boise River Basins. Ms. Cole-Hansen seconded. Roll Call Vote. 8 Ayes. Motion carried.

8. Mr. Van Stone moved to adopt Resolution #20-2019 approving stream alteration permit no. 21-20108. Mr. Barker seconded. Voice Vote. All were in favor. Motion carried.

IDAHO WATER RESOURCE BOARD

Brad Little
Governor

Roger W. Chase
Chairman
Pocatello
District 4

Jeff Raybould
Vice-Chairman
St. Anthony
At Large

Vince Alberdi
Secretary
Kimberly
At Large

Peter Van Der Meulen
Hailey
At Large

Albert Barker
Boise
District 2

John "Bert" Stevenson
Rupert
District 3

Dale Van Stone
Hope
District 1

Jo Ann Cole-Hansen
Lewiston
At Large

MINUTES
MEETING NO. 8-19

Idaho Water Center
Conference Rooms 602 B, C, D
322 East Front Street, 6th Floor
BOISE

September 19, 2019
Work Session

Chairman Chase called the work session meeting to order at 8:00 a.m. All Board members were present. IDWR staff members present were: Brian Patton, Cynthia Clark Bridge, Neeley Miller, Wesley Hipke, and Craig Tesch. Guests present were: Peter Anderson, Lynn Tominaga, Dan Temple, Bill Bosworth, and Fernando Castaneda.

During the Work Session the following items were discussed:

- The Board convened into Executive Session pursuant to Idaho Code §74-206(1) subsection (f) to discuss the topic of Lemhi River Water Right Applications.
- A training by Deputy Attorney General Darrell Early on Open Meeting Law and Ethics.
- A presentation on the Raft River Basin Hydrologic Investigation by Craig Tesch.
- An update on the ESPA Recharge by Wesley Hipke.
- An update on the Priest Lake Water Management Project by Neeley Miller.
- An update on the Boise River Feasibility Study was introduced by Cynthia Bridge Clark, with presentation planned during the board meeting by Roland Springer. There was some discussion among the board members.

No action was taken by the Board during the Work Session. The session adjourned at 11:45 a.m., after which, the Board broke for lunch and then on to a field trip to Anderson Ranch Dam.

At 8:30 a.m. Chairman Chase called the meeting to order. All members were present.

Agenda Item No. 1: Roll Call

Board Members Present

Roger Chase, Chairman
Vince Alberdi, Secretary
Bert Stevenson
Jo Ann Cole-Hansen
Jeff Raybould, Vice-Chairman
Pete Van Der Meulen
Dale Van Stone
Albert Barker

Staff Members Present

Gary Spackman, Director
Cynthia Bridge Clark, Water Projects Section Manager
Rick Collingwood, Water Projects Staff Engineer
Ann Vonde, Deputy Attorney General
Brian Patton, Executive Officer
Neeley Miller, Senior Planner
Wesley Hipke, Recharge Project Mgr.

Guests Present

Braden Jensen, ID Farm Bureau
Alexis Clark, Idaho Geological Survey
Roland Springer, US Bureau of Reclamation
Megan Sloan, US Bureau of Reclamation
Peter Anderson, Trout Unlimited
Lynn Tominaga IGWA
David Stephenson, BWCC

Agenda Item No. 2: Public Comment

David Stephenson from the Big Wood Canal Company (BWCC) mentioned to the Board that they are planning to conduct a study to raise the dam at Magic Reservoir. BWCC has asked engineers to informally estimate the amount of increased storage (acre-feet) if the dam were raised. His company wanted any comments or recommendations from the Board. Mr. Alberdi commended the group on their initiative. There were questions and some discussion.

Agenda Item No. 3: Financial Report

Mr. Miller provided a financial report on the secondary aquifer fund, the revolving development fund and the water management account. Chairman Chase asked about Dworshak funds. Mr. Patton answered.

Agenda Item No. 4: ESPA Recharge

Mr. Hipke briefed the board on the two resolutions related to ESPA recharge. There was some discussion about the costs of the project. Mr. Stevenson had concerns that the irrigation companies were not putting any money in the projects. Mr. Hipke said he would check the amount of money contributed by other parties. The first resolution approves funds from the secondary aquifer fund and provide signatory authority in the matter of the A&B Irrigation district's recharge injection wells.

Mr. Van Stone moved to adopt the resolution. Mr. Raybould seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, abstain; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; and Chairman Chase, aye. 7 ayes, motion passed.

The second recharge resolution approves funds from the secondary aquifer fund and provides signatory authority in the matter of the Twin Falls Canal Company's recharge injection wells. Mr. Raybould moved to adopt the resolution. Mr. Van Der Meulen seconded. Roll call vote: Mr. Alberdi, abstain; Mr. Barker, abstain; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; and Chairman Chase, aye. 6 ayes, motion passed.

Mr. Barker recused himself from both votes. Mr. Stevenson made a statement that his son has water rights in A&B Irrigation, but that he would be voting. Mr. Alberdi recused himself from the vote of the second recharge resolution, as he is a stock holder in Twin Falls Canal Company.

Agenda Item No. 5: Priest Lake Water Management Project

Mr. Miller provided a brief update on the Priest Lake project. The Board had a resolution to commit funds and provide signatory authority in the matter of Priest Lake Water management project, final engineering and design. Mr. Van Stone made a motion to accept the resolution as recommended. Mr. Van Der Meulen seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

Agenda Item No. 6: Boise River Feasibility Study

Mr. Patton stated that the speaker for this agenda item had not yet arrived. There was discussion to move the agenda item until Mr. Springer arrived. Mr. Barker moved to push agenda item 6 back until Mr. Springer arrived. Mr. Alberdi seconded the motion. Voice vote: all in favor.

Rejoining of the topic: Following the completion of Agenda Item 7, Ms. Clark introduced Roland Springer of the Bureau of Reclamation (BOR). Mr. Springer updated the Board on the progress of the study. BOR issued notice of intent to prepare the Environmental Impact Statement, the deadline for comment was September 9. Public meetings were held in Pine, Boise, and Mt. Home. Most comments related to access during construction, recreation and fishery impacts, and water supply to Elmore County. The final installment of the Board's initial commitment of $3M to share study costs was received and appreciated. He stated there are challenges with the federal budgeting process, but the project is included in the budget that is currently before the US Congress. If there are problems with the proposed budget, then regional budgets can cover BOR's project cost obligation.

BOR anticipates continued cooperation with the Board and IDWR as well as meeting the concerns of the tribes. During the next six-months they will prepare the draft feasibility study and environmental impact statement (EIS).

Ms. Clark and Mr. Springer spoke before the Board for action to commit additional funding for the feasibility study and EIS. The original project cost projection was $6M. Mr. Springer explained that total estimated project costs had increased by $1-1.5M, in part due to the accelerated project schedule and delays in the federal budgeting process. The resolution reflected authorization to commit up to an additional $550,000 for project expenses from the Board. Chairman Chase asked if the numbers presented today are likely to remain. Mr. Springer indicated that they are reasonably confident the project will remain under $7.5M total. Ms. Cole-Hansen asked about known endangered plant/animals. Mr. Barker added that there are some species of concern that will need to be evaluated. Mr. Springer said that other than Bull Trout, there were no known endangered plants or animals in the area. The US Fish and Wildlife Service is working with BOR to consult on those issues. Mr. Springer stated that they would know by next summer whether additional funds are needed. Concerns regarding campground space was discussed. BOR plans to address this issue in the study, by working with the Forest Service.

Before the Board was a resolution to commit additional funding for the feasibility study and provide signatory authority in the matter of the Boise River Basin Feasibility Study. Mr. Barker moved to adopt the resolution. Mr. Raybould seconded. Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

Agenda Item No. 7: Mountain Home AFB Water Sustainability Project

Mr. Patton updated the board on the status of this project. He described that the project is at an institutional impasse between the Federal and State governments. The Governor sent a follow-up letter (included in materials). As it stands, Mr. Patton stated that the next move related to a Memorandum of Agreement between the state and Air Force/DOD is currently with the Air Force Base. There was some discussion related to where Federal funding is still available.

The board moved back to agenda item 6, as the speaker had arrived.

Agenda Item No. 8: Bear Lake Update

Vice Chairman Raybould updated the Board on the Bear Lake activities. He stated there have been ongoing meetings with representatives from Wyoming, Utah and PacifiCorp. There is a late October meeting scheduled to review the status of the modeling work to date. Mr. Van Stone asked whether an adjudication has been scheduled for Bear River Basin. Mr. Patton said that an adjudication process has not been initiated. There was further discussion about Bear Lake issues related to flood releases and spinning reserves.

Agenda Item No. 9: Raft River Basin Hydrologic Investigation

Mr. Patton reminded the Board that a presentation related to this topic had been given the previous day in the Work Session, and there was a resolution for consideration.
Mr. Barker moved to adopt the resolution. He further stated that if the DOE funding doesn't come through, then a strong justification will need to be presented. Mr. Raybould seconded.
Roll call vote: Mr. Alberdi, aye; Mr. Barker, aye; Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, aye; Mr. Van Stone, aye; Chairman Chase, aye. 8 ayes, motion passed.

Agenda Item No. 10: IDWR Western Regional Manager Update

Nick Miller addressed the Board on Western Regional activities. He noted an increase in permit filings and an increase in permit & transfer protests. He discussed some of the notable applications in the region, including: Board's Anderson Ranch Dam project, MHAFB, Cat Creek, Elmore County and Micron.

Agenda Item No. 11: Director's Report

Director Spackman reported on several issues and updates. He provided some history and discussed an ongoing issue with Ada County about outages at Barber Dam that affect Boise River flows and downstream irrigators. There have been discussions with Ada County. A Notice of Violation had been issued in response. Other options have been considered because the problem happened another time.

The Director and Mr. Springer from BOR discussed a problem with Arrowrock Dam gates. Some gates were not closing and upon further investigation, it appeared that 2-3 of the gates will need repair. As a result, water was released from Anderson Ranch Dam to maintain levels to protect Bull Trout. Mr. Springer confirmed that there is an issue and that gate repairs will need to be made. An extra

5,000-10,000 acre feet of storage will need to be released to facilitate the repairs, which will create a shortfall in storage water.

Next, the Director stated the refill settlement on the Boise River is almost concluded. IDWR is awaiting Judge Wildman's decision. Mr. Barker replied that absent any further protests, Judge Wildman will vacate, per very recent order.

There was a brief update about controversy related to "reset date" at the Walcott/Minidoka facility.

From public meetings in Northern Idaho, adjudications will move forward. Additionally, Mark Gibbs has stated he will bring forth Bear River Basin adjudication legislation.

Related to the ESPA GW Management Area, there is a pre-hearing scheduled.

Finally, an update on the Department's budget was provided. The Director reported that the Department had been asked to remove all enhancements from the General Fund, and further, a potential 5% reduction of the General Fund FY2020 budget was required.

Agenda Item No. 12: Non-Action Items for Discussion
No items were presented.

Agenda Item No. 13: Next Meeting and Adjourn
The meeting adjourned at 11:15 a.m. The next scheduled meetings were November 14-15, 2019.

Respectfully submitted this _____ day of November, 2019.

_____

Vince Alberdi, *Secretary*

_____

Jennifer Strange, *Administrative Assistant II*

Board Actions:

1. Mr. Van Stone moved to adopt Resolution #21-2019 approving funds up to $202,000 to ABID to develop injection wells for recharge purposes. Mr. Raybould seconded. Roll Call Vote. 7 Ayes. 1 Abstain. Motion carried.

2. Mr. Raybould moved to adopt Resolution #22-2019 approving funds up to $178,000 to TFCC to develop injection wells for recharge purposes. Mr. Van Der Meulen seconded. Roll Call Vote. 6 Ayes. 2 Abstain. Motion carried.

3. Mr. Van Stone moved to adopt Resolution #23-2019 approving funds up to $653,000 for the final engineering and design phase of the Priest Lake Water Management Project. Mr. Van Der Meulen seconded. Roll Call Vote. 8 Ayes. Motion carried.

4. Mr. Barker moved to push Agenda Item 6 back until the presenter arrived. Mr. Alberdi seconded. Voice Vote. All Ayes. Motion passed.

5. Mr. Barker moved to adopt Resolution #24-2019 approving funds up to $550,000 to continue the feasibility study of the Boise River Basin. Mr. Raybould seconded. Roll Call Vote. 8 Ayes. Motion carried.

6. Mr. Barker moved to adopt Resolution #25-2019 approving funds up to $204,000 for one year of the Raft River Basin Hydrologic Project. Mr. Raybould seconded. Roll Call Vote. 8 Ayes. Motion carried.

IDAHO WATER RESOURCE BOARD

Brad Little
Governor

Roger W. Chase
Chairman
Pocatello
District 4

Jeff Raybould
Vice-Chairman
St. Anthony
At Large

Vince Alberdi
Secretary
Kimberly
At Large

Peter Van Der Meulen
Hailey
At Large

Albert Barker
Boise
District 2

John "Bert" Stevenson
Rupert
District 3

Dale Van Stone
Hope
District 1

Jo Ann Cole-Hansen
Lewiston
At Large

MINUTES
MEETING NO. 9-19

Idaho Water Center
Conference Rooms 602 B, C, D
322 East Front Street, 6th Floor
BOISE

October 4, 2019
Teleconference Meeting

At 1:30 p.m. Chairman Chase called the meeting to order.

Agenda Item No. 1: Roll Call

Board Members Present by telephone

Roger Chase, Chairman	Jeff Raybould, Vice-Chairman
Vince Alberdi, Secretary	Bert Stevenson
Jo Ann Cole-Hansen	

Board Members Not Present

Al Barker	Dale Van Stone
Pete Van Der Meulen	

Staff Members Present
Brian Patton, Executive Officer
Mathew Weaver, Deputy Director

Agenda Item No. 2: Administrative Rules

Deputy Director, Mat Weaver said the Board needed to adopt temporary and proposed administrative rules as pending rules. The deadline for adoption of the rules was prior to October 16, 2019. Public hearings were held and comments were accepted related to the proposed rules.

There was discussion related to the resolution. Chairman Chase asked if there were any questions.

Bert Stevenson made a motion to approve the resolution. Mr. Alberdi seconded the motion. Roll Call vote: Mr. Alberdi, aye; Mr. Barker, absent;

Ms. Cole-Hansen, aye; Mr. Raybould, aye; Mr. Stevenson, aye; Mr. Van Der Meulen, absent; Mr. Van Stone, absent; and Chairman Chase, aye. 5 Ayes, Motion Passes.

Agenda Item No. 3 Non-Action Items for Discussion

Mr. Weaver said the Legislature may have more work to complete this issue in the upcoming session as they plan to review the rules adopted.

Agenda Item No. 4 Adjourn

Motion to adjourn was made by Mr. Raybould. Seconded by Mr. Stevenson. Voice vote. All in favor. Meeting adjourned at 1:45 p.m.

Respectfully submitted this _____ day of November, 2019.

_____

Vince Alberdi, *Secretary*

_____

Jennifer Strange, *Administrative Assistant II*

Board Actions:

1. Mr. Stevenson made a motion to adopt the resolution to adopt and publish the IWRB's current and proposed rules as pending rules. Mr. Alberdi seconded. Roll Call Vote. 5 Ayes. Motion passed.

Memorandum

To: Idaho Water Resource Board

From: Brian Patton & Neeley Miller, Planning & Project Bureau

Date: November 4, 2019

Re: Financial Status Report

As **of September 30, 2019** the IWRB's available and committed balances are as follows:

Secondary Aquifer Fund:	
Committed/earmarked but not disbursed	$18,616,909
Uncommitted Balance	$3,485,604
Revolving Development Account:	
Committed/earmarked but not disbursed	$22,069,439
Loan principal outstanding	$26,716,514
Uncommitted Balance	$3,767,424
Anticipated loanable funds available next 1 year	$7,267,424
Water Management Account	
Committed/earmarked but not disbursed	$21,297,549
Uncommitted Balance	$300,758
Total committed/earmarked but not disbursed	**$61,983,897**
Total loan principal outstanding	**$26,716,514**
Total uncommitted balance	**$7,553,786**

- The committed/earmarked balance in the Water Management Account includes the remainder of the FY 2018 $1M legislative appropriation for the Flood Management Grant Program per HB 712. It also includes the $21M legislative appropriation per HB 285 to the IWRB's Water Management Account for the Anderson Reservoir Enlargement and/or MHAFB Water Supply Project ($20 M), the FY 2019 Flood Management Grant Program ($800K) and for the Mid-Snake Water Quality Monitoring and Modeling effort ($200K).

Idaho Water Resource Board
Budget and Committed Funds
as of September 30, 2019

SECONDARY AQUIFER PLANNING, MANAGEMENT, & IMPLEMENTATION FUND

FYE 2019 Cash Balance		**20,839,565.33**
FY 2020 Revenue		
Interest Earned State Treasury	144,754.47	
HB547 - State Recharge & Aquifer Stabilization (SRAS)		
HB256, Section 4 - Water Sustainability	5,000,000.00	
Department of Energy Grant ($2.068M)	23,600.00	
TOTAL FY 2019 REVENUE		**5,168,354.47**
FY 2020 Expenditures		
SRAS Equipment & Supplies - FY 20	(9,913.18)	
SRAS Conveyance Costs - FY 19	(2,171,885.11)	
SRAS Conveyance Costs - FY 20		
SRAS Site Monitoring - FY 20	(126,626.94)	
SRAS Regional Monitoring - FY 19	(28,273.98)	
SRAS Regional Monitoring - FY 20	(25,965.41)	
Big Wood Canal Company (CON01281 - Deitrich Drop Power Plant Improvements Project)	(289,275.02)	
Big Wood Canal Company (CON01293 - MP28 Hydro Plant Winterization Project)		
Elsing Drilling & Pump Co Inc (CON01368 - Wilson Canyon Recharge Basin Improvements Projects - monitoring wells)	(59,961.00)	
Floyd Lilly Company (CON01378 - Wilson Canyon Recharge Basin Improvements Projects - monitoring wells)	(7,782.55)	
North Side Canal Company (CON01331 - Wilson Canyon Recharge Basin Improvements Project)	(111,542.55)	
Quadrant Consulting Inc (CON01296 - MP29 Managed Recharge Site Engineering Services)		
Quadrant Consulting Inc (CON01337 - MP29 Managed Recharge Site Design Documents & Technical Specs)	(22,822.50)	
The Ferguson Group (FY 2019 Budget)	(11,671.72)	
The Ferguson Group (FY 2020 Budget)	(16,000.00)	
Steve Stuebner (FY 2019 Budget) - Media Services	(1,368.75)	
Steve Stuebner (FY 2020 Budget) - Media Services	(3,528.69)	
Clive Strong (CON01371)	(11,077.41)	
Elizabeth Cresto (CON01390)	(385.00)	
Elmore County (CON01251 - Canyon Creek Recharge Site)	(135,978.53)	
Travel Costs for IWRB and staff	(2,755.20)	
WS Hydrology Monitoring - FY 19	(13,249.53)	
WS Hydrology Monitoring - FY 20	(34,171.47)	
USGS - 1663 (Big Wood River Modeling)		
Wood River Model Misc Expenditures (room rentals, refreshments, etc.)		
USGS - 6605 (Treasure Valley Modeling) FY18	(50,235.39)	
University of Idaho (CON01210, TV Model)		
University of Idaho (CON01341, GIS)	(38,389.00)	
Lost Valley Reservoir Company (CON01282 - Northern Idaho Ground Squirrel Study)	(1,613.00)	
Brown & Caldwell (CON01320 - Treasure Valley Managed Recharge Feasibility Study)	(11,225.61)	
Department of Interior - Boise River Feasibility Study (FY2019)	(500,000.00)	
Department of Energy Grant expenditures (ESPA costs) 29871	(929.61)	
Department of Energy Grant expenditures (Big Lost costs) 29872	(165,650.14)	
Down Right Drilling & Pump Inc (CON01369, SE Boise GWMA) 29873	(53,130.00)	
Idaho Power - Cloudseeding Model (CON01254)		
Idaho Power - Cloudseeding O&M (CON01334)		
TOTAL FY 2020 EXPENDITURES		**(3,905,407.29)**
FY 2020 Cash Balance		**22,102,512.51**

COMMITTED FUNDS THRU FY 2018	**Budget**	**Amended**	**Obligated**	**Expenditures**	**Carry forward**	**Committed**
Cooperative Weather Modification Program (Cloud Seeding - CON01109)	492,000.00		492,000.00	(354,917.64)		137,082.36
Department of Energy SEP grant ($251,000)	**200,000.00**		**251,000.00**	**(251,000.00)**		**0.00**
Mountain Home Air Force Base (PCA 29800)	**1,000,000.00**	**900,000.00**	**1,900,000.00**	**(1,164,267.65)**		**735,732.35**
Remaining Initial Funds	**1,692,000.00**	**900,000.00**	**2,643,000.00**	**(1,770,185.29)**	**0.00**	**872,814.71**

ESPA Managed Recharge Infrastructure							
Milner-Gooding Dietrich Drop hydro plant bypass (CON01281)	50,000.00	1,450,000.00	1,500,000.00	(497,404.33)		1,002,595.67	
Egin Lakes Recharge Project, Phase II (CON01225)	500,000.00	80,000.00	580,000.00	(75,275.75)		504,724.25	
Total ESPA Managed Recharge Infrastructure	**5,360,436.45**	**2,330,000.00**	**7,690,436.45**	**(4,316,042.63)**	**(1,867,073.90)**	**1,507,319.92**	
STATEWIDE STUDIES & PROJECTS							
TREASURE VALLEY							
Treasure Valley Modeling (USGS 6605) Year 2 of 5	500,000.00		500,000.00	(446,594.27)		53,405.73	
TREASURE VALLEY TOTAL	**500,000.00**	**0.00**	**500,000.00**	**(446,594.27)**	**0.00**	**53,405.73**	
WOOD RIVER VALLEY							
Wood River Valley Aquifer GW Model (USGS 6601)	200,000.00		200,000.00	(200,000.00)		0.00	
Elmore County - Canyon Creek Recharge Site (CON01251)	50,000.00	90,000.00	140,000.00	(135,978.53)		4,021.47	
WOOD RIVER VALLEY TOTAL	**250,000.00**	**90,000.00**	**340,000.00**	**(335,978.53)**	**0.00**	**4,021.47**	
WEISER BASIN							
Lost Valley Reservoir - Northern Idaho Ground Squirrel Study (CON01282)	30,000.00		30,000.00	(24,759.00)		5,241.00	
WEISER BASIN TOTAL	**30,000.00**	**0.00**	**30,000.00**	**(24,759.00)**	**0.00**	**5,241.00**	
NORTHERN IDAHO AQUIFERS							
Lewiston Study Phase II	109,351.82		109,351.82		(709,351.82)	(600,000.00)	
NORTHERN IDAHO AQUIFERS TOTAL	**109,351.82**	**0.00**	**109,351.82**	**0.00**	**(709,351.82)**	**(600,000.00)**	
OTHER STATEWIDE STUDIES & PROJECTS							
Ground water conservation grants in priority aquifers (CON01205 & CON01223)	200,000.00		200,000.00	(62,484.03)	(112,515.97)	25,000.00	
Cloud Seeding Operations & Maintenance (1/3 of total)	600,000.00	18,000.00	618,000.00	(580,000.00)		38,000.00	
NRCS Snow Survey contribution USDA (CON01177)	100,000.00	100,000.00	200,000.00	(150,000.00)		50,000.00	
Total Statewide Studies & Projects	**900,000.00**	**118,000.00**	**1,018,000.00**	**(792,484.03)**	**(112,515.97)**	**113,000.00**	
TOTAL COMMITTED FUNDS THRU FY 2018	**8,841,788.27**	**3,438,000.00**	**12,330,788.27**	**(7,686,043.75)**	**(2,688,941.69)**	**1,955,802.83**	**Adjustments**

FY 2019 BUDGET	**Budget (as approved - May 2018)**	**Amendments**	**Budget (as amended)**	**Obligated**	**Expenditures**	**Carry forward**	**Committed**
ESPA Managed Recharge Operations							
Equipment & Supplies	89,000.00		89,000.00	89,000.00	(24,569.14)	(64,430.86)	0.00
Conveyance Cost	3,500,000.00		3,500,000.00	3,500,000.00	(2,580,123.11)	(919,876.89)	0.00
Recharge Monitoring	554,550.00		554,550.00	554,550.00	(263,712.43)	(290,837.57)	0.00
Regional Monitoring	200,000.00		200,000.00	200,000.00	(200,000.00)		0.00
Total ESPA Managed Recharge Operations	**4,254,550.00**	**0.00**	**4,254,550.00**	**4,254,550.00**	**(3,043,835.54)**	**(1,210,714.46)**	**0.00**
ESPA Managed Recharge Infrastructure							
North Side CC - Wilson Canyon Recharge Basin (CON01331, CON01368, CON01378)	1,750,000.00	150,000.00	1,900,000.00	1,900,000.00	(1,326,110.80)		573,889.20
AFRD2 MP29 Site	2,150,000.00		2,150,000.00	2,150,000.00		(1,500,000.00)	650,000.00
AFRD2 MP28 Hydro Plant Tailbay - Big Wood Canal (CON01293)	1,000,000.00	400,000.00	1,400,000.00	1,400,000.00	(1,365,000.00)		35,000.00
South Fork & other small Upper Valley sites (CON01297 & CON01298)	1,000,000.00		1,000,000.00	1,000,000.00	(134,941.65)	(865,058.35)	0.00
Reserved for Additional Recharge Projects	500,000.00	(400,000.00)	100,000.00	100,000.00		(100,000.00)	0.00
Total ESPA Managed Recharge Infrastructure	**6,950,000.00**	**150,000.00**	**7,100,000.00**	**7,100,000.00**	**(2,826,052.45)**	**(3,015,058.35)**	**1,258,889.20**
Managed Recharge Investigations							
North Side CC - Recharge Sites (CON01301)	200,000.00		200,000.00	200,000.00	(24,500.00)	(175,500.00)	0.00
MP 29 Managed Recharge Site (CON01296 & CON01337)		85,500.00	85,500.00	85,500.00	(47,560.98)		37,939.02
Reserved for additional investigations and engineering (CON01337)	300,000.00	(85,500.00)	214,500.00	214,500.00		(214,500.00)	0.00
Total Managed Recharge Investigations	**900,000.00**	**0.00**	**900,000.00**	**900,000.00**	**(72,060.98)**	**(790,000.00)**	**37,939.02**
ESPA Hydrologic Monitoring							
Hydrologic Monitoring (DOE - Year 1 of 3 = $928K)	310,000.00		310,000.00	310,000.00	(52,791.02)		257,208.98
ESPA Hydrologic Monitoring	**310,000.00**	**0.00**	**310,000.00**	**310,000.00**	**(52,791.02)**	**0.00**	**257,208.98**

TREASURE VALLEY							
Treasure Valley Modeling Year 3 of 5 (USGS 6605)	500,000.00		500,000.00	500,000.00			500,000.00
Boise River Storage Studies (final payment)	1,000,000.00		1,000,000.00	1,000,000.00	(1,043,661.63)		(43,661.63)
Southeast Boise Groundwater Management Area Monitoring	100,000.00		100,000.00	100,000.00	(53,130.00)		46,870.00
Treasure Valley Recharge Study (CON01320)	200,000.00		200,000.00	200,000.00	(147,581.46)	(10.00)	52,408.54
TREASURE VALLEY TOTAL	**2,000,000.00**	**0.00**	**2,000,000.00**	**2,000,000.00**	**(1,244,373.09)**	**(200,010.00)**	**555,616.91**
BIG LOST							
Hydrologic Monitoring (DOE - Year 1 of 3 = $1.14M)	380,000.00		380,000.00	380,000.00	(301,312.93)		78,687.07
BIG LOST TOTAL	**380,000.00**	**0.00**	**380,000.00**	**380,000.00**	**(301,312.93)**	**0.00**	**78,687.07**
STATE-WIDE							
Aquifer monitoring network enhancements in priority aquifers	309,351.82		309,351.82	309,351.82	(267,205.66)		42,146.16
Cooperative Cloud Seeding Program							
Operations & Maintenance (1/3 of total)	800,000.00		800,000.00	800,000.00	(800,000.00)		0.00
Cloud Seeding Modeling Project, CON01254 (Year 2 of 4, Total $1,470,000)	874,000.00		874,000.00	874,000.00	(412,052.50)		461,947.50
Operations Costs for add'l generators & Upper Snake aircraft	425,000.00		425,000.00	425,000.00		(425,000.00)	0.00
Administrative expenses (public information, staff training, etc)	80,000.00		80,000.00	80,000.00	(42,486.76)	(37,513.24)	0.00
Professional Assistance for securing Federal Funding	100,000.00		100,000.00	100,000.00	(83,887.82)	(16,112.18)	0.00
STATE-WIDE TOTAL	**2,588,351.82**	**0.00**	**2,588,351.82**	**2,588,351.82**	**(1,605,632.74)**	**(478,625.42)**	**504,093.66**
Unspecified Projects in Other Areas or Carry-over	**505,210.00**	**(150,000.00)**	**355,210.00**				
TOTAL FY 2019 BUDGETED FUNDS	**18,313,111.82**	**0.00**	**18,313,111.82**	**17,957,901.82**	**(9,146,058.75)**	**(6,119,408.23)**	**2,692,434.84**

FY 2020 BUDGET	Budget (as approved - May 2019)	Amendments	Budget (as amended)	Obligated	Expenditures	Carry forward	Committed
ESPA Managed Recharge Operations							-
Equipment & Supplies	192,880.00		192,880.00	192,880.00	(9,913.18)		182,966.82
Conveyance Cost	3,500,000.00		3,500,000.00				0.00
Recharge Monitoring	540,950.00		540,950.00	540,950.00	(126,626.94)		414,323.06
Regional Monitoring	200,000.00		200,000.00	200,000.00	(25,965.41)		174,034.59
Total ESPA Managed Recharge Operations	**4,433,830.00**	**0.00**	**4,433,830.00**	**933,830.00**	**(162,505.53)**	**0.00**	**771,324.47**
ESPA Managed Recharge Infrastructure							
North Side CC - Eden Projects	2,000,000.00		2,000,000.00				0.00
Large Upper Valley Investigations	500,000.00		500,000.00				0.00
Small Upper Valley Sites	1,000,000.00		1,000,000.00				0.00
A&B Irrigation - Injection Wells	550,000.00		550,000.00				0.00
Reserved for Additional Recharge Projects	500,000.00		500,000.00				0.00
Total ESPA Managed Recharge Infrastructure	**4,550,000.00**	**0.00**	**4,550,000.00**	**0.00**	**0.00**	**0.00**	**0.00**
Managed Recharge Investigations							
Big/Little Wood Sites	200,000.00		200,000.00				0.00
Reserved for additional investigations and engineering	300,000.00		300,000.00				0.00
Total Managed Recharge Investigations	**500,000.00**	**0.00**	**500,000.00**	**0.00**	**0.00**	**0.00**	**0.00**
ESPA Hydrologic Monitoring							
Hydrologic Monitoring (DOE - Year 2 of 3 = $928K)	310,000.00		310,000.00	310,000.00			310,000.00
ESPA Hydrologic Monitoring	**310,000.00**	**0.00**	**310,000.00**	**310,000.00**	**0.00**	**0.00**	**310,000.00**
TREASURE VALLEY							
Treasure Valley Modeling Year 4 of 5 (USGS 6605)	500,000.00		500,000.00	500,000.00			500,000.00

Treasure Valley DCMI Water Conservation Study	200,000.00		200,000.00				0.00
TREASURE VALLEY TOTAL	**700,000.00**	**0.00**	**700,000.00**	**500,000.00**	**0.00**	**0.00**	**500,000.00**
CAMAS PRAIRIE							
Ground & Surface Water Monitoring	15,000.00		15,000.00				0.00
CAMAS PRAIRIE TOTAL	**15,000.00**	**0.00**	**15,000.00**	**0.00**	**0.00**	**0.00**	**0.00**
BIG LOST							
Hydrologic Monitoring (DOE - Year 2 of 3 = $1.14M)	380,000.00		380,000.00	380,000.00			380,000.00
BIG LOST TOTAL	**380,000.00**	**0.00**	**380,000.00**	**380,000.00**	**0.00**	**0.00**	**380,000.00**
PALOUSE BASIN							
Water Sustainability Projects	100,000.00		100,000.00				0.00
PALOUSE BASIN TOTAL	**100,000.00**	**0.00**	**100,000.00**	**0.00**	**0.00**	**0.00**	**0.00**
BEAR RIVER BASIN							
Water Sustainability Projects	100,000.00		100,000.00	100,000.00	(385.00)		99,615.00
BEAR RIVER BASIN TOTAL	**100,000.00**	**0.00**	**100,000.00**	**100,000.00**	**(385.00)**	**0.00**	**99,615.00**
COOPERATIVE CLOUD SEEDING PROGRAM							
Operations & Maintenance (1/3 of total annual cost for O&M)	1,170,000.00	(217,736.00)	952,264.00	952,264.00			952,264.00
Capital Expenditures (HPC - Year 1 of 2, Total = $700K)	500,000.00		500,000.00	500,000.00			500,000.00
Program Development Activities	200,000.00		200,000.00	200,000.00			200,000.00
COOPERATIVE CLOUD SEEDING PROGRAM TOTAL	**1,870,000.00**	**(217,736.00)**	**1,652,264.00**	**1,652,264.00**	**0.00**	**0.00**	**1,652,264.00**
STATE-WIDE							
Administrative expenses (public information, staff training, etc)	80,000.00		80,000.00	80,000.00	(17,361.30)		62,638.70
Hydrological monitoring hardware and software	15,000.00		15,000.00	15,000.00			15,000.00
Professional Assistance for securing Federal Funding	100,000.00		100,000.00	100,000.00	(16,000.00)		84,000.00
Aquifer monitoring network enhancements in priority aquifers							
Northern Idaho	125,000.00		125,000.00	125,000.00			125,000.00
Southern Idaho (non-ESPA)	125,000.00		125,000.00	125,000.00			125,000.00
STATE-WIDE TOTAL	**445,000.00**	**0.00**	**445,000.00**	**195,000.00**	**(33,361.30)**	**0.00**	**161,638.70**
Unspecified Projects in Other Areas or Carry-over	**1,555,170.00**		**1,555,170.00**				
TOTAL FY 2020 BUDGETED FUNDS	**14,959,000.00**	**0.00**	**14,741,264.00**	**2,418,830.00**	**(196,251.83)**	**0.00**	**2,222,578.17**

IDAHO WATER RESOURCE BOARD
Sources and Applications of Funds
as of September 30, 2019
REVOLVING DEVELOPMENT ACCOUNT

Original Appropriation (1969)		$500,000.00
Legislative Appropriation FY90-91		$250,000.00
Legislative Appropriation FY91-92		$280,700.00
Legislative Appropriation FY93-94		$500,000.00
Legislative Appropriation 2001, SB1239		$200,000.00
Legislative Appropriation 2004, HB843, Sec 12		$500,000.00
Loan Interest		$11,695,818.15
Interest Earned State Treasury (Transferred)		$2,183,744.13
Water Supply Bank Receipts		$6,934,840.17
Transferred to/from Water Management Account		$317,253.80
Filing Fee Balance		$47,640.20
Bond Fees		$1,469,601.45
Series 2000 (Caldwell/New York) Pooled Bond Issuers fees		$43,657.93
2012 Ground Water District Bond Issuer fees		$369,500.00
Bond Issuer fees		$21,107.59
Pierce Well Easement		$2,000.00
Transfer from Aqualife Hatchery Sub-Account		$1,117,800.85
Transfer from Pristine Springs Sub-Account		$554,882.10
Legislative Audits		($49,404.45)
IWRB Bond Program		($15,000.00)
IWRB Studies and Projects		($249,067.18)
Arbitrage Calculation Fees		($12,000.00)
Protest Fees		($995.00)
Attorney fees for Jughandle LID (Skinner Fawcett)		($3,600.00)
Attorney fees for A&B Irrigation (Skinner Fawcett)		($4,637.50)
Lemhi Basin Protest Costs - (Attorney General's Office)		($5,514.00)
Weiser Galloway Study - US Army Corps of Engineers		($1,555,450.71)
Boise River Storage Feasibility Study		($333,000.00)
Geotech Environmental (Transducers)		($6,402.61)
Priest Lake Improvement Study (16-Mar-16)		($370,393.26)
Treasureton Irrigation Ditch Co		($5,000.00)
Mountain Home AFB Water Sustainability Project (29514)		
Legislative Appropriation 2014, HB 479 Sec 1 and 2	$4,000,000.00	
JR Simplot - WR Purchase	($2,500,000.00)	
LeMoyne Appraisal LLC	($10,500.00)	
IWRB WSB Lease Application	($750.00)	
Integrated Delivery Solutions - Mark Alpert	($34,459.18)	
Brown & Caldwell - Owner's Advisor	($1,218,298.11)	
SPF Engineering - WR Transfer	($118,715.75)	
Skinner-Fawcett - Bond Counsel	($31,602.41)	
Pillsbury, Winthrop, & Shaw - DBO Counsel	($79,839.30)	
Project Costs (mailings, travel, teleconference calls)	($1,769.91)	
Publishing Costs	($1,648.16)	
Water District 02 Assessments	($2,417.18)	
Balance for Mountain Home AFB Water Sustainability Project		**$0.00**
Galloway Dam & Reservoir Project (29517)		
Legislative Appropriation 2014, HB 479 Sec 1 and 2	$2,000,000.00	
Galloway Dam & Reservoir Project Costs (HB 479)	($124,708.68)	
Balance Galloway Dam & Reservoir Project		**$1,875,291.32**
Boise River (Arrowrock Enlargement) Feasibility Study (29518)		
Legislative Appropriation 2014, HB 479 Sec 1 and 2	$1,500,000.00	
Boise River (Arrowrock Enlargement) Feasibility Study Costs (HB479)	($1,500,000.00)	
Balance Boise River (Arrowrock Enlargement) Feasibility Study (HB479)		**$0.00**
Island Park Enlargement (29520)		
Legislative Appropriation 2014, HB 479 Sec 1 and 2	$2,500,000.00	
Island Park Enlargement Costs (HB 479)	($174,170.00)	
Balance Island Park Enlargement (HB 479)		**$2,325,830.00**
Water Supply Bank Computer Infrastructure (29519)		
Legislative Appropriation 2014, HB 479 Sec 1 and 2	$500,000.00	
Water Supply Bank Computer Infrastructure Costs (HB 479)	($497,350.75)	
Balance Water Supply Bank Computer Infrastructure (HB 479)		**$2,649.25**
Cash Balance of Legislative Appropriation 2014, HB 479 Sec 1 and 2		**$4,203,770.57**
Minidoka Dam Enlargement/Teton Dam Replacement Studies (29510)		
Legislative Appropriation 2008, SB1511 Sec 2, Minidoka/Teton Studies		$1,800,000.00
Legislative Appropriation 2008, SB1511 Sec 2, Minidoka Studies Expenditures		($1,229,460.18)
Balance for Minidoka Dam Enlargement/Teton Dam Replacement Studies		**$570,539.82**
Priest Lake Water Management Project (29521)		
Legislative Appropriation (2018, HB 677 Sec 5)	$2,400,000.00	
Legislative Approval (2018, HB 677 Sec 6	$2,419,580.50	
Bonner County Contribution	$160,000.00	
Interest Earned State Treasury	$88,068.06	
Contract Expenditures - Mott MacDonald (CON01290)	($511,941.67)	
Balance for Priest Lake Water Management Project		**$4,555,706.89**

Bell Rapids Water Rights Sub-Account		
Legislative Appropriation 2005, HB392	$21,300,000.00	
Bureau of Reclamation Payments Received	$29,446,335.46	
Remaining balance in ESPA Sub-Account	$341,759.55	
Interest Earned State Treasury	$698,613.04	
Total Bell Rapids Water Rights Sub-Account Revenue		**$51,786,708.05**
Bell Rapids Purchase	($22,041,697.55)	
Transfer to General Fund - P&I	($22,072,052.06)	
Payment to US Bank for Alternative Financing Note	($7,118,125.86)	
Payment for Water District 02 Assessments	($75,882.82)	
Payment for Ongoing Bell Rapids Finance Costs (trustee fees, water bank	($6,740.10)	
Total Bell Rapids Water Rights Sub-Account Expenditures		**($51,314,498.39)**
Cash Balance Bell Rapids Water Rights Sub-Account		**$472,209.66**
Commited Funds		
Ongoing Bell Rapids Finance Costs (trustee fees, WD02)	$472,209.66	
TOTAL COMMITTED FUNDS	$472,209.66	
Uncommitted Bell Rapids Water Rights Sub-Account Balance		**$0.00**
Pristine Springs Project Sub-Account		
Rental Payments to be Transferred to Secondary Aquifer Fund	$961,675.10	
Loan Interest	$2,368,601.05	
Loan Principal from Magic Valley & North Snake GWD	$5,379,030.89	
Total Pristine Springs Project Revenue to be Transferred		**$8,709,307.04**
Total Pristine Springs Project Revenue Transferred to 0129-01	($5,129,300.00)	
Total Pristine Springs Project Revenue Transferred to 0129	($3,580,000.00)	
Total Pristine Springs Project Sub-Account Transfers		**($8,709,300.00)**
Cash Balance Pristine Springs Sub-Account		**$7.04**
Pristine Springs Committed Funds		
Loan Payments to be transferred to 0129	$7.04	
TOTAL COMMITTED FUNDS	$7.04	
Loans Outstanding for Purchase of PS Water Rights		
Loan to North Snake & Magic Valley GWD	$10,000,000.00	
Payments from North Snake & Magic Valley GWD	($5,379,030.89)	
Total Loans Outstanding	$4,620,969.11	
Uncommitted Pristine Springs Sub-Account		**$0.00**
Rathdrum Prairie CAMP & Treasure Valley CAMP Sub-Account		
Pristine Springs Hydropower and Rental Revenues	$271,672.34	
Interest Earned State Treasury	$573.11	
Rathdrum Prairie CAMP & Treasure Valley CAMP Sub-Account Revenue		**$272,245.45**
Spokane River Forum	($23,000.00)	
Treasure Valley Water Quality Summit	($500.00)	
Kootenai-Shoshone Soil & Water Cons. Dist. - Agrimet Station	($20,000.00)	
Rathdrum Prairie-Spokane Valley Aquifer Pumping Study (CON00989)	($70,000.00)	
Idaho Washington Aquifer Collaborative	($10,000.00)	
Rathdrum Prairie CAMP & Treasure Valley CAMP Sub-Account Expenditures		**($123,500.00)**
Cash Balance Rathdrum Prairie CAMP & Treasure Valley CAMP Sub-Account		**$148,745.45**
Committed Funds		
Spokane River Forum	$0.00	
TOTAL COMMITTED FUNDS	$0.00	
Uncommitted Rathdrum Prairie CAMP & TV CAMP Sub-Account		**$148,745.45**
Upper Salmon/CBWTP Sub-Account		
Water Transaction Projects Payment Advances from CBWTP/Accord	$6,612,271.88	
PCSRF Funds for Admin of Non-Diversion Easements on Lemhi River	$222,457.16	
Interest Earned State Treasury	$290,591.08	
Upper Salmon/CBWTP Sub-Account Revenue		**$7,125,320.12**
Transfer to Water Supply Bank	($107,877.30)	
Change of Ownership	($600.00)	
Appraisals/Closing Costs	($13,905.98)	
Payments for Water Acquisition	($2,646,624.74)	
Upper Salmon/CBWTP Sub-Account Expenditures		**($2,769,008.02)**
Cash Balance CBWTP Sub-Account		**$4,356,312.10**
Committed Funds		
Administration of Non-Diversion Easements on Lemhi River	$141,540.61	
Bayhorse Creek (Peterson Ranch)	$28,952.25	
Badger Creek (OWBP) WSB	$10,511.60	
Beaver Creek (DOT LLP)	$114,994.78	
Big Timber Tyler (Leadore Land Partners)	$417,694.87	
Bohannon Creek DJ (Barbara Stokes)	$878,989.77	
Bohannon Creek BS (Betty Stokes)	$432,248.42	
Canyon Creek/Big Timber Creek (Beyeler)	$391,518.09	
Carmen Creek (Bill Slavin)	$209,569.89	
Carmen Creek (Bruce Slavin)	$131,506.75	
Fourth of July Creek (Defiance Investments)	$15,671.59	
Iron Creek (Koncz)	$189,065.83	
Kenney Creek Source Switch (Gail Andrews)	$22,324.44	
Lemhi - Big Springs (Merrill Beyeler)	$55,154.49	
Lemhi River & Little Springs Creek Kauer (McFarland Livestock Co)	$18,813.48	
Little Springs Creek (Snyder)	$251,630.25	
Lower Eighteenmile Creek (Ellsworth Angus Ranch)	$1,777.78	
Lower Lemhi Thomas (Robert Thomas)	$900.00	
P-9 Bowles (River Valley Ranch)	$249,924.63	
P-9 Charlton (Sydney Dowton)	$16,596.07	
P-9 Dowton (Western Sky LLC)	$198,873.69	
P-9 Elzinga (Elzinga)	$245,990.49	

Patterson-Big Springs PBSC9 (Silver Bit Angus/S Whitworth)	$167,615.32	
Pole Creek (Salmon Falls Land)	$640,552.57	
Pratt Creek (Mulkey)	$82,209.89	
Spring Creek (Richard Beard)	$2,576.35	
Spring Creek (Ella Beard)	$3,775.81	
Whitefish (Leadore Land Partners)	$147,479.89	
Total Committed Funds	$5,068,459.60	
Uncommitted CBWTP Sub-Account Balance		**($712,147.50)**
Water Supply Bank Sub-Account		
Interest Earned State Treasury	$27,128.81	
Payments received from renters	$4,084,682.44	
Payments made to owners	($3,481,751.05)	
Cash Balance Water Supply Bank Sub-Account		**$630,060.20**
Committed Funds:		
Owners Share	$602,931.39	
Total Committed Funds	$602,931.39	
Uncommitted Water Supply Bank Sub-Account Balance		**$27,128.81**
Eastern Snake Plain Sub-Account		
Legislative Appropriation 2005, HB392	$7,200,000.00	
Legislative Appropriation 2005, HB392, CREP Program	$3,000,000.00	
Interest Earned State Treasury	$2,048,414.71	
Loan Interest	$270,791.25	
Reimbursement from Commerce & Labor W-Canal	$74,709.77	
Reimbursement from MVGWD & NSGWD-Pristine Springs	$1,000,000.00	
Reimbursement from Water District 1 for Recharge	$159,764.73	
Reimbursement from BOR for Palisades Reservoir	$2,381.12	
Black Canyon Exchange Project Revenues	$23,800.00	
Eastern Snake Plain Sub-Account Revenue		**$13,779,861.58**
Installment payments to Bell Rapids Irr Co	($3,375,180.00)	
Interest Credit due to Bureau of Reclamation (Part of Fourth Installment)	($19,860.45)	
Pristine Springs Project Costs	($6,863.91)	
Palisades (FMC) Storage Costs	($3,521,385.63)	
W-Canal Project Costs	($326,834.11)	
Black Canyon Exchange Project Costs	($210,112.00)	
2008-2010 Recharge Conveyance Costs	($854,064.62)	
Additional recharge projects preliminary development	($7,919.75)	
Transfer to Bell Rapids Sub Account	($341,759.55)	
Transfer to Pristine Springs Sub Account	($1,000,000.00)	
Transfer to Priest Lake Sub-Account (2018 HB 677, Sec 6)	($2,419,580.50)	
Eastern Snake Plain Sub-Account Expenditures		**($12,083,560.52)**
Cash Balance Eastern Snake Plain Sub-Account		**$1,696,301.06**
Loans and Other Commitments		
Commitment - Additional recharge projects preliminary development	$337,594.00	
Commitment - Palasades Storage O&M	$3,221.64	
Commitment - Black Canyon Exchange Project (fund with ongoing revenu	$442,252.95	
Total Loans and Other Commitments	$783,068.59	
Eastern Snake Plain Sub-Account Balance after Committments		**$913,232.47**
CREP Loans Outstanding:		
American Falls-Aberdeen GWD (CREP)	$47,192.85	
Bonneville Jefferson GWD (CREP)	$31,612.12	
Magic Valley GWD (CREP)	$44,981.79	
North Snake GWD (CREP)	$0.00	
TOTAL ESP CREP LOANS OUTSTANDING	$123,786.76	
Uncommitted Eastern Snake Plain Sub-Account Balance		**$789,445.71**
Dworshak Hydropower Project		
Power Sales & Other	$10,790,892.73	
Interest Earned State Treasury	$786,880.84	
Total Dworshak Project Revenue		**$11,577,773.57**
Transferred to 1st Security Trustee Account	$148,542.63	
Construction not paid through bond issuance	$226,106.83	
First Security Fees	$314,443.35	
Operations & Maintenance	$2,950,489.56	
Powerplant Repairs	$180,409.72	
Bond payoff	$391,863.11	
Capital Improvements	$318,366.79	
FERC Payments	$126,877.99	
Total Dworshak Project Expenditures		**($4,657,099.98)**
Cash Balance Dworshak Hydropower Project		**$6,920,673.59**
Dworshak Project Committed Funds		
Emergency Repair/Future Replacement Fund	$1,872,962.73	
FERC Fee Payment Fund	$0.00	
Total Dworshak Project Committed Funds	$1,872,962.73	
Uncommitted Dworshak Hydropower Project Sub-Account Balance		**5,047,710.86**
TOTAL		**$29,425,792.52**

Loans Outstanding:	**Amount Loaned**	**Principal Balance**
A&B Irrigation District (Pipeline & Pumping Plant, Dec)	$3,500,000.00	$2,971,279.88
A&B Irrigation District (Pipeline & Pumping Plant, Sept)	$3,500,000.00	$3,106,407.72
Aberdeen-Springfield Canal Company (WRB-491; Diversion structure)	$329,761.00	$11,675.61
Bee Line Water Association (Sep 23, 2014; System Improvements)	$600,000.00	$584,615.41
Canyon County Drainage District No. 2 (28-Nov-12; Drain tile pipeline repla	$35,000.00	$16,089.41
Chaparral Water Association (21-Jan-11; Well deepening & improvement)	$68,000.00	$6,856.77

Clearview Water Company	$50,000.00	$31,867.94	
Consolidated Irrigation Company (July 20, 2012; pipeline project)	$500,000.00	$449,809.77	
Dalton Water Association	$1,036,900.00	$941,853.23	
Enterprise Irrigation District (14-Jul-06; Pipeline project)	$37,270.00	$660.60	
Evans Water Corporation & HOA	$20,000.00	$15,260.86	
Foothill Ranch Homeowners Association (7-oct-11; well rehab)	$150,000.00	$84,366.58	
Goose Lake Reservoir Corp	$320,000.00	$292,034.30	
Idaho Ground Water Appropriators (IGWA)	$3,208,115.35	$975,597.59	
Jefferson Irrigation Company (9-May-2008 Well Replacement)	$81,000.00	$3,343.26	
Last Chance Canal Company (14-July-2015, diversion dam rebuild)	$2,500,000.00	$1,883,428.89	
Lava Hot Springs, City of	$347,510.00	$0.00	
Lindsay Lateral Association (Engineering Design Project & Pipeline Study)	$19,700.00	$5,838.02	
Marsh Center Irrigation Company (13-May-05; Hawkins Dam)	$236,141.00	$22,446.02	
Marysville Irrigation Company (18-May-07, Pipeline Project Phase 1)	$625,000.00	$39,427.34	
Marysville Irrigation Company (9-May-08, Pipeline Project Phase 2)	$1,100,000.00	$264,890.37	
North Fremont Canal Company (Pipeline Project Phase 3)	$4,300,000.00	$3,800,000.00	
North Side Canal Company (Phase 1 - canal rehab project)	$1,846,092.61	$1,692,448.59	
North Side Canal Company (Phase 2 & 3 - canal rehab project)	$2,711,115.08	$2,635,311.07	
Outlet Water Association (22-Jan-16; new well & improvements)	$100,000.00	$77,750.03	
Pinehurst Water District (23-Jan-15)	$100,000.00	$47,565.79	
Point Springs Grazing Association (July 20, 2012; stock water pipeline)	$48,280.00	$22,373.06	
Producers Irrigation Company	$102,127.50	$37,785.38	
Skin Creek Water Association	$188,258.00	$0.00	
St. Johns Irrigating Company (14-July-2015; pipeline project)	$1,417,905.22	$1,297,911.08	
Sunset Heights Water District (17-May-13; Exchange water project)	$48,000.00	$9,962.26	
Twin Lakes Canal Company (Winder Lateral Pipeline Project)	$500,000.00	$168,758.73	
Valley County Local Improvement District No. 1/Jughandle HOA (well projec	$907,552.00	$474,142.36	
TOTAL LOANS OUTSTANDING			**$21,971,757.92**
Loans and Other Funding Obligations:			
Senate Bill 1511 - Teton Replacement and Minidoka Enlargement Studies		$678,161.82	
Weiser-Galloway Study (28-May-10)		$461,620.87	
Milner Irrigation District (pipeline replacement)		$2,000,000.00	
Monument Ridge Ranch Subdivision HOA		$300,000.00	
North Fremont Canal Company		$500,000.00	
TOTAL LOANS AND OTHER FUNDING OBLIGATIONS			**$3,939,782.69**
Uncommitted Funds			**$3,514,251.91**
TOTAL			**$29,425,792.52**

(1) Actual amount needed may vary depending on final determination of water actually purchased and interest income received.

Idaho Water Resource Board
Sources and Applications of Funds
as of September 30, 2019
WATER MANAGEMENT ACCOUNT

Original Appropriation (1978)	$1,000,000.00	
Transfer funds to General Account 1101(HB 130, 1983)	($500,000.00)	
Legislative Appropriation (6/29/1984)	$115,800.00	
Legislative Appropriation (SB1239, 2001)	$200,000.00	
Interest Earned	$121,604.62	
Filing Fee Balance	$2,633.31	
Water Supply Bank Receipts	$841,803.07	
Bond Fees	$277,254.94	
Funds from DEQ and IDOC for Glenns Ferry Water Study	$10,000.00	
Legislative Appropriation (HB988, 1994)	$75,000.00	
Reverted to General Account 6/30/95, (HB988, 1994)	($35,014.25)	
Legislative Appropriation (SB1260, 1995, Aquifer Recharge, Caribou Dam)	$1,000,000.00	
Legislative Appropriation (SB1239, 2001, Sugarloaf Aquifer Recharge Project)	$60,000.00	
Reverted to General Fund 1/22/19, (SB1239, 2001, Sugarloaf Aquifer Recharge Project)	($4,046.31)	
Legislative Appropriation (HB 843 Sec 6, 2004, ESPA Settlement Water Rentals)	$520,000.00	
Legislative Appropriation (SB1496, 2006, ESP Aquifer Management Plan)	$300,000.00	
Legislative Appropriation (HB 320, 2007, ESP Aquifer Management Plan)	$849,936.99	
Lemhi River Water Right Appraisals	($31,000.00)	
Legislative Audits	($10,645.45)	
IWRB Appraisal Study (Charles Thompson)	($5,000.00)	
Western States Water Council Annual Dues	($7,500.00)	
Transfer to/from Revolving Development Account	($317,253.80)	
Recharge Projects	($11,426.88)	
Grants Disbursed	($1,632,755.21)	
Obligated 1994 (HB988)	($39,985.75)	
SB1260, Aquifer Recharge	($947,000.00)	
SB1260, Soda (Caribou) Dam Study	($53,000.00)	
Sugarloaf Aquifer Recharge Project (SB1239, 2001)	($55,953.69)	
ESPA Settlement Water Rentals (HB 843, 2004)	($504,000.00)	
ESP Aquifer Management Plan (SB1496, 2006)	($300,000.00)	
ESP Aquifer Management Plan (HB320, 2007)	($801,077.75)	
CASH BALANCE		**$118,373.84**

Large Projects Program Sub-Account			
Legislative Appropriation (HB 285, Sec 1, 2019)	$20,000,000.00		
Interest Earned State Treasury	$182,429.31		
Total Revenue for Large Projects Program Sub-Account		**$20,182,429.31**	
	$0.00		
	$0.00		
Total Expenditures for Flood Management Program Sub-Account		**$0.00**	
Cash Balance for Large Projects Program Sub-Account			**$20,182,429.31**
Water Quality Collection Program Sub-Account			
Legislative Appropriation (HB 285, Sec 3, 2019)	$200,000.00		
Interest Earned State Treasury	$1,824.29		
Total Revenue for Water Quality Collection Program Sub-Account		**$201,824.29**	
	$0.00		
	$0.00		
Total Expenditures for Water Quality Collection Program Sub-Account		**$0.00**	
Cash Balance for Water Quality Collection Program Sub-Account			**$201,824.29**
Flood Management Program Sub-Account			
Legislative Appropriation (HB 712, Sec 1, 2018, Flood Management Program)	$1,000,000.00		
Legislative Appropriation (HB 285, Sec 3, 2019, Flood Management Program)	$800,000.00		
Interest Earned State Treasury	$10,797.07		
Total Revenue for Flood Management Program Sub-Account		**$1,810,797.07**	
Grants Disbursed for Leg Approp (HB 712, Sec 1, 2018, Flood Mgmt Pg)	($715,118.07)		
Grants Disbursed for Leg Approp (HB 285, Sec 3, 2019, Flood Mgmt Pg)	$0.00		
Total Expenditures for Flood Management Program Sub-Account		($715,118.07)	
Cash Balance for Flood Management Program Sub-Account			**$1,095,679.00**
TOTAL			**$21,598,306.44**

Grants and Other Funding Obligations **Flood Management Program grants - Year 1 (HB712, Sec 1, 2018)**	**Grant Amount**	**Expenditures**	**Remaining Balance**
Flood Control District 9 (CON01303)	***90,000.00***	***(84,851.70)***	***5,148.30***
Blaine County (CON01304)	121,331.00	(98,684.73)	22,646.27
Cassia County (CON01305)	42,336.38	(8,072.59)	34,263.79
Flood Control District 10 (CON01306 - New Dry Creek River Bank)	***78,400.00***	***(62,156.50)***	***16,243.50***
Flood Control District 10 (CON01307 - Duck Alley Pit Capture)	***153,550.00***	***(105,470.43)***	***48,079.57***
Flood Control District 10 (CON01308 - Porter & Mulchay Gravel Removal)	***38,808.00***	***(35,250.77)***	***3,557.23***
Clearwater Soil & Water Conservation Dist (CON01309)	***155,220.00***	***(155,219.00)***	***1.00***
Flood Control District 10 (CON01310 - Leighton & Wells Gravel Removal)	***22,000.00***	***(22,000.00)***	***0.00***
Flood Control District 11 (CON01311)	57,675.00	0.00	57,675.00

Twin Lakes/Flood Control Dist 17 (CON01312)	***7,750.00***	***(7,750.00)***	***0.00***	
Twin Falls Canal Company (CON01327)	***85,340.00***	***(85,340.00)***	***0.00***	
Nez Perce Soil & Water Conservation Dist (CON01328)	115,460.00	(44,297.35)	71,162.65	
Riverside Village HOA (CON01329)	***6,025.00***	***(6,025.00)***	***0.00***	
City of Pocatello (CON01330)	26,105.00	0.00	26,105.00	
Carryover from HB712 Year 1 to HB285 Year 2	*(73,029.60)*		*(73,029.60)*	
Flood Management Program grants - Year 2 (HB285, Sec 3, 2019)				
City of Boise (CON01396)	6,371.00		6,371.00	
Blaine County (CON01397)	100,000.00		100,000.00	
Board of Controls Irrigation (CON01398)	59,050.00		59,050.00	
Clearwater Soil & Water Conservation District (CON01399)	190,492.37		190,492.37	
Clearwater Soil & Water Conservation District (CON01400)	72,727.39		72,727.39	
City of Hailey (CON01401)	50,000.00		50,000.00	
Flood Control District No. 10 (CON01402)	160,000.00		160,000.00	
Idaho Soil and Water Conservation District (CON01403)	159,436.00		159,436.00	
Idaho Soil and Water Conservation District (CON01404)	21,619.50		21,619.50	
Blaine County (CON01405)	50,000.00		50,000.00	
Committed for Flood Management Grants	**$1,796,667.04**	**(715,118.07)**	**1,081,548.97**	
Other Funding Obligations				
ESPA Settlement Water Rentals (HB 843, 2004)		$16,000.00		
Legislative Appropriation (HB 285, Sec 1, 2019)		$20,000,000.00		
Legislative Appropriation (HB 285, Sec 3, 2019)		$200,000.00		
Committed for Other Funding Obligations			**$20,216,000.00**	
Uncommitted Funds				**$300,757.47**
TOTAL COMMITTED FUNDS BALANCE				**$21,297,548.97**

Bold and italicized indicates that project is completed and entity has received final payment

United States Department of the Interior
BUREAU OF RECLAMATION
Pacific Northwest Region
Snake River Area Office
230 Collins Road
Boise, ID 83702-4520

IN REPLY REFER TO:

SRA-1304
2.2.4.21

October 31, 2019

Mr. Roger Chase
Chairman
Idaho Water Resource Board
322 East Front Street
Boise, ID 83702

Mr. Roland Springer
Area Manager
Snake River Area Office
230 Collins Road
Boise, ID 83702

Subject: Boise River Basin Feasibility Study Status Update, Boise Project, Idaho

Dear Messrs. Chase and Springer:

This status update is being sent in preparation for the Idaho Water Resource Board (IWRB) meeting on November 14 and 15, 2019.

The IWRB and the Bureau of Reclamation have partnered to complete a feasibility study of new surface water storage options on the Boise River (Study). The Study includes an evaluation of small raises of the three large dams on the Boise River system: Anderson Ranch, Arrowrock, and Lucky Peak Dams, and is now focused on Anderson Ranch Dam.

Current Status

- IWRB and Reclamation signed a modification to the reimbursable Memorandum of Agreement on October 25 and 30, 2019, respectively. This modification documents the increased project projections and the Resolution passed by IWRB at the September board meeting.
- Recent project activities include:
    - September 18, 2019 – Reclamation conducted a site visit with IWRB and Reclamation's lead Designer to discuss design elements of the proposed dam raise.
    - September 30-October 4, 2019 – Reclamation completed a technical review of the draft Biological Assessment for the proposed dam raise.
    - October 14-18, 2019 – Reclamation completed a coordinated technical review with U.S. Fish and Wildlife Service of the draft Biological Assessment for the proposed dam raise.

  - October 18, 2019 – Reclamation briefed the Department of Interior Environmental Impact Statement (EIS) Review Team on the scoping period and received approval to proceed with the draft EIS.

- Ongoing project activities include:
  - Reclamation is completing water modeling of water supply scenarios to analyze potential fill of the new space in Anderson Ranch Reservoir in relation to other potential projects in the area.
  - Reclamation and Consultant are conducting environmental compliance analyses and consultations in accordance with Secretarial Order 3355. The Draft EIS is tentatively scheduled to be released in February 2020.
  - Reclamation and Consultant are working to complete remaining design and cost estimating, benefits and cost analyses, and feasibility report. The Draft Feasibility Report is tentatively scheduled to be released in February 2020.
  - Reclamation and IWRB are discussing the approach for identifying potential spaceholders and contracting for space.

Key Milestones

Nov 2017 - Jan 2019	Reclamation completed initial screening of the three potential dam raise alternatives and developed the Project Management Plan.
July 27, 2018	IWRB passed a resolution supporting the narrowed focus of the Study to a raise at Anderson Ranch Dam.
August 28, 2018	Reclamation and IWRB hosted a Legislative Infrastructure Tour to discuss large water infrastructure projects in Idaho with representatives from Idaho's Congressional delegation.
November 8, 2018	Reclamation and IWRB hosted an informational public open house on the Study in Boise, Idaho.
December 3-7, 2018	Reclamation conducted a Value Planning Study with a final Accountability Report received in February 2019.
December 25, 2018	Reclamation awarded an Indefinite Delivery/Indefinite Quality contract for architect and engineering services to Sundance-EA Joint Venture (Consultant) to complete the Study and environmental compliance activities.
April 30, 2019	Consultant submitted land, structure, infrastructure, and real estate impact assessment (Rim Analysis) Anderson Ranch Reservoir.
June 7, 2019	IWRB filed a water right permit application for the potential additional storage (Water Right No. 63-34753).
June 19, 2019	Reclamation's Technical Service Center completed feasibility-level design and cost estimates completed for Anderson Ranch Dam raise.
August 9, 2019	Reclamation published the Notice of Intent for an EIS in the Federal Register.
August 27-29, 2019	Reclamation conducted Public Scoping Open Houses in Pine, Boise, and Mountain Home, Idaho.

February 2020	Draft Feasibility Report and Draft EIS release.
February 3-7, 2020	Reclamation design, estimate, and construction review of the alternatives.
February 2020	Draft EIS Public Comment meetings in Mountain Home and Boise, Idaho.
July 2020	Final Feasibility Report and Environment Impact Statement release.
July 2020 - Aug 2020	Department of the Interior review and approval of the recommended plan.

Thank you for this opportunity to provide an update on the Boise River Basin Feasibility Study project. If you have any questions, please contact me at 208-383-2222 or via email at msloan@usbr.gov.

Sincerely,

Megan Sloan
Project Manager

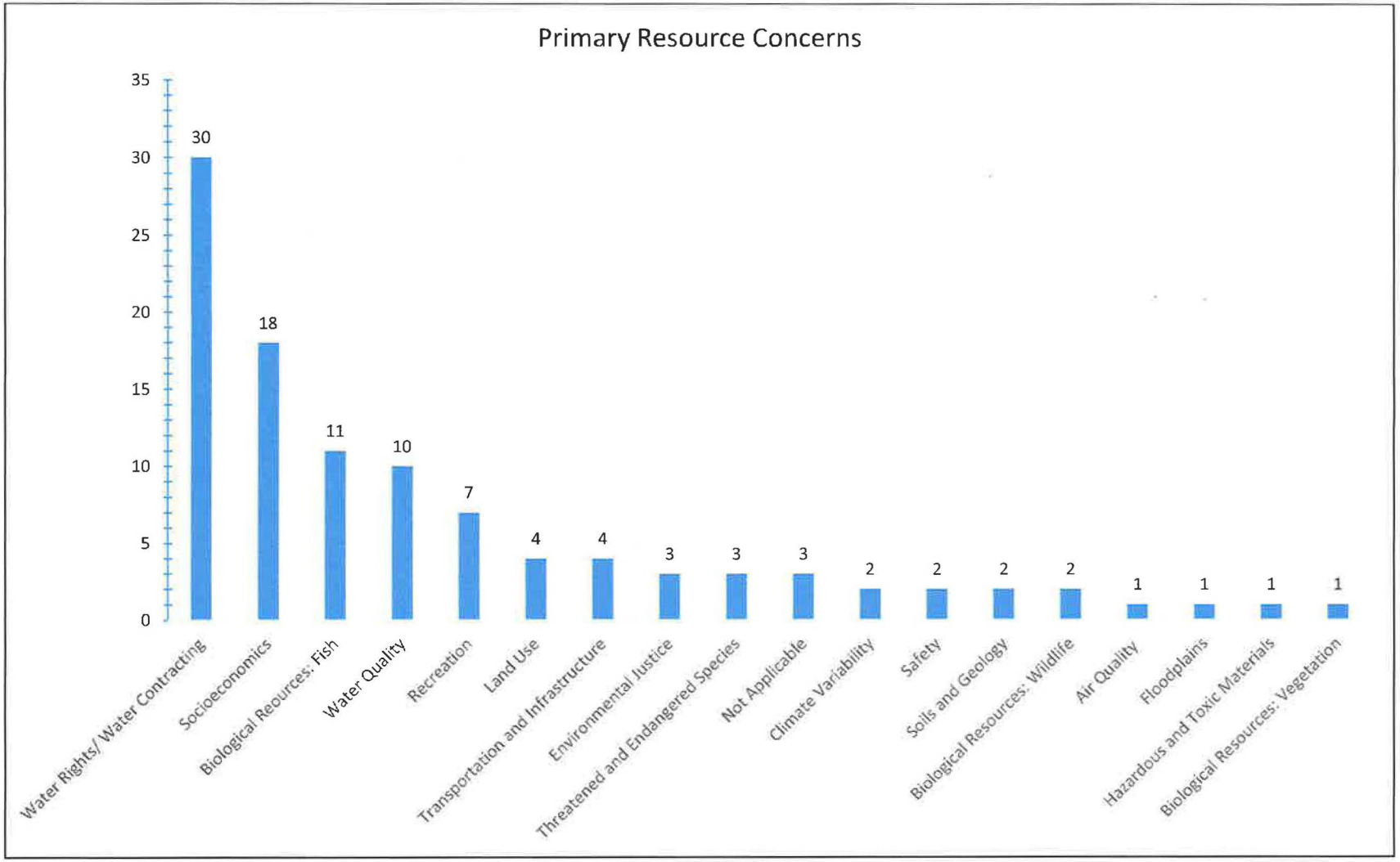


Figure 2. Primary resource concerns identified during Public Scoping

Memorandum

To: Idaho Water Resource Board (IWRB)

From: Neeley Miller & Rick Collingwood, Planning & Projects Bureau

Date: November 4, 2019

Re: Priest Lake Water Management Project Update

ACTION: No action requested

Background

As a result of limited water supply and drought conditions in northern Idaho in 2015 and 2016 (and 2019) it has been difficult to maintain required lake pool levels and downstream flow in the Priest River during the recreational season.

Phase 1: The Priest Lake Water Management Study was completed in February 2018. The study included the following recommendations:

- Temporarily raising the surface level of Priest Lake up to 6 inches during the recreational season for dry years and integrating real-time streamflow data to allow more operational flexibility
- Outlet dam structural and operational improvements
- Replacing the current existing porous breakwater with an impervious breakwater structure and dredging a portion of the Thorofare channel

Phase 2: As scheduled, the Priest Lake Water Management Project – Preliminary Engineering & Design concluded in the fall 2019. The status of the tasks are completed, with some regulatory permitting continuing over to phase 3.

Phase 3

Final Engineering & Design which includes finalizing regulatory permitting and bidding assistance began in November 2019.

Schedule

- NTP Sept 28rd and begin work by Nov 4th
- Submit 70% design in late Dec for review by IWRB staff
- 70% review by IWRB staff early Jan
- 90% design scheduled to begin late Jan pending permit receipt by IDWR Dam Safety
- Finalize 90% by late March. Assumes a 2-week review on 90%
- Finalize 100% by early-May
- Bidding (after 100% design is completed), with construction anticipated in the fall/winter of 2020/2021.

Funding Status

- $2,400,000 (Legislature Approved Funding via HB677) + $2,419,600 (Legislature Repurpose of CREP via HB 677) + $285,000 (Priest Lake Local Contribution) = **$5,104,600 Total Project Funding**
- $600,000 (Phase 2, Preliminary Engineering) + $652,717 (Phase 3, Final Engineering) + $2,128,069 (Outlet Dam Construction and Construction Management w/10% contingency) + $1,985,052 (Thorofare Improvements Construction and Construction Management w/10% contingency) = **$5,365,838 Total Estimated Funding Needed for Design and Construction**
- **$261,238 Funding Deficit (+/- $400K with 10% contingency)**

Outlet Dam Operations Plan

- IDWR hydrologist developing operations plan, including rule curves for use by the 2021 recreational season (post-construction). IWRB staff plans regular meetings with hydrologists and Doug Jones (Northern Regional manager) to plan for operations during the upcoming season.

Memorandum

To: Idaho Water Resource Board (IWRB)

From: Neeley Miller

Date: November 4, 2019

Re: Lakes Commission Comments

Representatives from the Lakes Commission will provide the IWRB with comments on 2019 Priest Lake outlet dam operations.

Lakes Commission
1224 Washington Ave, Suite 101
Sandpoint, Idaho 83864
(208)263-5310 ext. 107
lakescommission@gmail.com

November, 12, 2019

To: Idaho Water Resource Board
Chair Roger Chase

Idaho Department of Water Resource Director
Director Gary Spackman

Re: Priest Outlet Dam Operations 2019 and Operational Plan

Dear Chairman Chase and Director Spackman,

On behalf of the Lakes Commission and our local stakeholders, we are writing to you in the hopes of facilitating a collaborative conversation regarding the operations of Outlet Dam, Priest Lake/River, Idaho. Our charge is to study, investigate and selecting ways and means of controlling the water quantity and water quality as they relate to the waters of Lake Pend Oreille, Pend Oreille River, Priest Lake and Priest River for the communities' interests of the State of Idaho and for the survival of native fish species contiguous with the Pend Oreille Basin. We are statutorily directed to work with relevant state agencies to accomplish this. We have been actively involved in water related issues in the Priest area since our inception in 2003, and are well versed in the complexities that exist with Outlet Dam operations and the hydrology of the Priest watershed.

Over the nearly 70 plus years that Outlet Dam has been in operation, the communities and resource managers have come to know and expect specific operations. These include established processes that are necessary to facilitate the seasonal tourist economy, maintain functional waterfront infrastructure and provide for fisheries in both Priest Lake and Priest River. It wasn't until the record drought of 2015 that a noticeable deviation from these historic operations occurred.

The result of the 2015 drought resulted in the recognition of the need for low water year operation changes, to include a potential six-inch higher lake level, and the funding and approval to upgrade the dam. Due to these statutory changes, the communities expected changes to occur, but when they ultimately did, it caused concern and confusion. As the Governor's appointed board charged with representing the interests of communities and the State of Idaho in Priest Lake and Priest River, we, along with numerous community members were caught off guard, as

there did not appear to be a system in place for making procedural decisions, a known or available process to find information or a process to facilitate a meaningful discussion.

These changes also generated very valuable conversations and ideas that we think are of great benefit to both your agencies and to the impacted communities and that appear to have created a consensus.

The difference in operations this year that generated these discussions were:

1. An almost six-inch rise in Priest Lake between approximately June 21st and July 6th. This was an unprecedented occurrence that took place as the summer tourist season ramped up. We know that there was thought it would be a low water year, so lake was held a bit higher. We know that a rain event took place early July that was not predicted, which spiked the lake level. We were unaware that this situation could occur and we were unaware of these outcomes until we heard from the community and subsequently reached out to IDWR for information. We were also unaware that this 6-inch rise would generate concerns from community.

2. The above event resulted in a quick release of that extra water to the Priest River. This generated the legitimate question from Priest River landowners as to where the water was coming from, considering snow melt was complete. The flows themselves were not seen as negative; the lack of understanding was the concern.

3. On August 21, the Priest River dropped to 32 cfs or below for almost a week. We know that the gauge went off line and we know that the gauge cannot be read when flows are around 32 and below. This was a historic event, as even in 2015 flows didn't go below 45 cfs. It is still unclear as to whether this could have been prevented. We think a balance can be found between the statutory lake level and maintaining adequate flows to Priest River for the benefit of the fishery and property values.

4. The fall/winter drawdown began Oct 1st, which was earlier than the community is accustomed to and it was drafted very slowly. Both of these operations have implications to waterfront business operations, private property owners winterizing infrastructure and boats, and the potential of dewatering kokanee spawning beds.

5. The replacement of Karl Duncan, the lifelong dam operator with abundant institutional knowledge of the hydrologic nuances of the Priest Watershed. Not only did Karl keep things running smoothly, he was a known point of contact for the community.

Knowing that upgrades are forthcoming and public awareness necessary, we think that the development of an Operation Plan and decision tree that incorporates the input provided over the last year by the community and resource managers would result in better lake levels and flow outcomes, would lessen the current community concerns, and would provide IDWR staff with useful tools for decision making. Also, in understanding that the expertise of Karl Duncan is not assured in the future we also suggest you consider utilizing Karl Duncan for at least one more year, in order to fully understand his procedural decisions and the hydrology in the area. Ideally his strategies can be put in writing.

We appreciate IDWR's time and dedication to the task at hand and truly hope you see this input as helpful and encouraging. To clarify, the three main topics we want to discuss are the differences in operations this year from past, the protocol for communicating with the public, and an Operational Plan for the future.

We truly appreciate you taking the time to earnestly consider this request. We look forward to speaking with you about the future operations of Outlet Dam.

Very truly yours,

Ford Elsaesser
Chair, Lake Pend Oreille, Pend Oreille River, Priest Lake, Priest River Commission

The Lake Pend Oreille, Pend Oreille River, Priest Lake and Priest River Commission ("Lakes Commission") is an advisory board appointed by the Governor of Idaho. The Commission is comprised of five local community leaders, as well as representatives from U.S. Fish & Wildlife Service, the Attorney General's Office, and the State of Montana. The Commission is charged with "studying, investigating, and selecting ways and means of controlling the water quality and quantity as they relate to waters of Lake Pend Oreille, Pend Oreille River, Priest Lake, and Priest River for the communities' interests and the interests of the State of Idaho, and for the survival of native species of fish contiguous to the Pend Oreille Basin"

Idaho Water Resource Board Workshop
November 14, 2019
Lakes Commission – Molly McCahon and Craig Hill
lakescommision@gmail.com

Suggested Operational Guidelines for Outlet Dam

Low water year planning

Lake

- Unless there is a severe drought stay at 3.5 " or less
- Determine volume in acre feet/inches to cfs over a month or weeks in order to make that operational decision when low water year determined.
- Understand flows into Priest Lake by using USGS gauges, ideally installed on the largest tributaries East, West and North (Thorofare) portions of lake.
- Predict and stay on top of rain events and understand volume associated with those events.

Priest River Flows

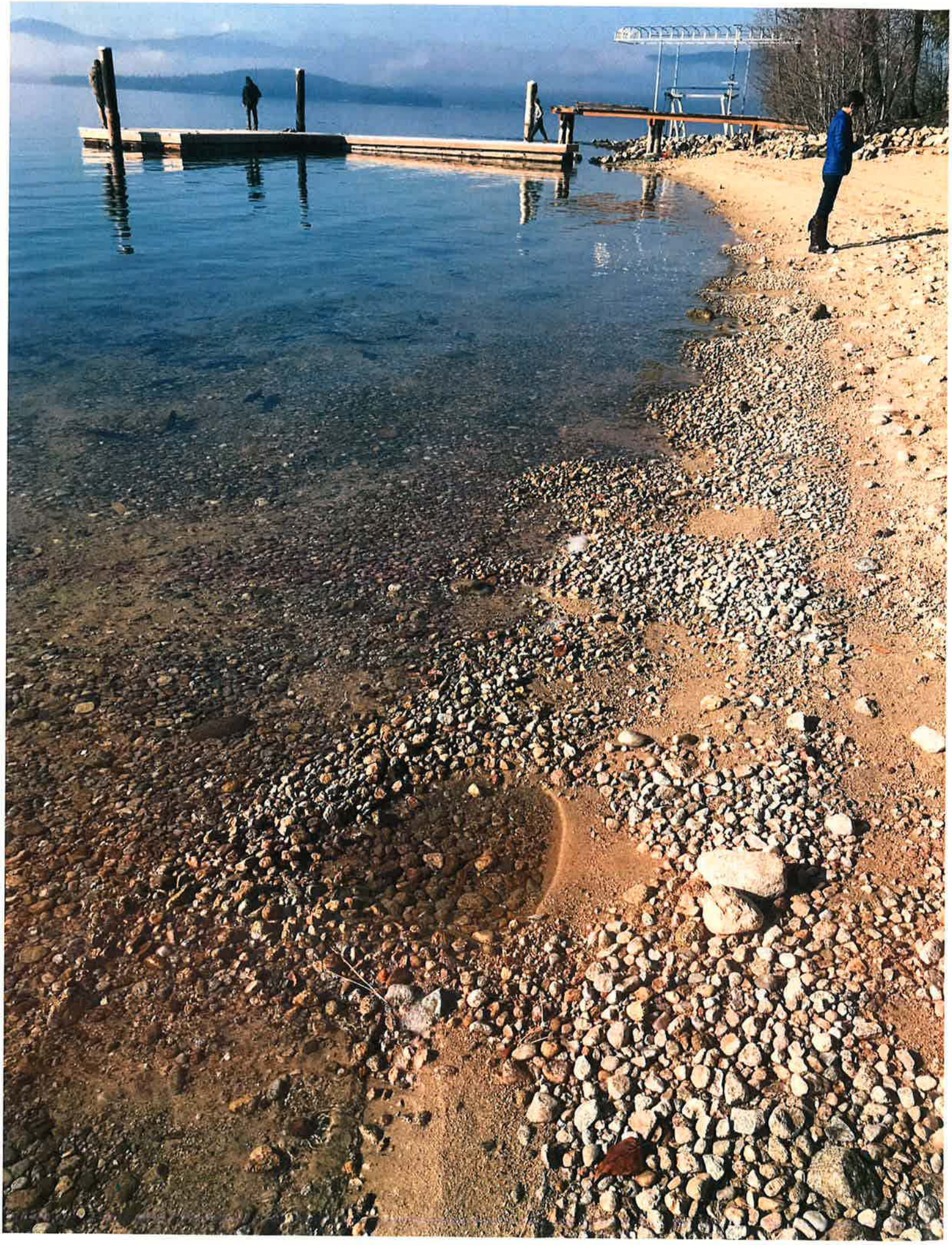
- Adequate flows might be an option if prediction tools in place
- 60 cfs to river should be the very bottom - worst case scenario
- Additional gauges on river important to determining more accurate river flow data independent of lake flows. When flows predicted to be low, lake level could be held at established height to meet adequate flows through a drought.

October Drawdown Date and Speed

- The first Monday after a full week in October.
- Let out flows quickly at an average 900 or more cfs to reach winter lake level, preventing dewatering kokanee spawning beds. See Photos.

Setting Up a System for Communication

- Because Priest is so remote and known for sudden storm events, provide local operators with specific weekly guidelines and tools for operating decisions so they can react quickly.
- If public understood how procedural decisions are made, it would alleviate community concerns and reduce amount of emails and calls to IDWR staff.
- Website – regularly updated
- Email Updates
- The Lakes Commission is here to help with public communication in anyway that you might find useful.



Memorandum

To: Idaho Water Resource Board (IWRB)

From: Neeley Miller

Date: November 4, 2019

Re: Palouse Basin Aquifer Committee (PBAC) Update

Representatives from the Palouse Basin Aquifer Committee (PBAC) will discuss recent efforts towards developing a long terms sustainable water supply with the IWRB.

Memorandum

To: Idaho Water Resource Board

From: Wesley Hipke

Date: November 5, 2019

Re: ESPA Managed Recharge Program Status Report

REQUIRED ACTION: No action is required at the November 15, 2018 IWRB meeting.

I. IWRB Managed Recharge Executive Summary

ESPA Managed Recharge – Natural Flow

The IWRB's Snake River recharge water rights came into priority below Minidoka Dam on October 22 and IWRB recharge activities started on October 24, 2019. Twin Falls Canal Company (TFCC), North Side Canal Company (NSCC), and Southwest Irrigation District (SWID) are conducing IWRB recharge and plan to continue through the winter. American Falls Reservoir District #2 (AFRD2) is planning to start recharge in December after construction of the headgates for the new MP29 recharge site is complete and the Milner-Gooding canal is open. Table 1 provides a summary of the Program's natural flow recharge.

Table 1. IWRB Managed Recharge Summary

Water Source	Area	Start	# Days	Current Rate (cfs)	Median Rate (cfs)	Total Recharged (Acre-feet)*
Snake River	Lower Valley	Oct. 24	13	308	244	5,467

* As of November 5, 2019 – Reported recharge volumes are preliminary and subject to change.

Managed Recharge for other Entities

The IWRB supports water user recharge efforts intended to improve and recover groundwater levels in the ESPA. As such, the IWRB is currently recharging storage water supplied by the Surface Water Coalition (SWC) and the Coalition of Cities (Cities). The IWRB is on track to recharge the total volume of 64,808 acre-feet (af) of storage water in the Upper Valley (above Minidoka Dam) by the end of November. The majority of the IWRB's partners assisting with the conveyance of recharge water stopped activities as of October 31. The Fremont Madison Irrigation District plans to continue conducting recharge through most of November. Table 2 provides a summary of the total volume of storage water the IWRB has recharged to date.

Table 2. Storage Water Recharged Summary for Other Entities

Water Source	Area	Start	# Days	Current Rate (cfs)	Median Rate (cfs)	Total Recharged (Acre-feet)*
Storage Water	Upper Valley	Aug. 22	76	250	369	58,011

* As of November 5, 2019 – Reported recharge volumes are preliminary and subject to change.

The SWC donated 58,500 af of storage water on August 22, 2019 to the IWRB for recharge in accordance with settlement agreements with the Idaho Ground Water Association (IGWA) and the Water Mitigation Coalition (WMC) (50,000 af and 8,500 af of storage water respectively).

In addition, the City of Pocatello contracted with the IWRB to recharge storage water to meet the terms of the Cities' settlement agreement with SWC. The City of Pocatello transferred 6,308 af of storage water on October 7, 2019 to the IWRB for recharge as part of this year's requirements.

II. 2019/2020 IWRB Natural Flow Recharge

Natural Flow Water Availability:

The IWRB Snake River recharge water rights came into priority on October 22, 2019 below Minidoka Dam. The Bureau of Reclamation (USBR) plans to keep flows from American Falls and Minidoka Dam at minimal levels (approximately 370 cfs and 550 cfs, respectively). The USBR will reevaluate operations in December/January based upon snow pack conditions. At the end of irrigation season the reservoir system was 48% full. Currently the system is 53% full. USBR reservoir operations will determine if and when the IWRB's water rights will come into priority in the Upper Valley (above Minidoka Dam).

At the time of this report, flow past Milner Dam was 175 cfs. There was an initial spike of 1,000 cfs at the start of the recharge season as the Milner Pool was drained to conduct inspections on the dam. USBR intends to fill the Milner Pool to normal winter operational levels and will account for managed recharge diversions in its operations. Figure 1 summarizes IWRB recharge activities as of November 1, 2019.

Lower Valley IWRB Recharge Status:

The IWRB recharge rights on the Snake River came into priority in the Lower Valley (below Minidoka Dam) on October 22, 2019. New five-year conveyance contracts reflecting the new conveyance payment schedule for the Lower Valley have been executed with all of the IWRB's current recharge partners in the Lower Valley.

TFCC: After conducting canal inspections, TFCC started IWRB recharge on Oct 24. TFCC is not planning any further shutdowns. Throughout the recharge season, TFCC normally averages recharge over 30 cfs; currently it is recharging approximately 50 cfs.

NSCC: NSCC completed its canal maintenance activities ahead of schedule, and began recharge on October 25. Testing of the new Wilson Canyon site started on October 30. At the time of this report NSCC was diverting approximately 200 cfs and approximately 100 cfs was being routed into the Wilson Canyon Site. Full pool level is 30 feet; currently the pool level is holding at 8 feet. Diversion into the site will be increased slowly to determine a steady-state maximum diversion rate.

SWID: IWRB recharge was started on October 29 after the new conveyance contract was executed. SWID is recharging over 55 cfs and plans to continue recharge activities throughout the recharge season.

AFRD2: Stopped irrigation deliveries on October 15 and will be conducting canal maintenance along with constructing the new MP29 recharge site. AFRD2 is planning to start recharge activities in December.

Over 260 cfs/day is currently being recharged under the IWRB's program. As the Wilson Canyon site is fully developed this rate is expected to increase. Once the Milner-Gooding Canal is operational, the IWRB's potential program capacity in the Lower Valley is estimated to be around 1,200 cfs. Actual recharge rates will be dependent on water availability, weather conditions, canal operations, and other variables the IWRB may take into consideration.

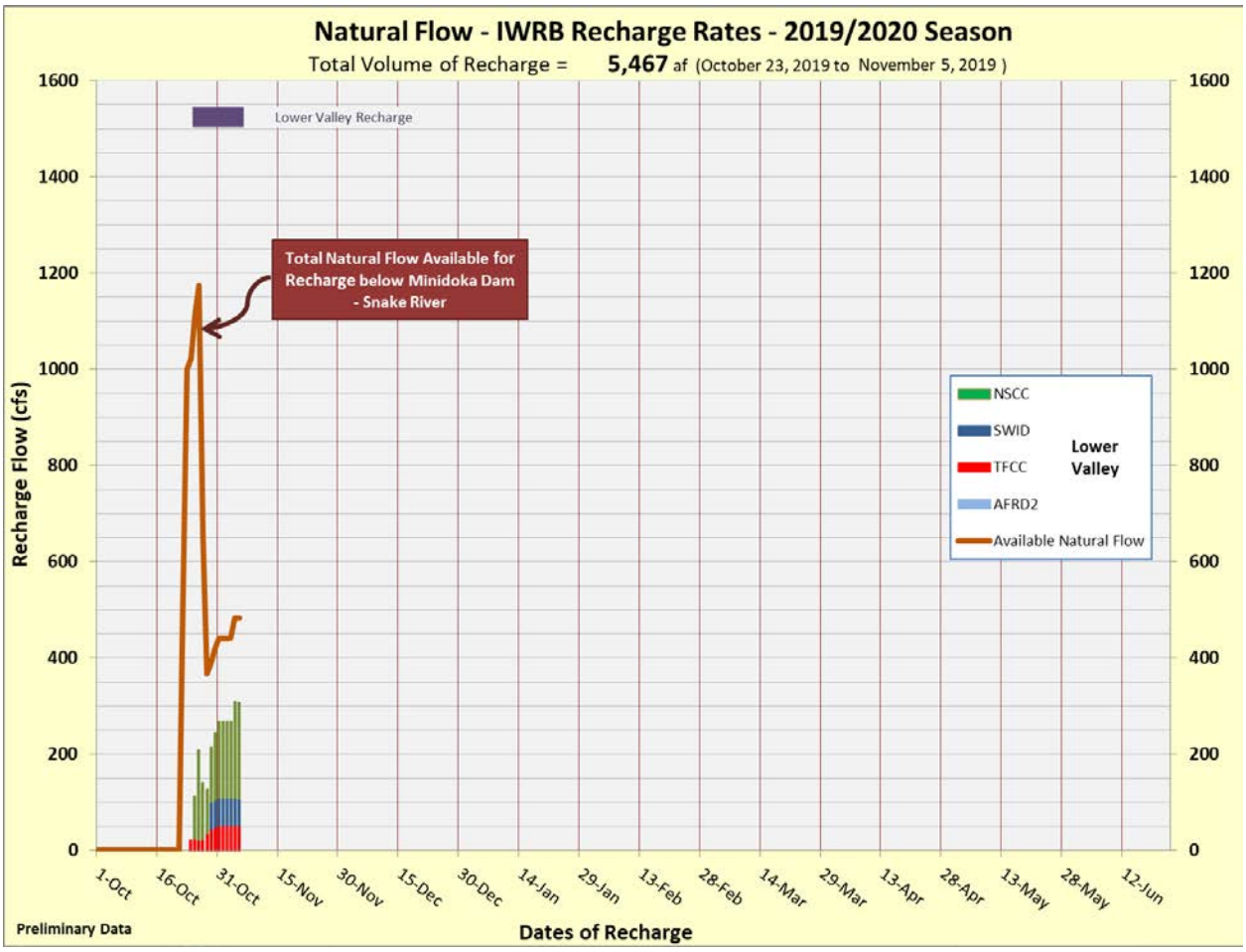


Figure 1. IWRB daily natural flow recharge flows for the 2019/2020 season.

III. 2019 Managed Recharge for Other Entities

Over the past five years the IWRB has developed partnerships, infrastructure, and an administrative structure to conduct managed recharge throughout the ESPA. The IWRB also supports other water user recharge efforts consistent with ESPA aquifer stabilization objectives.

Table 3 and Figure 2 summarize IWRB recharge efforts for the other entities as of November 1, 2019.

Table 3. IWRB Recharge - Storage Water for Other Entities

Storage Water Source	IWRB Partner	Start	End	Avg. Rate (cfs)	Total Recharged (af)*
SWC – IGWA/WMC	Aberdeen-Springfield CC	Aug 24	Oct 13	198	20,000
	New Sweden ID	Aug 23	Oct 15	34	3,681
	Idaho ID	Sept 14	Oct 25	5	436
	Progressive ID	Oct 12	Oct 29	73	2,598
	Snake River Valley ID	Aug 30	Oct 29	36	4,359
	Farmers Friend IC	Aug 24	Oct 31	35	4,007
	Fremont-Madison ID	Aug 22		111	8,632
	Great Feeder CC	Sept 7	Oct 25	94	7,979
				Total	51,703
Cities	Fremont-Madison ID	Oct 7		105	6,308

* As of November 1, 2019 – Reported recharge volumes are preliminary and subject to change.

SWC – IGWA/WMC Settlement Agreements:

The SWC receives a total of 58,500 af of storage water from IGWA (50,000 af) and WMC (8,500 af) as part of their settlement agreements. Any of the storage water not utilized for irrigation is to be used for targeted conversion projects and managed recharge as determined by the parties to the agreements. As in previous years, the IWRB has agreed to recharge this storage water.

The IWRB worked with eight of its partners in the Upper Valley to conduct this recharge, which started on August 22 and is expected to continue through the later part of November. Most of the IWRB's partners finished recharging in October. In some cases, recharge was terminated when an entity maximized its allotted recharge volume, and in other cases recharge was stopped due to canal maintenance, severe cold weather, and/or limitation due to the USBR Winter Water Savings stipulation related to Palisades Storage Water contracts. The Fremont Madison Irrigation District (FMID) is scheduled to recharge the remaining volume of water in the month of November after completing recharging the water from the Cities.

Coalition of Cities-SWC Settlement Agreement:

The settlement agreement between the Cities and the SWC requires a commitment of 7,650 af on average per year to be used for aquifer enhancement projects on the ESPA. The agreement outlines criteria for various aquifer enhancement projects including providing water to the IWRB for managed recharge in the ESPA. The City of Pocatello supplies storage water to the Cities to meet their obligation and has contracted with the IWRB to conduct managed recharge for some of the water. This year, Pocatello transferred 6,308 af of storage water to the IWRB for recharge.

Most of the IWRB's partners in the Upper Valley will stop recharge activities on October 31 to comply with the Winter Water Savings Stipulation associated with Palisades Reservoir storage water contracts. The Fremont Madison Irrigation District is not subject to this stipulation and plans to continue recharging through most of November. All of the water associated with the Cities' agreement has been recharged in the FMID system.

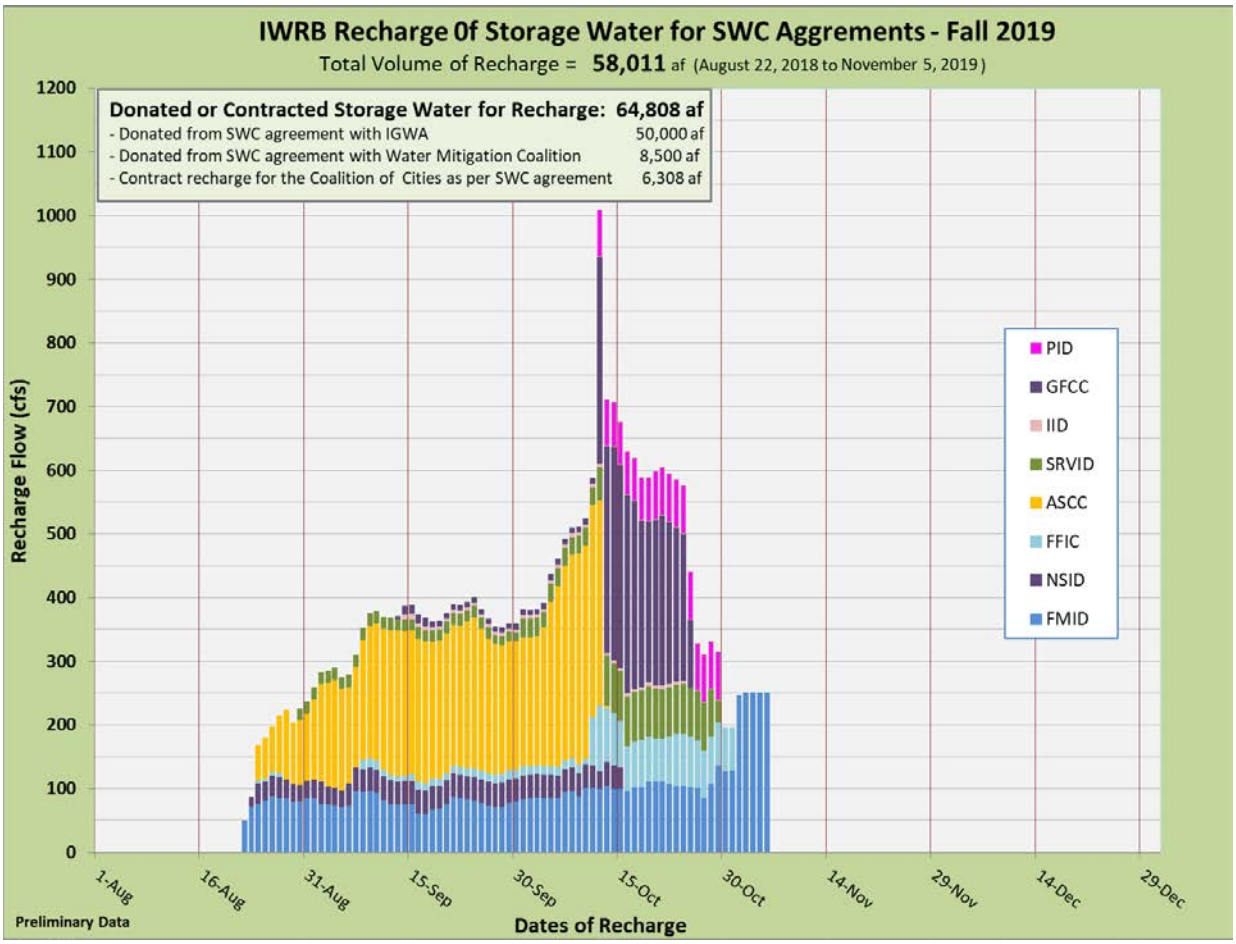


Figure 2. IWRB daily recharge flows for all storage water from other entities, Fall 2019.

IV. ESPA Recharge Program Projects and Buildout Activities

The IWRB has actively supported development of additional recharge capacity throughout the ESPA to meet the managed recharge goal of an average 250,000 af/yr. For managed recharge projects involving infrastructure improvements to which the IWRB provided funding, a Memorandum of Intent (MOI) was developed to establish a long-term agreement (twenty years) between the IWRB and the entity implementing the project. The MOI acknowledges: 1) the IWRB provided financial assistance for a project; and 2) the entity agreed to deliver and prioritize delivery of the IWRB's recharge water as compensation for financial assistance from the IWRB.

ESPA Managed Recharge Infrastructure Project Summary:

The IWRB allocated over $20 million dollars from 2013 through fiscal year 2020 for infrastructure improvements to increase managed recharge throughout the ESPA. In fiscal year 2020, the IWRB budgeted $5 million for development of managed recharge infrastructure throughout the ESPA. The status of the current projects in the Lower and Upper Valleys is included in Tables 2 and 3, respectively. A summary of the projected recharge projects is presented in Table 4.

Table 2. Current IWRB ESPA Managed Recharge Projects - Lower Valley						
IWRB Partner	**Project Name**	**Project Type**	**Status**	**Approved Funds**	**Scheduled Completion**	**Description /** Key Items
AFRD2	Dietrich Drop Hydro Plant Winter By-pass	Design / Construction	Active	$1,500,000	Dec 2019	**Winter recharge by-pass of the Dietrich Drop Power Plant** • Finalize cost and project schedule – May 2018 • Constr. of tail race gate & bypass improv. – Jan 2019 • Final FERC submittal for forebay improv. – Sept 2019 • Construction of forebay improv. – Oct/Nov 2019
AFRD2	MP 28 Hydropower Plant Tailbay Winterization Project	Construction	Active	$1,400,000	Nov 2019	**Tailbay isolation and forebay improvements for winter recharge** • Design Completion – Sept 2018 • Start Construction – Oct 2018 • Tailrace Building – Oct/Nov 2019
AFRD2	MP 29 Recharge Site	Construction	Active	$640,000	Mar 2020	**Construction of new site** • Survey data - Feb 2018 • Design & Contractor hired – July/Aug 2019 • GW Quality Monitoring Plan & Wells – Fall 2019 • Start construction – Oct 2019 • In canal construction complete – Dec 2019
North Side CC	Wilson Canyon Site	Design / Construction	Active	$1,900,000 Est. Cost $1.33 M.	Nov 2019	**Design & construction of recharge site** • Design completed & Bid advertisement – Sept 2018 • BLM ROW & constr. outside the canal – Mar 2019 • Completion of monitor wells – June/July 2019 • Final Testing of infrastructure – Nov 2019
TFCC	TFCC Injection Wells	Construction	Active	$178,000	Mar 2020	**Construction of recharge site** • Well Permitting & Easements – Fall/Winter 2019 • Start construction – Fall/Winter 2019 • Testing injection well – Winter 2019/Spring 2020
A&B ID	A&B Injection Wells	Construction	Active	$202,000	Spring 2021	**Construction of recharge site** • USBR easements / project transfer – Spring 2020 • Well Permitting – Summer 2020 • Start Construction – Fall 2020 • Testing injection well – Winter 2020/Spring 2021

Table 3. Current IWRB ESPA Managed Recharge Projects - Upper Valley						
IWRB Partner	**Project Name**	**Project Type**	**Status**	**Approved Funds**	**Scheduled Completion**	**Description /** Key Items
Fremont-Madison ID	Egin Lakes Phase II	Construction	Active	$580,000	Fall/Winter 2019	**Construction of Egin Lakes Phase II - recharge capacity expansion** • BLM approval – Oct 2018 • Finish construction on new areas – May 2019 • Testing of Site - Summer/Fall 2019 • Constructing Berms in new area – Fall/Winter 2019
Great Feeder Canal Co.	Ward Site	Construction	Active	$120,000	**Complete** Oct 2019	**Construction of recharge site** • Evaluation of area complete – Jan 2018 • Finish of site construction – Apr 2019 • Submit GW monitoring plan – Apr 2019 (est. completion Sept 2019) • Drilling & equipping monitor well – Oct 2019

Table 4. Projected Lower & Upper Valley - IWRB ESPA Managed Recharge Projects						
IWRB Partner	**Project Name**	**Project Type**	**Status**	**Approved Funds**	**Scheduled Completion**	**Description /** Key Items
North Side CC	Additional Managed Recharge Sites below Wilson Lake	Survey, Design	Planning	None at this time	2020	**Preliminary Design of potential recharge site** • Staff Evaluation and additional survey data – Summer 2018 • LiDAR Survey Data – Nov 2018 • Analysis of survey – Mar 2019 • IWRB feedback on potential sites – Apr 2019 • Design and Cost Estimate – After test of Wilson Canyon
IWRB	Upper Valley – Large Scale Recharge Project	Evaluation	Planning	None at this time	2020?	**Evaluation of the Upper Valley to determine the potential of developing a large scale managed recharge project** • Ranking of best areas – Spring 2019 • Field evaluation of potential areas – Summer 2019 • Analysis of available data & report of potential areas – Aug/Sept 2019 • IWRB/Aquifer Stabilization Committee input on potential sites – Nov 2019

IDAHO
Water Resource Board

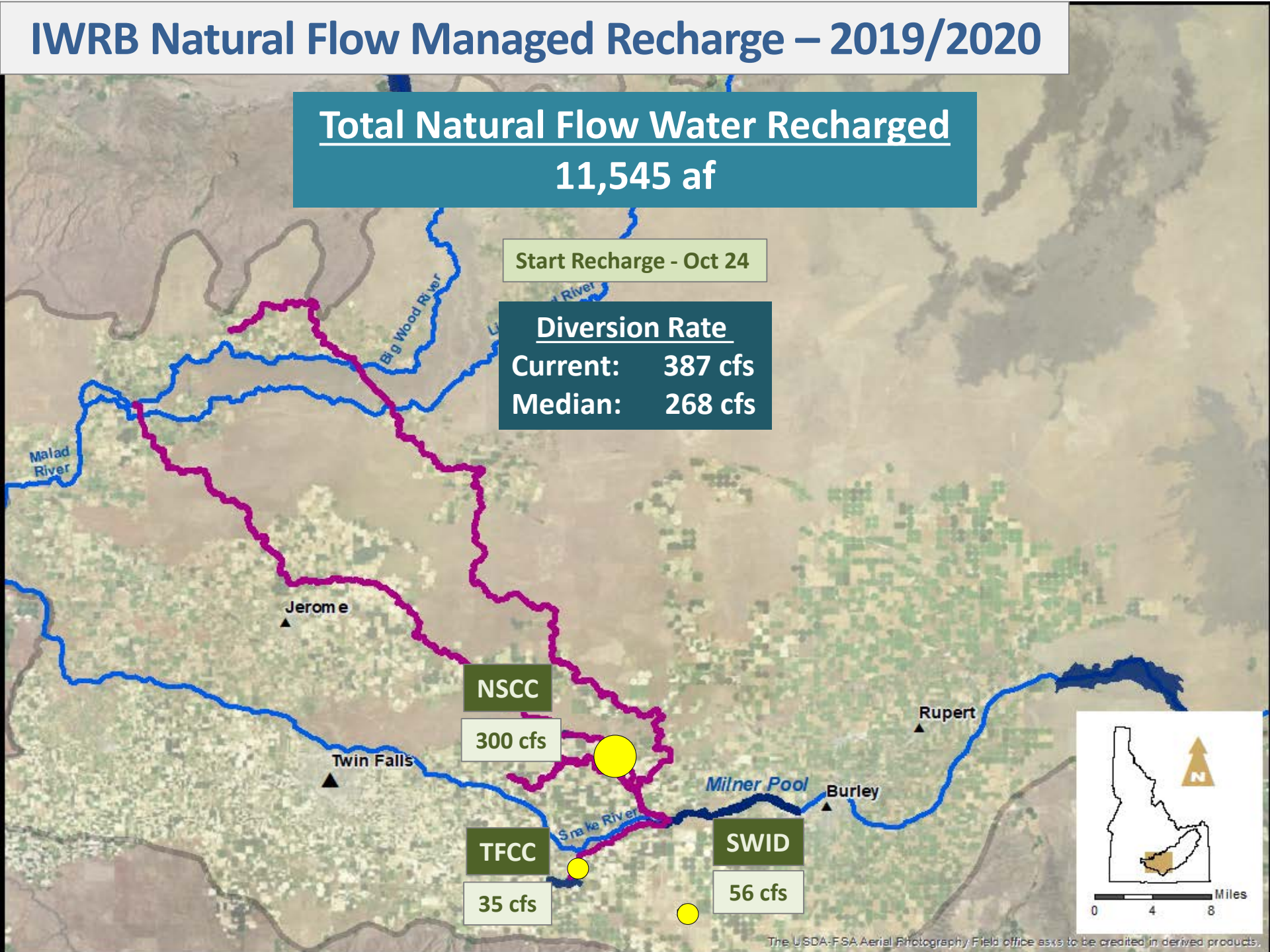
IWRB Managed Recharge Program

IWRB Board Meeting

Wesley Hipke
IWRB Recharge Program Manager

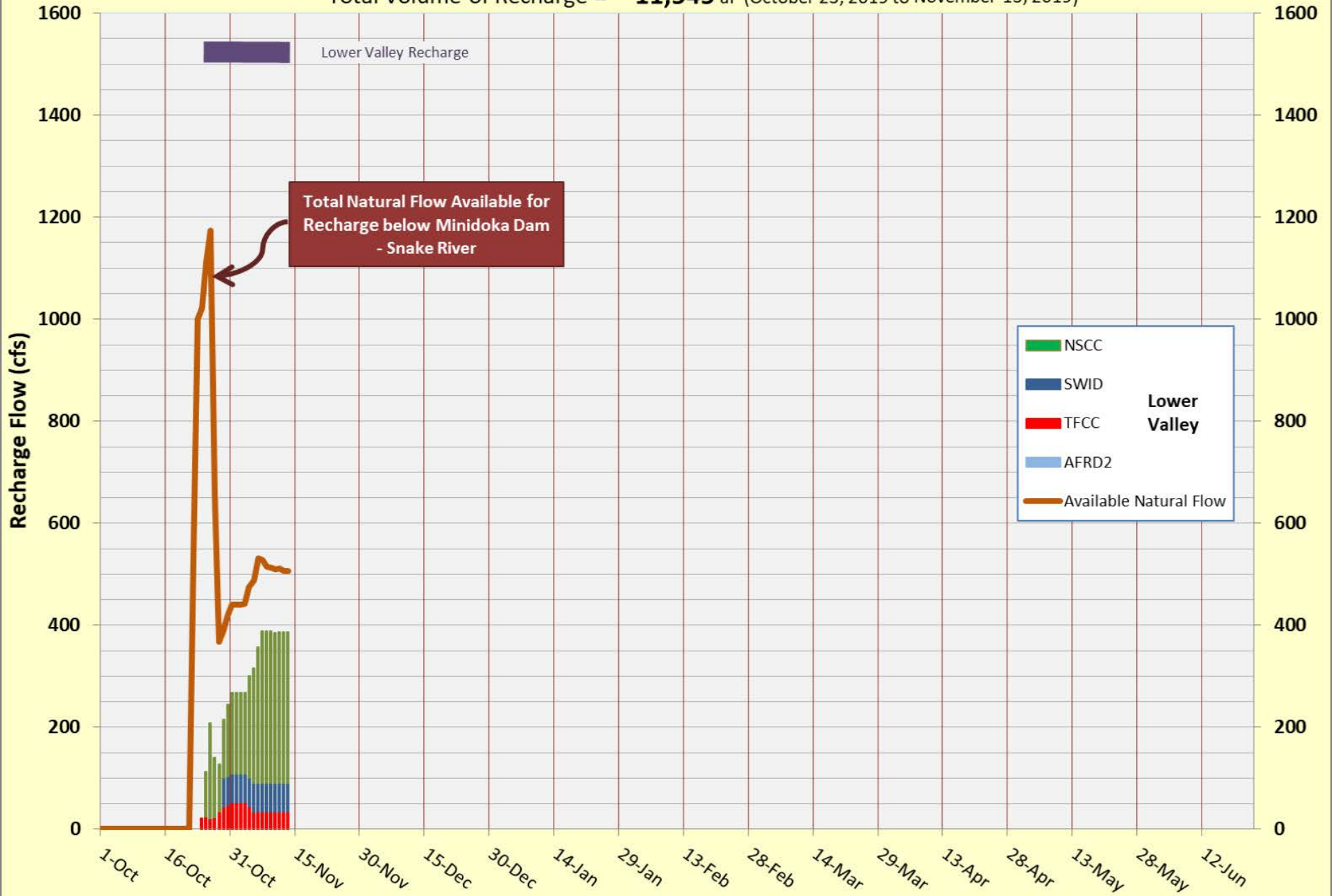
November 14, 2019

IWRB Natural Flow Managed Recharge – 2019/2020



Natural Flow - IWRB Recharge Rates - 2019/2020 Season

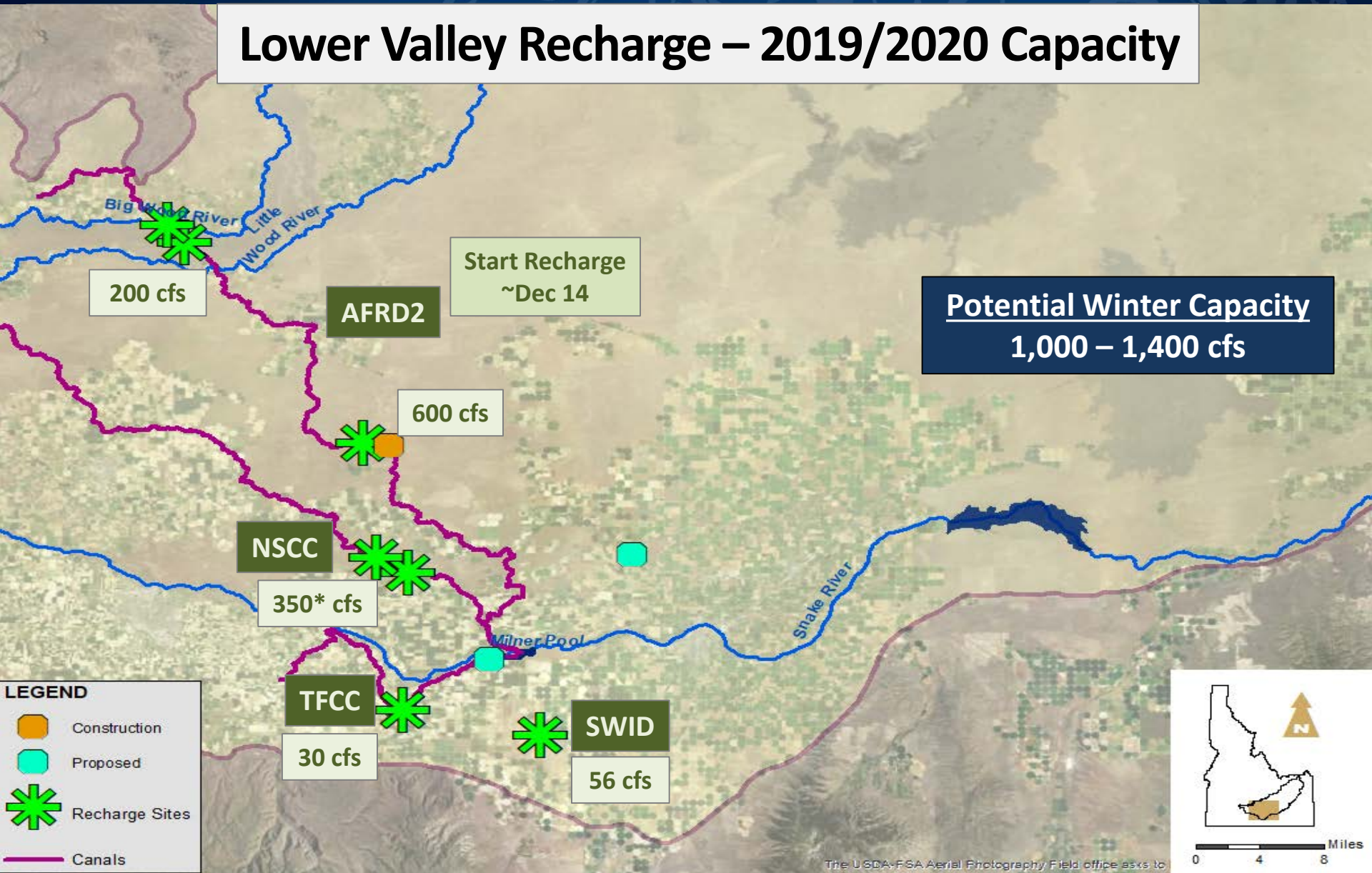
Total Volume of Recharge = **11,545** af (October 23, 2019 to November 13, 2019)



Preliminary Data

IDAHO
Water Resource Board

Lower Valley Recharge – 2019/2020 Capacity



Potential Winter Capacity
1,000 – 1,400 cfs

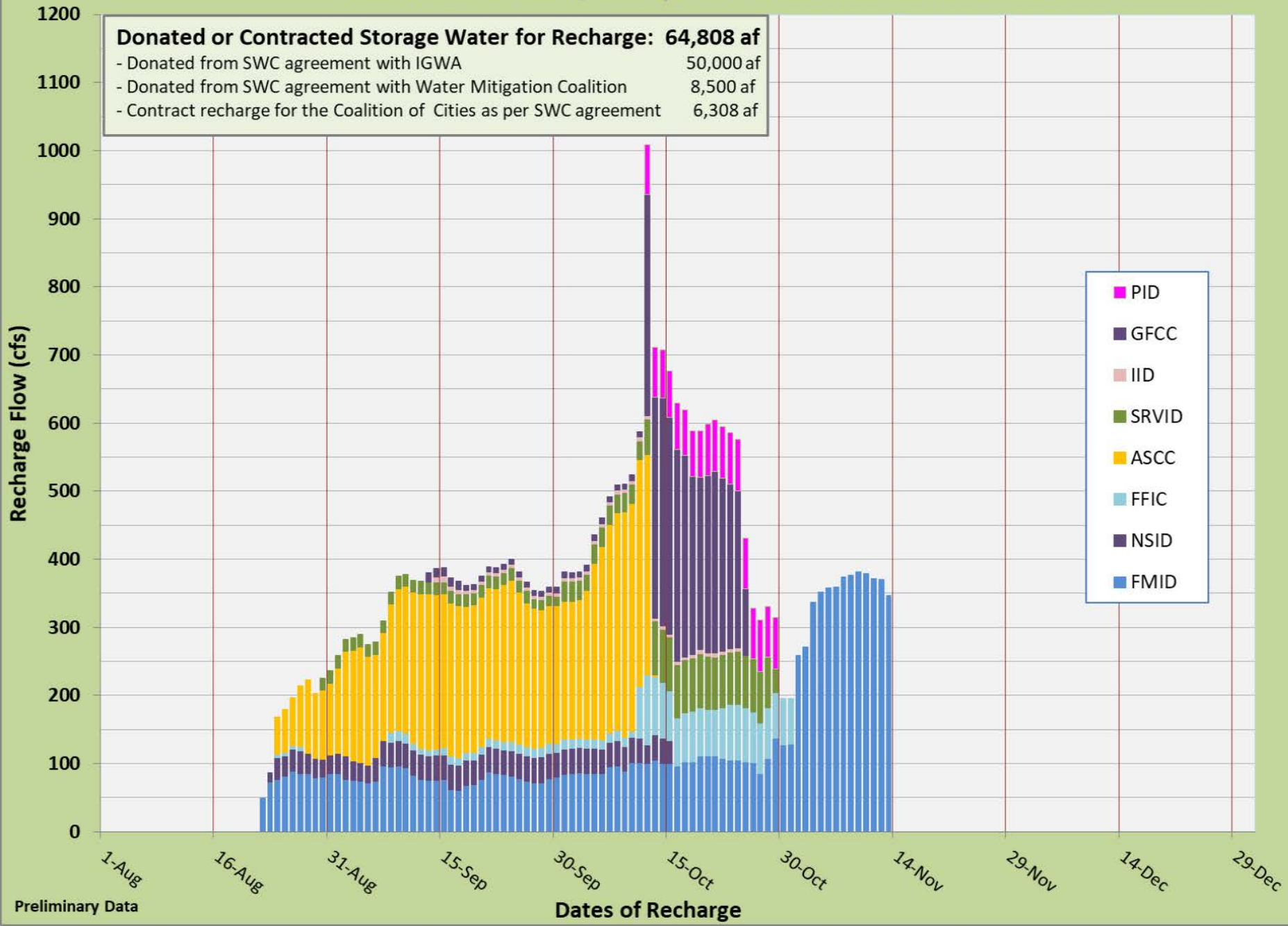
ESPA Managed Recharge Program

Potential Impacts to Recharge:

- Water Availability
- Weather
  - Freezing Conditions
  - Warming Conditions
- Canal Operations / Infrastructure Issues
- Others??

IWRB Recharge 0f Storage Water for SWC Aggrements - Fall 2019

Total Volume of Recharge = **64,530** af (August 22, 2018 toNovember 13, 2019)



Preliminary Data

IWRB Managed Recharge for SWC Agreements – Fall 2019

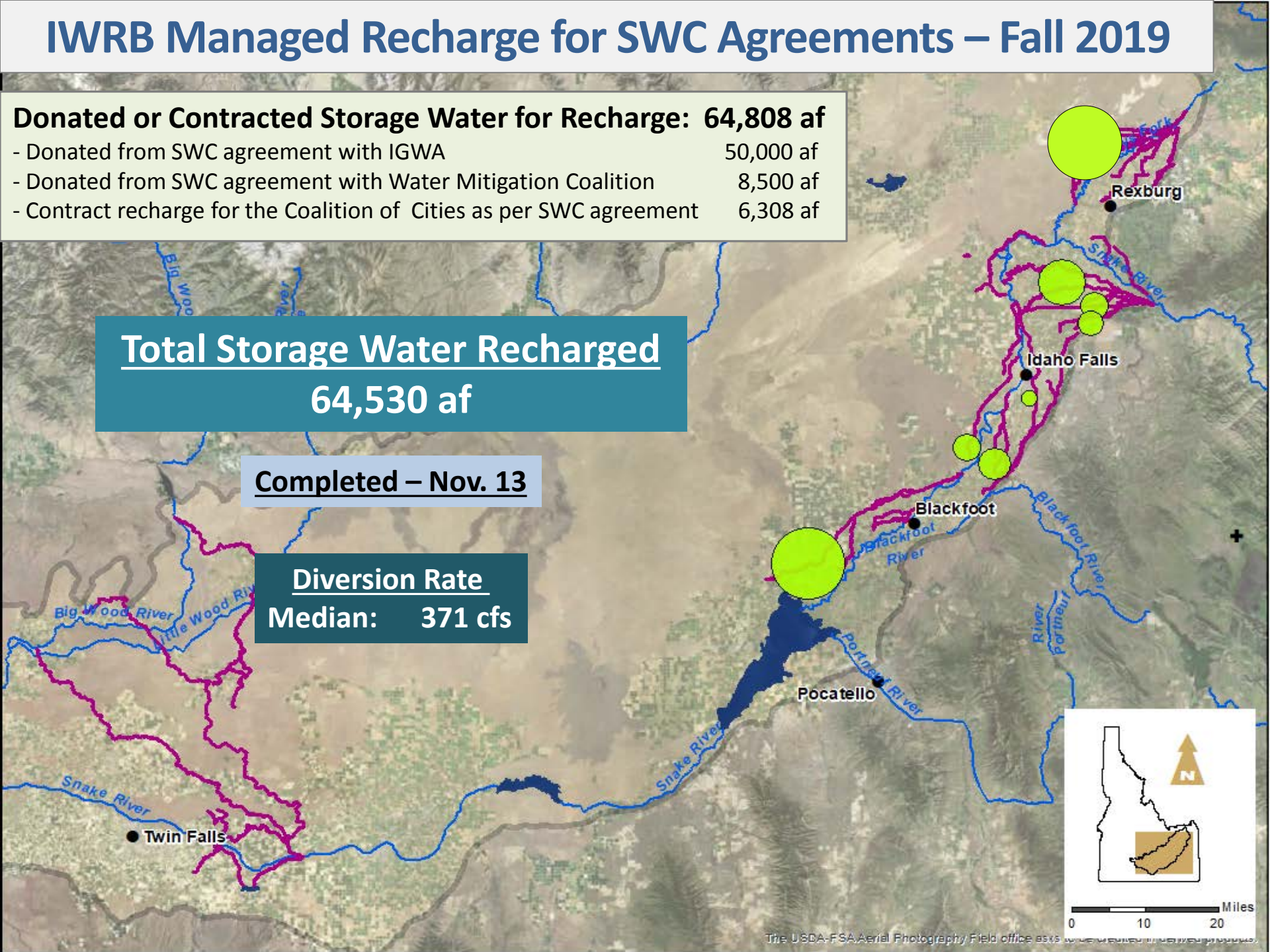
Donated or Contracted Storage Water for Recharge: 64,808 af

- Donated from SWC agreement with IGWA 50,000 af
- Donated from SWC agreement with Water Mitigation Coalition 8,500 af
- Contract recharge for the Coalition of Cities as per SWC agreement 6,308 af

Total Storage Water Recharged
64,530 af

Completed – Nov. 13

Diversion Rate
Median: 371 cfs



IDAHO
Water Resource Board

Questions

Memorandum

To: Idaho Water Resource Board

From: Randall Broesch P.E.

Date: October 31, 2019

Re: Large Recharge Project in the Upper Valley of the ESPA

REQUIRED ACTION: No action required.

Project Concept

Develop a large recharge project in the upper valley of the Eastern Snake Plain Aquifer (ESPA) for the purposes of expanding current recharge operations to stabilize aquifer levels across the ESPA.

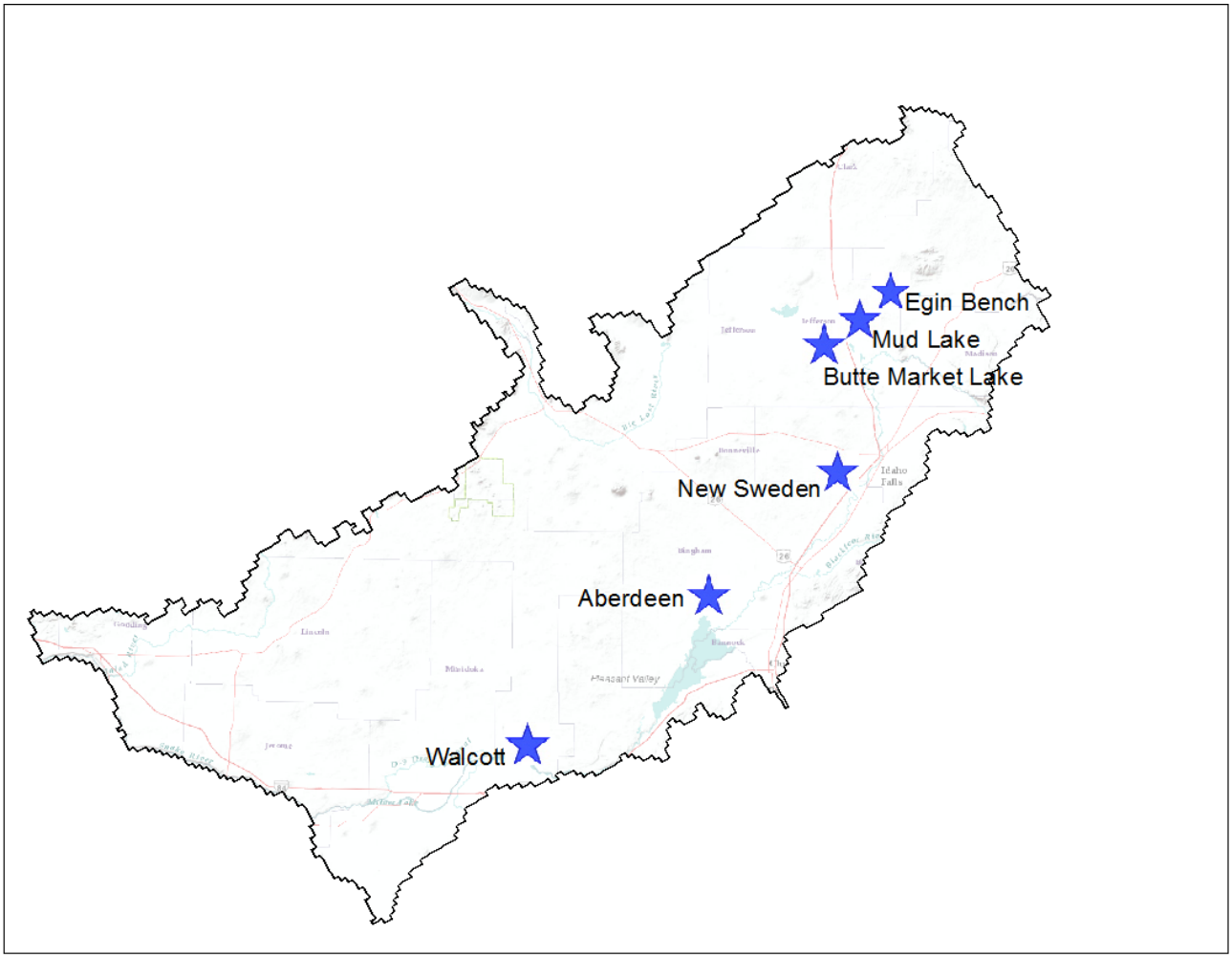
Project Update

April 23rd, 2019 Aquifer Stabilization Committee Meeting – In the meeting, staff presented the results of a modeling analysis using recharge related criteria such as depth to water, retention time, and land use to identify 6 possible large scale recharge areas across the ESPA. Those areas were Lake Walcott, Aberdeen-Springfield, New Sweden, and the Mud Lake/Egin Bench/Butte Market Lake areas. At the conclusion of the meeting staff notified the committee members field reconnaissance would occur in the spring and summer months to gather more information regarding the capability for large recharge efforts to occur in these areas.

Spring/Summer 2019-Staff gathered topographic information regarding basins identified in each area as well as any features that may be impacted from a large recharge project. While out in the field, visual observations were noted of the surface geologic features indicative of potential recharge sites (i.e. rocky porous depressions capable of accepting large volumes of water). Also, physical depth to water measurements were made in the areas if wells happened to be nearby.

Summer/Fall 2019-Staff contacted the Bureau of Land Management (BLM) to verify whether there were any conflicting land uses in project areas identified earlier in the spring. Using the information provided by the BLM, all the information was compiled into the analysis model and the project areas were screened for the capability to develop a large recharge project.

Staff will present the results of the analysis and solicit feedback from the Board regarding the findings of the analysis and how to proceed with the project. Project areas are highlighted below:



Picture 1 Recharge Areas Identified Across the ESPA

IDAHO Water Resource Board

Planning & Development For a Large Recharge Project

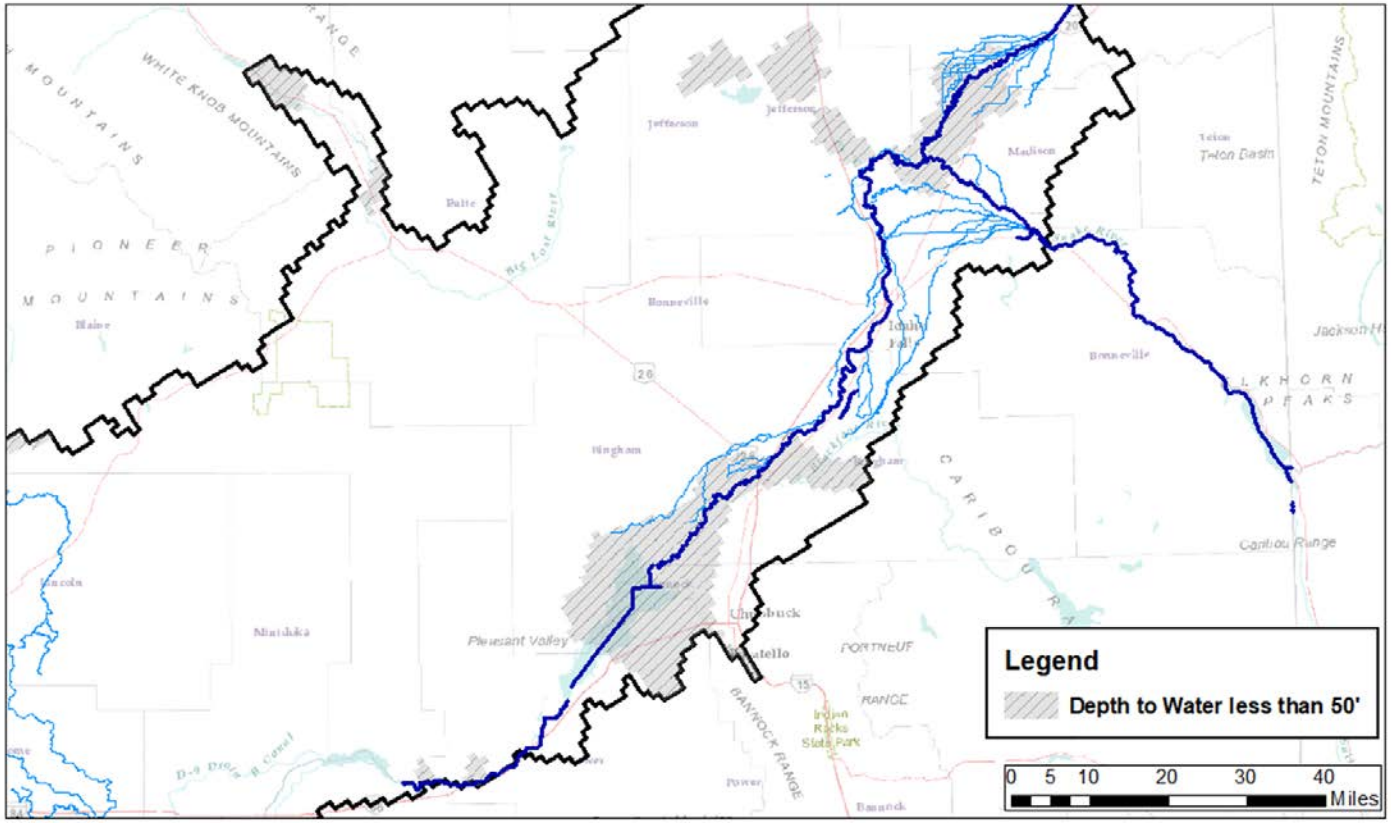
November IWRB Board Meeting No. 10-19

Randy Broesch P.E. • Staff Engineer • November 14, 2019

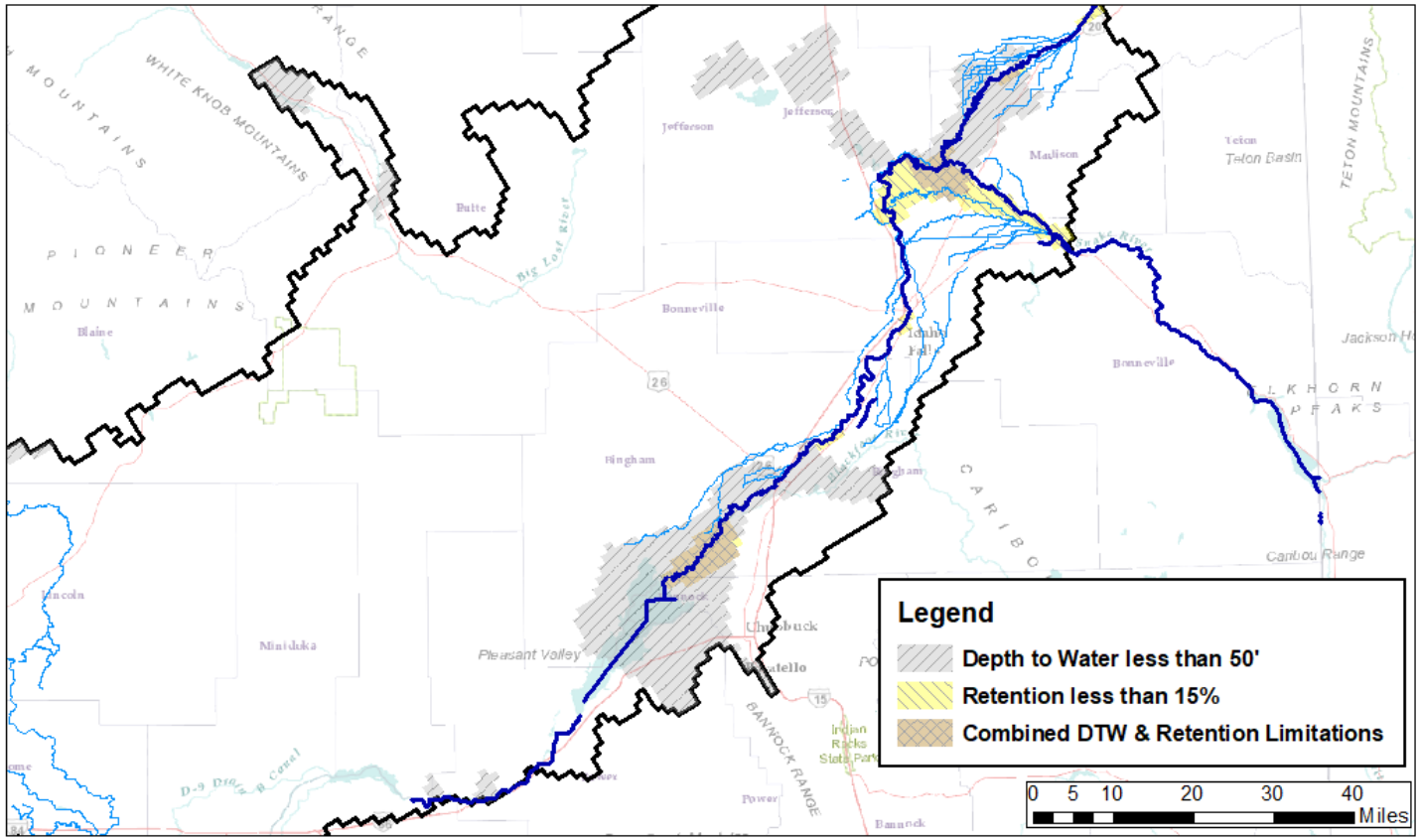
Large Recharge Project Development

- Purpose: Report Findings and Solicit Feedback from the Board
- Development of Project Areas (Recap)

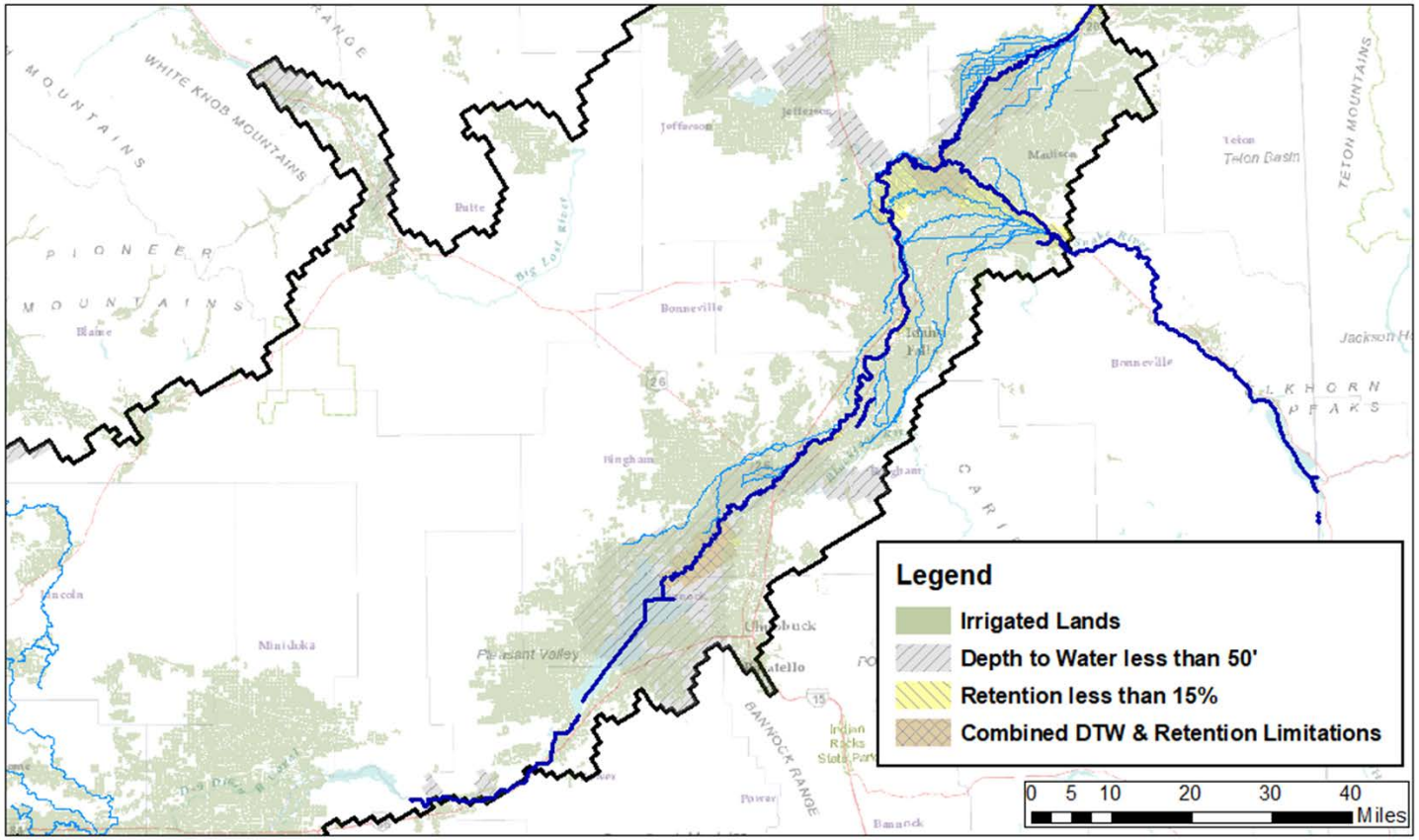
Large Recharge Project Development



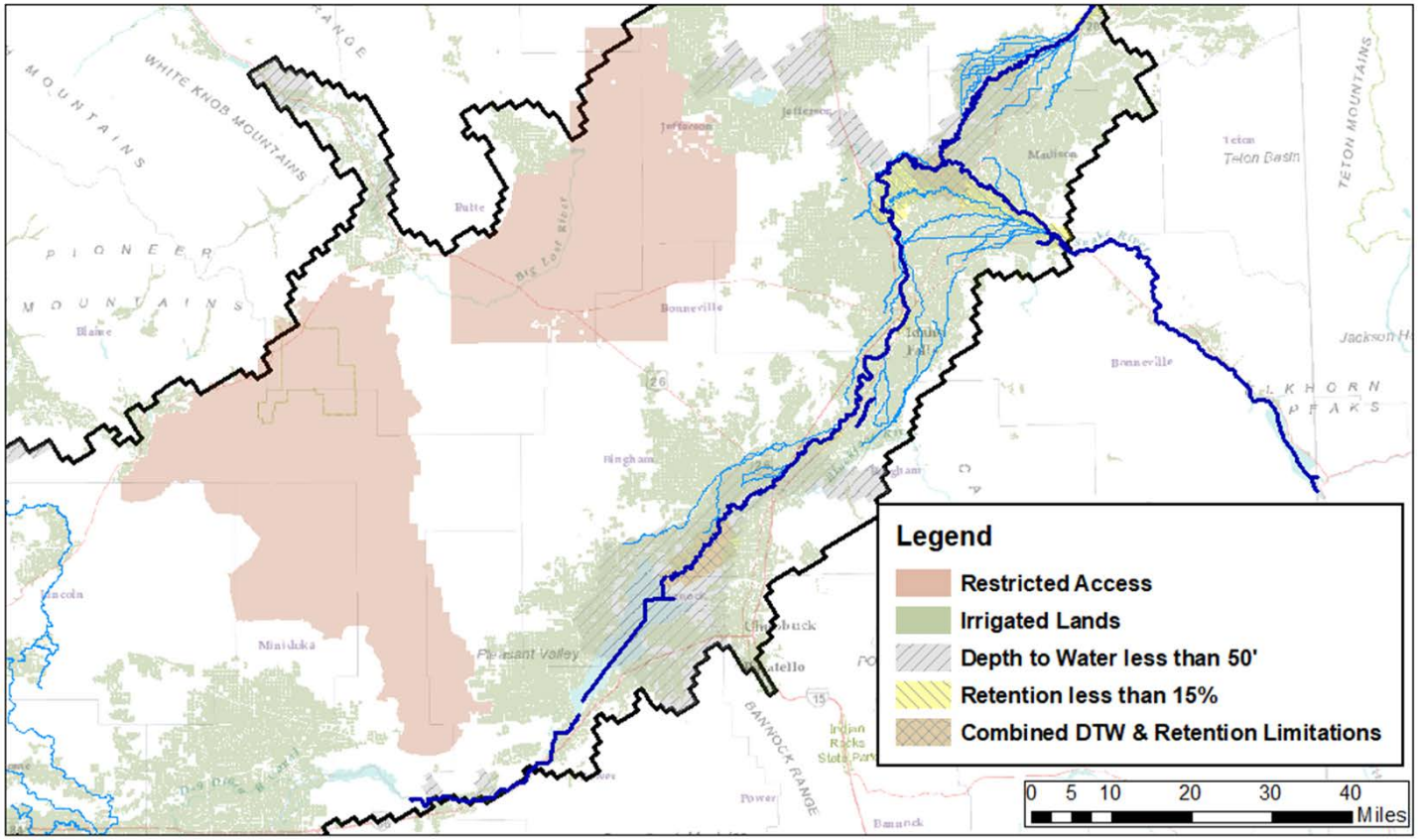
Large Recharge Project Development



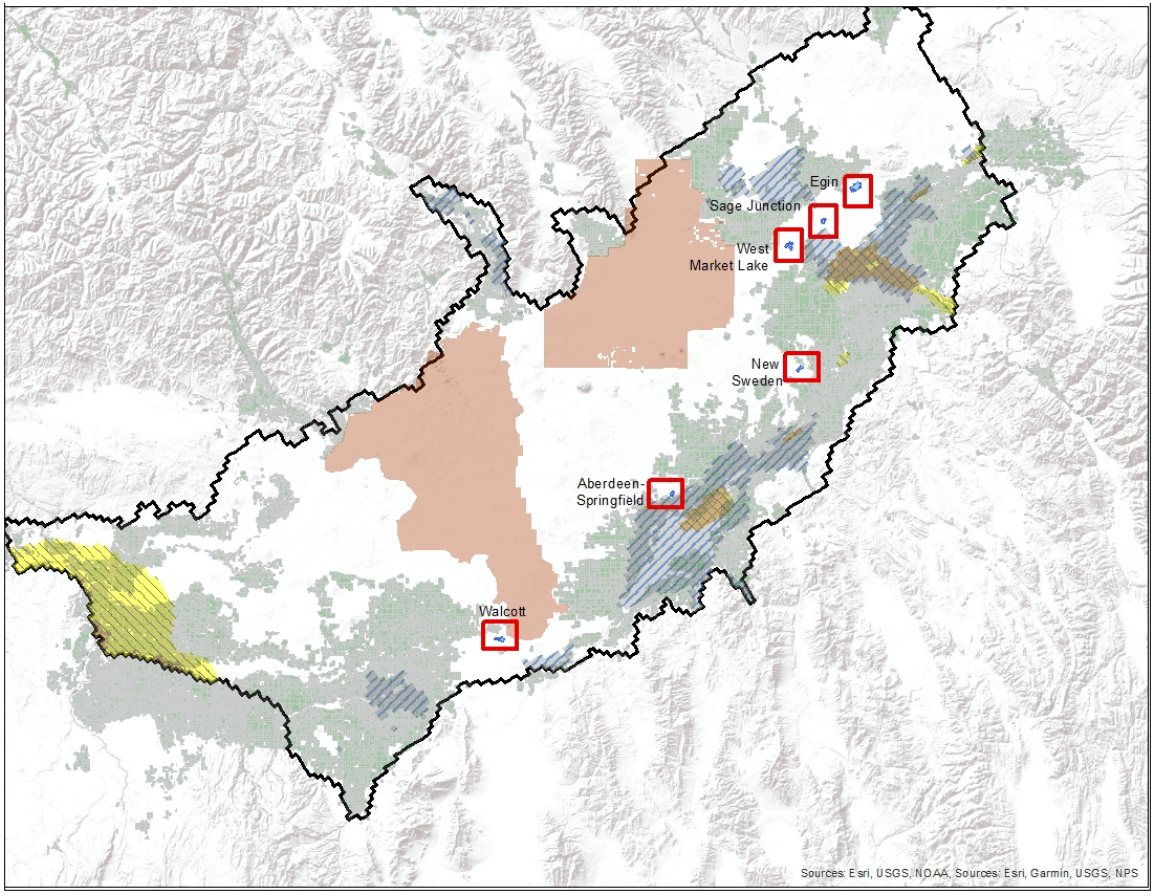
Large Recharge Project Development



Large Recharge Project Development



ESPA Large Recharge Project Areas

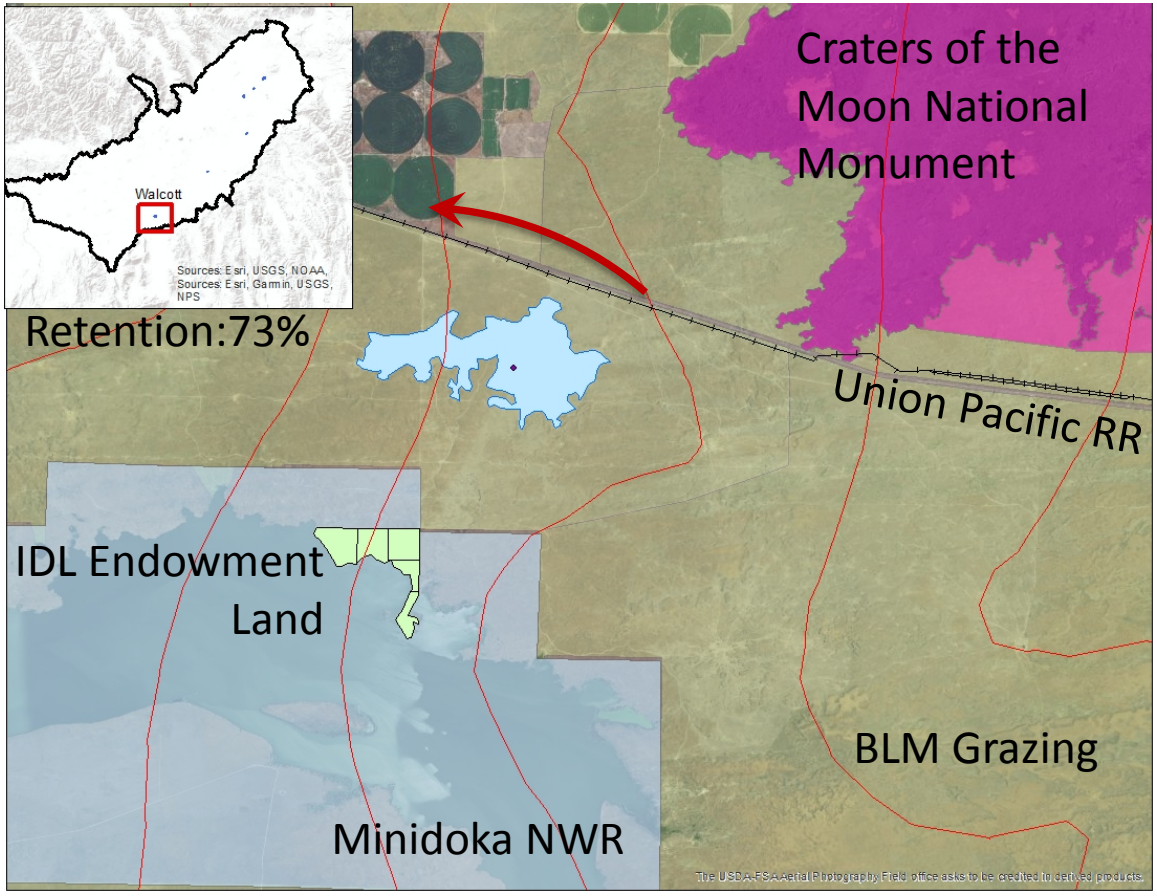


Large Recharge Project Development

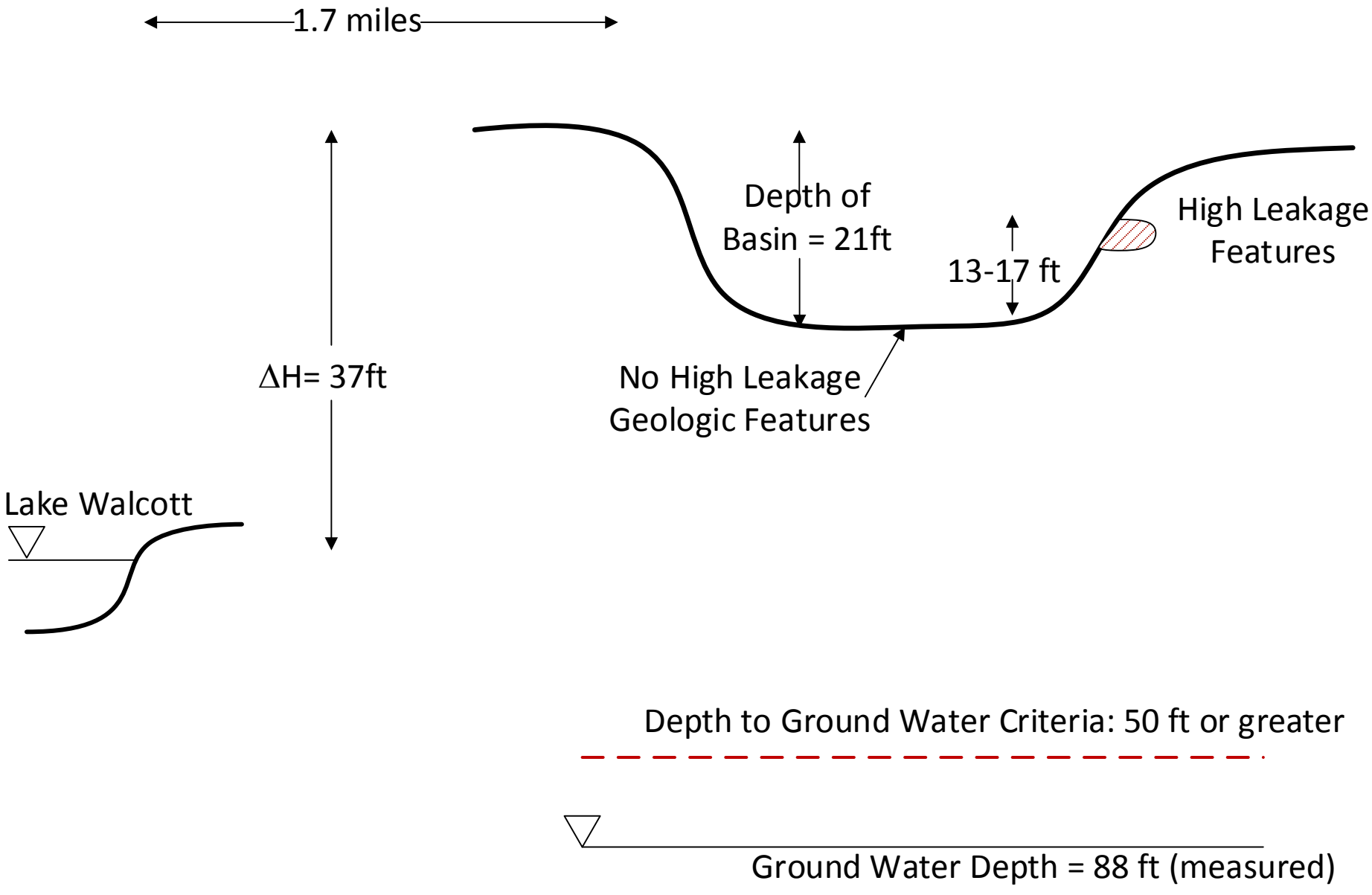
- Additional Information Gathered:
  - BLM Land Use Information
  - Field Reconnaissance/Investigation

Large Recharge Project Development

Walcott Project Area



Walcott Concept

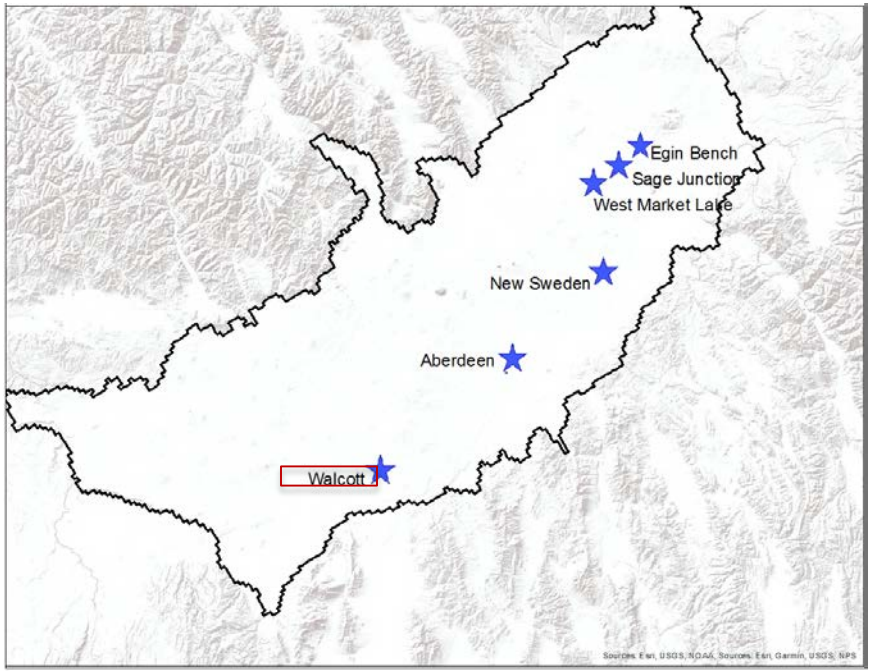


Walcott-Surface Features

Leakage Feature High on Basin Shoulder

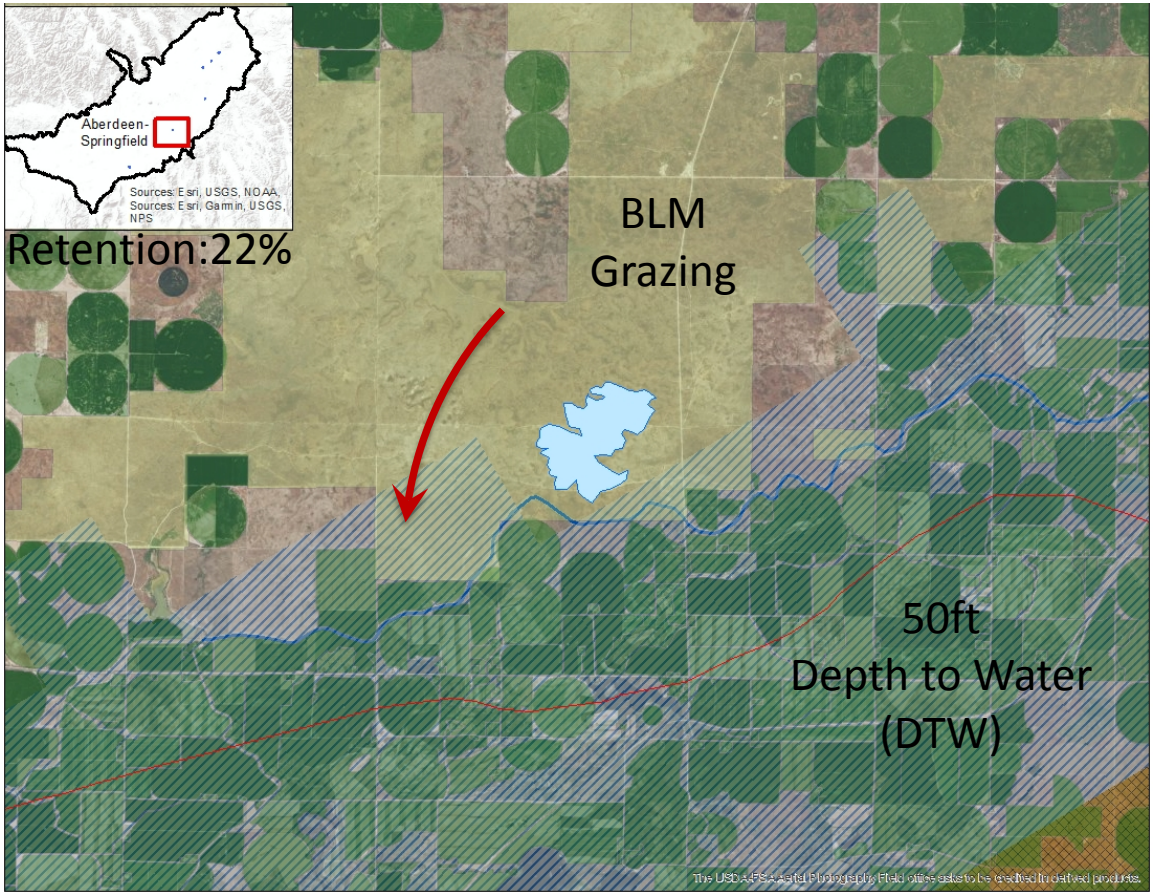
Sediments Filling in Open Areas in Basin Floor

Walcott-Summary

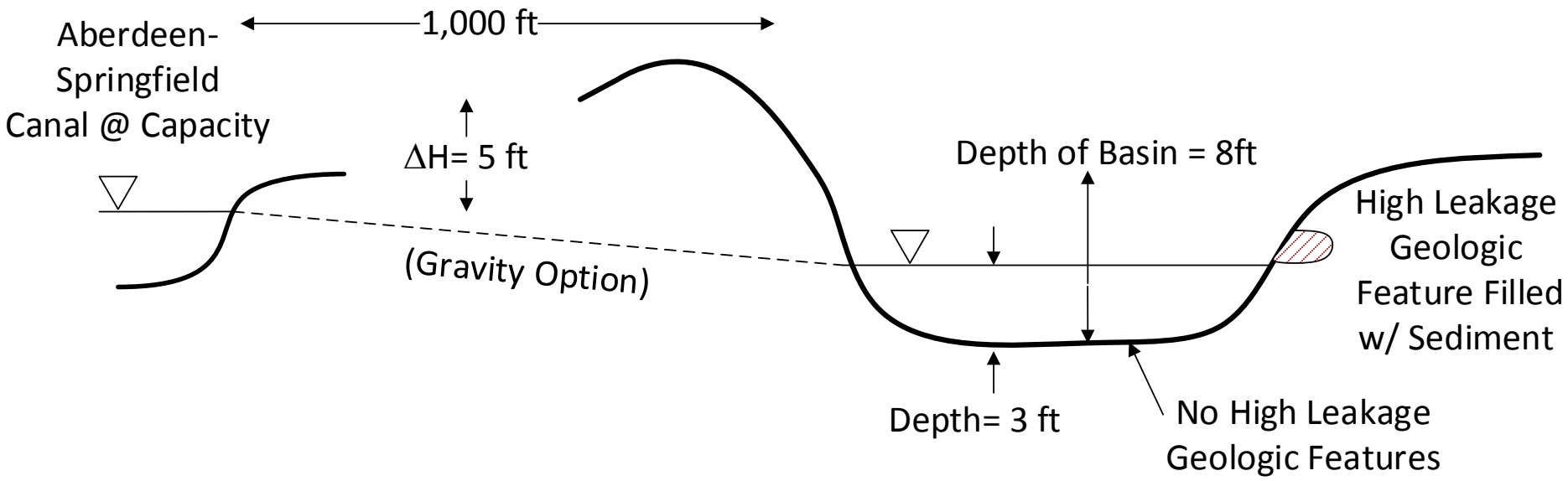


- Advantages:
  - Meets DTW Criteria
  - Retention: 73%
  - Land Uses (Grazing)
  - High leakage geologic features high on the basin shoulders
- Disadvantages
  - No high leakage geologic features on the basin floor
  - Elevated Basin from the water supply
  - Power lines in the inundation area
  - Stockwell in the inundation area
  - Basin spills towards railroad tracks

Aberdeen Springfield Project Area



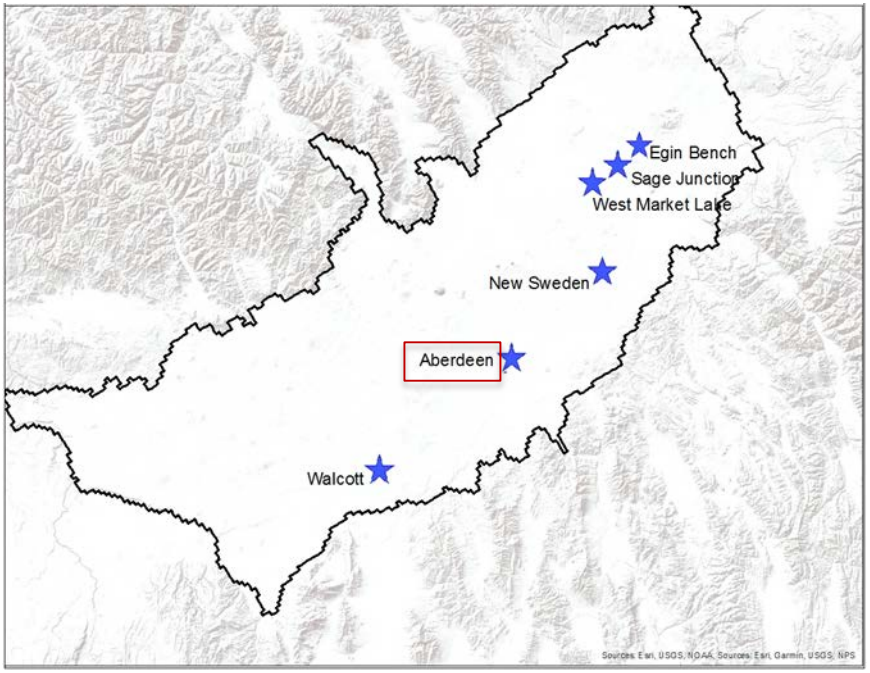
Aberdeen Springfield Concept



Ground water depth
▽ = 50 ft (estimated)

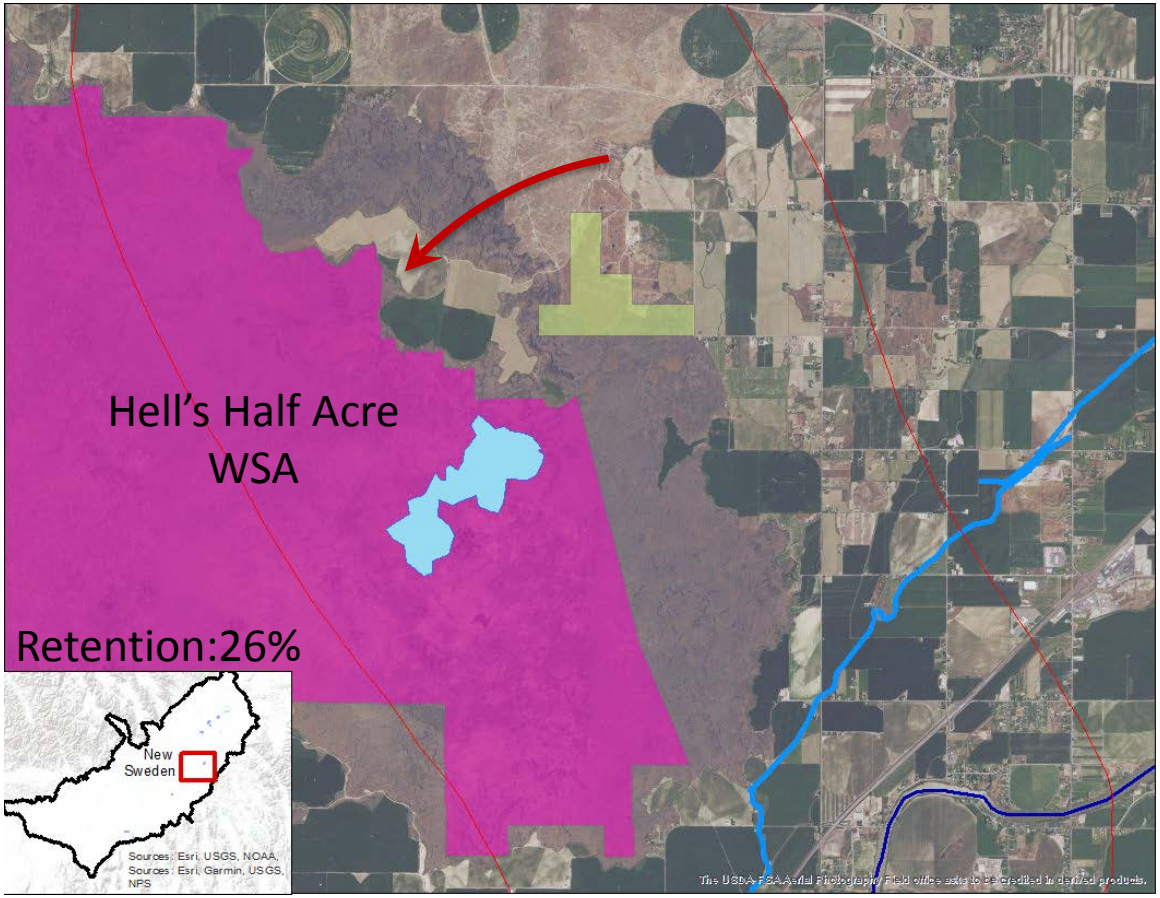
Depth to Ground Water
Criteria: 50 ft or greater

Aberdeen Springfield-Summary



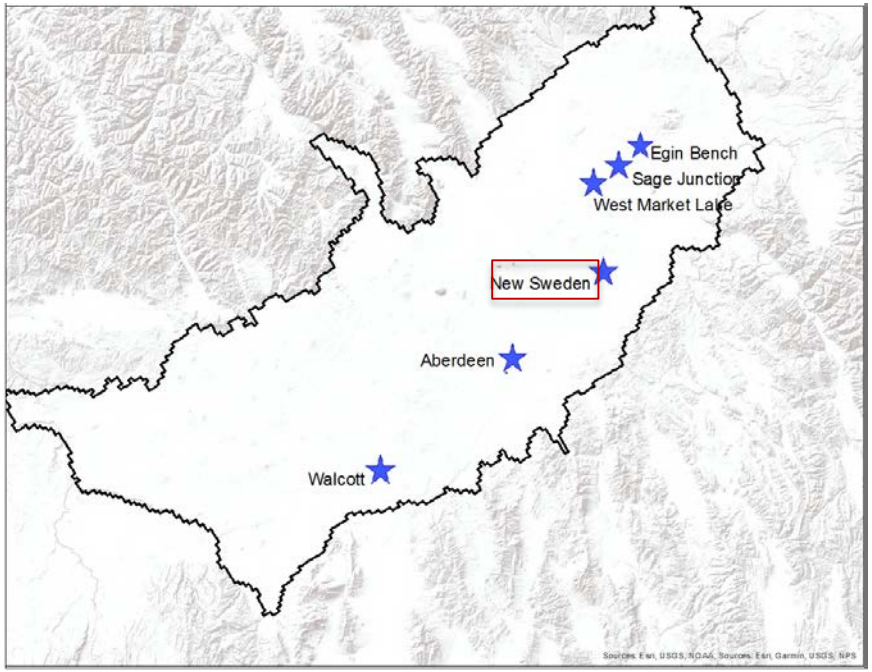
- Advantages:
  - DTW meets criteria
  - Water Supply in close proximity
  - Gravity conveyance possibility
  - Land Use-BLM Grazing
- Disadvantages
  - Retention: 22%
  - No Observed high leakage geologic feature
  - Groundwater gradient trends to the springs
  - Location High Leakage Geologic features
  - Basin observed to be filled with sediment
  - Species of Concern (Potential Land Use Limitations)
  - Powerlines located in the basin

New Sweden Project Area



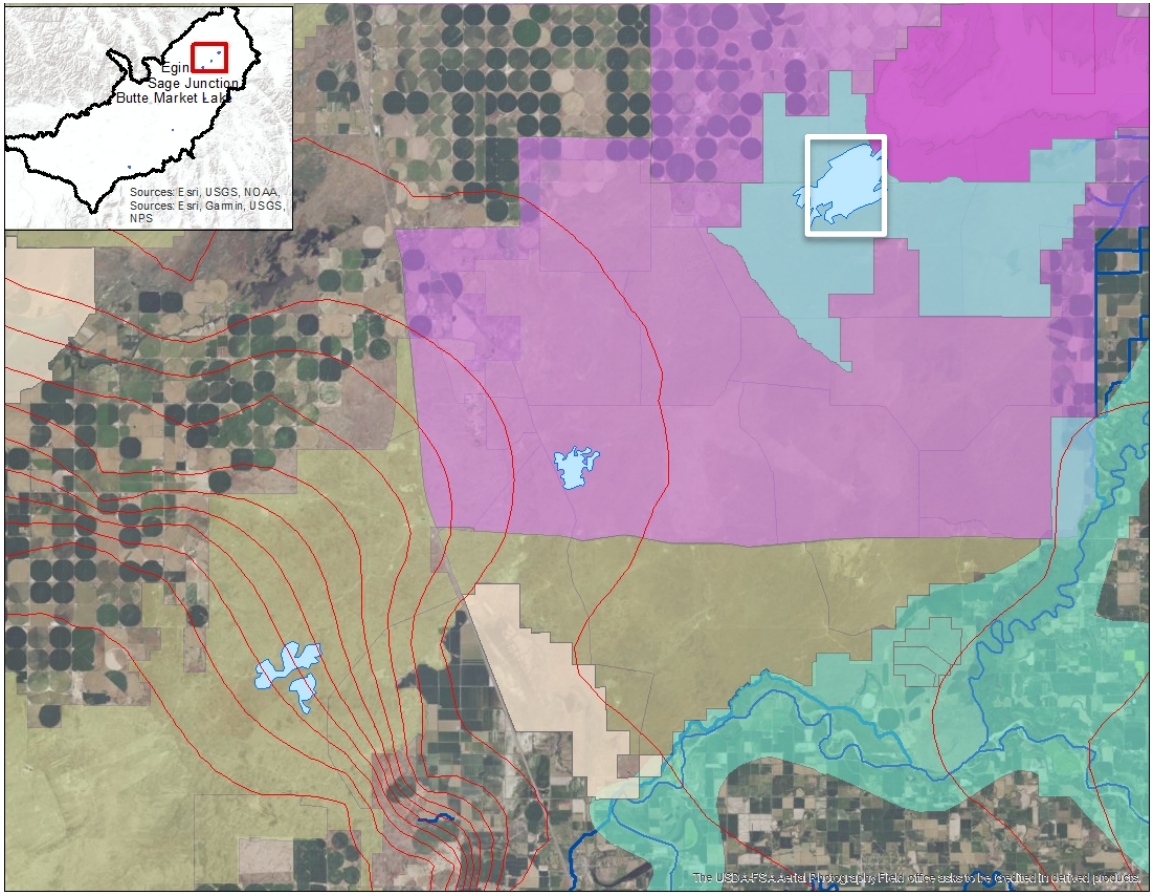
New Sweden Features

New Sweden Advantages/Disadvantages

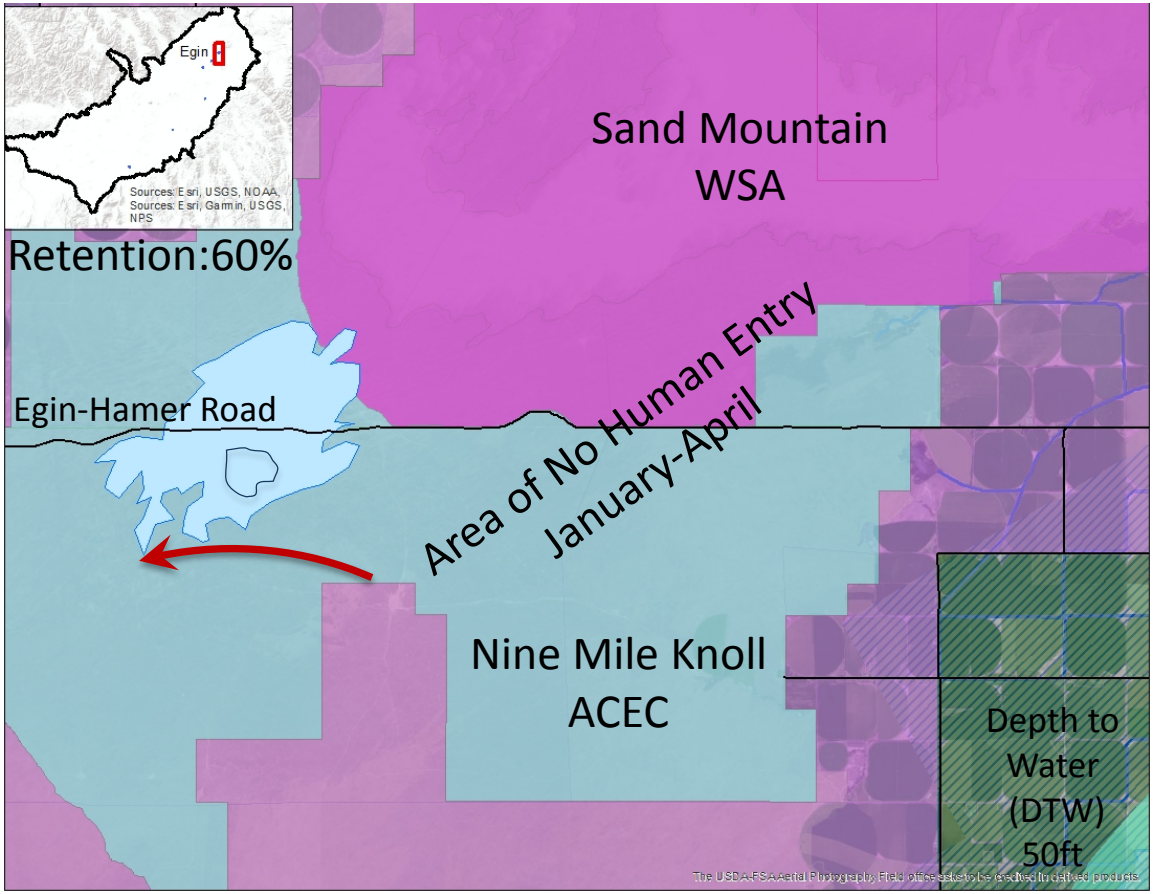


- Advantages:
  - Retention: 26%
  - High Leakage Geologic Features at Land Surface
- Disadvantages
  - Hells Half Acre WSA
  - Water availability during recharge season (urban influence)
  - Elevated Basin from the water supply
  - Sub-surface clay layer identified in surrounding well logs
  - Species of Concern

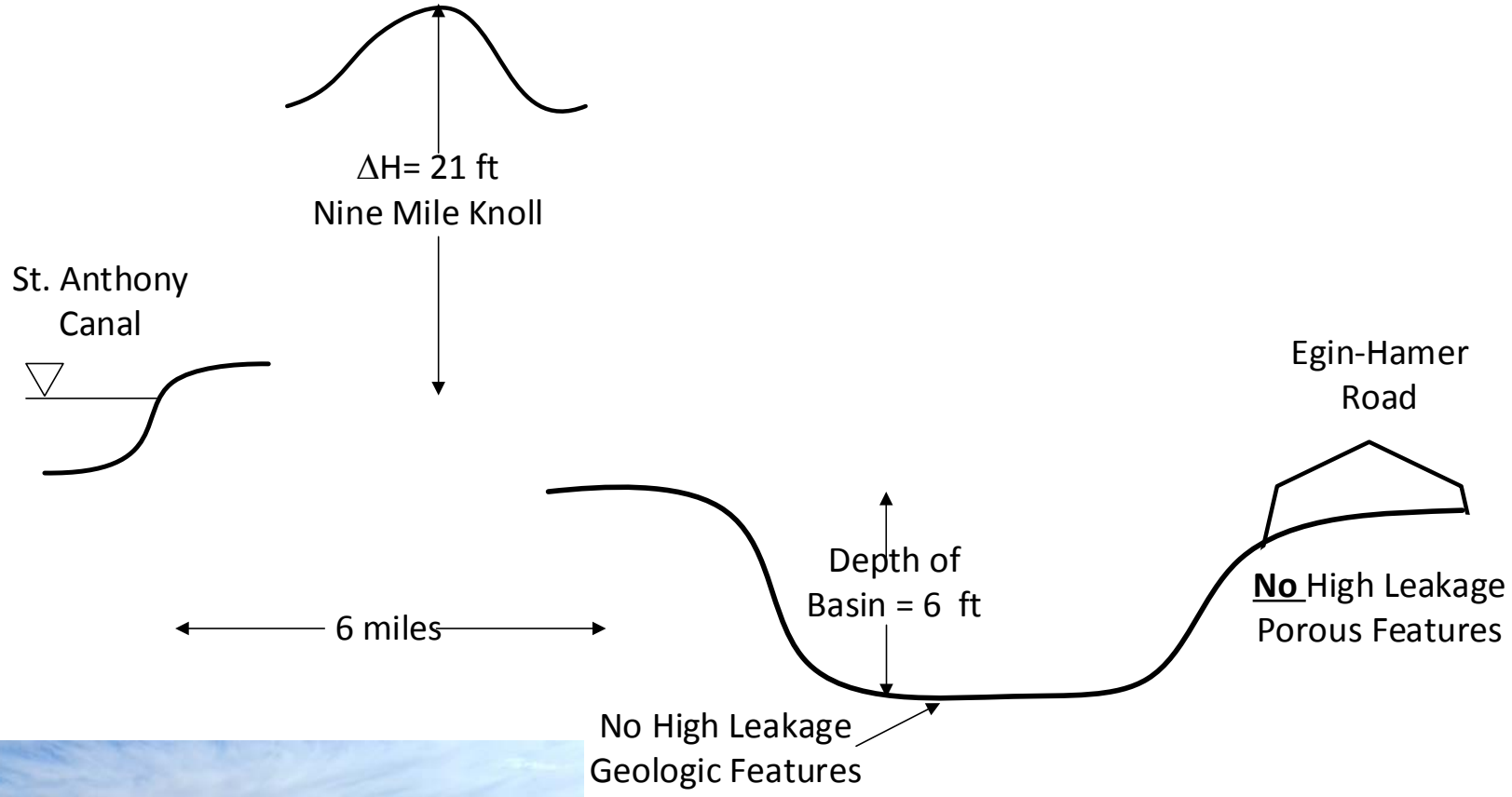
West Market Lake/Sage Junction/ Egin Bench

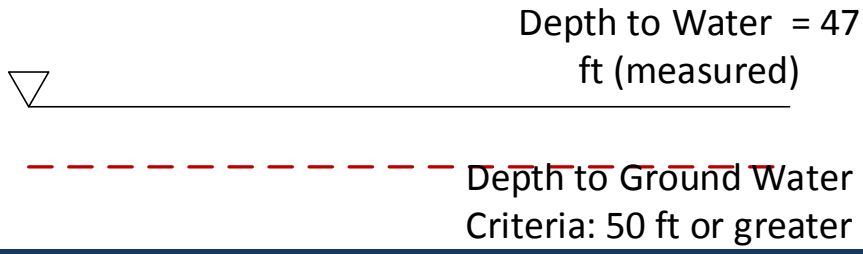


Egin Bench

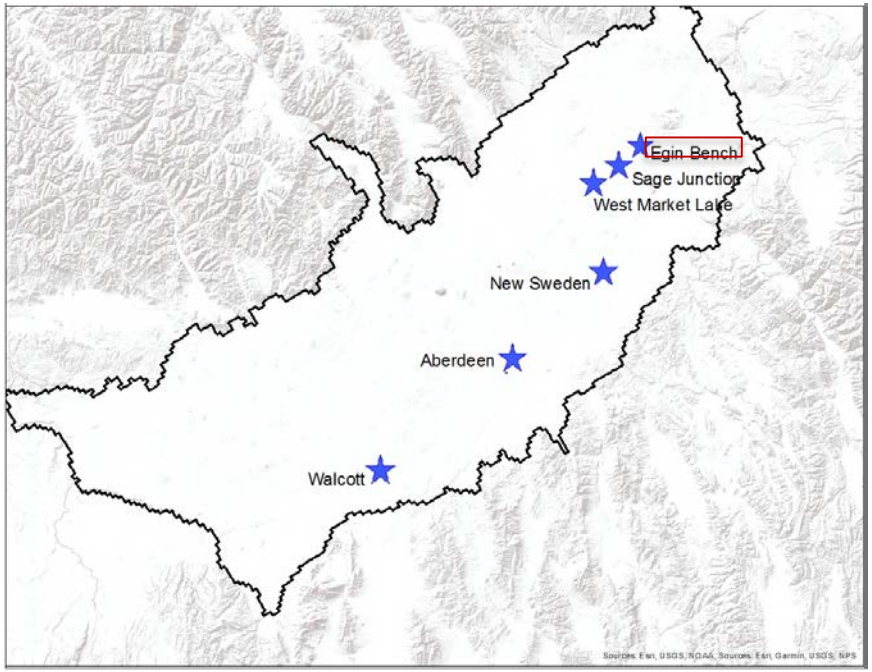

Egin
Sources: Esri, USGS, NOAA
Sources: Esri, Garmin, USGS, NPS
Sand Mountain WSA
Retention:60%
Egin-Hamer Road
Area of No Human Entry January-April
Nine Mile Knoll ACEC
Depth to Water (DTW) 50ft

Egin Bench Concept



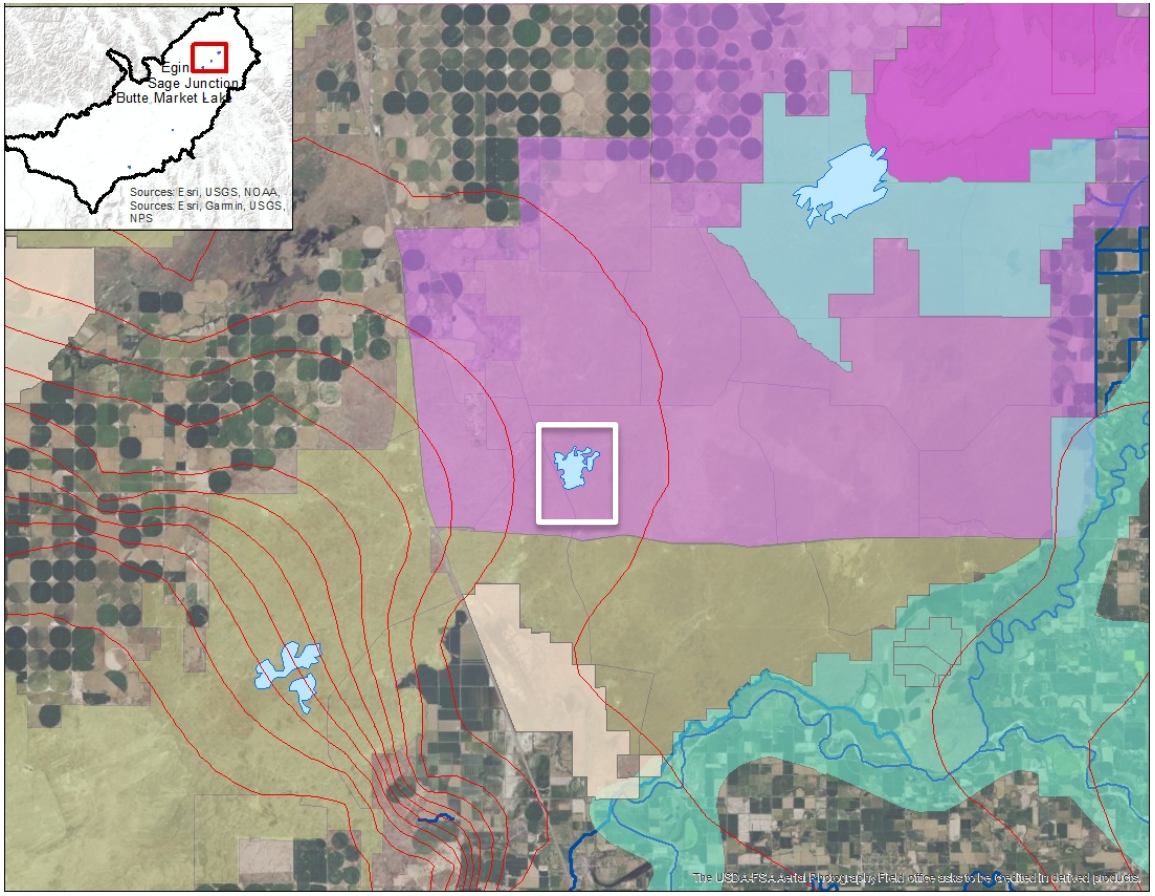


Egin Bench Advantages/Disadvantages

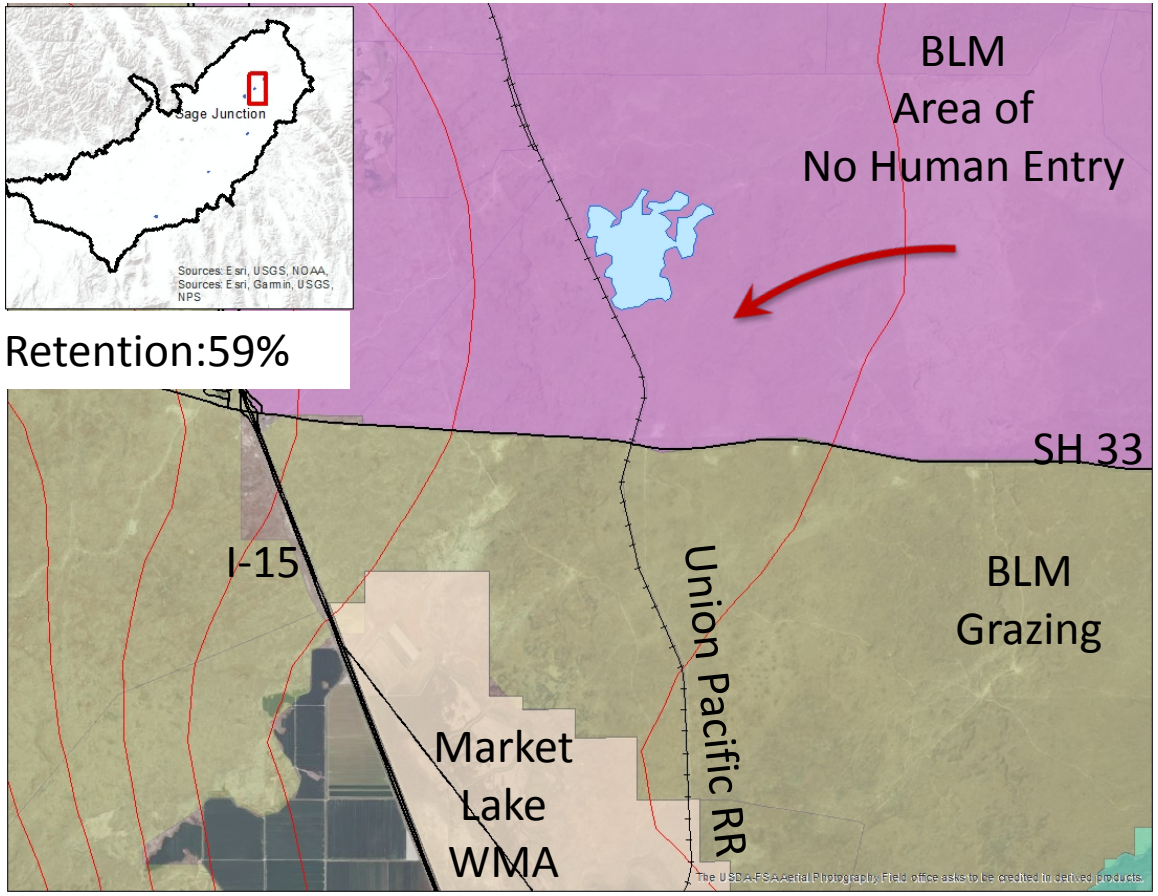


- Advantages:
  - Retention: 60%
  - Basin is lower than water supply
- Disadvantages
  - Nine mile knoll is located between water supply and basin
  - DTW
  - Species & Habitat of Concern
  - High leakage geologic features not observed
  - Land Use Limitations
  - Importance of Egin-Hamer Road Year Round Usage

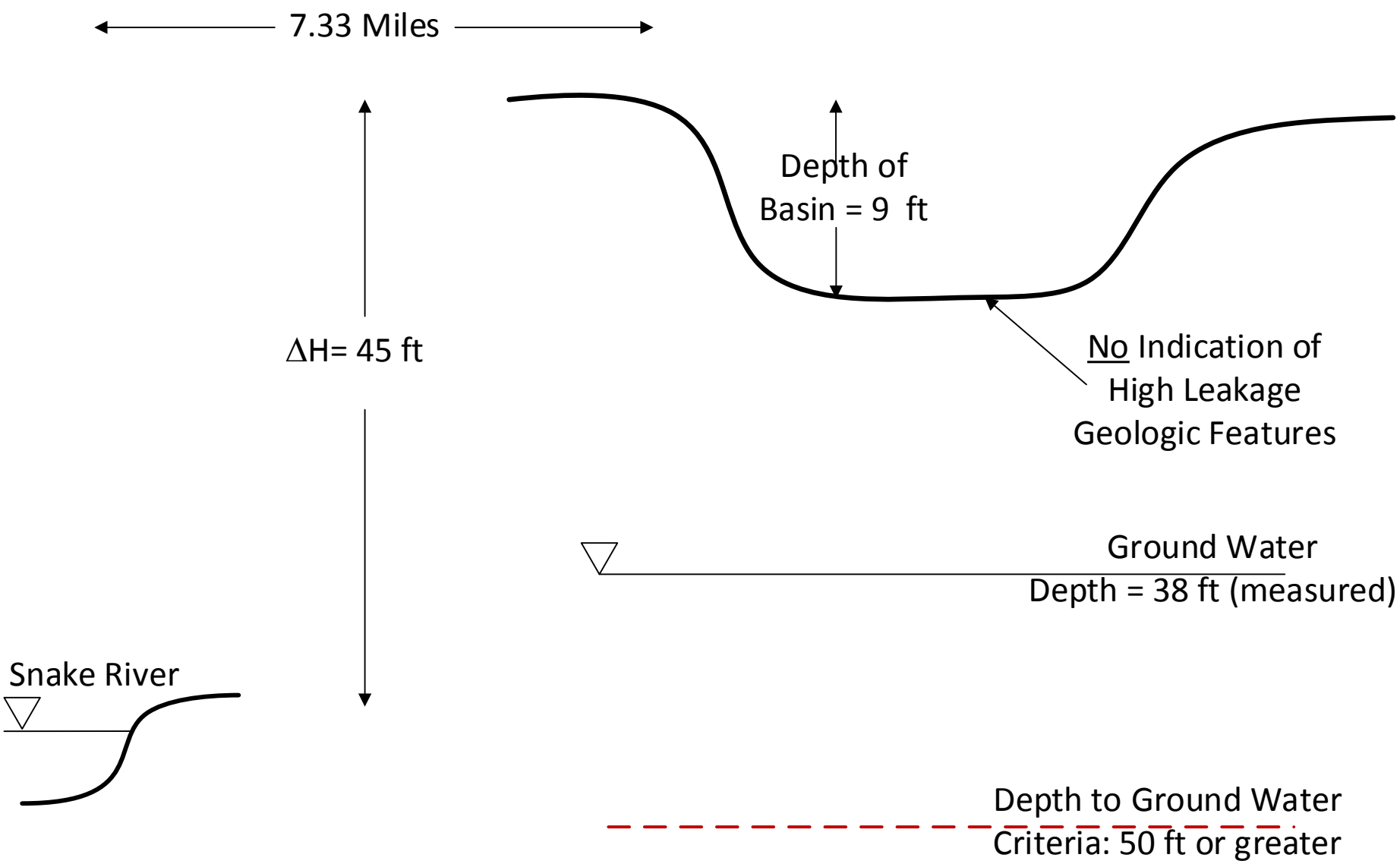
West Market Lake/Sage Junction/ Egin Bench



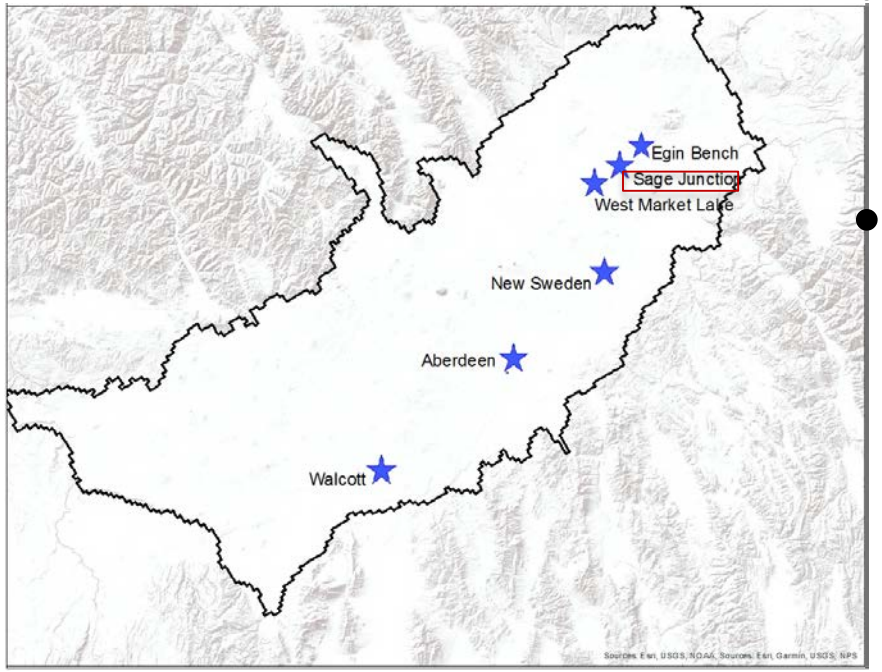
Sage Junction



Sage Junction

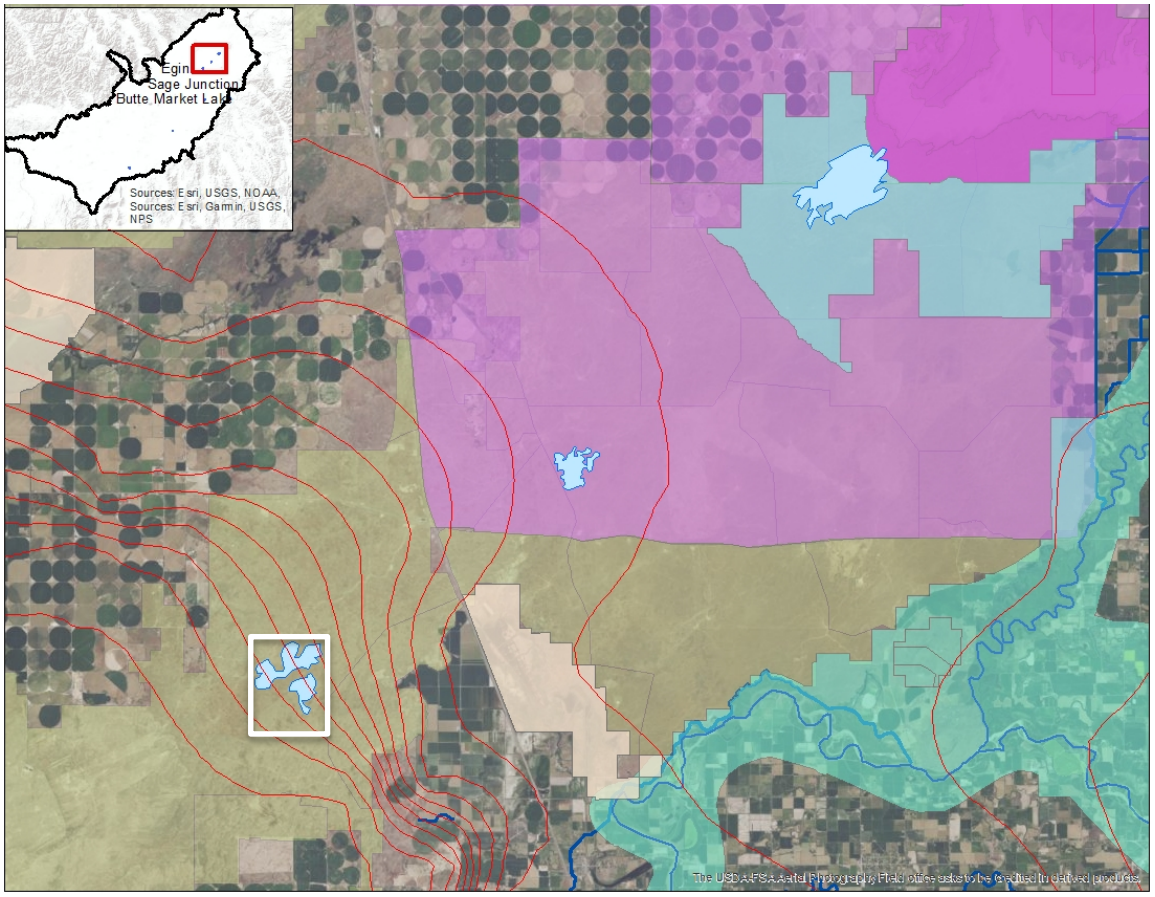


Sage Junction Advantages/Disadvantages

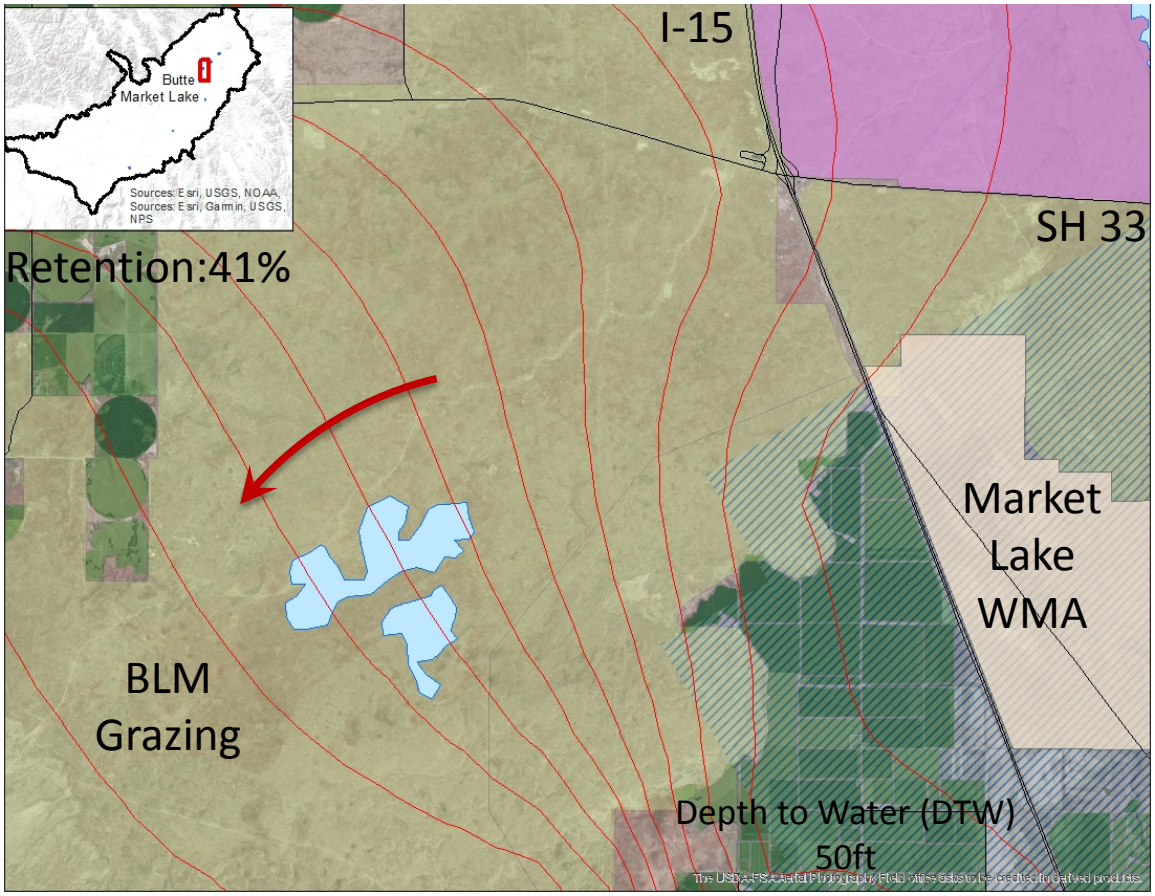


- Advantages:
  - Retention: 59%
  - No observed infrastructure
- Disadvantages
  - No observed high leakage geologic features
  - DTW Shallow for a Large Recharge Project
  - Land use limitations
  - Species of concern/cultural sites along railroad
  - Elevated basin from the water supply

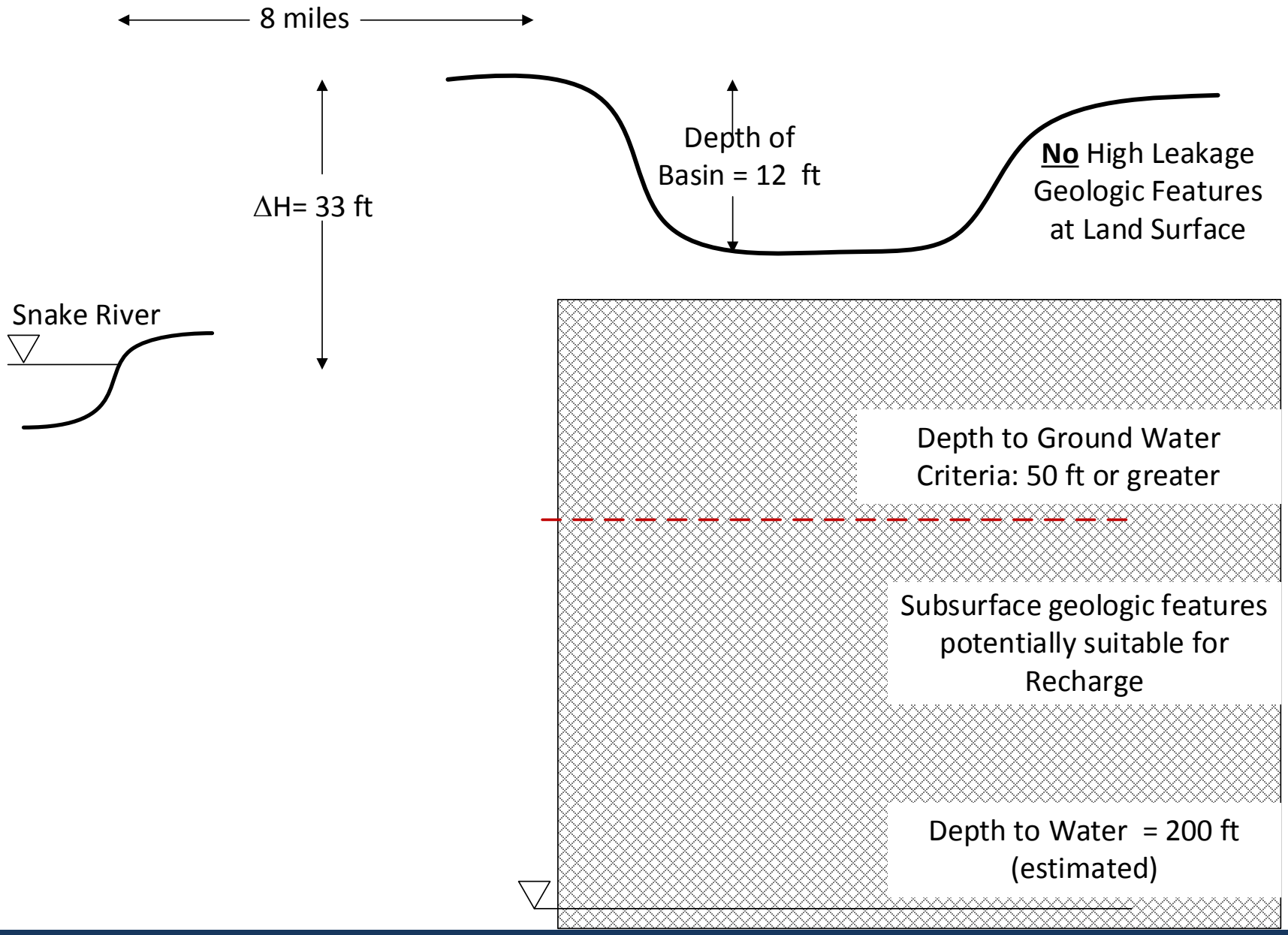
West Market Lake/Sage Junction/ Egin Bench



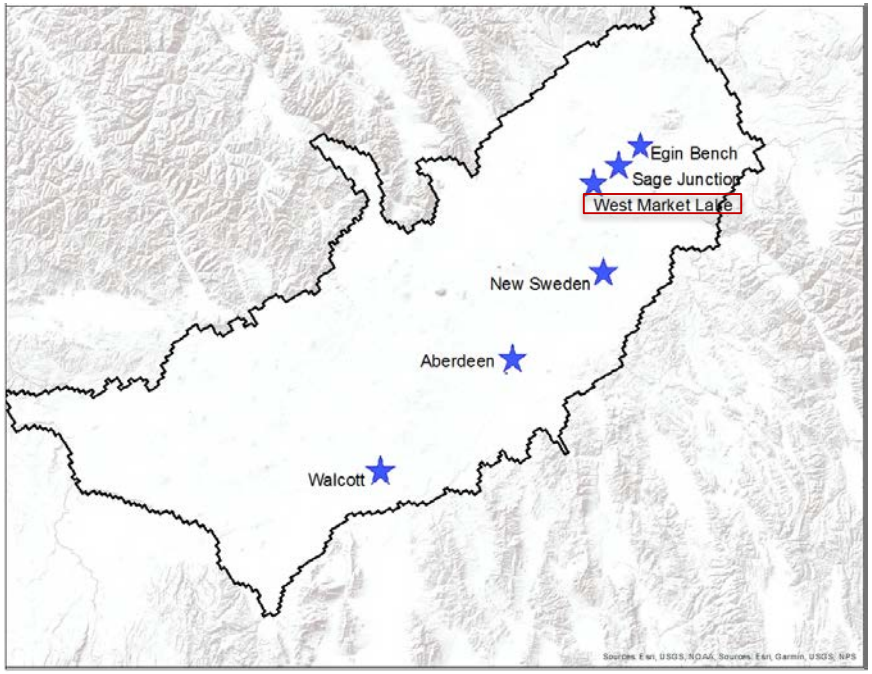
West Market Lake



West Market Lake



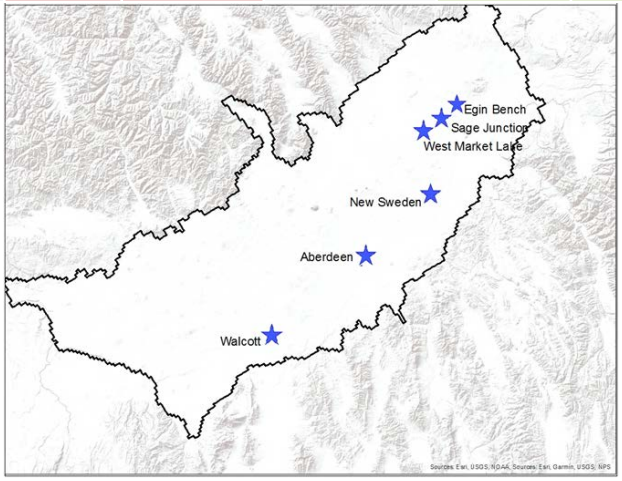
West Market Lake Advantages/Disadvantages



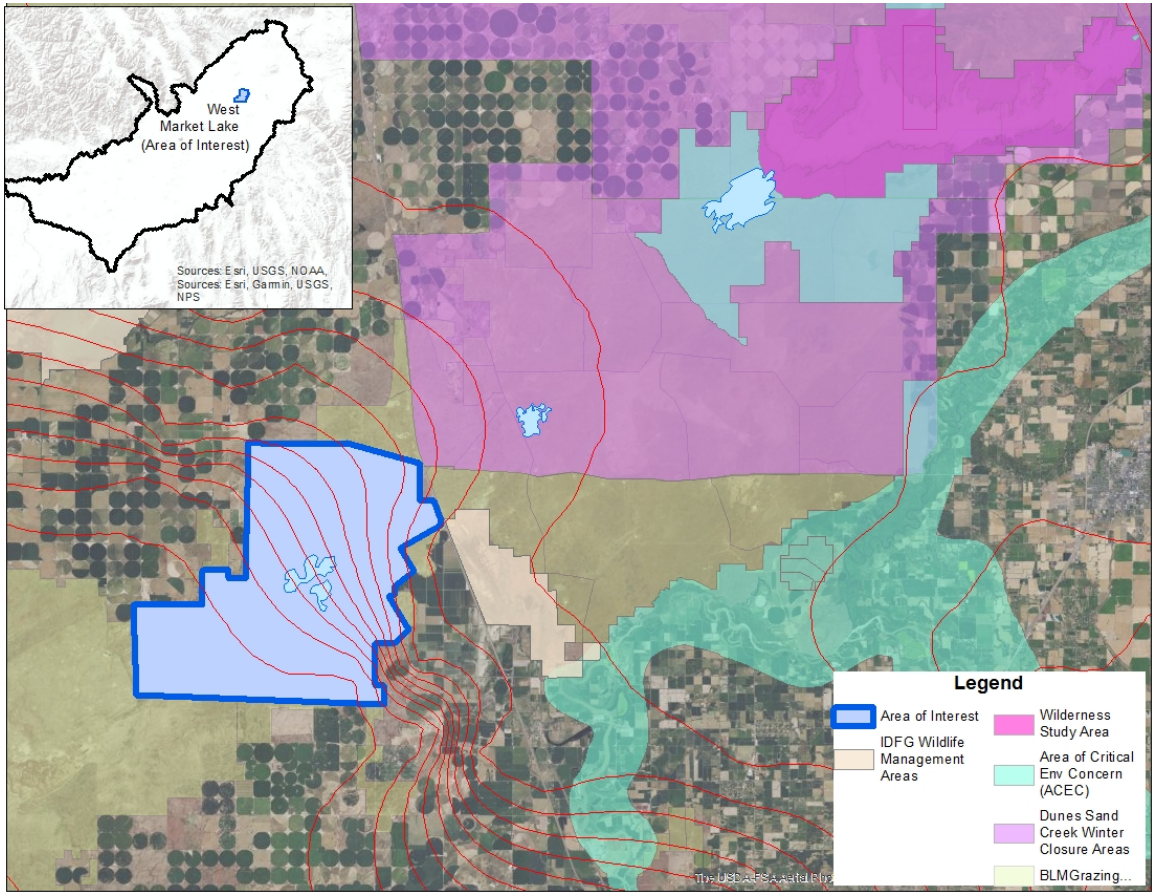
- Advantages:
  - Meets DTW Criteria for a Large Recharge Project
  - Retention Value: 41%
  - Sub-Surface Geology
  - Land Use (BLM Grazing)
  - No Existing Infrastructure in the Area
  - No Species of Concern
- Disadvantages
  - Elevated Basin from the water supply
  - High leakage geologic features were not observed at land surface

Area of Interest

Basin Features	Walcott	Aberdeen	New Sweden	Egin Bench	Sage Junction	**West Market Lake**
Depth to Water (DTW)	+	o	-	-	-	+
Retention	+	o	+	+	+	+
Geologic Features	+	+	+	-	-	+
Limited Land Use/ No Species of Concern	+	+	-	-	-	+
No Impacts to Existing Infrastructure	-	-	+	-	+	+
Location on ESPA	-	-	o	+	+	+



Area of Interest



Steps Forward

Guidance from the Board to Staff
&
Questions/Discussion

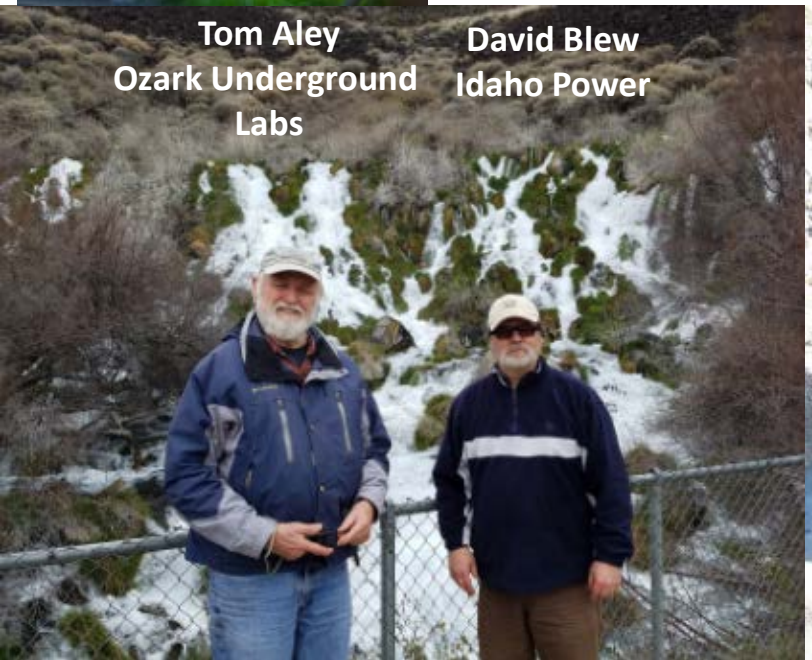
Cooperative ESPA Dye Tracing Program – 10 Year Review –

by:
Neal Farmer, Idaho Department of Water Resources
and
David Blew, Idaho Power Company

for

Idaho Water Resource Board

November 14, 2019



Background of the Dye Tracer Studies

Dye tracer studies were initiated in response to the Swan Falls Reaffirmation Agreement between Idaho Power and the State of Idaho and the Completion of ESPA CAMP

Data from tracers can provide information on:

- Ground water velocities
- Estimates of hydraulic conductivity
- Direction of flow
- Pollutant source and transport
- Potential impacts of recharge and other management practices

Initial efforts were to develop an understanding of near canyon aquifer characteristics

- Spring discharge comprises a significant portion of the flow in the Snake River below Milner Dam
- Important for maintaining hydropower production
- Important for maintaining and improving water quality of the Snake River
- Springs are important habitats for many species
- Allowed for the development of technique and skills that could be utilized on a larger scale

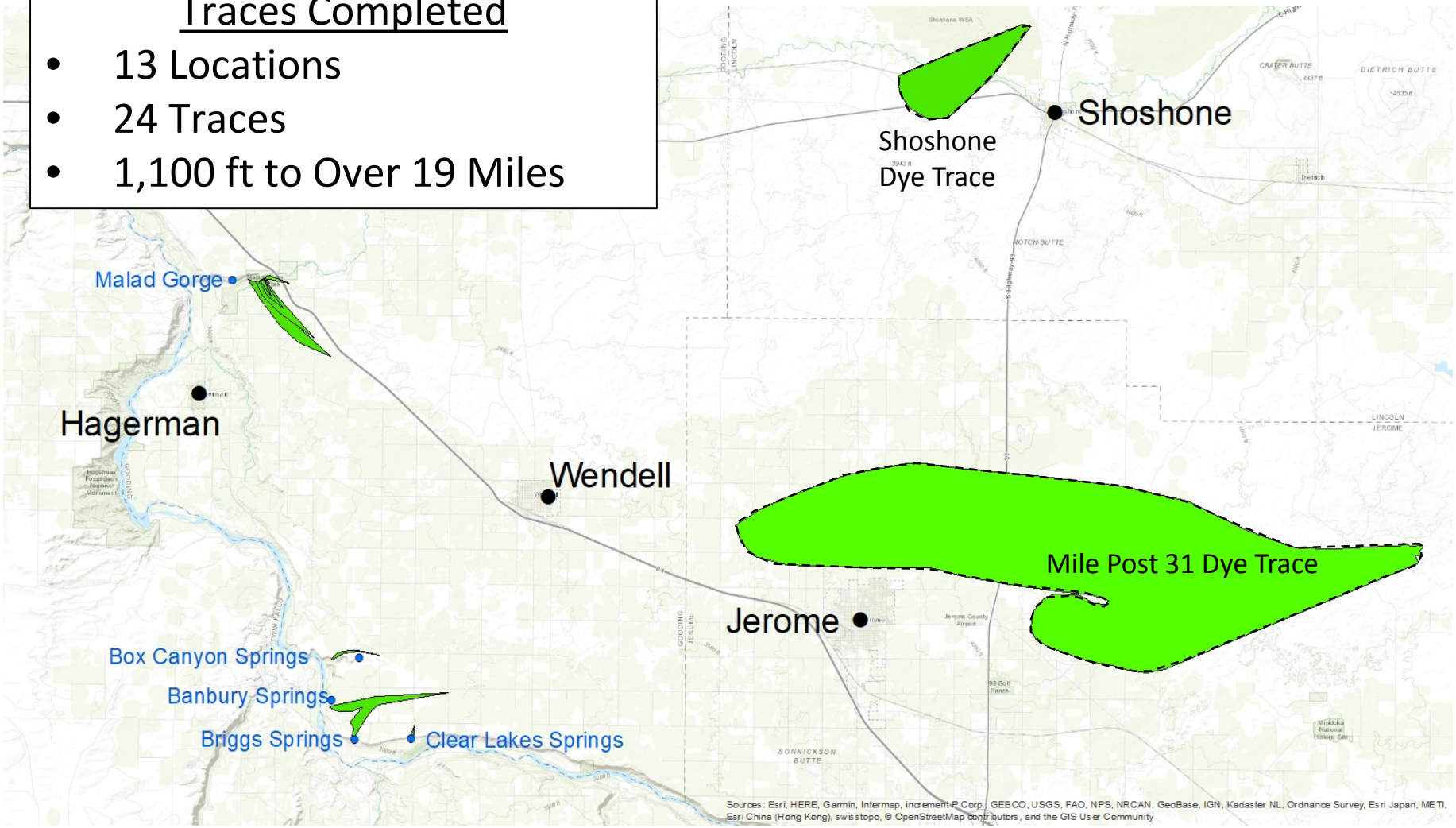
Background of the Dye Tracer Studies

The first 5-years allowed for the development of the skills and techniques which have benefited the recharge program over last 5-years.

- Large-scale tracers from recharge sites
- Targeting and placement of monitoring wells
- Improved monitoring and management at recharge sites

Traces Completed

- 13 Locations
- 24 Traces
- 1,100 ft to Over 19 Miles



Additional Efforts Undertaken to Support Tracer Studies

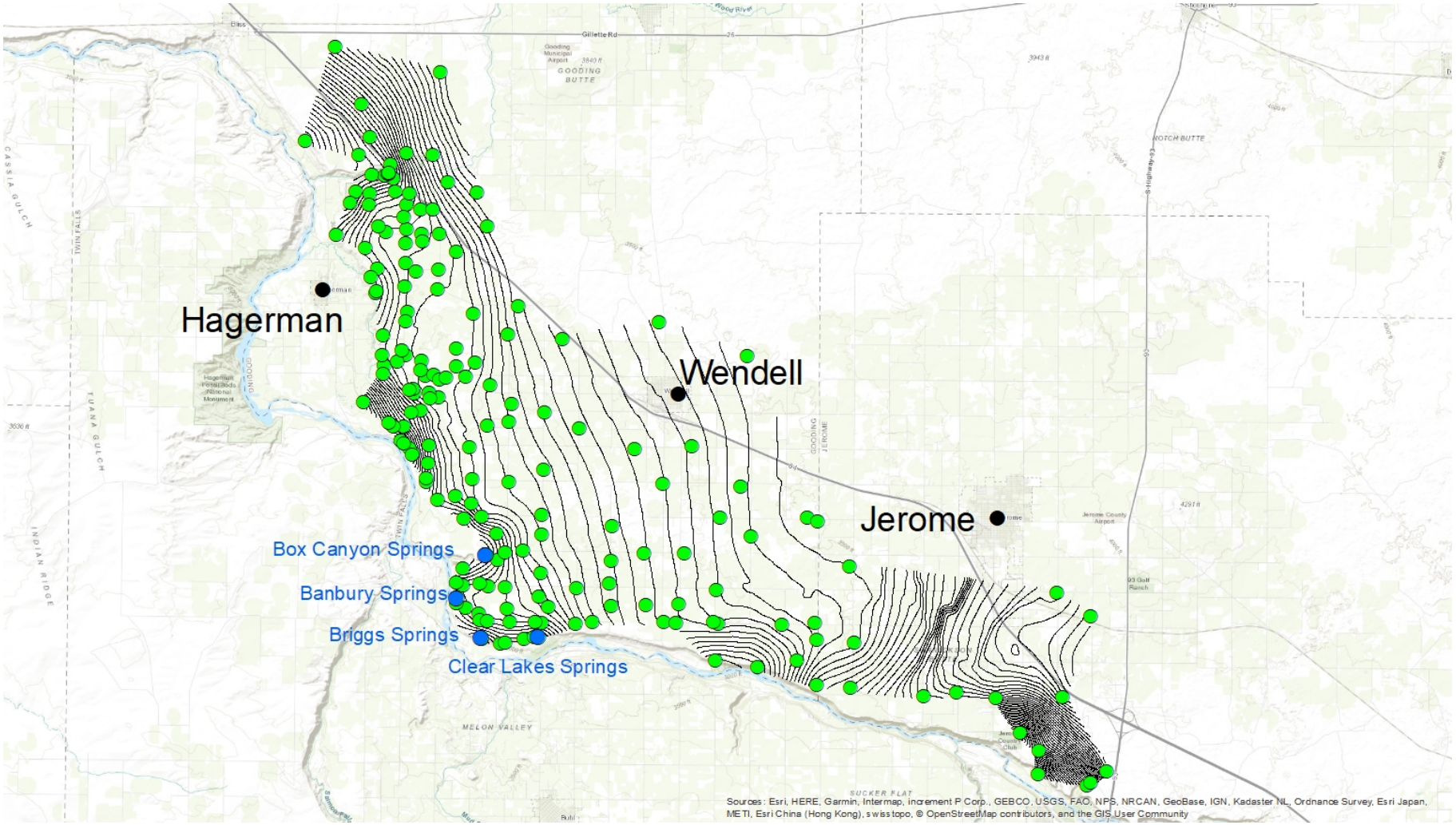
Development of High Resolution Ground Water Maps

- In the fall of 2011, IDWR and Idaho Power participated in a cooperative effort to develop a high resolution water table map for the western edge of the ESPA.
- In one week, through this cooperative effort, approximately 300 wells were measured and GPS'ed with high accuracy survey grade quality.
- Data collection efforts included depth to water, temperature and electrical conductivity.
- The development of high resolution maps is now part of our tracing protocol.

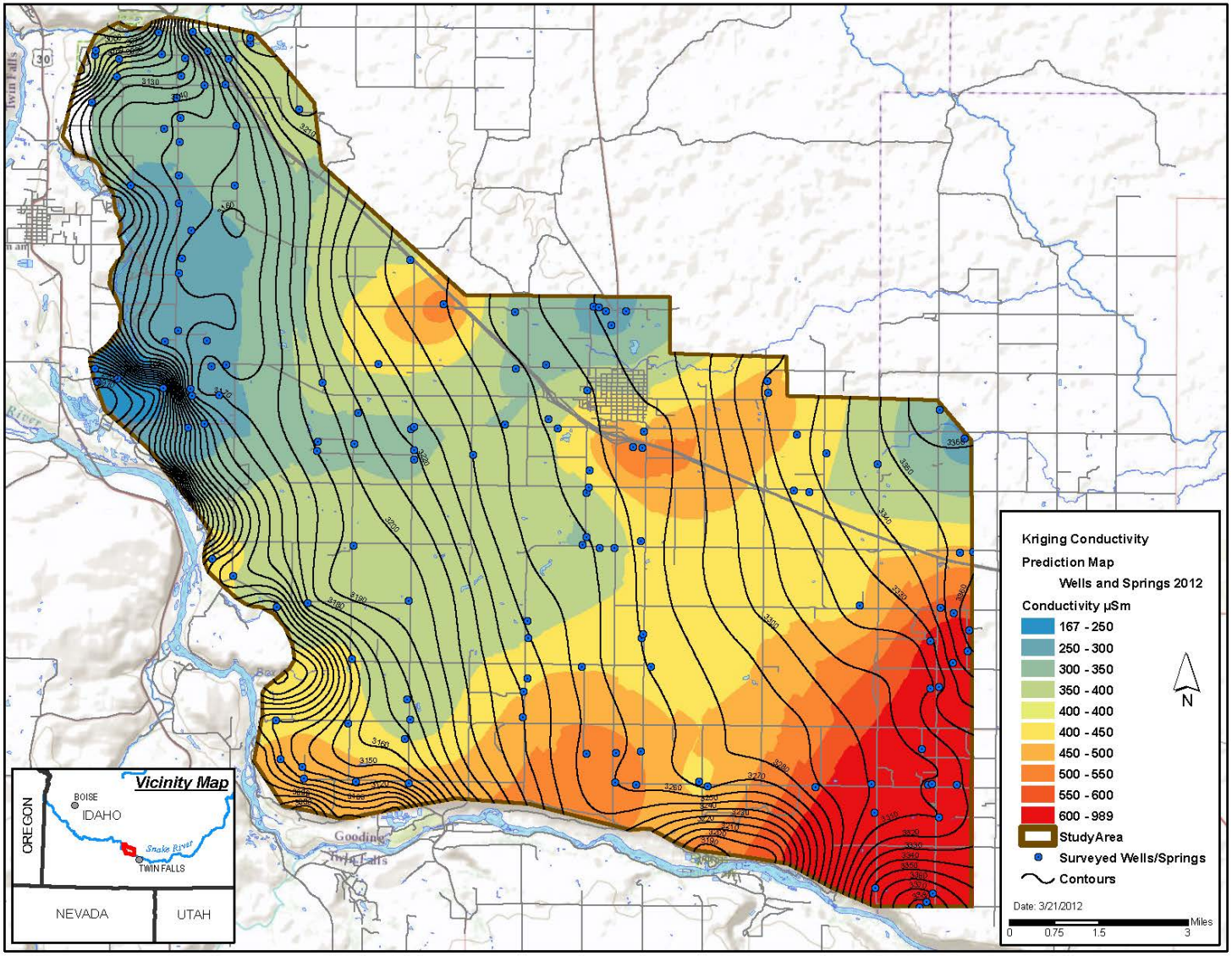
Additional Efforts Undertaken to Support Tracer Studies

Development of High Resolution Ground Water Maps

- From this effort, IDWR acquired high accuracy GPS and continued to develop protocols for high accuracy ground water elevations.



Water Table Contours of the Western Edge of the ESPA



Electrical Conductivity of the Western Edge of the ESPA

Additional Efforts Undertaken to Support Tracer Studies

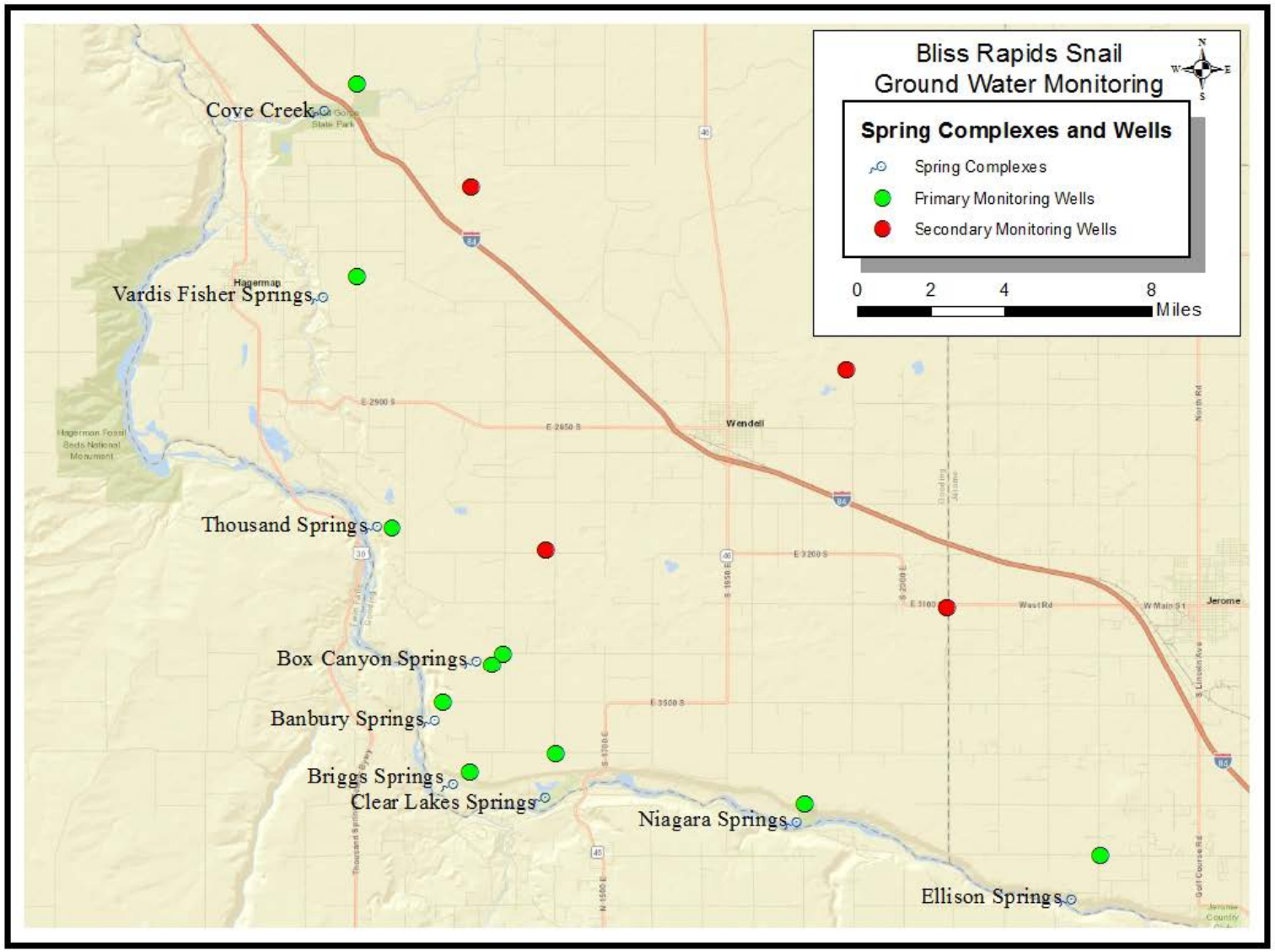
Construction of Long-Term Near Rim Monitoring Wells

- The 2011 synoptic measurement effort noted a lack of near rim monitoring wells
- Few near rim wells for tracer monitoring or dye injection
- Idaho Power was developing a monitoring program for the ESA listed Bliss Rapids Snails
  - Utilize ground water levels as a surrogate for flow at small spring sites
  - However, there were few near rim wells near spring sites to measure ground water table elevations.

Additional Efforts Undertaken to Support Tracer Studies

Construction of Long-Term Near Rim Monitoring Wells

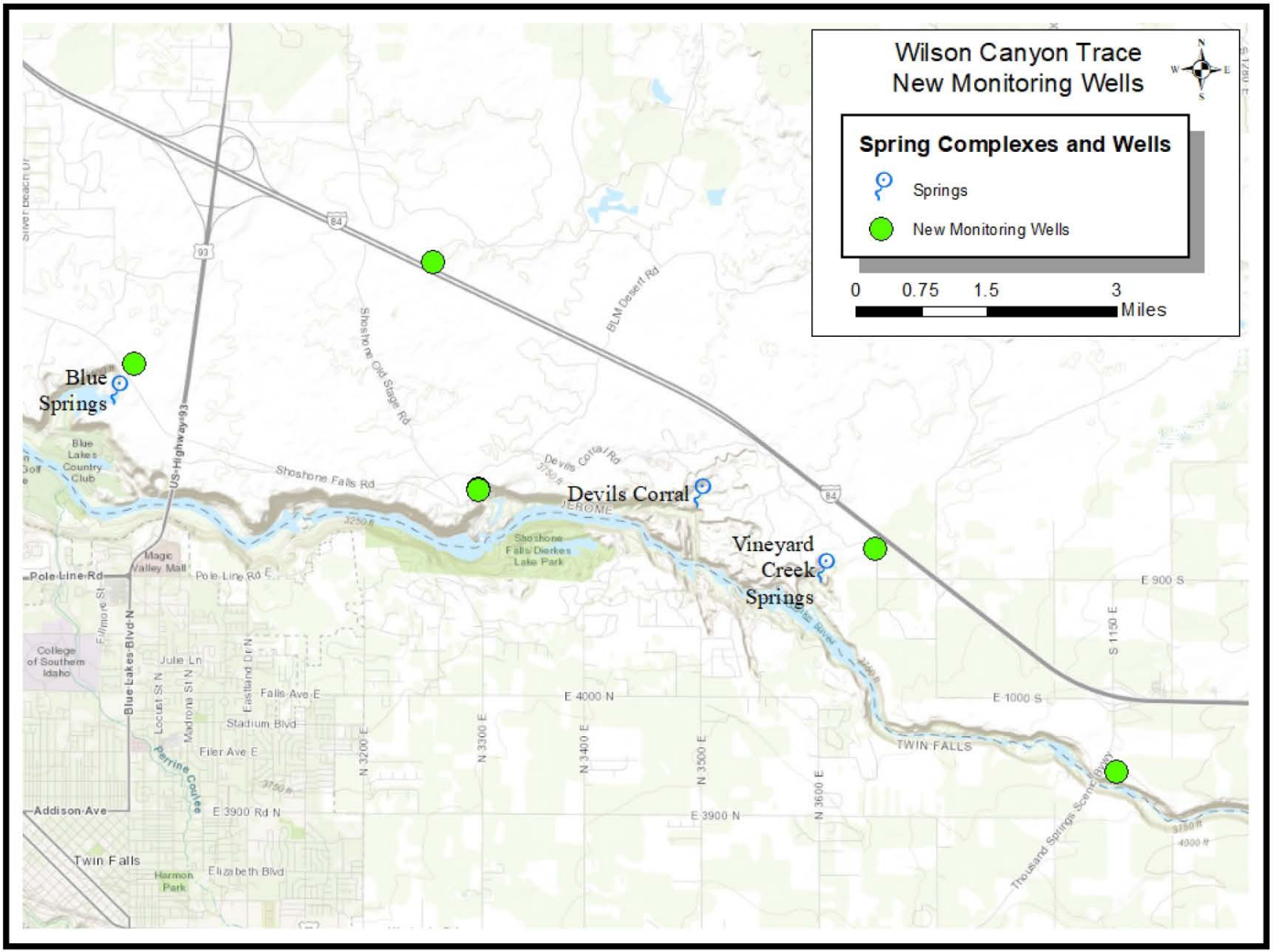
- From 2013 through 2017 IDWR and Idaho Power have cooperatively developed 14 monitoring wells
  - Drilled 6 new monitoring wells
  - Retrofitted 5 unused wells
  - Equipped 3 existing domestic wells


Bliss Rapids Snail
Ground Water Monitoring
Spring Complexes and Wells
Spring Complexes
Primary Monitoring Wells
Secondary Monitoring Wells
0 2 4 8
Miles
Cove Creek
Vardis Fisher Springs
Thousand Springs
Box Canyon Springs
Banbury Springs
Briggs Springs
Clear Lakes Springs
Niagara Springs
Ellison Springs
Wendell
Jerome

Additional Efforts Undertaken to Support Tracer Studies

Development of Long-Term Near Rim Monitoring Wells

- For the Wilson Canyon trace, 5 additional monitoring wells have been established at:
  - Blue Lakes,
  - Shoshone Falls
  - Vineyard Creek
  - Hansen Bridge
  - Old Rest Area Well


Wilson Canyon Trace
New Monitoring Wells
Spring Complexes and Wells
Springs
New Monitoring Wells
0 0.75 1.5 3
Miles
Blue Springs
Devils Corral
Vineyard Creek Springs
Shoshone Falls Rd
Pole Line Rd
Addison Ave
Twin Falls
TWIN FALLS
JEROME
E 4000 N
E 3900 N
E 1000 S
E 900 S
Falls Ave E
Stadium Blvd
Filer Ave E
E 3900 Rd N
Elizabeth Blvd
Julie Ln
Eastland Dr N
College of Southern Idaho
Blue Lakes Country Club
Magic Valley Mall
Shoshone Falls Dierkes Lake Park
Harmon Park
Perrine Coulee
Thousand Springs Scenic Byway
US Highway 93
BLM Desert Rd
Shoshone Old Stage Rd
Devils Corral Rd
Blue Lakes Blvd N
Fillmore St
Locust St N
Madrona St N
N 3200 E
N 3300 E
N 3400 E
N 3500 E
N 3600 E
S 1150 E

Additional Efforts Undertaken to Support Tracer Studies

Development of Real-Time Ground Water Data

- In 2015, we began experimenting with the telemetry of real time ground water data.
- Idaho Power purchased 10 telemetry units and through a cooperative effort with IDWR installed them in select wells on the ESPA
- IDWR has adopted this technology in approximately 18 wells and at recharge diversions
- Idaho Power provides access to IDWR for all of their telemetry data and vice versa.
- This cooperative effort spearheaded collecting hourly water level data which has been adopted by some at IDWR.

Financial Contributions for Tracers

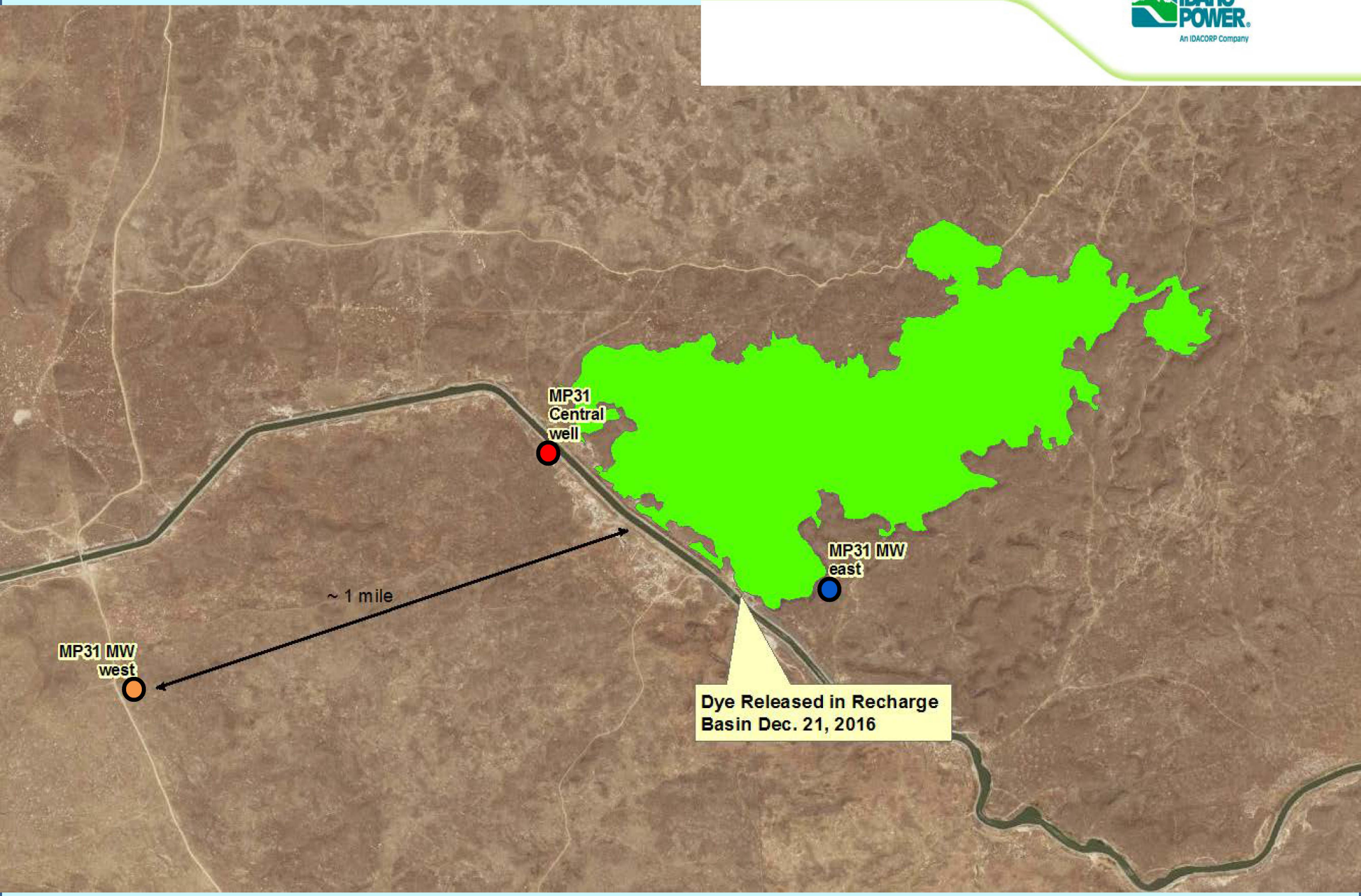
Idaho Power

- $97,000 - Direct Payments to IDWR since 2009
- $30,000 – Five C3 Fluorometers
- Labor and Other In-Kind Services

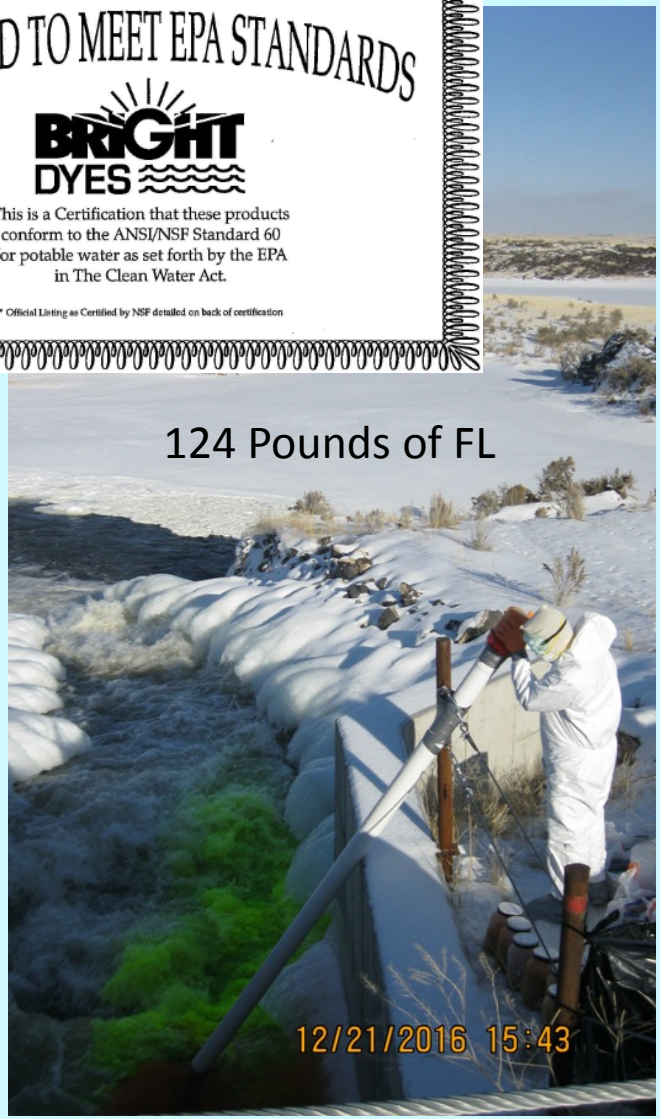
Idaho Department of Water Resources

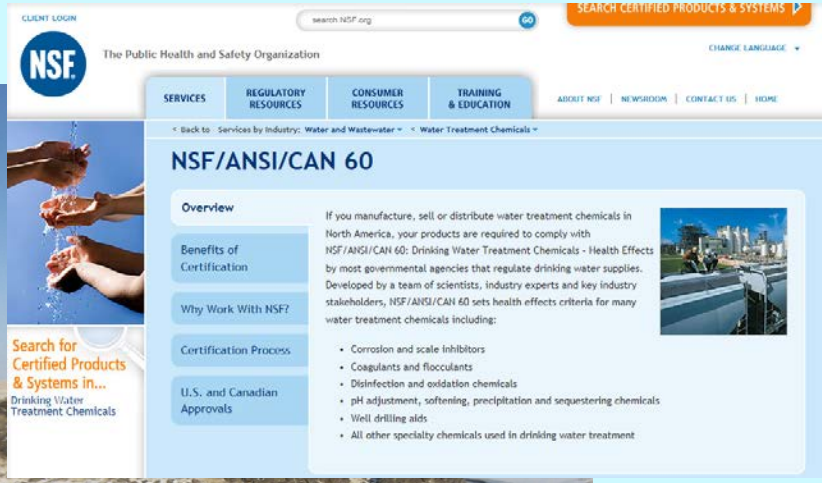
- $54,700 - Lab Analysis
- $16,200 – Dye and materials
- $13,150 – 4 Cyclops Fluorometers
- $6,285 – C3 Fluorometers
- Labor, Vehicle, and Other In-Kind Services

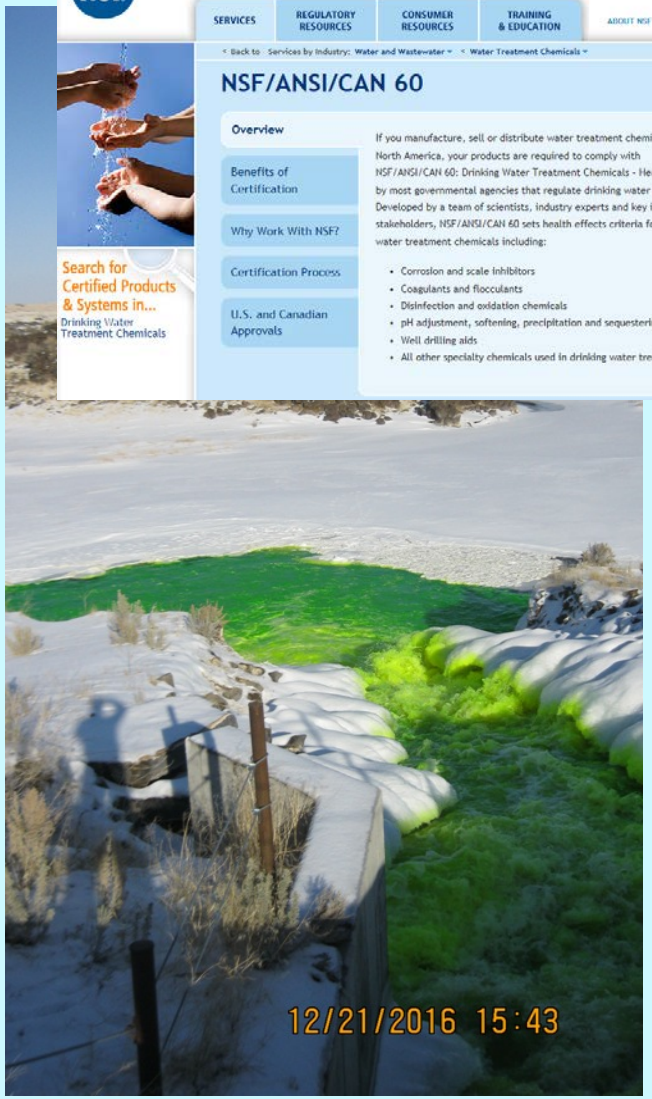
These costs do not include expenditures on monitoring wells or telemetry


MP31
Central
well
MP31 MW
east
~ 1 mile
MP31 MW
west
Dye Released in Recharge
Basin Dec. 21, 2016

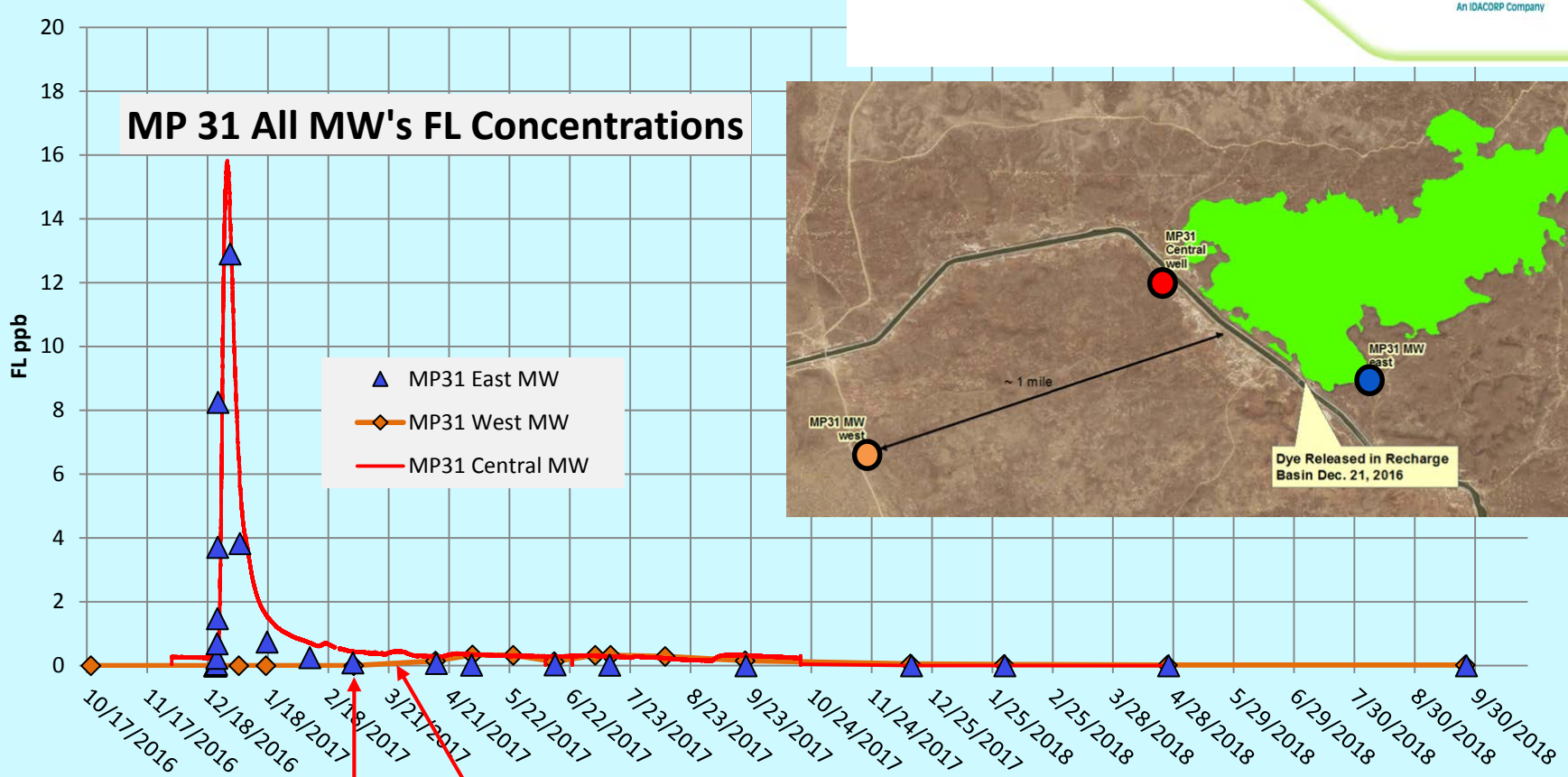
124 Pounds of FL

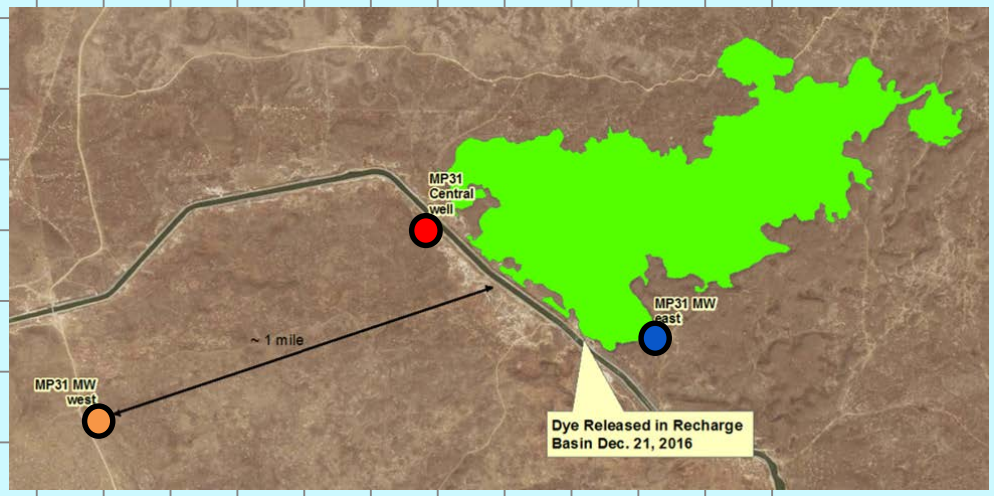






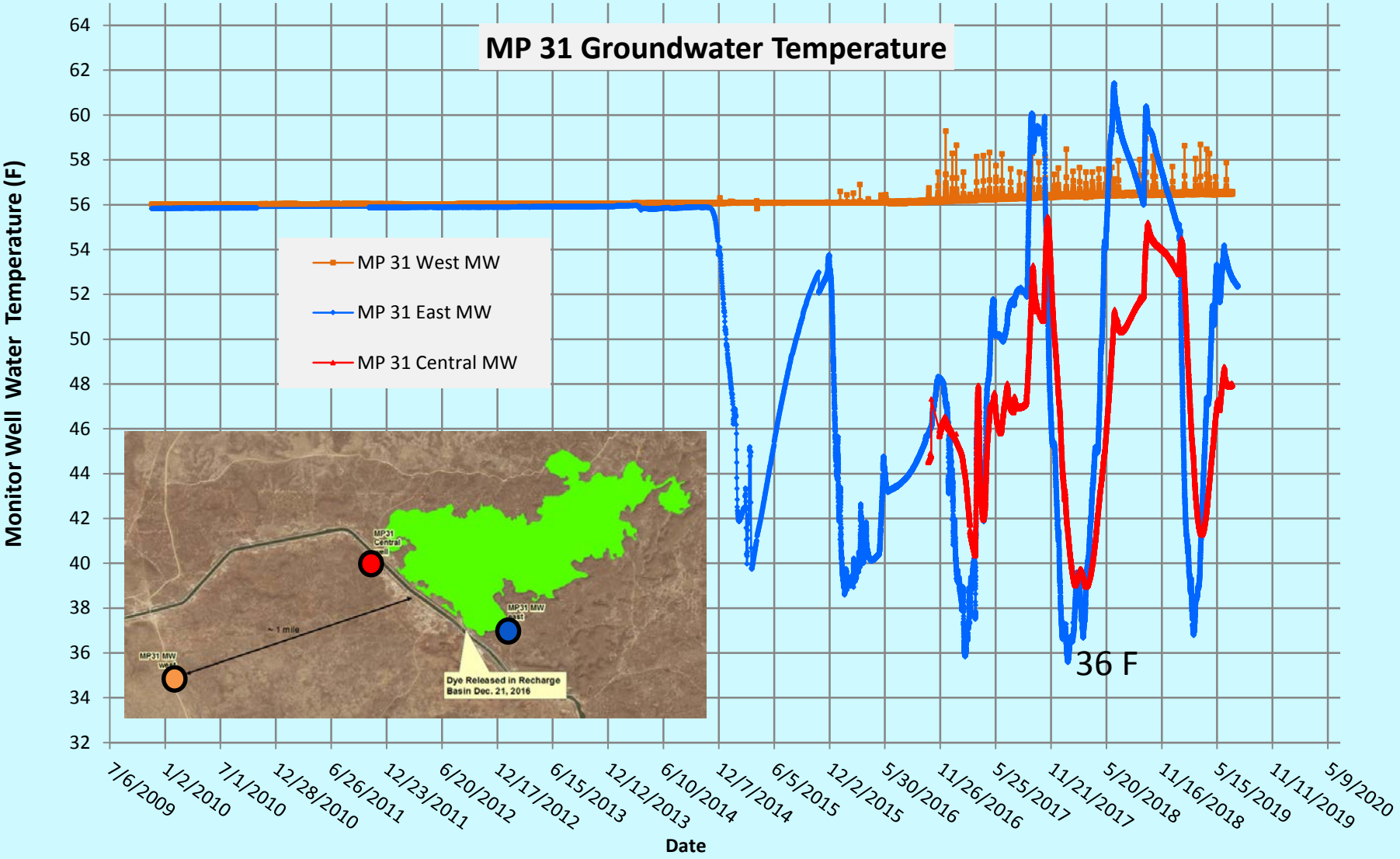
Sampled East MW for 44 hours straight after dye released.

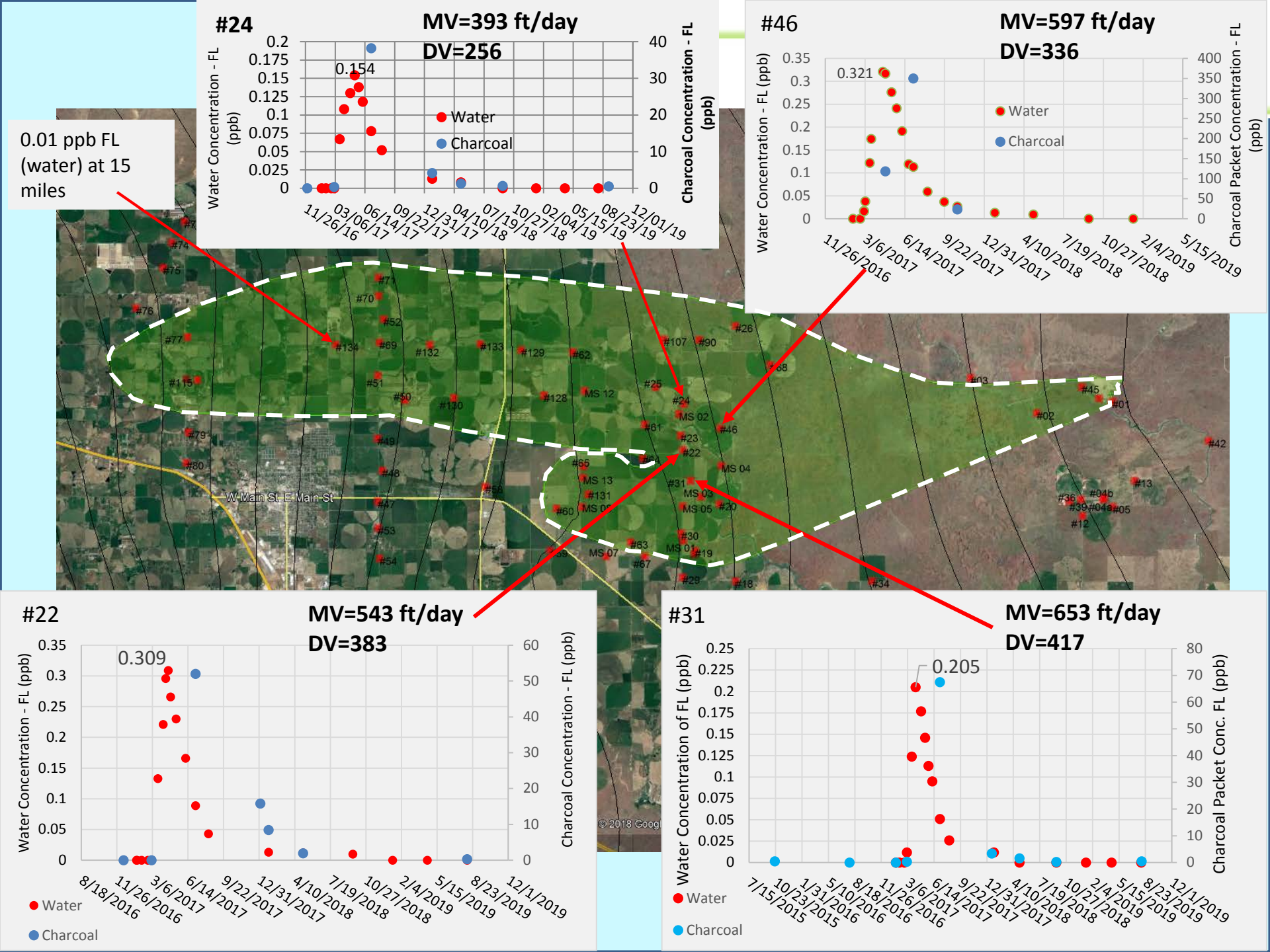




March 3, 1st dye detected 8 miles west.
(67 days since dye release)

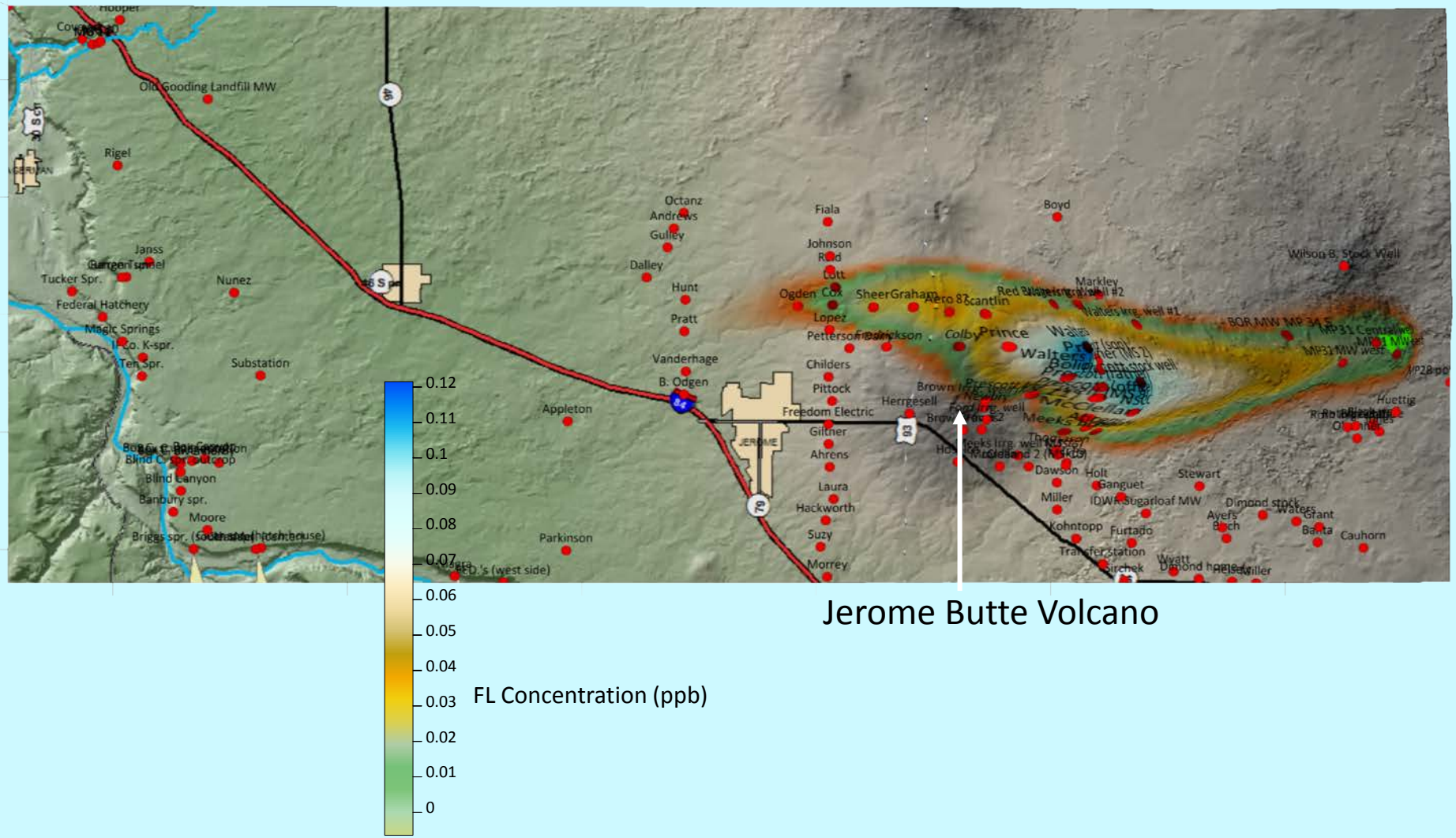
March 22 (3 months post dye release), recharge water starts to spill past the check dam.


MP 31 Groundwater Temperature
Monitor Well Water Temperature (F)
64
62
60
58
56
54
52
50
48
46
44
42
40
38
36
34
32
MP 31 West MW
MP 31 East MW
MP 31 Central MW
36 F
~ 1 mile
MP31 MW West
MP31 Central well
MP31 MW East
Dye Released in Recharge Basin Dec. 21, 2016
7/6/2009
1/2/2010
7/1/2010
12/28/2010
6/26/2011
12/23/2011
6/20/2012
12/17/2012
6/15/2013
12/12/2013
6/10/2014
12/7/2014
6/5/2015
12/2/2015
5/30/2016
11/26/2016
5/25/2017
11/21/2017
5/20/2018
11/16/2018
5/15/2019
11/11/2019
5/9/2020
Date


0.01 ppb FL (water) at 15 miles
#24
MV=393 ft/day
DV=256
0.154
Water
Charcoal
Water Concentration - FL (ppb)
Charcoal Concentration - FL (ppb)
11/26/16
03/06/17
06/14/17
09/22/17
12/31/17
04/10/18
07/19/18
10/27/18
02/04/19
05/15/19
08/23/19
12/01/19
#46
MV=597 ft/day
DV=336
0.321
Water
Charcoal
Water Concentration - FL (ppb)
Charcoal Packet Concentration - FL (ppb)
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
#22
MV=543 ft/day
DV=383
0.309
Water
Charcoal
Water Concentration - FL (ppb)
Charcoal Concentration - FL (ppb)
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
8/23/2019
12/1/2019
#31
MV=653 ft/day
DV=417
0.205
Water
Charcoal
Water Concentration of FL (ppb)
Charcoal Packet Conc. FL (ppb)
7/15/2015
10/23/2015
1/31/2016
5/10/2016
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
5/15/2019
8/23/2019
12/1/2019
W Main St
E Main St

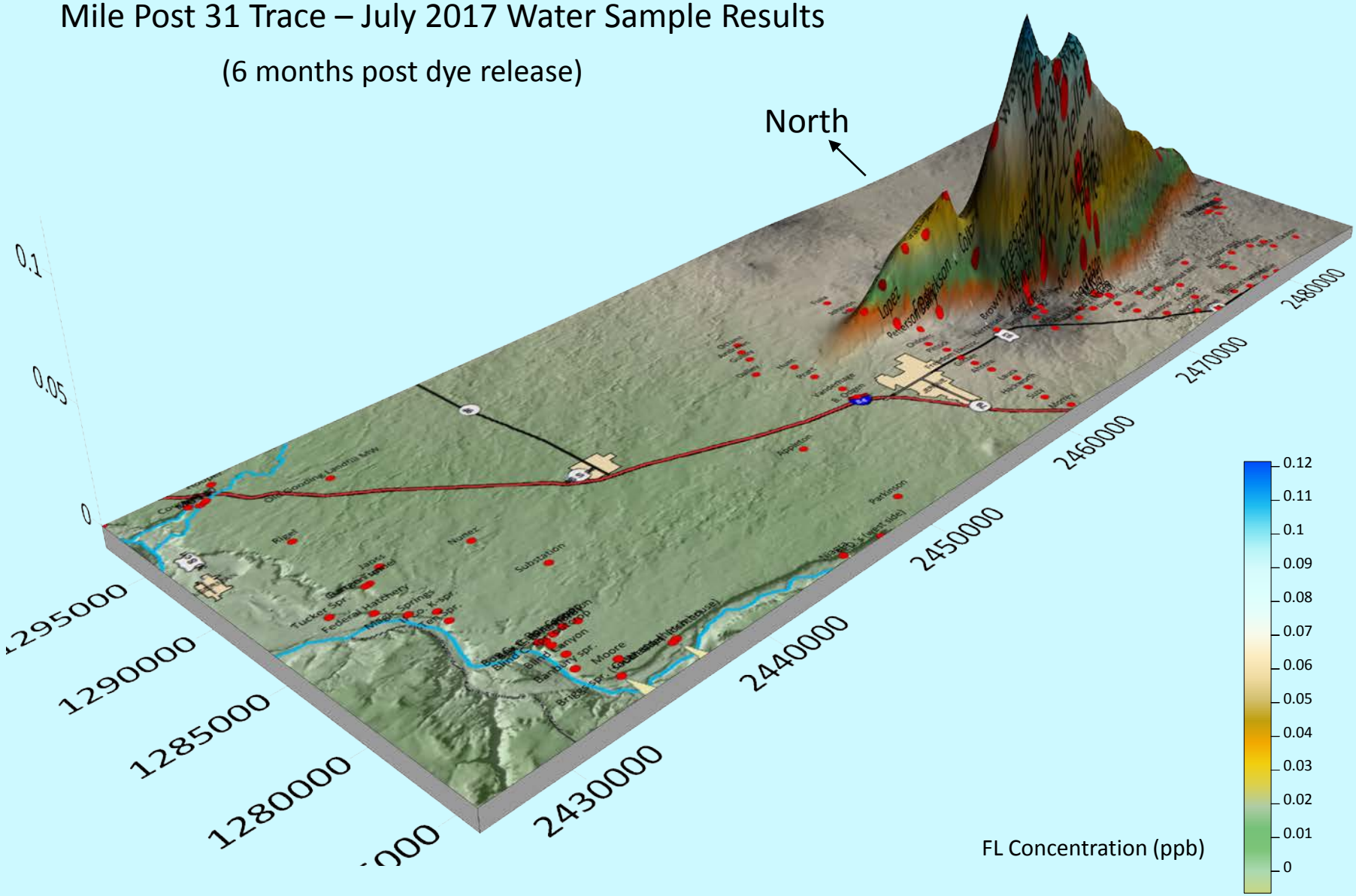
Mile Post 31 Trace – July 2017 Water Sample Results

(6 months post dye release)



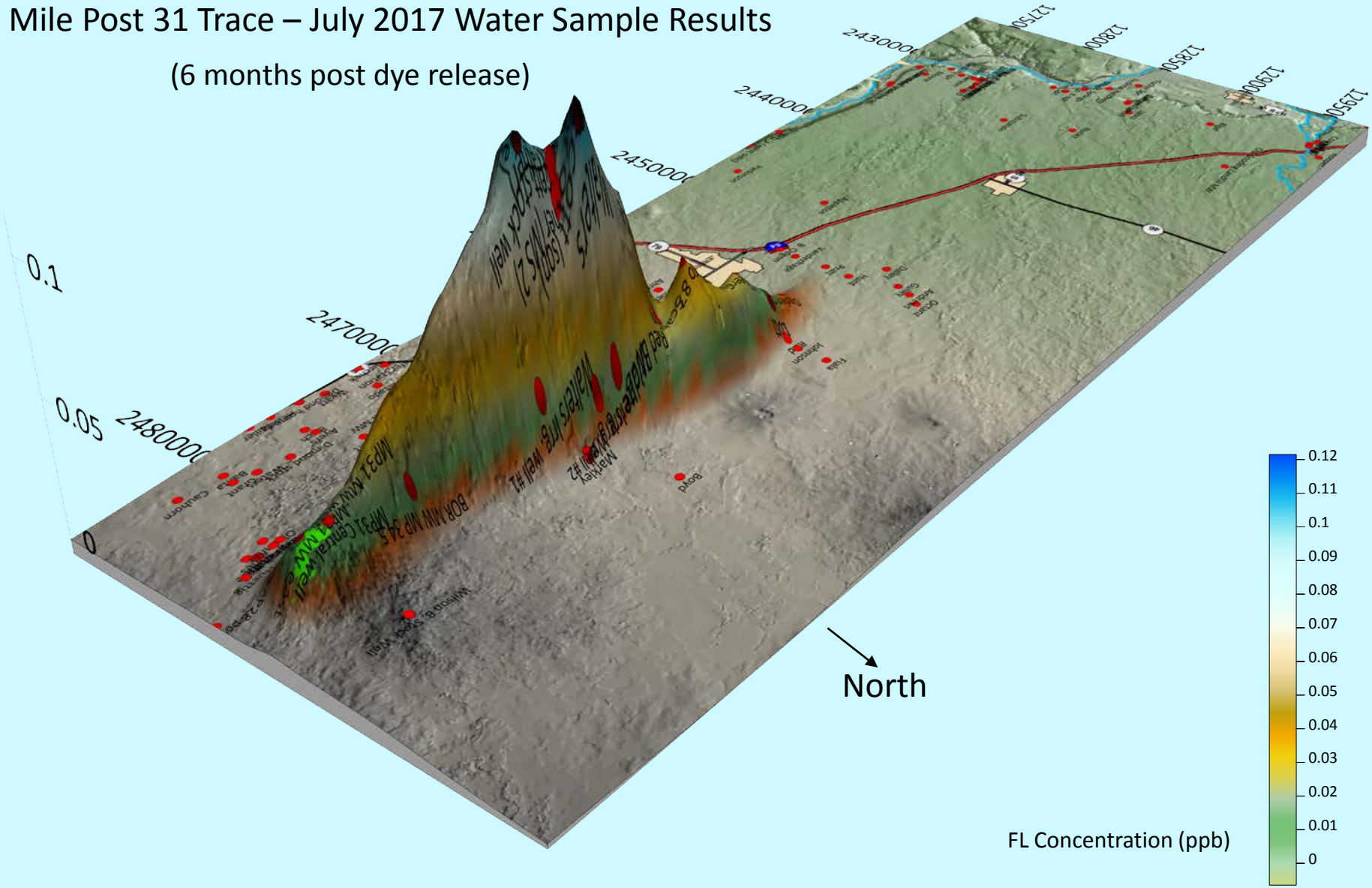
Mile Post 31 Trace – July 2017 Water Sample Results

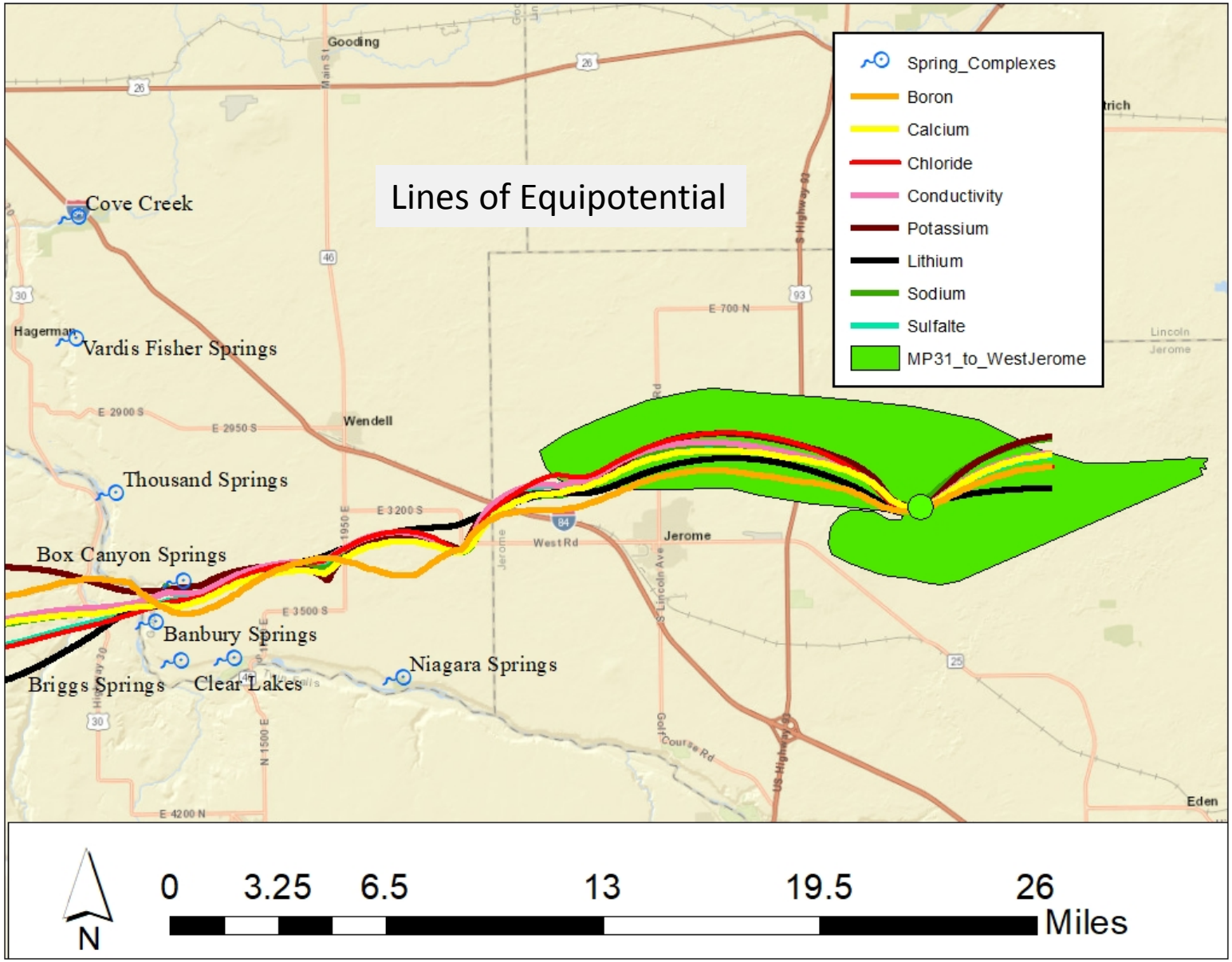
(6 months post dye release)



Mile Post 31 Trace – July 2017 Water Sample Results

(6 months post dye release)




Lines of Equipotential
Spring_Complexes
Boron
Calcium
Chloride
Conductivity
Potassium
Lithium
Sodium
Sulfalte
MP31_to_WestJerome
Cove Creek
Hagerman
Vardis Fisher Springs
Wendell
Thousand Springs
Box Canyon Springs
Banbury Springs
Briggs Springs
Clear Lakes
Niagara Springs
Jerome
Eden
Gooding
Lincoln
N
0
3.25
6.5
13
19.5
26
Miles

Gradient of Salmon River

http://www.southwestpaddler.com/docs/Salmon12report.html

Gradient of Salmon River idah... | Main Salmon River Trip Rep...

View Favorites Tools Help

WATER DISTRICT 1 (2) WATER DISTRICT 1 Yahoo (2)

Page Safety To

- Trip Reports
- Advertise
- Advertiser Index
- Links
- Visitor Comments
- Disclaimer
- Product Reviews
- Gear Swap
- Navigation Rights
- Credits
- Website Awards
- Campfire Recipes

SOAR INFLATABLES

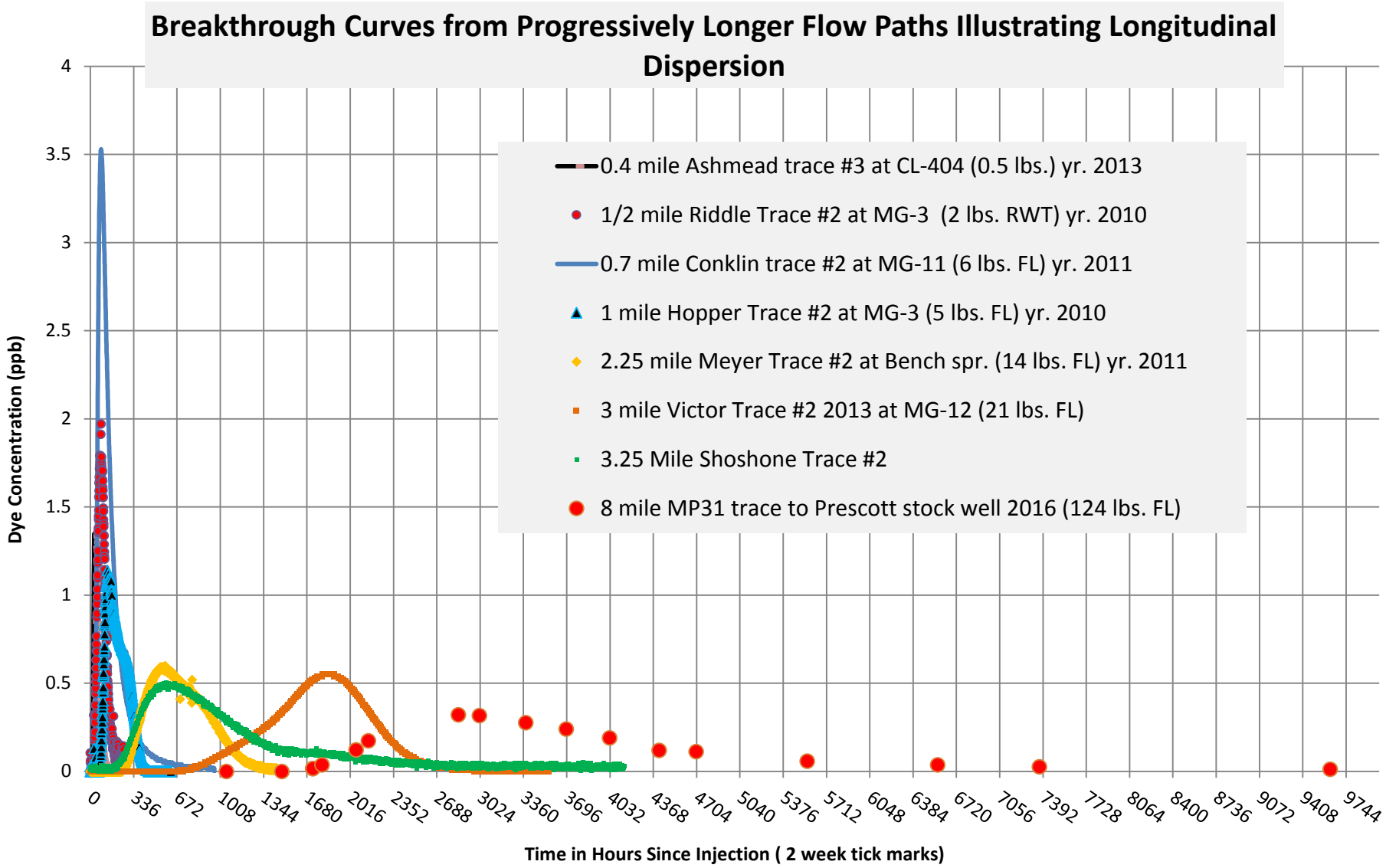
BOAT SMART. BOAT SAFE.

season is from late-May to mid-July, depending upon winter snowpack and recent local rainfall. By the end of July the Main Salmon was at what is locally referred to as "low runnable", which can be very misleading - I am not certain I would even want to be on that river in a loaded solo boat at a higher level. On the third day of our drive up to Idaho we navigated a long, dirt road that ran parallel to and in full view of the river from Salmon to our put-in at Corn Creek where the permit section begins. My friend Randy Stovall had been here the previous year and loved this river, so he was champing at the bit to go again. Randy was rowing his cataraft, his wife Libbi was rowing a 14-foot self-bailing raft and carrying Josh Newton whose father Carey was paddling a Perception Dancer kayak (and carrying NO gear whatsoever!) At the last minute my friends Tom Taylor and Stan Pully rounded out our group of seven, them and me each in our SOAR inflatable canoes.

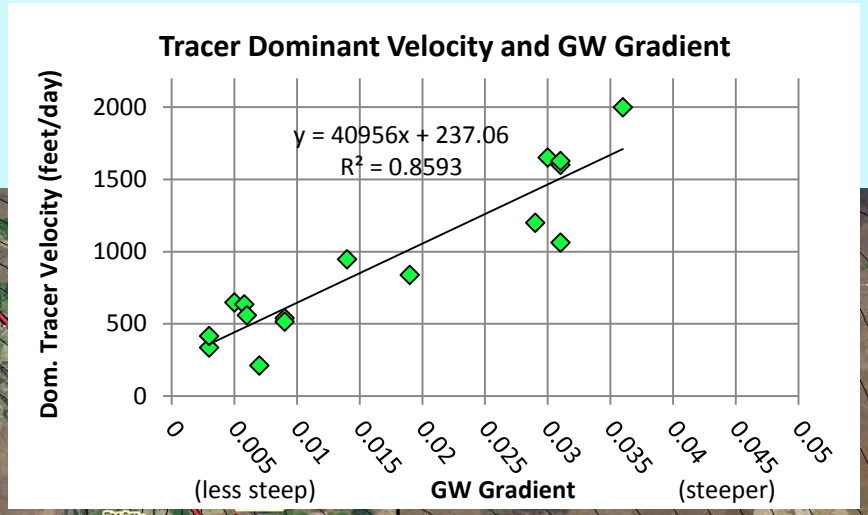
With every rapid we saw driving to the campground at Corn Creek we grew more excited about what was in store for us. We watched large rafts bucking the huge waves and skirting deep holes, and even from the road above we could tell that we were in for the rides of our lives. Unlike most pool and drop rivers the Main Salmon has almost as much drop as pool, and that is a major change from our Texas topography of shallow gradients and a lot more flatwater than whitewater. We knew that this would be a really super trip even before we hit the water (or before the water hit us!) For the record, the Main Salmon drops about 1,910 feet in 151 miles at an average gradient of about 12 feet per mile, which means the water flows as a steady current.

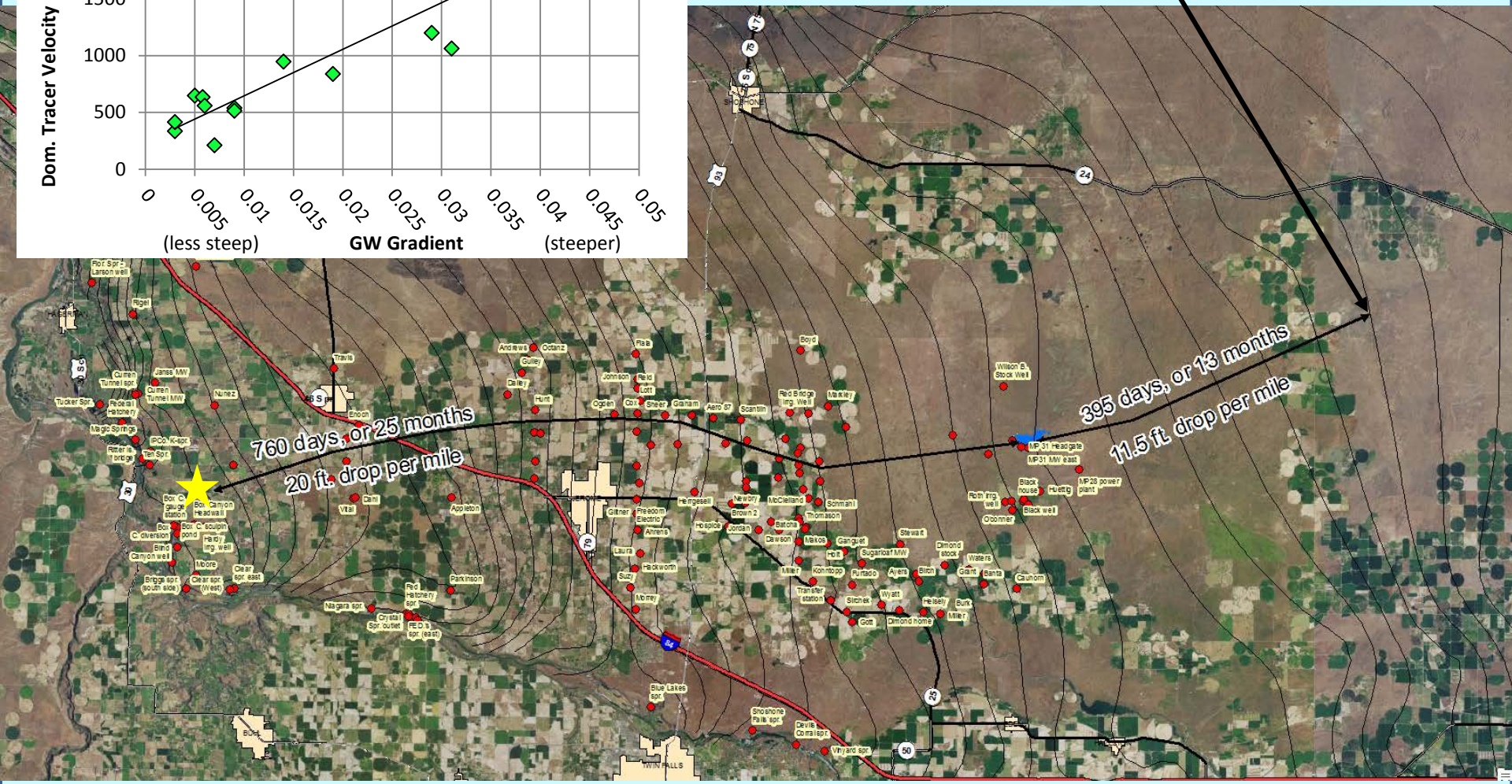
Arriving at Corn Creek Campground, we immediately went to the boat ramp to survey our access, then chose a vacant campsite for the night before our launch. Then, we proceeded back to the boat ramp where we unloaded the cataraft and raft so that Randy and Libbi could start rigging for the next day. It took a long time just to unload the pieces and lay them out so that we could begin assembling the boats. Our SOARs, and Carey's kayak, were much easier to prepare - Carey merely had to put his boat on the river and we had to inflate three tubes on each SOAR before loading them for our trip, and our loading time was about 30 minutes, so we elected to inflate our SOARs in camp and bring them down the morning of our launch.

On July 22, we finished preparing boats, got our orientation, checkout and campsite assignments from the Ranger, and then were on the water around 1:00 PM, which may seem like a late start, but we only had about 13 miles to go and the water was fast, so we were in great shape. The one truly unexpected encounter was the Idaho summer heat, which was rivaling what we left behind in Texas - we had daytime

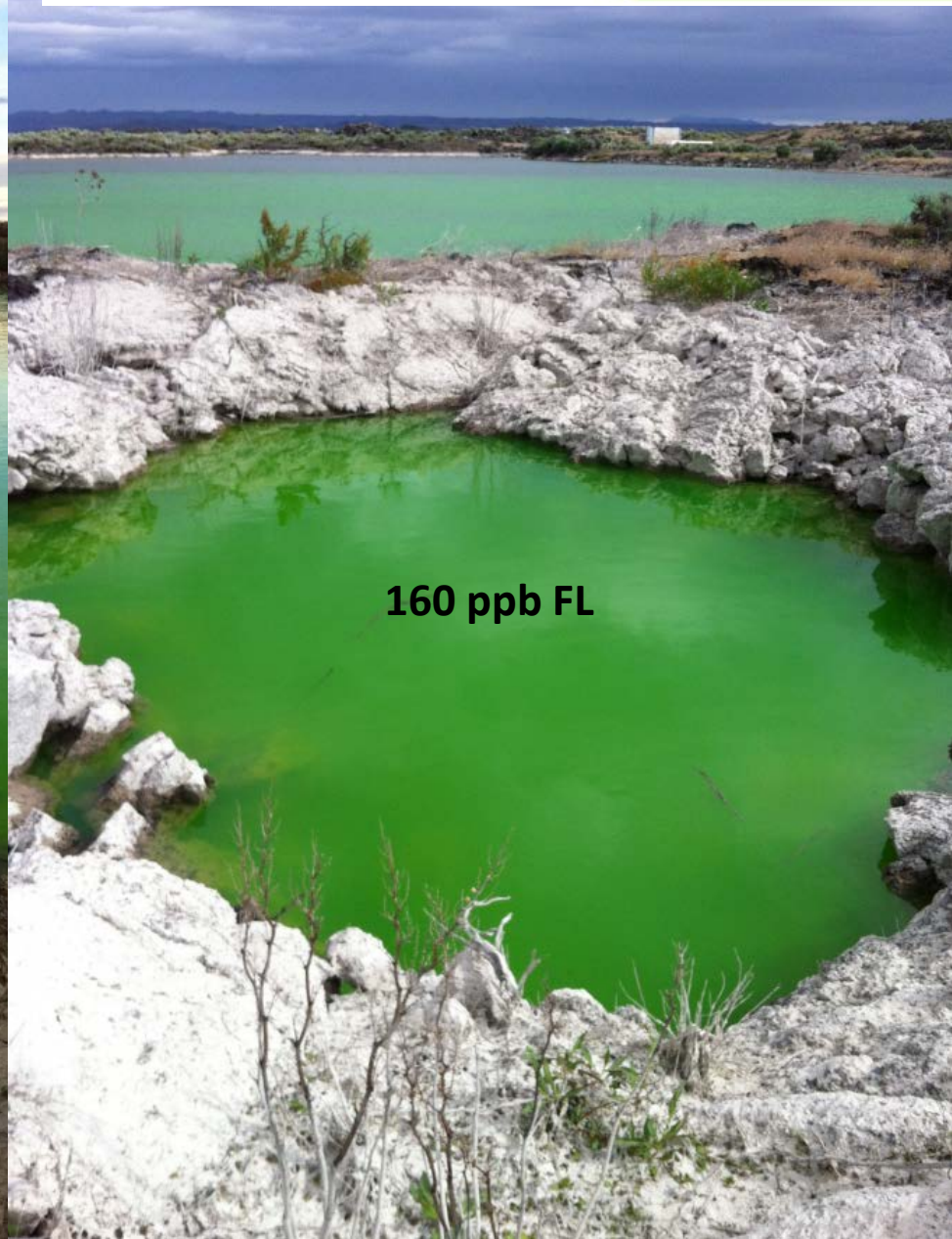

Breakthrough Curves from Progressively Longer Flow Paths Illustrating Longitudinal Dispersion
0.4 mile Ashmead trace #3 at CL-404 (0.5 lbs.) yr. 2013
1/2 mile Riddle Trace #2 at MG-3 (2 lbs. RWT) yr. 2010
0.7 mile Conklin trace #2 at MG-11 (6 lbs. FL) yr. 2011
1 mile Hopper Trace #2 at MG-3 (5 lbs. FL) yr. 2010
2.25 mile Meyer Trace #2 at Bench spr. (14 lbs. FL) yr. 2011
3 mile Victor Trace #2 2013 at MG-12 (21 lbs. FL)
3.25 Mile Shoshone Trace #2
8 mile MP31 trace to Prescott stock well 2016 (124 lbs. FL)
Dye Concentration (ppb)
0
0.5
1
1.5
2
2.5
3
3.5
4
0
336
672
1008
1344
1680
2016
2352
2688
3024
3360
3696
4032
4368
4704
5040
5376
5712
6048
6384
6720
7056
7392
7728
8064
8400
8736
9072
9408
9744
Time in Hours Since Injection (2 week tick marks)

3-Year Calculation of Groundwater Flow



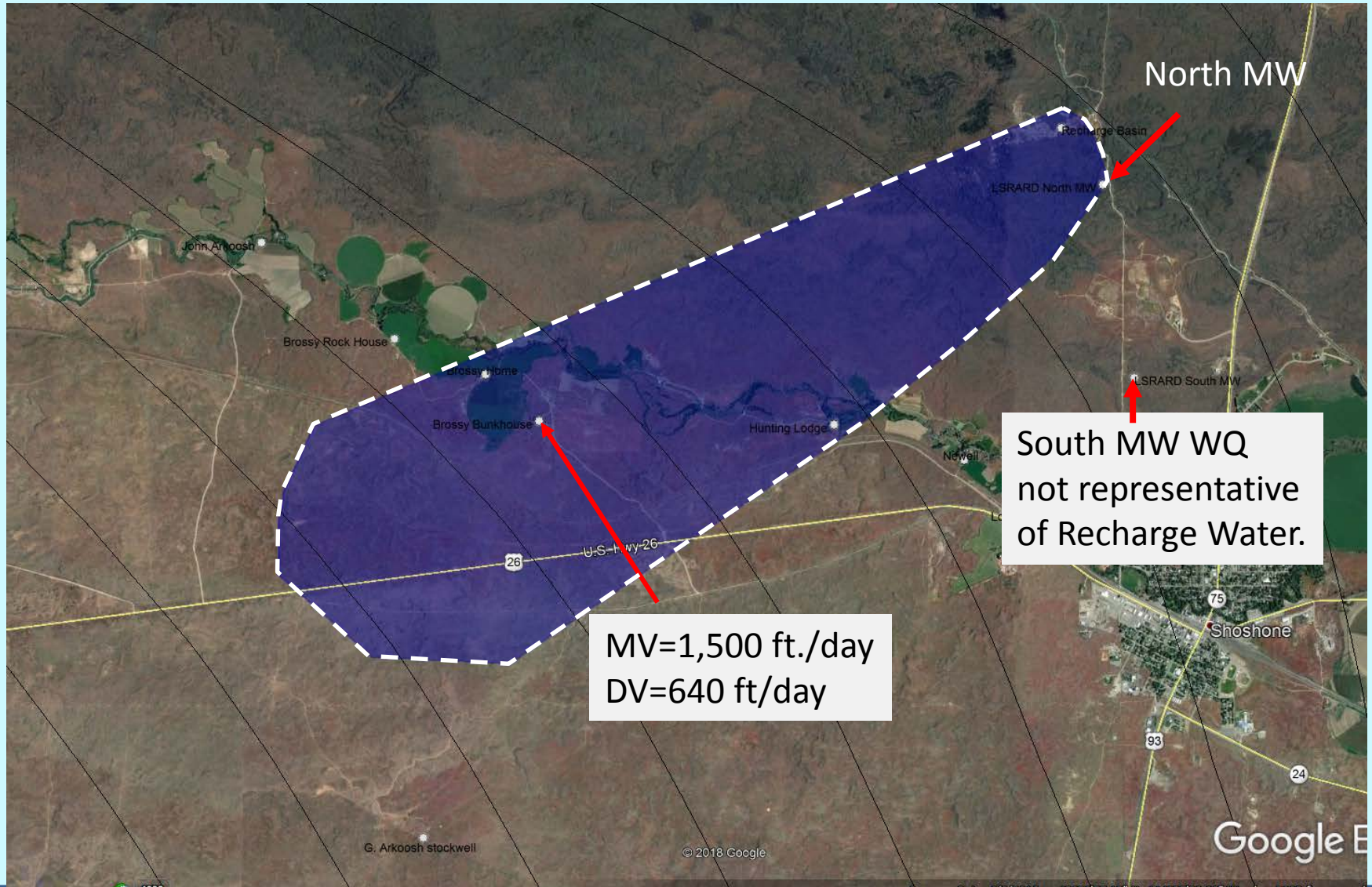


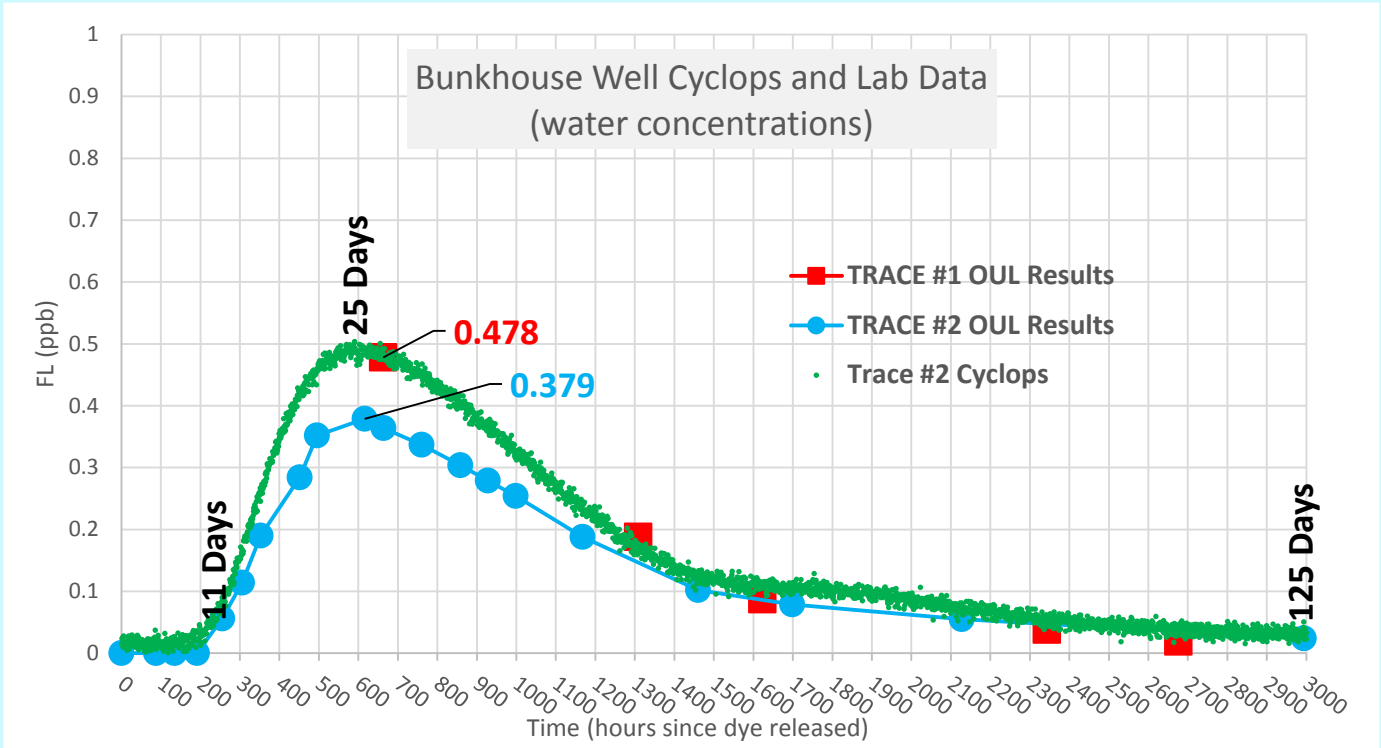

Shoshone Dye Trace June 15
(59 pounds FL)


160 ppb FL

Shoshone Trace 3.25 miles

(Depth to Water Table is 190 feet)





‘Spin Off’ Technology
Cyclops Field Instrument

https://www.pme.com/case-studies/dye-tracing-study

Dye Tracing Study – PME | ...

File Edit View Favorites Tools Help

Dyes WATER DISTRICT 1 (2) WATER DISTRICT 1 Yahoo (2)

Page Safety Tools

Dye Tracing Study

Project Details

REQUEST A QUOTE

PRODUCT(S)	Cyclops-7 Logger
APPLICATION	Freshwater
PARAMETER	Fluorescein Dye
LOCATION	Idaho, USA
ORGANIZATION	Idaho Department of Water Resources
RECOGNITION	Neal Farmer, Idaho Department of Water Resources, Turner Designs

Case Study Description

The Cyclops-7 Logger was used to detect Fluorescein dye in a dye tracing study near Clear Lakes, Idaho. The Fluorescein dye was injected into the bottom of a well and was later detected by the logger 18 hours after the injection began. It was discovered that the Fluorescein dye traveled over a linear distance of roughly 2,150 feet with a maximum velocity of 119 feet/ hour. The logger was set to sample Fluorescein dye every 30 minutes. PME provides software that produces visual plots of the data collected. The plot for this study illustrated that the peak Fluorescein concentration was at approximately 2.6 ppb, and that the range changed from x100 (Low) to x10(Medium) due to an increase in Fluorescein concentration.

STAY IN THE LOOP

Get emails about new Products, Case Studies and Company Info

Email

Yes. I'd like to receive relevant updates from you.

Subscribe

HELPFUL INFO

Downloads & Resources

View Our Products

Case Studies

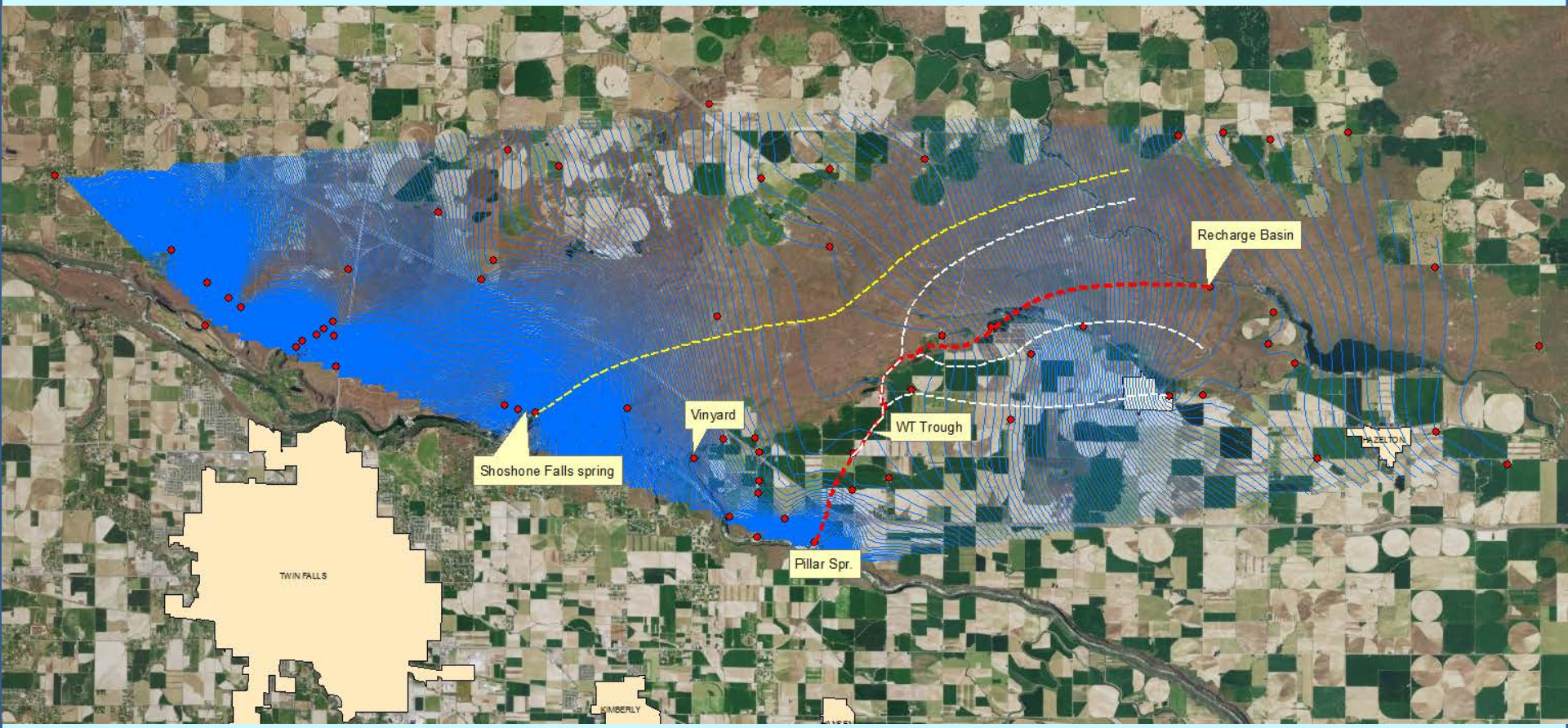
75%

24 Traces in 10 years

Date	Trace Name	Trace Distance (miles)	Max GW Velocity (ft./day)	Dominant Flow Velocity (ft./day)	Ave. GW Velocity (ft./day)	Hydraulic Conductivity K=(Pe*V_{dom})/I (Lowman 1972) Pe=0.08 (Heath 1983 & ESPAM 2.2) (ft./d)
April 7, 2009	Park picnic	0.2				
June 23, 2009	Park picnic 1	0.2	5,280	1st peak = 2,112 2nd peak = 754		
June 29, 2009	Park picnic 2	0.2	5,867	1st peak = 1,955 2nd peak = 776	871	1991
Sept. 22, 2009	Park picnic 3	0.2	5,867	1st peak = 1,955 2nd peak = 788	871[b]	
Oct. 20, 2009	R. Riddle 1	0.5				
March 1, 2010	R. Riddle 2	0.5	2,456	839	800	3448
April 19, 2010	R. Hopper 1	1.0				
May 21, 2010	R. Hopper 2	1.0	1,996	948	665	5326
Dec. 17, 2010	Meyer 1	2.3	1,098	541	456	4778
March 25, 2011	Meyer 2	2.3	1,094	517	426	4676
June 7, 2011	N. Riddle 1	0.5				
July 11, 2011	R. Conklin 1	0.7				
Aug. 19, 2011	R. Conklin 2	0.7	2,874	1063	716	2716
Nov. 18, 2012	N. Victor 1	3.1				
Nov. 4, 2013	N. Victor 2	3.1	564	212	218	2440
Dec. 13, 2012	Ashmead 1	0.4	2,976	1653		4402
Jan. 31, 2013	Ashmead 2	0.4	3,064	1602	1302	4171
Oct. 25, 2013	Ashmead 3	0.4	3,064	1628	1353	4249
Nov. 14, 2013	Strickland 1	3.5	771	561		7342
Mar. 9, 2014	Mile Post 31	7.6				
April 20, 2015	Box Canyon	1.3		3,550		9628
Dec. 21, 2016	Mile Post 31 (to prescott stock well)	7.6	556	336	265	8964
	MP31 to McClelland well	8.3	657	419	312	11175
	MP31 to Prescott Office	8.3	543	383		10203
	MP31 to Andy Prescott	8.3	393	256		6822
	MP31 to Hary Irrg. Well at Box Canyon	31.3	200			
June 15, 2017	Shosh. Rech. Basin-(Brossy Bunkhouse)	3.1	1,200	650		10400
April 4, 2019	Shosh. Rech. Basin-(Brossy Bunkhouse)	3.1	1,500	641	428	8836

Wilson Canyon Trace Preparation

(contours = 2 foot intervals.)



Summary

- Tracks Groundwater Flow for improved characterization of the aquifer.
- Cooperative effort between Idaho Power, IDWR, IWRB.
- Dye tracing has eliminated monitor wells that were previously thought to be in the flow path of recharge water and assist with WQ data interpretation.
- Dye tracing has confirmed some monitor wells are indeed in the flow path of recharge waters.
- Dye tracing has provided a strategic approach to locate new WQ monitoring wells.
- What we've learned at a local scale: using empirical data from dye tracing, water levels and water quality provides important information for developing and monitoring individual recharge sites, and can help improve a regional or sub-regional model.
- Tracing shows where the water flows but not necessarily the area influenced by water level rise due to recharge.
- The Tracing Program has pioneered the initiation of developing new field methods and equipment and instruments by private industry.

Ozark UNDERGROUND LABORATORY 1572 Aley Lane • Protem, MO 65733 • (417) 785-4289 • fax (417) 785-4290 • contact@ozarkundergroundlab.com

REVIEW OF THE DYE TRACING PROGRAM CONDUCTED BY THE IDAHO DEPARTMENT OF WATER RESOURCES AND IDAHO POWER.

May 30, 2018

Thomas Aley, PHG & PG
President, Ozark Underground Laboratory, Inc.
Protem, MO 65733

A report prepared for the Idaho Department of Water Resources and Idaho Power.

Purpose

This review was requested by Mr. Neal Farmer of Idaho Department of Water Resources (IDWR) with the concurrence of Mr. David Blew of Idaho Power (IP). The objective of the review was to evaluate the dye tracing program and recommend improvements that should be considered. The review and this report were conducted by the author (Tom Aley). I am a Professional Hydrogeologist certified by the American Institute of Hydrology and I am licensed as a Professional Geologist in Missouri, Arkansas, Kentucky, and Alabama.

I have extensive experience in dye tracing studies and have been involved with about 4,000 groundwater traces in the United States and abroad during the last 50 years. The vast majority of these traces have used fluorescent tracer dyes including the dyes that have routinely been used in the IDWR/IP tracing work. Most of the tracing work has been focused on problem-solving rather than research studies, and has included tracer studies conducted on behalf of a wide range of public and private entities. My resume is included as Attachment A.

Review Work Conducted

I spent the period from the evening of March 18 until the early afternoon of March 22, 2018 in Idaho. This include 2.5 days in the offices of IDWR (including time in their laboratory facilities) and one long and highly productive day in the field looking at locations where tracing work has been conducted or is ongoing.

The laboratory is very nice and includes a wide range of basic laboratory equipment. It does not include (and was not expected to include) a spectrofluorophotometer that can be operated under a synchronous scan protocol. This equipment provides the best available method for accurately separating fluorescent tracer dyes from background fluorescence and for separating and quantifying multiple dyes in the same sample. Neal Farmer has allocated space in the laboratory adequate for basic laboratory work he might need to conduct. The laboratory facilities are fully adequate for the dye tracing work that Mr. Farmer needs to conduct.

The office time involved well organized explanations of the groundwater tracing work that Neal Farmer and Dave Blew have conducted since about 2008. The first report that had both Neal Farmer's and Dave Blew's names as authors was dated 2009. I was given a very comprehensive, well organized short-course on ten years of groundwater tracing investigations in the Snake Plain aquifer. A large multi-colored table about 1 foot by 3 feet presented data on up to 34 parameters for each of the traces conducted to date; I found it very informative.

As a part of the review I presented brief case-history information from four large scale and highly productive dye tracing investigations I have been involved with elsewhere in the

United States. The cases I selected had features with similarities to tracing work in the Snake Plain aquifer. These included:

- Tracing to Big Spring in the south central Missouri Ozarks. This is a karst aquifer developed primarily in dolomitic rocks. The mean annual flow rate of Big Spring is 435 cfs. The longest traced distance through the groundwater system was 39.5 miles. The mean groundwater travel rate based on 10 traces was 9,870 feet per day. All of these traces used fluorescein dye and primary sampling reliance was based on activated carbon samplers.
- Tracing to Silver Springs, Ocala, Florida. There are approximately 30 individual spring openings (locally called "vents") with a combined mean flow rate of about 1,000 cfs. This is a karst aquifer with appreciable secondary and tertiary porosity. The longest traced distance was 8.5 miles. MODFLOW capture zone analysis for Silver Springs estimated a 200 year travel time for a trace that actually covered the most distant half of the total distance in 188 days. The mean travel rate for 16 successful traces was 456 feet per day. The dyes used were fluorescein, eosine, rhodamine WT, and sulforhodamine B; all dyes were successfully detected using activated carbon samplers.
- Tracing in the Barton Springs Segment, Edwards Aquifer, Austin, Texas. Mean flow of Barton Springs is 53 cfs. This segment of the Edwards Aquifer is federally designated as a Sole Source Aquifer and provides groundwater for a population of 44,000 plus important recreational facilities. Barton Springs also provides habitat for a federally endangered salamander. At low flow conditions groundwater extraction from production wells in the delineated recharge area for the spring is about 50% of spring flow. We have had many successful traces to production wells. The longest traced distance has been 14.9 miles and first arrival times for dyes have ranged from 11 feet per day to greater than 4.3 miles per day. Traces from several sites initially proposed for artificial recharge have demonstrated that much of any water that might be artificially recharged in these locations would rapidly reach and discharge from Barton Springs. Primary sampling reliance has been placed on activated carbon samplers with secondary reliance on water samples for shorter distances traces using larger amounts of dye. Fluorescein, eosine, and rhodamine WT have been the primary dyes used.
- Tracing through fractured andesite and ryolite overlain by thick alluvium and colluvium in southern New Mexico. All traces were to wells, and most were to non-pumping monitoring wells with short screened intervals. There were a total of 16 successful traces during the first two years of the study with underground travel distances ranging from 2,800 to 14,650 feet; the mean travel distance was 7,260 feet. The mean groundwater velocity for first dye arrivals was 60 feet per day; it ranged from 4 to 500 feet per day. Fluorescein, eosine, rhodamine WT and sulforhodamine B dyes were all successfully used. Primary sampling reliance was based on activated carbon samplers except in multiport wells where only water samples could be collected. At a number of wells sampled with both carbon samplers and grab samples of water dye was detected

in the carbon samplers but not in the water samples. This is because dye concentrations in the well water were below the detection limits for the dyes in water samples.

An important discussion related to the case histories focused on public acceptance and use of the resulting information. The work in the Edwards Aquifer has received more public and scientific attention than the other projects and has been very well received by professionals and the public. There have been numerous reports and publication prepared, and land and water resource decisions have made substantial use of the results. The Ozark Underground Laboratory (OUL) has been an integral part of the tracing work and has conducted all of the laboratory analysis for tracer dyes. All field work has been conducted by well trained and experienced personnel; this is important since sampling is routinely conducted at both public and private water supplies and maintaining good and professional relationships with the owners or managers of wells and water supplies is critical to this and other programs. A high priority is given to maintaining sampling schedules, and these schedules are primarily based on data needs. The program is operated cooperatively by the Watershed Management Department, City of Austin and by the Barton Springs Edwards Aquifer Conservation District.

Reviewed Documents

I was provided with copies (and have reviewed) the following reports:

Farmer, Neal and Dennis Owsley. 2009. Fluorescent dye tracer test at the W-Canal aquifer recharge site. IDWR Open-file report. 23p.

Farmer, Neal and Dave Blew. 2009. Fluorescent dye tracer tests at the Malad Gorge State Park. IDWR Open-file report. 23p. plus 4 page addendum.

Farmer, Neal and David Blew. 2010. Fluorescent dye tracer tests near the Malad Gorge State Park (Riddle well test). IDWR Open-file report. 36p.

Farmer, Neal and David Blew. 2011. Fluorescent dye tracer tests and hydrogeology near the Malad Gorge State Park (Hopper well test). IDWR Open-file report. 41p.

Farmer, Neal and David Blew. 2012. Fluorescent dye tracer tests and hydrogeology near the Malad Gorge State Park (Meyer, Conklin and Riddle wells). 77p.

Stockton, Kelly A.; Christine M. Moffitt; David L. Blew; and C. Neal Farmer. 2011. Acute toxicity of sodium fluorescein to Ashy Pebblesnails (*Fluminicola fuscus*). Report prepared for Hagerman National Fish Hatchery, USFWS. 21p.

Farmer, Neal and David Blew. 2014. Fluorescent dye tracer tests near Clear Lakes from the "Ashmead" well. IDWR Open-file report. 50p.

Farmer, Neal; David Blew; and Tom Aley. 2014. Fluorescent dye tracer tests from the Victor Well south east of the Malad Gorge State Park. IDWR Open-file report. 55p.

Blew, David and Neal Farmer. Undated. Evidence of high velocity flow and small transverse dispersion using dye tracer tests in a fractured basalt aquifer. 6p.

Comments on the Reviewed Documents

Comment 1. The tracing program and the individual traces have been well planned and conducted. The team of Farmer and Blew started with relatively simple and short distance traces and used these to develop approaches tailored to the hydrogeologic environment of the Snake Plain aquifer. The acknowledgement section of Farmer and Blew (2009, p. 20) credits multiple agencies and entities. This clearly shows that input and cooperation was requested and received from many sources. This is a very commendable strategy.

Comment 2. In some of the earliest tracing work by Farmer and Blew (2010) they used dye mixture in which the dye equivalent (the percent of actual dye) in the mixture was unknown. As is typical, this information was not available in MSDS sheets provided by the dye supplier. While this did not detract from the quality of the study, it identifies an important point that persons planning dye tracing studies or using the resulting data need to understand. Commercial grade dye mixtures used for groundwater tracing are never 100% dye; they are always mixtures. The dye mixtures are used for many commercial purposes and dye tracing underground water is not one of the major uses. In fact, most of the companies that market "tracer dyes" are focused on supplying plumbers and others working with sewers with a colorful tracer that they can visually detect. In my experience most of the sellers of dye mixtures do not accurately know the dye equivalent values for their products. Additionally, the actual percent of dye in a mixture varies slightly from batch to batch as manufacturers standardize the performance of their product by adjusting the non-dye portion of the mixture. In summary, dye mixtures for groundwater tracing investigations must be purchased from a supplier that carefully controls the quality of the product provided. Unless you know the dye equivalent value in different mixtures you cannot credibly compare the costs. Finally, dye analysis standards must be made from the dye mixtures used, and reported dye concentrations must be based on the dye mixture used rather than the approximate dye equivalent in the mixture.

Comment 3. Flow paths indicating small transverse dispersion are supported by the data, but care should be taken to not unduly limit future sampling plans that would be capable of detecting much broader transverse dispersion. As an illustration, much early groundwater

tracing in karst aquifers assumed that dye would discharge from a single spring and sampling of other springs was sometimes halted prematurely once dye was detected at a particular spring. More extensive spatial and temporal sampling in karst aquifers has often demonstrated that multiple springs and wells receive at least some dye from individual dye introduction points. Study plans for future tracing work in the Snake Plain aquifer should give adequate consideration to the possibility of broader and more complex flow paths downgradient of dye introduction points than is suggested by the studies reviewed.

Comment 4. All of the reports reviewed are of very good professional quality. They all include both basic data and interpretations based on the data.

Review of the Design and Conduct of Tracer Tests

First, I want to identify and briefly discuss important strong points in the program.

1. The program is clearly a science-based program. The various traces near the Malad Gorge State Park are a good example. The first traces were simple and short-distance traces. They provided data which were used in designing and conducting subsequent traces. Distances subsequently traced increased as the team of Farmer and Blew gained experience with tracing and with the performance of the aquifer. Open-file reports were prepared on each of the traces. Information and experience gained in the Malad Gorge area has provided a strong foundation for subsequent larger scale tracing efforts.
2. The same individuals have been involved throughout the program. This has provided a very important continuum. Furthermore, Farmer and Blew have made the contacts with owners or users of wells and springs and they also do the sampling. In my experience this level of personal and professional contact is very important. I also think it is desirable to have a team of two people doing the sampling, especially when some of the sampling is done on private property and even sometimes inside people's homes. The team of two professionals sends a message to the cooperating landowner that important work is being conducted and that his cooperation in the project is appreciated.
3. So far as I can determine all facets of the tracing work are done with great care and professionalism. The methods for dye introductions in wells are excellent. The sampling is also done very carefully.

Next, I have a list of suggestions for actions that I believe could strengthen the dye tracing program.

1. I recommend preparing a table for inclusion in subsequent open-file dye tracing reports that briefly describes each sampling station where activated carbon samplers are used. The table would indicate as accurately as possible how private water wells were sampled. This

is important because the amount of dye in a carbon sampler is a function of the concentration of dye in the water in contact with the carbon sampler and the amount of time that the carbon sampler has been exposed to the water. Activated carbon adsorbs dye from water in contact with the carbon particles. Water in contact with the carbon needs to be at least slowly replaced with water in which there has been little or no dye lost due to adsorption onto carbon. If this condition is not met then the carbon sampler in place in such water will not adsorb as much dye as a carbon sampler in identical water if that water were adequately circulated. Activated carbon samplers placed in toilet tanks are likely to under estimate the magnitude of passing dye pulses or potentially miss detecting small concentration dye pulses. In my experience such a table would help the authors and report readers understand why some sampling stations detect less dye than nearby stations.

2. A good way to sample a well is to place a carbon samplers in a PVC sample holder at the end of a garden hose and let water pass through it at a rate of about one gallon per minute. If well owners do not want to pump this much water a timer such as used in cities that allow lawn watering only on certain days and certain times during the day works well. This approach is superior to placing carbon samplers in toilet tanks, yet the toilet tanks are better than no sampling at all.
3. The open-file reports would be strengthened if there were a table summarizing all dye analysis results from activated carbon samplers. The table should be organized by sampling station and would indicate the following columns:
    a. Date and time of sampler placement
    b. Date and time of sampler recovery
    c. Dye concentration in sampler
    d. Mean daily dye concentration in sampler
    e. Additional columns similar to columns c and d can be used if more than one dye is in use.
4. The open-file reports would be strengthened if there were a table summarizing all dye analysis results from water samples. The table should be organized by sampling station and would include date and time of sample collection and dye concentration present.
5. More frequent sampling at more or less evenly spaced intervals would be beneficial. While this increases the workload and costs, this is a very valuable program that is developing information previously unavailable and information that will be of great long-term value. Having two or more samples that contain no detectable dye from a location, followed by several sampling periods where dye is detected, is clear proof of a hydrologic connection to the dye introduction point.
6. The narrow dye paths demonstrated by six separate traces in the Malad Gorge area (Farmer and Blew, 2012) are noteworthy and important in assessing the potential for contaminant transport in the Snake Plain aquifer. The flow paths are much narrower than those

commonly encountered in other hydrogeologic environments where comprehensive groundwater tracing projects have been conducted. It is important to determine if these conditions are typical in the Snake Plain aquifer and, if they are, that they are not an artifice of an inadequate breadth of sampling points or an inadequate sampling duration.

7. While I do not believe it has caused any problems in the past, custody of samples in the field could be improved. The findings of the tracing studies will have important current and future value and all facets of the work must be carefully conducted. Sampling materials, and especially collected samples, should always be in the control of at least one of the people doing the sampling. One approach is to lock the vehicle every time you leave it; that can be uncomfortable in hot summer weather. An easier approach would be to put collected samples in a cooler that is kept inside a locked box or locked compartment in the truck. I have testified a number of times in court cases involving dye tracing studies and custody of samples is often a major topic of court examination. A little extra care with samples protects the integrity of the resulting data.
8. Another custody issue involves the use of activated carbon samplers. They are not in the custody of the people doing the study when they are left in a spring or some other unlocked sampling location. Their credibility as accurate samples is enhanced if:
    a. Multiple samples are collected from sampling stations and the dye concentrations all appear reasonable. This may mean more frequent sampling than might otherwise be necessary, especially at critical locations.
    b. An additional and very well hidden carbon sampler is routinely used and analyzed at critical springs. The results should be consistent with those from the primary sampler.
    c. Grab samples of water are collected and analyzed and those results are consistent with the findings from carbon samplers.
9. A good approach is to collect and replace activated carbon samplers at equal time intervals so that dye concentrations can be directly compared. For many reasons this is not always possible. Carbon samplers adsorb and retain the tracer dyes. The standard activated carbon samplers produced by the OUL contain 4.25 grams of activated carbon. Manufacturer's data indicates that there is over an acre of surface area on that amount of carbon. As dyes and other materials are adsorbed on the carbon the amount of available sites for more dye to be adsorbed decreases. However, the rate of decrease is relatively small given the large amount of surface area in the sampler. As a result, dye concentration values from carbon samplers can be normalized by dividing the dye concentration by the number of days the sampler was in place and calculating a mean dye concentration per day value.
10. Values from carbon samplers at a particular sampling station can be added together to create a cumulative dye breakthrough curve (see Figure 1). In this case fluorescein and rhodamine WT dyes were both injected at the same time and location, both were

discharging from a monitored spring, and both were detectable during a 58 day sampling period in both grab samples of water and in carbon samplers.

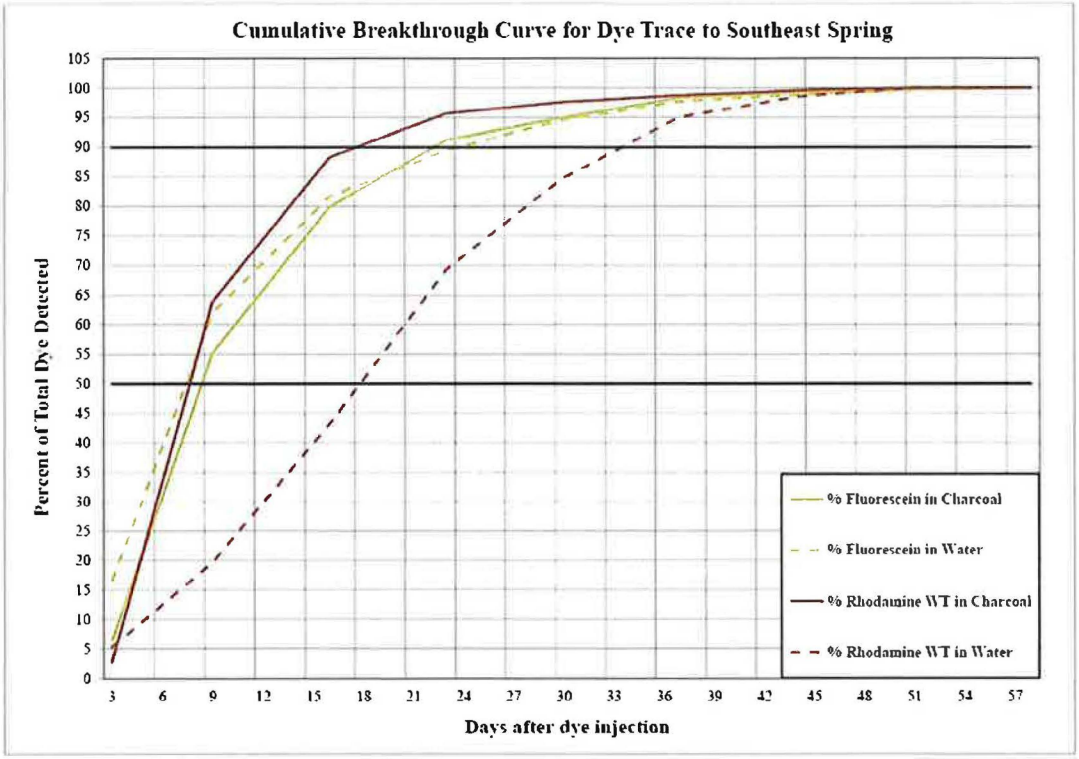


Figure 1

11. The tracing work under review is primarily sampling relatively clean water so activation sites on carbon remain available for a longer period of time than is the case when sampling in contaminated water. As general guidance I recommend that carbon samplers not be left in place for longer than about one month at springs nor longer than about two months at wells. Samplers left in place for longer periods are still valuable, but I have less confidence in mean daily dye concentration values from such samplers.

12. When sampling water from homes that have water treatment equipment it is best to sample prior to the treatment, but this is often not reasonable. In my experience the home treatment methods do not remove all of the dye and many of them may not remove most of it. When sampling homes with such systems the existence of the systems must be noted in the reporting since it might result in false-negative data. I also recommend that samplers at such wells not be left in place for longer than one month.

13. I was very impressed by the dye traces from artificial recharge basins at Mile Post 31 and at the Shoshone Recharge Basin. Using dye traces to assess the downgradient movement of water from the basins provides valuable information. One possible improvement in the design of recharge basin traces would be to restrict the dye introduction to one or two localized parts of the basins where recharge rates are expected to be the highest. If

reasonable, once the dye is introduced allow most of it to enter the subsurface and then apply most of the recharge water to flush the dye into and through the groundwater system. This approach will concentrate and localize the dye plume and reduce losses to surficial soils, sunlight degradation, and dilution. The result will be more efficient use of the dye and larger dye concentrations at downgradient sampling locations.

14. Consideration should be given to conducting two or three dye introductions at or near the same time and utilizing many of the same sampling stations. With spectrofluorophotometer analysis using synchronous scan protocols fluorescein, eosine, and rhodamine WT dyes can be detected and each quantified in a single sample with a single analytical charge. The amounts of each dye to be used must be balanced so that a large concentration of one dye does not obscure a small concentration of another dye. As a general rule of thumb for traces of equal distance and complexity, and using standard dye mixtures supplied by the OUL, use about 1.5 times as much eosine dye mixture as fluorescein mixture and about 5 times as much rhodamine WT mixture as fluorescein mixture. The need to use larger quantities of eosine and rhodamine WT dye mixtures can be overcome if rhodamine WT is used for the shortest distance traces, eosine for the intermediate distance traces, and fluorescein for the longest traces. As an example, fluorescein could be introduced into a recharge basin, eosine in a well 5 miles downgradient of the basin, and rhodamine WT in another well 10 miles down gradient of the basin. Rhodamine WT concentrations at detection sites would likely have substantially decreased before any eosine arrives, and eosine would likely have substantially decreased before any fluorescein arrives. There are other strategies that can be used to trace with multiple dyes concurrently. A benefit of concurrently tracing with multiple dyes is that it increases the information gained with only small increases in the cost of sampling and analysis.

15. Recognize that dye standards deteriorate with time. The approach used at the OUL is to make 10 ppb standards for eosine and fluorescein in water each day that dye analysis is done. These standards are made from 1 ppm stock solutions. Fresh 1 ppm stock solutions are made monthly from 100 ppm stock solution which are made once a year. For rhodamine WT in water 100 ppb standards are made daily from 10 ppm stock solutions. A fresh stock solution is made monthly from a 1,000 ppm stock solution that in turn is made once a year. If you are doing any quantitative dye analysis in the lab in Boise I recommend the above frequency for making standards.

16. Control stations are sampling locations where no dyes are expected. Control stations should be established and routinely sampled for tracer dyes using activated carbon samplers. Consideration should be given to establishing control stations periodically along irrigation canals that pass through areas where groundwater tracing is occurring and where dyes are likely to be detected in sampled wells. Such control stations demonstrate that dye detected in nearby wells is not derived from dye that was somehow present in the canals and that the dye introduction point is the only credible source for detected dyes. I see no indication that the absence of control stations has adversely impacted any of the tracer studies conducted by the team of Farmer and Blew.

17. At springs and surface water sampling locations it is a good protocol to place a carbon sampler and a duplicate. It takes very little time to routinely place, collect, and replace duplicate samplers. The duplicates are extremely valuable if the original sampler is lost or damaged. The team of Farmer and Blew places carbon samplers in a porous container to protect them from animals that occasionally damage them. The duplicate carbon sampler could be attached to the outside of this container or could be separately anchored. Duplicate samplers can be placed in the same collection bag as the original sampler. If one sampler is damaged or has been partially washed out of the spring being sampled the other sampler is doubled and a note is placed on the custody sheet telling the laboratory to analyze the folded sample.
18. Mean Relative Percent Difference (RPD) values for dyes eluted from duplicate carbon samplers in field studies are about 40%. The shape of breakthrough curves for dye concentrations in carbon samplers can be smoothed if the carbon sampler and its duplicate are both analyzed each time dye is detected at the sampling station. When the data are graphically displayed, the mean dye concentration from the two samplers is used as the plotted value.
19. Some very important work utilizing some novel approaches has been conducted. While the open-file reports are a good way of disseminating the information and preventing it from being lost, efforts should be made to publish results of the tracing studies in other places as well.
20. High quality field work is essential in groundwater tracing programs. I recommend that the team of Farmer and Blew continue to do the field work rather than delegate it to people with less commitment to high quality and comprehensive work.

Summary and Conclusions

The dye tracing studies conducted by Neal Farmer and Dave Blew are excellent. The studies are very well designed, very well conducted, and the reporting is both thorough and of high technical quality. The findings are providing important and highly credible information about the hydrologic functioning of the extremely valuable Snake Plain aquifer. An expansion of the program would be desirable, but such an expansion should not be allowed to degrade the basic quality of the work.

I very much enjoyed the opportunity to provide this program review.

Thomas Aley, PHG & PG
President and Senior Hydrogeologist
Ozark Underground Laboratory, Inc.

S:\tom\IDWRreport2.doc

ATTACHMENT A. RESUME OF THOMAS ALEY

Resume of Thomas Aley

PERSONAL DATA

Born September 8, 1938 in Steubenville, Ohio. U.S. Citizen. Married, two adult children.

EDUCATION

University of California, Berkeley. B.S. in Forestry (1960).

University of California, Berkeley. M.S. in Forestry with emphasis in forest influences and wildland hydrology. (1962).

University of California, Berkeley. Department of Geography (1962-1963); emphasis in hydrology and geology.

University of Arizona, Tucson. Department of Watershed Management (1963-1964); emphasis in wildland hydrology.

Southern Illinois University, Carbondale. Department of Geography (1972-1973). Emphasis in hydrology and geology.

PROFESSIONAL CERTIFICATION & REGISTRATION

Professional Hydrogeologist, Certificate Number 179, American Institute of Hydrology, Board of Registration. Granted 1983.

Certified Forester, Society of American Foresters. Granted 1996.

Professional Geologist, State of Arkansas Registration Number 1646. Issued 1991.

Professional Geologist, State of Kentucky Registration Number 1541. Issued 1994.

Registered Geologist, State of Missouri Registration Number 0989. Issued 1998.

Professional Geologist, State of Alabama Registration Number 1089. Issued 2003.

Registered Water Tracer #038, State of Missouri.

PROFESSIONAL SOCIETY MEMBERSHIPS

American Institute of Hydrology
Association of Ground Water Scientists and Engineers
Society of American Foresters
Missouri Consulting Foresters Association
National Speleological Society

HONORS AND AWARDS

1960. Pack Prize in Forestry. University of California.
1961. Membership in Xi Sigma Pi, honorary forestry society.
1972. Award for outstanding performance, United States Forest Service.
1972. U.S. Forest Service nominee for the American Motors Conservation Award.

1973. Lester B. Dill Award for significant contributions to speleology. Mississippi Valley-Ozark Region of the National Speleological Society.
1977. Chairman's Conservation Award. Mississippi Valley-Ozark Region of the National Speleological Society.
1979. J Harlan Bretz Award for outstanding contributions to the study of speleology in the state of Missouri. Missouri Speleological Survey.
1981. Outstanding Service to Education Award. Phi Delta Kappa honorary educational fraternity for southwest Missouri.
1981. Fellow. National Speleological Society.
1988. In The Name of Science Award. Springfield, Missouri Public Schools. In recognition of outstanding service and dedication to science.
2012. Berry Commoner Science in Environmental Service Award. Missouri Coalition for the Environment.

EMPLOYMENT HISTORY

1973 to Present. Director and President, Ozark Underground Laboratory, Protem, Missouri. Conducts or directs consulting and contract studies in hydrogeology, cave and karst related issues, and natural resource management of karst regions.

1966 to 1973. Hydrologist, United States Forest Service. Winona, Missouri and Springfield, Missouri. Directed the Hurricane Creek Barometer Watershed study, which assessed the interactions of land use and ground water hydrology in a forested karst area. Directed Grey Hollow study. Conducted "trouble shooting work" in Missouri, Arkansas, Wisconsin, Utah, Illinois, and Indiana. Left government service as GS-12.

1964 to 1965. Chief Hydrologist, Toups Engineering, Inc., Santa Ana, California. Duties included basic data collection and analysis for plaintiffs in Santa Ana Basin adjudication and similar work for defendants in San Gabriel Basin adjudication; these were both ground water basin adjudication suits. Directed technical work on ground water basin management and artificial recharge.

1963 to 1964. Teaching Assistant, Department of Watershed Management, University of Arizona, Tucson. Aerial photogrammetry and photo interpretation.

1963. Researcher, grant from Office of Naval Research, U.S. Navy, through Department of Geography, University of California, Berkeley. Conducted field studies on the origin and hydrology of caves in Jamaica, Haiti, and the Dominican Republic. Responsible for all field work. Work resulted in 3 publications.

1960 to 1963. Teaching Assistant and Research Assistant, School of Forestry, University of California, Berkeley. Teaching in aerial photogrammetry, photo interpretation, and forest influences. Research assistant in the same fields.

SUMMARY OF EXPERIENCE

53 years of professional experience in ground water and surface water hydrology, pollution control investigations, and land management issues with particular emphasis on soluble rock landscapes. The following projects are representative examples.

1. Hydrologic studies for land management and spring protection with particular emphasis on soluble rock regions. Numerous studies of this type have been conducted for local, state, and federal agencies in Missouri, Arkansas, Alabama, Florida, Kentucky, Illinois, Tennessee, Alaska, and Wyoming.

2. Expert witness testimony on pollution potential of underground injection of hazardous wastes into deep-lying soluble rocks in Oklahoma.

3. Expert witness testimony in ground water and surface water hydrology in Missouri, Arkansas, Oklahoma, Kansas, California, Alabama, Maryland, Washington, and Indiana.

4. Expert witness testimony on riverbank stability problems in Missouri before U.S. Senate Committees at request of Senator John Danforth of Missouri.

5. Member of 6-member review panel on the adequacy of testing to determine radionuclide migration from a radioactive waste disposal site at the Idaho National Engineering Laboratory, Idaho. Served as the only hydrogeologist on the panel.

6. Member of 6-member expert hydrogeology panel on hydrological issues associated with the St. Louis Airport Radioactive Waste Site.

7. Chairman of a 4-member "blue ribbon" panel established by the U.S. Forest Service to assess the significance of cave and karst resources in southeastern Alaska. The panel also assessed the extent to which land management activities were adversely impacting the resources.

8. Hydrologic consultant to St. Charles County, Missouri on clean-up of radioactive wastes at Weldon Spring Site, a former Atomic Energy Commission processing facility. Advised on actions to protect county well field from radioactive contaminants dumped in an abandoned quarry.

9. Ground water tracing in soluble rock landscapes, and delineation of recharge areas for spring systems. Work conducted in Missouri, Arkansas, Oklahoma, Indiana, Illinois, Kentucky, Tennessee, Alabama, Florida, Georgia, Texas, Maryland, Pennsylvania, New York, West Virginia, Arizona, Oregon, California, Nevada, Wyoming, and Alaska. Foreign work in Canada, Barbados, Australia, Indonesia, and Peru. Ground water tracing in fractured rock landscapes in New Hampshire, Alabama, New Mexico, Minnesota, Idaho, Utah, and Washington. Ground water tracing in unconsolidated geologic units in New York, Massachusetts, Florida, North Carolina, South Dakota, Missouri, Arkansas, California, Oregon, Washington, Alaska, British Columbia (Canada), and Sweden.

10. Hydrogeologic investigations of groundwater impacts from pipeline corridors. Missouri, Oklahoma, and Texas.

11. Ground water tracing investigations at mines in Virginia, West Virginia, Pennsylvania, New York, Missouri, Illinois, Utah, Colorado, Montana, Alabama, Maryland, Canada, Indonesia, Australia, Peru, and Ghana.

12. Hydrologic investigations to determine sources of pollutants that caused fish kills at commercial fish farms in Missouri and Arkansas.

13. Hydrogeologic site investigations (and sometimes testimony) on municipal landfills with emphasis on site suitability and probability of ground water contamination. 23 sites in Arkansas, Missouri, Wisconsin, Tennessee, Alabama, and Alaska.

14. Hazardous waste remediation investigations with emphasis on hydrogeology. Sites in Missouri, Arkansas, Oklahoma, Colorado, Kentucky, Pennsylvania, Maryland, New York,

Alabama, Tennessee, and California. Second opinion review of projects in Missouri, Kansas, and New York.

15. Impacts of food processing wastes on surface and ground water quality. Various projects in Arkansas and Missouri.

16. Hydrologic investigations of petroleum pollution of wells. Multiple sites in Missouri, Arkansas, New York, and North Carolina.

17. Assessment of the hydrologic impacts of proposed geothermal energy development on the Santa Clara Indian Reservation, New Mexico.

18. Investigations on the extent and sources of sewage contamination in about 100 springs at Eureka Springs, Arkansas. Work involved the delineation of recharge areas for most of these springs and the identification of sewer line segments which had the greatest leakage problems.

19. Hydrogeologic hazard area mapping for proposed sewer line corridors in a sinkhole plain area south of Mammoth Cave, Kentucky. Work included hydrologic recommendations for minimizing exfiltration and monitoring strategies.

20. Hydrogeologic mapping of Greene County, Missouri to identify areas where sinkhole flooding and serious ground water contamination could result from land development.

21. Assessment of impacts of proposed highways on springs, caves, and endangered cave-dwelling species, Arkansas, Missouri, Indiana, Virginia, West Virginia, and Alaska. Similar work for airports in Missouri and Arkansas, and for coal-fired power plants in Missouri and Arkansas.

22. Identification and delineation of rare, threatened, and endangered animal species' habitats in caves and ground water systems. Studies in Arkansas, Missouri, Oklahoma, Tennessee, Alabama, and Illinois.

23. Health and safety assessment of Harrison's Crystal Cave, Barbados.

24. Health and safety assessment of natural radiation as encountered in caves open to the public in the United States. Development of industry standards under OSHA Alliance Agreement.

25. Investigations and management recommendations for reducing TCE vapor intrusion into the air of two show caves in Missouri

26. Various microclimate, hydrologic, biologic, interpretive, and management investigations of caves in Missouri, Arkansas, Tennessee, Kentucky, New Mexico, Arizona, California, Wyoming, Oregon, Alaska, British Columbia, New Zealand, and Australia.

27. Evaluation of 19 sites for designation as National Natural Landmarks; sites are in Indiana, Missouri, Arkansas, Iowa, Ohio, and New Mexico.

28. Assessment of hydrologic impacts of rock quarries. Multiple sites in Missouri, Arkansas, Maryland, Illinois, Alabama, and Alaska.

29. Assessment of the impacts of deep mining on regional hydrology. Missouri.

30. Preparation of sole-source aquifer designation petition. Missouri.

31. Delineation of wellhead protection zones for public ground water supplies in Arkansas, Missouri, Alaska, Alabama, South Dakota, New Hampshire, Maryland, and Florida.

32. Groundwater tracing at four nuclear power plants, USA.

33. Feasibility study for creation of a national-scale American Cave and Karst Museum.

34. Instructor in numerous professional short-courses. These have included:

1) Over 20 four-day courses in karst hydrogeology and groundwater monitoring sponsored by the Association of Ground Water Scientists and Engineers and by Environmental Education Enterprises;

2) Two courses on groundwater site investigation techniques for health department professionals in Washington State; and

3) Courses on land management in karst terrains for resource managers in West Virginia, Indiana, Kentucky, Tennessee, Missouri, Arkansas, Utah, Idaho, Oregon, Washington, Alaska, and New Mexico.

PUBLICATIONS

1. _____. 1962. Analytical review of Gurnee, Russell; Richard Anderson; Albert C. Mueller; and Jose Limeras. 1961. Barton Hill Project; a study of the hydrology of limestone terrain. National Speleological Society Bulletin. Vol. 23, Part I. 30p. Review in Cave Notes, Vol. 4:4, pp. 32-33.

2. _____. 1963. Water balances for limestone terrain. *Cave Notes*, Vol. 5:3, pp. 17-22.

3. _____. 1963. Basic hydrographs for subsurface flow in limestone terrain: theory and application. *Cave Notes*, Vol. 5:4, pp. 26-30.

4. _____. 1964. Sea caves in the coastal karst of western Jamaica. *Cave Notes*, Vol. 6:1, pp. 1-3.

5. _____. 1964. Echinoliths--an important solution feature in the stream caves of Jamaica. *Cave Notes*, Vol. 6:1, pp. 3-5.

6. _____. 1964. Origin and hydrology of caves in the White Limestone of north central Jamaica. Dept. of Geography, Univ. of Calif., Berkeley. 29p.

7. _____. 1965. Corrasional cave passage enlargement. *Cave Notes*, Vol. 7:1, pp. 2-4.

8. _____. 1965. Analytical review of Brown, R.F. and T.W. Lambert. 1963. Reconnaissance of ground-water resources in the Mississippian Plateau region of Kentucky. U.S. Geol. Surv. Water Supply Paper 1603. 58p. Review in Cave Notes, Vol. 7:2, pp. 9-13.

9. Crooke, Howard W., John M. Toups, and _____. 1965. Ground water recharge means "progress insurance" in Orange County, California. *Water and Sewage Works*, Vol. 112:7, pp. 257-261.

10. _____. 1967. Analytical review of Sweeting, M. M.; G. E. Groom; V. H. Williams; C. D. Pigott; D. Ingle Smith; and G. T. Warwick. 1965. Denudation in limestone regions; a symposium. Geographical Journal, Vol. 131, Part 1, pp. 34-57. Review in *Caves and Karst*, Vol. 9:1, pp. 5-6.

11. _____. 1967. Water balance study of Greer Springs, Missouri. *Caves and Karst*, Vol. 9:2, pp. 12-15.

12. _____. 1967. Analytical review of White, William B. and Victor A. Schmidt. 1966. Hydrology of a karst area in east-central West Virginia. *Water Resources Research*, Vol. 2:3, pp. 549-560. Review in Caves and Karst, Vol. 9:5, pp. 44-46.

13. _____. 1968. Hydrology of a karst watershed in the Missouri Ozarks. *Caves and Karst*, Vol. 10:6, pp. 49-55.

14. _____. 1969. Out of sight, out of mind. *Missouri Mineral Industry News*, Vol. 9:12, pp. 163-166.

15. _____. 1970. Temperature fluctuations at a small Ozark spring. *Caves and Karst*, Vol. 12:4, pp. 25-30.

16. _____. 1972. The sinkhole dump and the spring. *Missouri Conservationist*, Vol. 33:2, pp. 16-17.

17. _____. 1972. Groundwater contamination from sinkhole dumps. *Caves and Karst*, Vol. 14:3, pp. 17-23.

18. _____. 1972. Control of unwanted plant growth in electrically lighted caves. *Caves and Karst*, Vol. 14:5, pp. 33-35.

19. _____, James H. Williams, and James W. Massello. 1972. Groundwater contamination and sinkhole collapse induced by leaky impoundments in soluble rock terrain. *Engineering Geology Monographs*, Series 5. Missouri Geol. Survey and Water Resources. 32p.

20. _____. 1974. Groundwater problems in southwest Missouri and northwest Arkansas. *Missouri Speleology*, Vol. 14:2, pp. 1-13.

21. _____. 1975. Hydrology. IN: Gott, J. D. Soil survey of Mark Twain National Forest Area, Missouri. U.S. Dept. of Agric. Soil Survey Report, pp. 47-50.

22. _____. 1976. Caves, cows, and carrying capacity. *Proc. First National Cave Management Symposium,* pp. 70-71.

23. _____. 1976. Hydrology and surface management. *Proc. First National Cave Management Symposium*, pp. 44-45.

24. _____ and Mickey W. Fletcher. 1976. The water tracer's cookbook. *Missouri Speleology*, Vol. 16:6, pp. 1-32.

25. _____ and Doug Rhodes; Editors. 1977. *Proc. Second National Cave Management Symposium,* 106p.

26. _____. 1977. Comments on cave radiation. *Proc. Second National Cave Management Symposium,* pp. 75-76.

27. _____. 1977. Introductory comments on commercial and high value caves. *Proc. Second National Cave Management Symposium*, pp. 52-53.

28. _____. 1977. The Ozark Underground Laboratory. *Proc. Second National Cave Management Symposium,* pp. 94-98.

29. _____. 1977. A model for relating land use and groundwater quality in southern Missouri. IN Dilamarter, R. R. and S. C. Csallany, Editors. Hydrologic problems in karst regions. Western Kentucky Univ. Press, pp. 323-332.

30. _____. 1977. The Ozark Underground Laboratory. IN Sloane, Bruce; Editor. Cavers, caves, and caving. Rutgers Univ. Press, pp. 140-158.

31. _____. 1977. Springs and sewage. IN Sloane, Bruce; Editor. Cavers, caves, and caving. Rutgers Univ. Press, pp. 318-329.

32. _____. 1978. A predictive hydrologic model for evaluating the effects of land use and management on the quantity and quality of water from Ozark springs. *Missouri Speleology*, Vol. 18, 185p.

33. Harmon, R.S.; H.P. Schwarcz, and _____. 1978. Isotopic studies of speleothems from a cave in southern Missouri, U.S.A. IN: Zartman, Robert E. (Editor). Short Papers of the Fourth Intern'l. Conf. on Geochronology, Cosmochronology, and Isotope Geology. U.S. Geol. Surv. Open File Rept. 78-701.

34. _____ and Catherine Aley. 1979. Prevention of adverse impacts on endangered, threatened, and rare animal species in Benton and Washington Counties, Arkansas. Northwest Arkansas Regional Planning Commission, Springdale, 35p.

35. _____ and David I. Foster. 1979. Deep secrets and dark problems; studies of karst springs in the Ozark National Scenic Riverways. *Proc. Second Conference on Scientific Research in the National Parks,* Vol. 5, pp. 499-505. U.S. National Park Service.

36. _____. 1979. Do threatened and endangered species threaten or endanger commercial interests at show caves? *Down Under*, Vol. 14:2, pp. 24-26.

37. _____ and Kenneth C. Thomson. 1981. Hydrogeologic mapping of unincorporated Greene County, Missouri, to identify areas where sinkhole flooding and serious groundwater contamination could result from land development. Mo. Dept. of Natural Resources, map folio and project summary.

38. _____ and Danny Halterman. 1982. A conceptual characterization of the subsurface movement of toxic chemicals in soluble rock lands. *Proc. Fifth National Cave Management Symposium*, pp. 77-80.

39. _____. 1982. Hydrologic impacts of urbanization in the soluble rock lands of Greene County, Missouri. *Proc. Fifth National Cave Management Symposium*, pp. 61-69.

40. _____ and Cathy Aley. 1982. Interpretive training for show cave personnel. *Proc. Fifth National Cave Management Symposium*, pp. 91-92.

41. _____. 1984. Groundwater tracing in water pollution studies. *National Speleological Society Bulletin*, Vol. 46:2, pp. 17-20.

42. _____. 1985. Optical brightener sampling; a reconnaissance tool for detecting sewage in karst groundwater. *Hydrological Science and Technology Short Papers,* Vol. 1:1, pp. 45-48.

43. _____, Cathy Aley, and Russell Rhodes. 1986. Control of exotic plant growth in Carlsbad Caverns, New Mexico. *Proc. Sixth National Cave Management Symposium*, pp. 159-171.

44. _____ and Cathy Aley. 1986. Effects of land management on cave and water resources, Dry Medicine Lodge Creek Basin, Bighorn Mountains, Wyoming. *Proc. Sixth National Cave Management Symposium,* pp. 79-92.

45. Quinlan, J.F.and _____. 1987. Discussion of "A new approach to the disposal of solid waste on land" by R.C. Heath and J.H. Lehr. *Ground Water* Vol. 25:5, pp. 615-616.

46. _____. 1988. Complex radial flow of ground water in flat-lying residuum-mantled limestone in the Arkansas Ozarks. *Proc. Second Environmental Problems in Karst Terranes and Their Solutions Conference,* pp. 159-170. National Water Well Association.

47. _____. 1989. Assessing the areal extent of groundwater impacts in karst. *Third Annual Watershed Conf. Proc., Watershed Comm. of the Ozarks*, Springfield, MO, pp. 187-191.

48. _____. 1990. The karst environment and rural poverty. *Ozarks Watch* (Southwest Mo. State Univ.) Vol. 4:1, pp. 19-21. (Reprinted in "An anthology of Ozarks Watch", Ozarks Watch, Vol. 5:3, pp. 60-62).

49. _____ and Cathy Aley. 1991. Delineation and hazard area mapping of areas contributing water to significant caves. *Proc. Eighth National Cave Management Symposium*, pp. 116-122.

50. Stringer, Jeffrey W.; Bruce L. Slover; and _____. 1991. Speleoforestry; planning for an unseen resource. *Jour. of Forestry*, Vol. 89:12, pp. 20-21.

51. _____. 1992. The water below. *Ozark Watch* (Southwest Mo. State Univ.) Vol. 6:1 & 2, pp. 42-44.

52. _____, Catherine Aley, William R. Elliott, Peter W. Huntoon. 1993. Karst and cave resource significance assessment of the Ketchikan Area, Tongass National Forest, Alaska. Report by the Karst Resources Panel to the U.S. Forest Service. 79p. + appendixes.

53. _____. Some thoughts on environmental management as related to cave use. *Australian Cave and Karst Management Association Jour.* Vol. 17, pp. 4-10.

54. Field, Malcolm S.; Ronald G. Wilhelm; James F. Quinlan; and _____. 1995. An assessment of the potential adverse properties of fluorescent tracer dyes used for ground-water tracing. *Environmental Monitoring and Assessment*, Vol. 38:1, pp. 75-96.

55. Stone, Paul R. III; William C. Nelson; Dennis Bowser; _____; Thomas R. Tibbs; Rusi B. Charna; Edward M. Kellar; and Gerald J. Murphy. 1995. Defining contaminant flow pathways in a complex geologic terrain using dye tracer studies. *Proc. Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection, and Remediation.* Nat'l Ground Water Assn. and Amer. Petroleum Institute, pp. 239-253.

56. _____. 1996. Procedures for tracing water with fluorescent dyes. Robert W. Seabloom, Editor. *Proceedings of 9th Northwest On-Site Wastewater Treatment Short Course and Equipment Exhibition.* Univ. Washington, Seattle, pp. 329-341.

57. Chilman, Kenneth; David Foster; and _____. 1996. River management at Ozark National Scenic Riverways. IN: Halvorson, William L. and Gary E. Davis, Editors. *Science and Ecosystem Management in the National Parks.* Univ. Ariz. Press, Tucson, pp. 295-317.

58. _____. 1997. Caves in crisis. Encyclopaedia Britannica Yearbook of Science and the Future, 1997, pp. 116-133.

59. _____ and Wilgus B. Creath. 1997. Chapter 5, Mining and hydrology. IN: Mineral Policy Center. Golden dreams, poisoned streams, pp. 125-142.

60. _____. 1997. Groundwater tracing in the epikarst. *The Engineering Geology and Hydrogeology of Karst Terranes; Proc. 6th Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst.* A.A. Balkema, Rotterdam, pp. 207-211.

61. _____. 1997. Keynote Address: Dyes don't lie; practical karst hydrology. *Proc. Karst-water Environment Symposium.* Virginia Tech. Water Resources Research Center, pp. 1-8.

62. _____. 1997. Beyond the passage ends. IN: Taylor, Robert L. and Jonathan Beard (Editors). Guidebook for the National Speleological Society Annual Convention; Exploring Missouri caves, pp. 38-45.

63. _____. 1998. An editorial: The Illinois cave amphipod; a collection of classical problems. *Amer. Caves*, Vol. 11:1, pp. 8-11.

64. Stokes, T.R.; _____; and P. Griffiths. 1998. Dye tracing in forested karst terrain: a case study on Vancouver Island, British Columbia. *Post-Conference Proc. of the 8th. Intern'l. Assoc. of Geological Engineers*, Vancouver, B.C.

65. Mott, David N.; Mark R. Hudson; and _____. 1998. Water resources studies, geologic mapping, and dye tracing employed to develop a model of interbasin recharge, Buffalo National River, Arkansas. *Friends of Karst, Intern'l. Global Correlation Program Abstracts*. Western Kentucky University, Bowling Green, p. 26.

66. Hauwert, Nico M.; David A. Johns; and _____. 1998. Preliminary report on groundwater tracing studies within the Barton Creek and Williamson Creek watersheds, Barton Springs / Edwards Aquifer. Barton Springs / Edwards Aquifer Conservation District and City of Austin Watershed Protection Department. 55p.

67. George, Scott; _____; and Arthur Lange. 1999. Karst system characterization utilizing surface geophysical, downhole geophysical and dye tracing techniques. *Proc. 7th Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst*. A.A. Balkema, Rotterdam, pp. 225-242.

68. Mott, David N; Mark R. Hudson; and _____. 1999. Nutrient loads traced to interbasin groundwater transport at Buffalo National River, Arkansas. *On the Frontiers of Conservation; Proc. of 10th Conference on Research and Resource Management in Parks and on Public Lands*, pp. 114-121.

69. _____. 1999. Modern dye-tracing data as fundamental input for karst modeling. IN: Palmer, Arthur N.; Margaret V. Palmer; and Ira D. Sasowsky (Editors). *Karst Modeling; Proc. of Karst Modeling Symposium*. Karst Waters Institute Special Publication 5. p. 228.

70. _____. 1999. The Ozark Underground Laboratory's groundwater tracing handbook. Ozark Underground Laboratory, Protem, MO. 35p. Revised 2002.

71. _____. 1999. Karst hydrology; the dye is cast. Keynote Address, *Proc. 13th Australasian Conference on Cave and Karst Management*, Mt Gambier, South Australia. Pp. 17-23.

72. Call, G.K.; _____; D.L. Campbell; and J. Farr. 1999. Use of dye tracing and recharge area delineation in cave protection and conservation on private land. Proc. 1997 National Cave Management Symposium, pp. 23-27.

73. _____. 2000. Water and land-use problems in areas of conduit aquifers. IN: Klimchouk, Alexander; Derek C. Ford; Arthur N. Palmer; and Wolfgang Dreybrodt (Editors). Speleogenesis; evolution of karst aquifers. National Speleological Society, Huntsville, AL. Pp. 481-484.

74. _____. 2000. Ubiquitous environmental contaminants: radon and radon daughters. Chapter 15, Section 15.3 IN: Lehr, Jay (Editor). Handbook of environmental science, health, and technology. McGraw-Hill. Pp. 15.20 to 15.29.

75. _____. 2000. Sensitive environmental systems: karst systems. Chapter 19, Section 19.1. IN: Lehr, Jay (Editor). Handbook of environmental science, health, and technology. McGraw-Hill. Pp. 19.1 to 19.10.

76. David N. Mott; Mark R. Hudson; and _____. 2000. Hydrogeologic investigations reveal interbasin recharge contributes significantly to detrimental nutrient loads at Buffalo National River, Arkansas. *Environmental Hydrology; Proc. of the Arkansas Water Resources Center Annual Conference*. Arkansas Water Resources Center Publ. MSC-284, pp. 13-20.

77. _____. 2000. Karst groundwater. *Missouri Conservationist*, Vol. 61:3, pp. 8-11.

78. _____. 2001. Discussion of "A conceptual model for DNAPL transport in karst ground water basins" by Caroline M. Loop and William B. White. *Ground Water*, Vol. 39:4, pp. 483-484.

79. _____. 2001. Fantastic Caverns Spring. IN: Bullard, Loring; Kenneth C. Thomson; and James E. Vandike. Missouri Dept. of Natural Resources, Mo. Water Resources Report No. 68, pp. 74-79.

80. David Bednar and _____. 2001. Groundwater dye tracing: an effective tool to use during the highway development process to avoid or minimize impacts to karst groundwater resources. IN: Barry F. Beck and J. Gayle Herring, Editors. Geotechnical and environmental applications of karst geology and hydrogeology. A.A. Balkema Publishers, pp. 201-207.

81. Hauwert, Nico M.; David A. Johns; James W. Sansom; and _____. 2002. Groundwater tracing of the Barton Springs Edwards Aquifer, Travis and Hays Counties, Texas. *Gulf Coast Association of Geological Societies Transactions*, Vol. 52, pp. 377-384.

82. _____ and David Ashley. 2003. Saving the Tumbling Creek Cavesnail. *Wings, Essays on Invertebrate Conservation*, Spring 2003, pp. 18-23.

83. Neill, H; M. Gutierrez; and _____. 2003. Influences of agricultural practices on water quality of Tumbling Creek cave stream in Taney County, Missouri. *Environmental Geology, International Journal of Geosciences*. Springer-Verlag. Published online 8 October 2003.

84. Moss, Philip L. and _____. 2003. Mapping presumptive habitat for subterranean aquatic species of concern. 2003 National Cave and Karst Management Symp., pp. 7j0-73.

85. _____, 2003. Findings from some hydrologic investigations in the epikarst. Epikarst; Proceedings of the symposium held October 1 through 4, 2003, Shepherdstown, WV Karst Waters Institute Special Publication 9. Pp. 79-84.

86. _____. 2004. Forests on Karst. IN: John Gunn (Editor). Encyclopedia of Cave and Karst Science. Fitzroy Dearborn Publishers, New York and London, pp. 368-369.

87. _____. 2004. Tourist caves; algae and lampenflora. IN: John Gunn (Editor). Encyclopedia of Cave and Karst Science. Fitzroy Dearborn Publishers, New York and London, pp. 733-734.

88. Evans, David; Henri Letient; and _____. 2005 Aquifer vulnerability mapping in karstic terrain Antamina Mine, Peru. Proc. Annual Mtng. Society for Mining, Metallurgy, and Exploration. 13p.

89. Elliott, William R; Stephen T. Samoray; Sara E. Gardner; and _____2005. Tumbling Creek Cave: an ongoing conservation and restoration partnership. American Caves, Spring 2005. Pp. 8-13.

90. _____; Kimberly Castillon; and John Sagendorf. 2006. Strategy for managing alpha radiation in show-caves to protect caves, cave employees, and cave businesses. Proc. of the 2005 National Cave Management Symposium, Albany, NY. Pp. 62-71.

91. Elliott, William R. and _____. 2006. Karst conservation in the Ozarks: forty years at Tumbling Creek Cave. Proc. of the 2005 National Cave Management Symposium, Albany, NY. Pp. 204-214.

92. Elliott, William R. and _____. 2006. Case study: Tumbling Creek Cave. IN: Thurgate, M; D. Culver; H. Hobb; W. Humphreys; and B. Sket Editors. Guidelines for the protection of subterranean and karst biodiversity. IUCN/WCPA Working Group on Cave and Karst Protection.

93. Elliott, William R.; _____; and Catherine L. Aley. 2008. Conserving an Ozark cave. Missouri Conservationist, Vol. 68:10, pp. 17-21

94. _____. 2008. Chapter 15. Tracer tests- dyes. IN: Weight, Willis D. Hydrogeology field manual, Second Edition. McGraw-Hill. Pp. 675-698.

95. Elliott, William R.; Kathy Echols; David C. Ashley; _____; Alan Leary; and Paul McKenzie. 2008. Waterborne contaminants in Tumbling Creek Cave, Missouri. Proc. of 2007 National Cave and Karst Management Symposium, St. Louis. Pp. 107-123.

96. Moss, Philip and _____. 2008. Dye tracing and recharge area delineation for varied land management purposes in the Southwest Illinois karst. Proc. of 2007 National Cave and Karst Management Symposium, St. Louis. Pp. 138-143.

97. _____; Cathy Aley; Philip Moss; and Eric Hertzler. 2008. Hydrogeological characteristics of delineated recharge areas for 40 biologically significant cave and spring systems in Missouri, Arkansas, Oklahoma, and Illinois. Proc. of 2007 National Cave and Karst Management Symposium, St. Louis. Pp. 154-167.

98. _____. 2010. Management strategies for responding to White-Nose Syndrome in bats. National Speleological Soc. News, Feb. 2010, Pp. 10-14.

99. Klingel, Eric J.; Shiflet, Jason E.; _____. 2010. Fluorescent dye tracing for defining chlorinated ethene plume remediation targets. Remediation Summer 2010, Pp 111-119, www.interscience.wiley.com.

100. Curtis, Randy M; _____; R. Keith Barnhill; and Shiloh L. Kirkland. 2012. An investigation of monitorability issues for groundwater in the Zachs Knob synchline area, Northeast Tennessee, USA. Proceedings of Environmental Impacts of Karst Symposium, St. Louis, MO 2012. Carbonates and Evaporates Vol. 97:2, Springer publications. DOI: 10.1007/s13146-013-0152-7. Available on-line through Open Access.

101. _____ and Shiloh L. Kirkland. 2012. Down but not straight down: significance of lateral flow in the vadose zone of karst terrains. Proceedings of Environmental Impacts of Karst Symposium, St. Louis, MO 2012. Carbonates and Evaporates Vol. 97:2, pp. 193-198. Springer publications. DOI: 10.1007/s13146-012-0106-5. Available on-line through Open Access.

102. Beeman, Shiloh L.; _____; and Michael Slay. 2013. The need for presumptive habitat considerations in working with subterranean aquatic species of concern; three Ozark region case histories, USA. Proceedings of Sinkholes and the Engineering and Environmental Impacts of Karst; Proceedings of the 13th Multidisciplinary Conference; Carlsbad, New Mexico. National Cave and Karst Research Institute Symposium 2. Pp. 377-381.

103. Farmer, Neal; David Blew; _____. 2014. Fluorescent dye tracer tests from the Victor Well southeast of the Malad Gorge State Park, Idaho. Idaho Dept. of Water Resources Open File Report, October 6, 2014. 55p.

104. White, Keith A; _____; Michael K. Cobb; Ethan O. Weikel; and Shiloh L. Beeman. 2015. Tracer studies conducted nearly two decades apart elucidate groundwater movement through a karst aquifer in the Frederick Valley of Maryland. Proceedings of Sinkholes and the Engineering and Environmental Impacts of Karst; 14th Multidisciplinary Conference, Rochester, MN. National Cave and Karst Research Institute Symp. 5., pp. 101-112.

105. _____. 2016. Using activated carbon samplers to improve detection of fluorescent tracer dyes in groundwater remediation studies. Tenth International Conference on Remediation of

Chlorinated and Recalcitrant Compounds, Palm Springs, CA. ISBN 978-0-9964071-1-3, Battelle Memorial Institute. Paper A-056 10p.

106. _____. 2017. Improving the detection of fluorescent tracer dyes in groundwater investigations. Remediation, Vol. 27:4, pp. 39-46.

107. _____, Cathy Aley, and Paul McKenzie. 2017. Managing endangered species on private property as assets, not as liabilities or problems. Proc. National Cave and Karst Management Symposium, Eureka Springs, AR. October 16-20, 2017, pp. 44-48.

108. _____. 2017. Sixty years of cave and karst management and challenges ahead. Keynote Address. Proc. National Cave and Karst Management Symposium, Eureka Springs, AR. October 16-20, 2017, pp. 2-10.

109. _____. 2018. In Press. Tracer tests- dyes. IN: Weight, Willis D. Practical hydrogeology: principles and field applications. McGraw-Hill.

MEMORANDUM

To: Streamflow Enhancement and Minimum Streamflow Committee

From: Sarah Lien, Friends of the Teton River

Date: October 30, 2019

Re: Teton River Basin Water Transactions Program – Teton River Flow Transaction

Action Requested: Committee vote recommending that the transaction be presented to the Idaho Water Resource Board for a vote on the associated funding resolution

I. Transaction Summary:

This two-year pilot project aims to generate flow and temperature conditions in the mainstem Teton River to support Yellowstone Cutthroat Trout by increasing flow levels and decreasing temperature during the hottest, driest months of the year. This will be accomplished by conducting managed groundwater recharge efforts, utilizing water from tributary streams during the months of April, May, and June, which will in turn improve flow levels and temperature conditions in the Teton River, via return flows, during the months of June, July, August, September, and October. *See*, attached map depicting approximate location of recharge sites and location of expected response in Teton River.

II. Transaction Overview:

Friends of the Teton River (FTR), in partnership with the Teton Water Users Association (TWUA), present the following flow restoration proposal. *See*, attached document entitled "Description of Teton Water Users Association," which describes the Teton Water Users Association and provides a list of participating entities. This water transaction proposal aims to generate more favorable conditions for native Yellowstone Cutthroat Trout (YCT) in the Teton River by: (1) stabilizing flow conditions; and (2) decreasing water temperature during the warmest months of the year.

Historically, flow restoration efforts in the Teton River watershed have focused on restoring flows in tributary streams to the Teton River. Those efforts will continue, yet it is critically important to generate favorable conditions for YCT in the Teton River itself. The Teton River is never completely dewatered like most of the tributaries in the watershed, but it is subject to

annual low flow conditions and elevated temperatures, particularly during the latter part of the summer when ~90% of fluvial YCT in the watershed are holding in its waters.

Eight to ten months per year the tributaries to the Teton River are disconnected from the mainstem river itself, limiting the chance to add water via surface flow inputs and demanding the development of an alternative strategy. The watershed demonstrates a three month return flow period, meaning that approximately three months after water seeps into the ground, it will re-emerge as return flow in the Teton River. In short, water recharged during a 60-day window in the spring (April 15 - June 15) will increase base flows and drive down temperatures in the Teton River from June 15 - October 31. Information regarding the groundwater-surface water model upon which this transaction is premised is detailed in a document entitled "Teton Valley Groundwater Surface Water Model," authored by Dr. VanKirk, which is available upon request.

Utilizing the information derived from Dr. VanKirk's model, the TWUA worked to generate water management strategies, appropriate for the Teton River watershed specifically, which will stabilize the local aquifer while improving flow and temperature conditions in the Teton River. As a result, the TWUA implemented an initiative, in 2018 and 2019, that aimed to increase the number of acres being flood irrigated throughout the watershed, in recognition that flood irrigation methods support groundwater levels and, through return flows, have the potential to improve flow and temperature conditions in the Teton River. The TWUA intends to continue this flood irrigation initiative into the foreseeable future.

This two-year pilot project, the subject of this project proposal, builds upon the flood irrigation initiative discussed above through the implementation of a managed groundwater recharge program. Each year of the two-year pilot period, the TWUA aims to recharge 10,000 acre-feet of water, above and beyond any incidental recharge which may result from the flood irrigation initiative. By recharging 10,000 acre-feet of water, the groundwater-surface water model projects an increase in Teton River base flows of ~15-18 cfs from June 15-October 31. The model projects that an additional 4,322 acre-feet of water will accrue to the Teton River, annually, during that June 15-October 31 time period.

The Idaho Department of Water Resources ("IDWR") issues Temporary Water Right Permits, on an annual basis, that allow irrigators to recharge water when the waters of the State of Idaho are abundant. FTR will work with the relevant irrigation entities to apply for, and secure, a Temporary Water Right Permit for the purpose of conducting managed recharge. These permits will be applied for each year of the project and will serve as the legal vehicle by which water is diverted for managed recharge purposes as part of this pilot project. The TWUA anticipates that if this pilot project proves to be a worthwhile effort that it will work with individual irrigation entities to apply for managed recharge water rights.

Friends of the Teton River is actively working with Idaho Department of Environmental Quality to develop appropriate groundwater quality monitoring protocol for this pilot project.

Participating irrigation entities will be contracted to deliver water to identified groundwater recharge sites. The irrigation entities will sign water delivery contracts which specify how water

is to be diverted and delivered to accrue maximum flow and temperature benefits in the Teton River.

III. Transaction Cost and Pricing Information:

Sixty thousand six hundred dollars ($60,600) is available through the Columbia Basin Water Transaction Program, over the two-year term, to support this transaction. Each year three hundred dollars ($300) will be utilized to pay the fees associated with applying for Temporary Water Right Permits, while thirty thousand dollars ($30,000) will be made available for payment to participating irrigation entities.

The pricing structure for this two-year pilot project is as follows:

- If the total quantity of managed recharge in any given year is 7,500 acre-feet or less, participants will be compensated at a rate of $4/acre-foot recharged.
- If the total quantity of managed recharge in any given year exceeds 7,500 acre-feet, participants will receive a portion of a $30,000 funding pool, equal to their individual contribution to the total quantity of water recharged. By way of example, for the purpose of illustrating how compensation shall be determined, the following facts are assumed: (1) a participant recharges 750 acre-feet of water; (2) the total quantity of recharge is 10,000 acre-feet; and (3) the funding pool is $30,000. Compensation shall be calculated as follows:
    1. 750 AF (participant's recharge)/10,000 AF (total recharge) = 0.075
    2. 0.075 x 100 = 7.5% = participant's percentage of recharge
    3. $30,000 x 7.5% = $2,250 = participant's compensation

This hybrid payment structure aims to incentivize participation, while simultaneously avoiding the potential that participants may be compensated at a rate in excess of market.

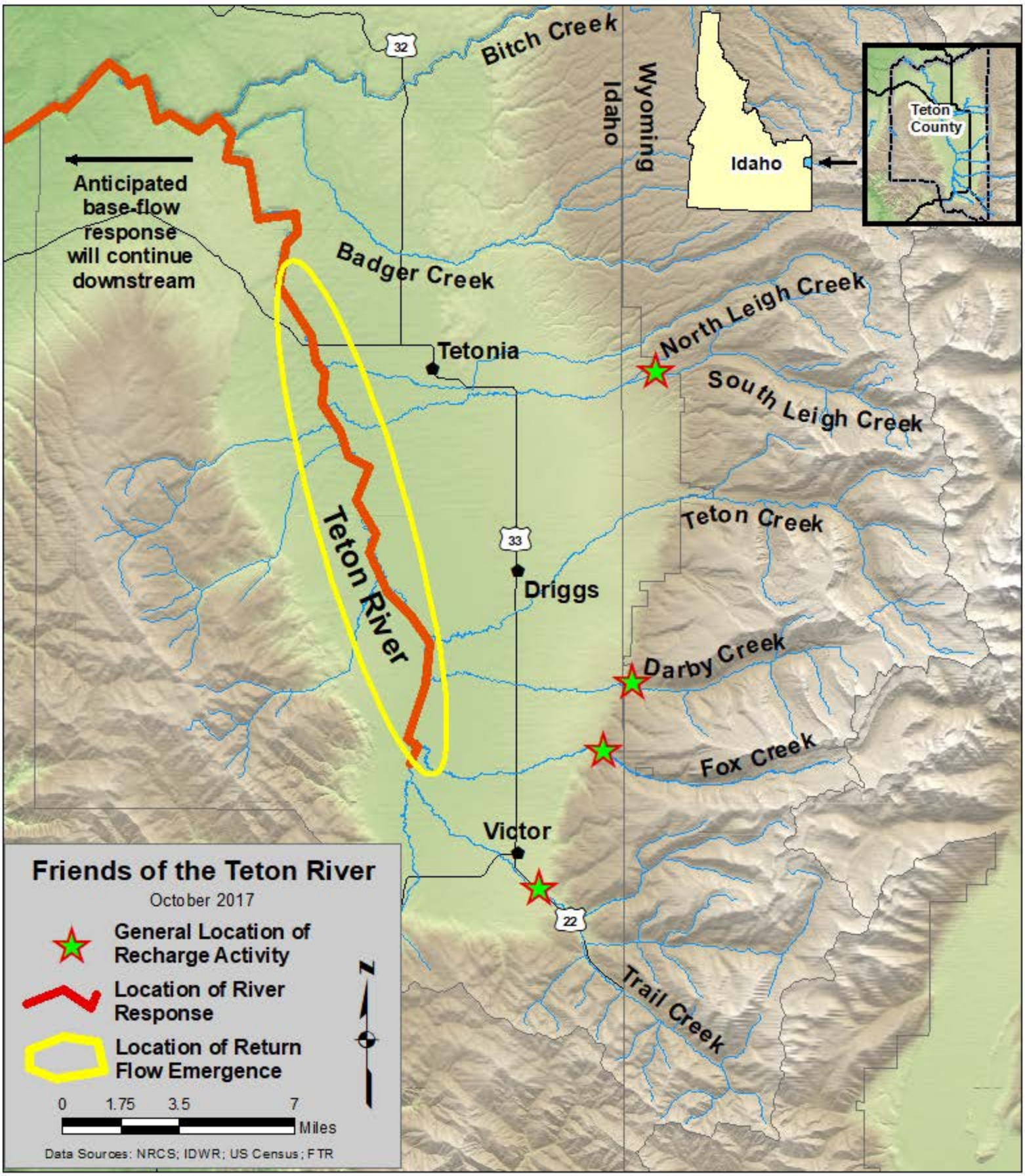
IV. Committee Action Requested:

The transaction has been reviewed by the Columbia Basin Water Transaction Program's technical advisory committee and funding to support the transaction has been authorized.

At this time, FTR requests that the Committee vote to support the transaction and recommend that it be presented to the Idaho Water Resource Board for a vote on the associated funding resolution.

Teton River Flow Restoration Pilot Program

Geographic Extent of Anticipated Return Flow Emergence and River Response



Description of Teton Water Users Association

Water has long played a central role in the cultural and economic prosperity of the Teton River watershed, and currently supports robust agricultural and recreational economies. Yet, there are several emerging water issues that promise to shape a future water management paradigm that looks dramatically different from the past. These factors include declines in Idaho's aquifer and river levels, climate variability and prolonged drought, development pressure to convert farmland to subdivisions, mitigation and water-supply concerns for growing cities and rural areas, continued declines of Yellowstone cutthroat trout distribution and abundance, water-quality concerns, potential changes in Rule 50, and the formation of a Groundwater Management Area for the Eastern Snake Plain Aquifer.

In response to these issues, the Teton Water Users Association (TWUA) formed in the fall of 2015, bringing together individuals who can, collectively, identify solutions that satisfy the needs of all constituents within the community – farmers who depend on water for crop and livestock production, municipalities that require clean and adequate water for residents, and conservation interests seeking water for fish and wildlife. The TWUA currently works exclusively in Teton Valley in Teton County Idaho. The TWUA is a collaboration of interests and is represented by a true cross-section of Teton Valley's population, being comprised of approximately 50% agricultural water users, 30% conservation water users, and 20% municipal water users.

The mission of the TWUA reflects its diversity by addressing problems and implementing projects that:

- Keep working lands working by securing and maintaining a reliable and affordable supply of water to sustain agriculture.
- Protect and restore stream flows and water quality in the Teton River and its tributaries, for the benefit of fish, wildlife, and people.
- Secure and maintain a safe, affordable, and high-quality water supply for municipalities and residential water users.

Participants in the TWUA include: Teton County Farm Bureau; NRCS; Teton Soil Conservation District; Water right holders and canal companies that utilize water from the following areas: Trail Creek, Fox Creek, Darby Creek, Mahogany Creek, Spring Creek, South Leigh Creek, and Middle Leigh Creek; Friends of the Teton River; Teton Regional Land Trust; Henrys Fork Foundation; City of Victor; City of Driggs; City of Tetonia; Teton County, Idaho; Idaho Fish and Game; Wyoming Game and Fish; US Wildlife Service; US Forest Service, and Idaho Department of Environmental Quality.

BEFORE THE IDAHO WATER RESOURCE BOARD

IN THE MATTER OF THE TETON RIVER WATER TRANSACTION AGREEMENTS	RESOLUTION TO MAKE A FUNDING COMMITMENT

WHEREAS, the Teton River provides quality habitat for fluvial and resident Yellowstone cutthroat trout, but is flow and temperature limited at certain times of the year; and

WHEREAS, it is in the interest of the State of Idaho to increase stream flow and decrease temperature in the Teton River and its tributaries to encourage the recovery of Yellowstone cutthroat trout, which are managed as an Idaho Species of Greatest Conservation Need; and

WHEREAS, the Idaho Water Resource Board (IWRB) is authorized to expend Bonneville Power Administration funds for flow restoration through the Columbia Basin Water Transaction Program; and

WHEREAS, IWRB staff (staff) has developed a two-year groundwater recharge pilot program to improve flow and temperature conditions for fish in the Teton River; and

WHEREAS, staff has developed water delivery agreements with local water users to deliver water to identified groundwater recharge sites for the purpose of improving stream flow in the Teton River; and

WHEREAS, a proposal in the amount of $60,600.00 has been submitted to the Columbia Basin Water Transaction Program to be used to fund water delivery agreements with irrigators in the Teton River watershed ($60,000.00) and the administrative fees associated with securing Temporary Water Right Permits ($600.00); and

WHEREAS, staff anticipates the funds being placed into the IWRB's Revolving Development Account for annual payment to support the pilot program; and

WHEREAS, the two-year groundwater recharge pilot program and water delivery agreements are in the public interest and in compliance with the State Water Plan.

NOW THEREFORE BE IT RESOLVED that the IWRB authorizes the Chairman to enter into water delivery agreements for the purpose of conducting managed recharge, using an amount not to exceed $60,600.

NOW THEREFORE BE IT FURTHER RESOLVED that this resolution is subject to the

DRAFT

conditions that the IWRB receives the requested funding from the Columbia Basin Water Transaction Program in the amount of $60,600, temporary water right permits authorizing the diversion of water for managed recharge are secured, and an appropriate Ground Water Monitoring Program is developed with Idaho Department of Environmental Quality.

DATED this 14 day of November, 2019.

_____

ROGER W. CHASE, Chairman
Idaho Water Resource Board

ATTEST _____
VINCE ALBERDI, Secretary

Memorandum

To: Idaho Water Resource Board

From: *Brian Patton*

Date: November 4, 2019

Re: Potential legislation of Interest

Garrick Baxter of the Attorney General's office will brief the Board on potential legislation proposed by IDWR as well as potential legislation of interest proposed by others.

POTENTIAL LEGISLATION OF INTEREST

Presented by Garrick Baxter, Deputy Attorney General

November 14, 2019

Proposed legislation from IDWR

1. Filing of Statutory Claims
    - This legislation proposes to remove the June 30, 1988, limitation from the beneficial use claim filing exception in Idaho Code § 42-245. With the change, claiming a water right pursuant to Idaho Code § 42-243 would not be required if a claim to the water use is filed in the northern Idaho adjudications or any future general water rights adjudication.
    - IWUA support for legislation.
2. Records Management
    - This legislation amends Idaho Code § 42-1805 to give the Director explicit authority to receive, file, record, or retain documents on media other than paper.
    - Makes clear that IDWR can use media other than paper for long term storage of documents.
    - IWUA support for legislation.
3. Water Districts
    - The legislation amends Chapter 6, Title 42, Idaho Code (which deals with water districts) to consolidate language and reduce duplication of sections related to the collection of water district assessments; create flexibility for counties to collect water district assessments; correct errors; consolidate the requirements for watermaster reporting into one section; authorize watermasters to estimate the amount of water delivered to water users where actual delivery data are not available for purposes of assessment; and amend requirements for water district annual meeting notices.
    - Work in progress. When raised at the IWUA Legislative Committee meeting, the proposed legislation was referred to a workgroup.

DEQ Legislation

1. Emergency Response
    - Authorizes state or local emergency response teams to divert water without a water right if necessary to clean up releases of hazardous substances that threaten public health or the environment.
    - IWUA support for legislation.

Municipal Legislation Proposed By City of Twin Falls

1. Reasonably Anticipated Future Needs (RAFN) Water Rights
    - This legislation modifies the current process for licensing RAFN water rights.
    - The development period for a RAFN water right can extend many years – 15, 20 or more. However, under the current statute, the Department often has to issue a license well before the end of that development period.
    - The legislation authorize the Director to license the water right in incremental steps based on actual beneficial use.
    - Work in progress. Has been referred to a IWUA workgroup.

Idaho Ground Water Appropriators

1. Ground Water Management Areas
    - This legislation proposes to amend Idaho Code § 42-233b. It modifies the process for designating a GWMA, requires the creation of an advisory committee, and establishes committee make-up.
    - Work in progress. Has been referred to a IWUA workgroup.

Adjudication

1. Bear River Basin Adjudication

Memo

To: Idaho Water Resource Board

From: Mat Weaver, Brian Patton

Date: November 1, 2019

Re: Administrative Rules Status Update

Requested Action Item

No request at this time.

Background

The Idaho Water Resource Board (IWRB) is the executive branch entity with statutory oversight and authority over 11 chapters of Administrative Rules in IDAPA 37, including:

- IDAPA 37.01.01 Rules of Procedure of the IDWR
- IDAPA 37.02.01 Comprehensive State Water Plan Rules
- IDAPA 27.02.03 Water Supply Bank Rules
- IDAPA 37.02.04 Shoshone Bannock Tribal Water Supply Bank Rules
- IDAPA 37.03.03 Rules and Minimum Standards for the Construction and Use of Injection Wells
- IDAPA 37.03.04 Drilling for Geothermal Resources Rules
- IDAPA 37.03.05 Mines Tailing Impoundment Structures Rules
- IDAPA 37.03.06 Safety of Dams Rules
- IDAPA 37.03.07 Stream Channel Alteration Rules
- IDAPA 37.03.09 Well Construction Standards and Rules
- IDAPA 37.03.10 Well Driller Licensing Rules

Several other sets of rules related to water right processes are under the control of the Director of the Idaho Department of Water Resources (IDWR).

Issue at Hand

Idaho Code § 67-5292, states, *"every adopted rule shall automatically expire on July 1 of the following year unless the rule is extended by statute."* The extension of Idaho's administrative rules by statute requires the Idaho Legislature to pass a bill every year, reauthorizing Idaho's administrative rules for another year before adjourning the legislative session. The 2019 Legislature adjourned without reauthorizing Idaho's existing administrative rules, including Title 37.

On April 23, because the legislature did not reauthorize Idaho's administrative rules, the Governor directed all agencies to review all of their rules and prepare temporary and proposed rules to be published in a special Administrative bulletin in June 2019. In response to the Governor's direction, the IWRB has undertaken the following activities:

- Comprehensively reviewed all rules and eliminated approximately 20% of rules because they were ineffective, outdated, contrary to existing Idaho Code, contrary to federal law, or contrary to current court rulings;
- Published revised rules as temporary and proposed rules on June 19, 2019, in a special edition of the Idaho Administrative Bulletin;
- Received written comments from the public regarding its proposed rules;

- Held three public hearings in September to receive public testimony regarding its proposed rules;
- Coordinated rulemaking with the Idaho Water Users Association in May, July, September, and October;
- Fully considered all written and public comments received regarding its proposed rules; and
- Submitted a *Notice of Omnibus Rulemaking – Adoption of Pending Rules* and a *Notice of Omnibus Rulemaking – Adoption of Pending Fee Rules* to the Division of Financial Management (DFM) on October 16, 2019, for publication on November 20, 2019, in a special edition of the Idaho Administrative Bulletin.

Next Steps

The IWRB adopted its pending rules on October 4, 2019. DFM will formally publish the pending rules on November 20, 2019. Idaho Code Section 67-52-1(14) defines a pending rule as a rule that has been adopted by an agency under regular rulemaking procedures and remains subject to legislative review before becoming final and effective. The pending rules are the final versions of the rules that are submitted for legislature review and final approval.

The next step in the process is for the legislature to review the IWRB's pending rules during the 2021 Legislative Session. Following legislative review, unless rejected, the rules will become final. The legislature has yet to determine its review process for its unprecedented comprehensive review of the Idaho Administrative Code. To prepare agency staff for the upcoming legislative review, DFM is requiring training for all "agency personnel who will present a rule to the 2020 legislature." The training will cover "unique aspects of legislative review of omnibus rules as well as executive branch expectations for presentation." Appropriate IDWR staff will receive training on December 12 or December 18.

Becoming a Final Rule

The Idaho Administrative Procedures Act (APA) defines a "final rule" as one that has been adopted by an agency under regular rulemaking procedures in accordance with the APA and is of full force and effect. Final rules are sometimes referred to as permanent rules (although no rule is ever permanent), and it is these rules, for the most part, that comprise the Administrative Code.

According to Idaho Code Section 67-5224(5), a pending rule will become *"final and effective"…*

(a) …upon conclusion of the legislative session at which the rule was submitted to the legislature for review or as provided in the rule, but no pending rule adopted by an agency shall become final and effective before the conclusion of the regular or special legislative session at which the rule was submitted for review. A rule which is final and effective may be applied retroactively, as provided in the rule.

(b) When the legislature approves a pending rule pursuant to section 67-5291, Idaho Code, the rule shall become final and effective upon adoption of the concurrent resolution or such other dates specified in the concurrent resolution.

(c) *Except as set forth in sections 67-5226 and 67-5228, Idaho Code, no pending rule or portion thereof imposing a fee or charge of any kind shall become final and effective until it has been approved by concurrent resolution.*

In its review, where the legislature finds that an agency rule is inconsistent with the legislative intent of the statute being implemented or prescribed, it may adopt a concurrent resolution rejecting the entire rule, or any subpart of the rule deemed inconsistent.

2020 Tentative Board Meeting Dates

Month	Proposed Dates	Concurring Events/Field Trip	Location
January	23rd & 24th	IWUA(1/20-1/23, 2020)	BOISE
March	19th & 20th		BOISE
May	28th & 29th	Field Trip in Magic Valley	TWIN FALLS Hilton Garden
June: IWUA	8th & 9th	Water Law & Resource Issues Seminar	SUN VALLEY Sun Valley Resort
July	30th & 31st	Field Trip to Avista Facilities	COEUR D'ALENE Red Lion, Post Falls
September	17th & 18th		BOISE
November	19th & 20th		BOISE