Exhibit submitted by Marie Callaway Kellner
Idaho Conservation League 9/11/12 TV CAMP public hearing

Idaho Conservation League's TV CAMP Public Hearing Comments

Boise, September 11, 2012

Chairman Uhling, and members of the Water Resource Board, thank you for the opportunity to speak before you this evening. My name is Marie Callaway Kellner, and I am the Water Associate at the Idaho Conservation League.

Since 1973, the Idaho Conservation League has worked to protect clean water, clean air, wilderness, and Idaho's unique quality of life. As Idaho's oldest and largest state-based conservation organization, we represent over 20,000 supporters, most of whom live in the Treasure Valley. This evening, I stand before you representing myself, the Idaho Conservation League staff and board of directors, and our Treasure Valley members, in the shared belief that Idaho's water is one of our most precious resources, and Idaho's future depends on proactive water management.

ICL will file more thorough written comments on the TV CAMP, however, tonight, I'd like to highlight two aspects of the plan which ICL finds to be of particular importance: first, the benefits of demand reduction through conservation, and, second, suggested study & funding priorities.

Demand Reduction Through Conservation

First, ICL strongly supports the CAMP's suggestion that reducing demand through water conservation measures should be a primary strategy for meeting future water demand. In saying this, I'd like to emphasize that I mean for the term "conservation" to mean smart, timely and efficient use of water. These measures should include financial incentives & penalties, financial support for diversion upgrades & automation, as well as educational programs.

Not only would these efforts result in the discovery of water to address anticipated future water needs, these efforts are cheaper, and more socially and environmentally palatable than the building of a new storage reservoir in the Boise basin. Additionally, all of these measures could provide opportunities for growth without requiring more overall water storage.

Funding & Study Priorities

Our second topic of emphasis is to encourage the Board's support for the CAMP's prioritization of funding for study of the following three areas: the hydraulic connections between our ground and surface water, the creation of a Treasure Valley Drought Plan, and an in-depth analysis of future demand based on anticipated population and land use changes.

As is stated in the CAMP, for our water managers to effectively manage the Treasure Valley's water resources, they need a more thorough understanding of the hydraulic connections of our water resources.

Similarly, in order for our water managers to guide the Treasure Valley through drought seasons, they need a Drought Plan. As the population center of the state, the Treasure Valley should not only have a drought plan, but be a leader in formulating one.

Finally, we cannot make fully educated decisions about our future water storage needs until we have a deeper understanding of what those needs will be. While the CAMP states that "urbanization has changed some water demand from agricultural irrigation to residential irrigation and other uses," it also states that there is no consensus as to the impact of these changes. The CAMP does not specifically prioritize studies which will help planners better understand what our future water needs are likely to be in light of land use changes. Therefore, we suggest that the CAMP prioritize creation of tools that will allow water managers to better understand future needs as they relate to evolving land use changes.

Wrap-up

In summary, ICL is pleased to see demand reduction through conservation prominently featured in the CAMP and we suggest that this concept be supported by financial incentives and penalties, diversion upgrades and automation, and education. Additionally, we ask the Board to prioritize the following three areas of study: the hydraulic connection of our ground and surface water resources, a drought plan, and future demand in relation to land use changes. ICL believes that the Board's support for these areas of emphasis will help to ensure that the Treasure Valley is prepared for the difficult times we will undoubtedly face.

On behalf of the members, board and staff of the Idaho Conservation League, I want to thank you again for the opportunity to speak to you this evening.

Exhibit submitted by Lynn Tominaga
IGWA 9/11/12 TV CAMP public hearing

IDAHO GROUND WATER APPROPRIATORS, INC.
P.O. Box 1391
Pocatello, Idaho 83201

Officers:

Tim Deeg, President
American Falls, Idaho 83211
208-226-2562

Craig Evans, Vice President
1523 W. 300 N.
Blackfoot, Idaho 83211
208-680-3527

Randall C. Budge, Gen. Counsel/ Secretary
P. O. Box 1391
Pocatello, Idaho 83204-1391
208-232-6101

Lynn Tominaga, Executive Director
IGWA
P.O. Box 2624
Boise, Idaho 83701
208-381-0294

Members:

American Falls-Aberdeen GW District
Bingham GW District
Bonneville-Jefferson GW District
Jefferson-Clark GW District
Madison GW District
Magic Valley GW District
North Snake GW District
Southwest Irrigation District
Busch Agricultural Resources, Inc.
Jerome Cheese
United Water, Inc.
City of American Falls
City of Blackfoot
City of Chubbuck
City of Heyburn
City of Jerome
City of Paul
City of Post Falls
City of Rupert

September 11, 2012

Terry T. Uhling, Chairman
Idaho Water Resource Board
P.O. Box 83720
Boise, Idaho 83720-0098

Re: TV CAMP and the need for 50-year municipal planning

Dear Mr. Uhling:

I am writing on behalf of the Idaho Ground Water Appropriators ("IGWA") to urge support by the Idaho Water Resource Board for a 50-year planning horizon for those municipal water providers that are serving growing Idaho communities.

IGWA is composed of ground water pumpers from across the State of Idaho, including ground water and irrigation districts, industrial and municipal water users, and eight municipalities. IGWA has been an active participant in and supporter of the TV CAMP process. IGWA commends the Idaho Water Resources Board for its commitment of resources and effort to the goal of better cooperation, understanding, and long term planning that is at the heart of the CAMP process throughout the State.

I write today to underscore IGWA's recognition of the importance of the long-term planning by its municipal members. The Municipal Water Rights Act of 1996 embodies the vision and foresight of the Legislature and the people of Idaho in recognizing the vital role played by municipal water providers within the prior appropriation doctrine. Idaho is growing, but its

water supply is not. We face not only increasing demands from within the state, but growing pressures from without.

Cities and states across the West are following the lead set by Idaho in adopting the 1996 Act. They are establishing long term planning horizons for municipal water providers aimed at securing their future. Idaho must do the same, or risk forfeiting its enviable position as an upstream state to out-of-state interests who covet Idaho's water.

From its outset, the TV CAMP process has recognized and embraced the need for long term planning. The Executive Summary of the proposed TV CAMP expresses this recognition:

> The Plan describes the overarching goals and actions that can be implemented to successfully accomplish the stated goals for local residents and the state of Idaho and to promote productive regional cooperation to benefit the area over the next 50 years.
>
> ***
>
> The Treasure Valley CAMP Committee identified several challenges facing the region over the next 50 years. . . .:
>
> ***
>
> Use tools associated with the Municipal Water Rights Act of 1996 (placeholder).

The introduction to the proposed TV CAMP at page 3 continues: "The specific goals of the statewide Comprehensive Aquifer Management Plan (CAMP) program are to: Provide reliable sources of water, projecting 50 years into the future." This is reiterated again at page 21: "A challenge for the Treasure Valley will be to meet new and on-going water demands over the next 50 years." The proposed text states at page 25: "Another tool is the Municipal Water Rights Act of 1996 which provides for growing municipalities to acquire water rights based on future growth projections." And again at page 28: "The Municipal Water Rights Act of 1996 is a tool available to municipal provides to secure water rights for growing municipal water demands based on anticipated future needs."

IGWA applauds these statements and encourages the board to set policy clearly recognizing the need for 50-year planning under the Municipal Water Rights Act of 1996. If other states are planning for 50 years and beyond – and they are – and Idaho fails to do the same, we may impair our ability to withstand out of state challenges. Should long term planning by municipal providers is good policy not just for cities, but for every Idaho water user.

Sincerely,

RANDALL C. BUDGE

CITY OF KUNA
P.O. BOX 13
KUNA, ID 83634
www.cityofkuna.com

Telephone (208) 287-1727; Fax (208) 287-1731
Email: gordon@cityofkuna.com

GORDON N. LAW
CITY ENGINEER

August 14, 2012

Department of Water Resources
Attn: Neeley Miller
PO Box 83720
Boise, Idaho 83720-0098

Re: Comments on ~~Draft~~ Report
Treasure Valley CAMP

Dear Mr. Miller;

Thank you for providing the opportunity to comment on the *Draft* Treasure Valley Comprehensive Aquifer Management Plan. In responding, I am of the opinion that management of the available water supply in this valley, including the aquifer, will be critical to future growth and success of this valley. In light of that opinion, I read the report with interest in hopes that it would effectively present a well outlined plan for management in the future. I feel that this *Draft* did not accomplish that purpose.

I did appreciate the report's discussion of the valley's water budget. On the other hand, the projections of demand growth going forward were very sketchy and did not provide a comprehensive breakdown of the elements of that demand growth, or any basis on which "management" of the aquifer might be justified, or even any indication of the nature of the conflict or competing interests which surely will characterize efforts to manage it. The report needs this element to be useful.

I was puzzled that a vision statement was provided which did not even use the word "aquifer" as if it was neutral to the entire purpose of the plan. Perhaps that is why the report seemed to wander back and forth between issues related to surface water and issues related to the aquifer. The report needs to demonstrate that its purpose is to present an AQUIFER MANAGEMENT PLAN and to justify a need for that plan.

Finally, the report did not provide adequate foundation or justification for assertions included within the listed "Challenges", actions needed or elements of implementation. Let me give just one example – Challenge #1 in the Executive Summary includes this phrase: "Predicted future demand cannot be met solely…by groundwater…". This sweeping statement might be true but in the report scant evidence is provided of its veracity, relevance or timing. I expect and need substance to give such conclusions credibility.

I have no intention of addressing each challenge, action or element. The defect noted in the preceding paragraph is general throughout the report. I apologize for the negative tone. I really don't want to be critical – but as a manager of a municipal water supply, I do have need that this report serves its useful purpose. Feel free to contact Gordon Law at 287-1727.

Sincerely,

Gordon N. Law, P.E.
Kuna City Engineer

Miller, Neeley

From: Diane Jones [sweethomeidaho@yahoo.com]
Sent: Tuesday, August 28, 2012 5:35 PM
To: Miller, Neeley
Subject: Comment on CAMP

I appreciate the opportunity to comment on the Comprehensive Aquifer Management Plan. I have not read the plan, but have seen a synopsis provided by Idaho Rivers United, and there is a point that I would like to address.

As I understand it (and please correct this impression if it is inaccurate), CAMP does not recommend strong incentives and/or mandatory measures to convince residents to conserve water in their homes and workplaces. CAMP relies only on education and encouragement. In my opinion, the residents of the Boise Valley need to wake up and realize that we live in a desert and that we need to start using water accordingly. This will only happen when strong incentives--including mandatory conservation measures--are in place. Other cities in the Rocky Mountain West have long ago realized the truth of this and have enacted strong measures, but in the Boise Valley we seem to be living in denial.

For the last 10 years I have grown and sold drought-tolerant, including native, plants to the public. I know that attractive landscapes can be created and maintained using a fraction of "normal" levels of irrigation. However the change to more sustainable landscaping practices is taking place very slowly despite years of efforts at education on the part of United Water. The problem is that there are no strong incentives to conserve--in terms of price of water or regulation. So, our community wastes tremendous amounts of water each year maintaining landscapes which are simply inappropriate for the region in which we live.

I believe conservation, including mandatory conservation, is a much more realistic and environmentally benign solution to future water shortages than the construction of another impoundment dam on the upper Boise River.

Sincerely

Diane M. Jones
Draggin' Wing Farm
Water-thrifty Plants for Idaho

Miller, Neeley

From: sara rodgers [manifesting_health@yahoo.com]
Sent: Wednesday, August 29, 2012 12:17 PM
To: Miller, Neeley
Subject: Comment Draft Treasure Valley Comprehensive Aquifer Plan

Idaho Water Resource Board
c/o Neeley Miller

Please accept the following comments regarding the Treasure Valley Comprehensive Aquifer Plan (Plan)

I would like to thank the Board for the work to create the Plan.

My comments are as follows.

1. Prioritization of water management in the following manner.
    1. Highest priority: water conservation measures domestically, agriculturally, and industrially. Water conservation measures in all sectors to include education, incentives, and potentially fines for wasting water.
    2. The concept of water storage, as mentioned in the plan, should include the concept of storage by storm water, roof rain water, and non-use (ie conservation). Economic incentives do not have to wait for 'economic feasability' as mentioned in the draft plan.
    3. Encourage legislators and industry members to support building and remodeling standards to investigate safety, efficacy, and use of grey water and built-in water conservation mechanisms.
    4. Lowest priority: creation of surface water containment in the forms of dams.
2. Using science to determine the best management procedures should be the basis for all management decisions.
3. The management and protection of ground water water quality should be included in the plan. Although quantity is an issue, the quality of the ground water may affect future users and should be considered. Current controversy of fracking and potentially other industrial contamination should not be disregarded in this plan.
4. I agree and support the suggestion of working with multiple partners -state, local, federal, and community.

Sincerely and respectfully submitted,
Sara Rodgers
3021 Grover St
Boise, ID 83705

Miller, Neeley

From: Rosentreter, Roger D [rrosentreter@blm.gov]
Sent: Friday, September 07, 2012 1:45 PM
To: Miller, Neeley
Subject: Boise River Plan

Thanks for your work on the Boise River Plan.
I would like to recommend that some of the invasive exotic trees along the Boise river be targeted for removal to allow the more wildlife friendly native trees and shrubs to prevail. Exotic trees and shrubs that should be controlled are Salt cedar, Russian olives, tree of heavens, white mulberry, indigo bushes and poison nightshade.
Thanks for the opportunity to summit comments.

Roger Rosentreter PhD
State Office Botanist
Bureau of Land Management
1387 S. Vinnell Way
Boise, ID 83709
208-373-3824

Miller, Neeley

From: Laurie K [laurie_kuntz@hotmail.com]
Sent: Friday, September 07, 2012 3:08 PM
To: Miller, Neeley
Subject: public comment on the draft CAMP

Hello,
I am a biology graduate and am very concerned about Idaho's future water use and how it affects wildlife and our quality of life. I strongly disagree with the proposal to look into building future dams along the Boise River. This would have a huge negative impact the environment and would totally transform a naturally flowing river where people currently go to raft, fish, and otherwise recreate. It would also cost millions of dollars, which is a very poor use of Idaho's limited monetary resources.

Secondly, we need to implement strong incentives for people and companies to reduce their water use. I have never understood why new construction continues to be allowed to install green lawns rather than xeroscaped lawns, which are not only beautiful, but far more suitable to our desert climate. Also, if companies or individuals use a large portion of our water resources, they should pay for the privilege. We should be moving toward more sustainable water practices, even for farming. Aquaponics, for example, produces much larger quantities of food than traditional farming, and yet uses a fraction of the water to grow the crops, all without using chemical fertilizers or pesticides. There should be rewards for farmers who put these modern, efficient farming practices into use.

Third, we need to have a better understanding of how the aquifer interfaces with surface water, and therefore need to fund additional research. We need tools and the understanding of what we're working with to be able to effectively manage our water.

Thank you,
Laurie Kuntz
Boise ID 83713

September 24, 2012

To: IWRB

Please change the definition of Aquifer in the CAMP document to be consistent with the definition of Aquifer in the in State Code for Well Drilling.

Thank you

Gary Duspivia

Miller, Neeley

From: Rex Barrie [waterdistrict63@qwestoffice.net]
Sent: Wednesday, September 12, 2012 8:26 AM
To: TVCAMP
Subject: RE: Proposed Treasure Valley CAMP Public Comments

Idaho Water Resources Board

Gentlemen,

I have reviewed the Treasure Valley Camp as presented at the Public meetings held on September 10 and 11, 2012 and would like to provide some feedback.

As a member of the TV Camp Committee I was very involved in the development of the current document. Today I am providing comments as the Watermaster for Basin 63, Boise River.

Throughout the entire Camp process we continually heard about the success of communities like Portland and Seattle and how they were able to conserve water to meet their needs. It needs to be pointed out that those areas of the northwest receive annual amounts of rainfall that far exceed our annual amounts. From my perspective as a water manager for the last 30 years, the only way to ensure a reliable water supply 50 years into the future is to increase our ability to store the spring flows. This increase in storage would serve a dual purpose. Not only would this help protect us from a drought by providing additional water during short water years it would also help to prevent potential flooding that as we all know is not a matter of "if but when" it happens. The current storage study that is underway by the Board and the Army Corp of Engineers provides an informative look at how best to accomplish these goals.

Thanks you for the opportunity to comment on this issue.

Respectfully,

Rex R. Barrie
Boise River Watermaster

H. SCOTT RHEAD
Director of Engineering

UNITED WATER IDAHO
8248 West Victory Road, Boise, ID 83709
P.O. Box 190420, Boise, ID 83719-0420
Tel: 208.362.7345 • Fax: 208.362.3858
scott.rhead@unitedwater.com

September 26, 2012

Terry T. Uhling, Chairman
Idaho Water Resource Board
P.O. Box 83720
Boise, Idaho 83720-0098

RE: TV CAMP and the need for 50 year municipal planning

Dear Mr. Uhling:

United Water Idaho is writing to urge support by the Idaho Water Resource Board for a 50-year planning horizon for those municipal water providers that are serving growing Idaho communities. United Water Idaho commends the Idaho Water Resources Board for its commitment of resources and effort to the goal of better cooperation, understanding, and long term planning that is at the heart of the Comprehensive Aquifer Management Plan process throughout the State.

The Municipal Water Rights Act of 1996 embodies the vision and foresight of the Legislature and the people of Idaho in recognizing the vital role played by municipal water providers within the prior appropriation doctrine. Idaho is growing, but its water supply is not. We face not only increasing demands from within the state, but growing pressures from without.

Cities and states across the West are following the lead set by Idaho in adopting the 1996 Act. They are establishing long term planning horizons for municipal water providers aimed at securing their future. Idaho must do the same, or risk forfeiting its enviable position as an upstream state to out-of-state interests who covet Idaho's water.

From its outset, the Treasure Valley CAMP process has recognized and embraced the need for long term planning. The Plan describes the overarching goals and actions that can be implemented to successfully accomplish the stated goals for local residents and the state of Idaho and to promote productive regional cooperation to benefit the area over the next 50 years.

The introduction to the proposed TV CAMP at page 3 states: "The specific goals of the statewide Comprehensive Aquifer Management Plan (CAMP) program are to: "Provide reliable sources of water, projecting 50 years into the future." This is reiterated again at page 21: "A challenge for the Treasure Valley will be to meet new and on-going water demands

over the next 50 years." The proposed text states at page 25: "Another tool is the Municipal Water Rights Act of 1996 which provides for growing municipalities to acquire water rights based on future growth projections." And again at page 28: "The Municipal Water Rights Act of 1996 is a tool available to municipal provides to secure water rights for growing municipal water demands based on anticipated future needs."

United Water Idaho fully supports these statements and encourages the Board to set policy clearly recognizing the need for 50-year planning under the Municipal Water Rights Act of 1996. If other states are planning for 50 years and beyond (and they are) and if Idaho fails to do the same, we may impair our ability to withstand out of state challenges. Solid long term planning by municipal providers is good policy not just for cities, but for every Idaho water user.

Sincerely,

Scott Rhead, P.E.
Director of Engineering

cc: Gary Spackman, Director, IDWR
Greg Wyatt, Vice President, UWID
Roger Dittus, Hydrologist, UWID

IDAHO RIVERS UNITED

PO Box 633
Boise, ID 83701
800-574-7481
Fax 208-343-9376
www.idahorivers.org

Idaho Water Resource Board
PO Box 83720
Boise ID 83720

September 27, 2012

Dear Chairman Uhling and Idaho Water Resource Board Members,

The Treasure Valley Comprehensive Aquifer Management Plan will have a significant impact on management of surface and groundwater in the Treasure Valley. If the Plan is to meet its important goals of providing water security for 50 years while reducing conflicts and determining future investment, it must have the overarching goal of protecting the Boise River.

The future of the Boise River, the river that flows in the blood of all residents of the Treasure Valley, is in the balance as our population grows, land use evolves and the climate changes. The Plan offers us the opportunity to adopt management goals that protect and even improve the health and function of the Boise River as it flows above and below ground. Our highest priority must be to protect the Boise River as nothing can replace it and the tremendous wealth it provides us.

Idaho Rivers United is a statewide river conservation organization. We have helped shape Idaho water policy for over twenty years, and our comments on the Treasure Valley Comprehensive Aquifer Management Plan reflect our oft-demonstrated belief in the importance of public planning. We want the Plan to be grounded in scientifically accurate information and ecologically sound principals and include clear direction for future action.

Thank you for your dedication to the water resources of Idaho and this opportunity to comment.

Sincerely,

Liz Paul
Boise River Campaign Coordinator

COMMENTS OF IDAHO RIVERS UNITED

Introduction

After observing the meetings of the Citizen Advisory Committee and reviewing the Proposed Treasure Valley Comprehensive Aquifer Management Plan, Idaho Rivers United sees the potential for this document to serve as a positive framework for protection of the Boise River ecosystem, for providing water security for 50 years, for reducing conflicts and for determining future investment.

The Board needs to eliminate Plan language supporting the continued study of new water storage as a means to supply water. This will ensure that the long list of much more viable options are considered with the limited resources at hand.

The Board should expand the Plan's emphasis on the creation and support of water conservation and efficiency programs. These programs will provide immediate benefits for water supply throughout the Treasure Valley, reducing demand and stress on the aquifer.

The Board should put high priority on the acquisition of complete information concerning the ecological and hydrological function of the aquifer system. Existing gaps in knowledge now prevent the completion of a scientifically sound management plan.

Finally, the Board should revise the Plan to ensure that it is accurate and provides clear direction. The adoption of a factually correct and easy-to-understand document is a crucial step in meeting the goals of the Plan. Our suggested revisions, various in nature, are listed in the second section of this document.

Section One

1. **Consideration of new storage will not meet Plan goals**

   The language used throughout the draft TV CAMP assumes there will be unmet water demand by 2050 and that new surface water storage is a viable option to meet that demand.

   Idaho Rivers United doesn't support the conclusion that current available supplies of water will be inadequate to meet future demand. With the exception of drought, existing natural flow and storage meet the current needs of the Treasure Valley as demonstrated, in part, by quantities of carryover water in reservoirs and unused water rights that are available in the Rental Pool and Water Supply Bank annually.

   Predicted population growth will increase the number of water users, but growing cities around the world have decreased per capita water use and lowered total water demand. The Treasure Valley's current water use rate of 160 gallons per person per day is far above the national average. To meet Plan goals, the Plan must highlight the large role that demand reduction can play in meeting water supply needs and reducing the potential for conflict at a very economical price. The Plan should recommend strategies to achieve demand reduction.

There are many steps that can be easily taken to reduce water demand right away and "bank" those water supplies to meet future demand. Some examples include: conservation and efficiency programs supported by incentives, water infrastructure modernization, and increasing the coordination between land use planning and water resource planning so that growth occurs in areas with ample water supply. All of these options extend the existing water supply to meet future demand and most, if not all, will provide desired water security more reliably and at lower cost than new surface water storage. These same steps will create a buffer to deal with water supply variability resulting from climate change.

The Plan can and should lay out clear steps to make better use of the water we already have.

Additionally, Idaho Rivers United does not believe that additional storage capacity will necessarily lead to additional affordable and reliable water supply. While feasibility studies have begun, there has yet to be a conclusion that additional storage is a viable option for increasing supply. In a normal year, most of the water in the upper Boise River where a new storage project is being considered is spoken for. Water above and beyond what is already appropriated is unpredictable and unreliable and not an appropriate source of drinking water, the only sector predicted to demand more water in the future.

Creation of new storage capacity will not create more water. Dams are costly to build and have continued costs of operation and maintenance, which often make them the most expensive alternative.

Finally, the environmental impacts associated with the creation of new storage capacity are too high for the Treasure Valley to accept. Diverting more water from the Boise River or its headwater streams or blocking flow with a new water storage dam would have a negative impact on fish, wildlife, recreation, water quality and other values of the Boise River all the way to its mouth with the Snake River and beyond. People will let their lawns go brown in short water years rather than sacrifice the Boise River.

The notion that there is excess water in the Boise River in some years is absurd. It has no basis in ecology or science or local economics. No one will like what will become of the Boise River if high winter, spring and summer flows are reduced or eliminated. Unless the Board has a hidden agenda to meet future water demands by making the Treasure Valley an unappealing place to live and work thereby decreasing population and water demand, the consideration of new water storage in the Plan is a poor choice. All other options to meet the goals of the Plan should be given investigation, implementation and funding priority.

2. **High priority for funding should be given to water conservation and efficiency programs, including incentive based programs.**

Based on the availability of current information, the best possible option for moving towards greater water security is to create programs encouraging agricultural, domestic, commercial, municipal, and industrial waster conservation and efficiency. Conservation programs encourage the saving of water through restriction of uses, while efficiency programs aim to reduce the waste of water.

Water conservation and efficiency programs should be given priority in implementation and funding. Conservation and efficiency are proven to be effective and predictable. As the Treasure Valley plans for population growth, there are several opportunities for aquifer and surface water management that can provide secure water supply and reduce water conflict. Investing in programs that research shows can meet the water challenges of the Treasure Valley offers the best possible option for implementation now. The best thing is that the cost is low and federal dollars from the Department of Energy, Bureau of Reclamation, EPA and others is available to match state dollars.

3. Effects on the Boise River ecosystem should be fully determined.

As indicated in the Plan, there are many gaps in current knowledge that prevent the implementation of the best, or even adequate, management of the aquifer and surface water. In order to meet the goals of the Plan and the goal of protecting the Boise River, the Plan should prioritize improving our understanding of the Boise River ecosystem.

Currently there is limited understanding of the full wealth provided by the Boise River and its companion aquifer, the provision of clean water for agriculture being a rare exception. The Boise River ecosystem provides us with many other things – many of which have no replacement. Here is a partial list.

Ecosystem Services		
Provisioning Services	Cultural Services	Regulating and Supporting Services
Hydroelectric Power	Cultural Diversity	Avoided Sedimentation
Commercial/Industrial Uses	Spiritual & Religious Values	Water capture function
Drinking Water (Fresh Water)	Educational Values	Erosion prevention
Irrigation water (Food, Timber, Fiber)	Inspiration	Biological regulation
New biodiversity products	Knowledge Systems	Climate Regulation
Recreation and Ecotourism	Aesthetic Values	Air Quality Regulation
	Social Relations	Natural Hazard regulation
	Sense of Place	Disease Regulation
	Cultural Heritage Values	Cabon Sequestration
		Pollination
		Nutrient cycling (dispersal and cycling)
		Water cycling
		Habitat creation
		Soil Formation
		Photosynthesis
		Primary production
		Ecosystem regulation of infectious diseases
		Waste processing, detoxification, purification

Without the necessary information about the ecosystem services of the Boise River and aquifer, we are at risk of unknowingly diminishing these often irreplaceable services. The Board must recognize all uses of the Boise River and adopt a Plan that ensures our communities will continue to enjoy this tremendous wealth.

Section Two

Executive Summary

- Page 2, Bullet #2: "Investigate and ~~support~~ additional storage and supply"
    - Indicating "support" for additional storage is unfounded based on the content of the Plan and the presentation of Actions Needed on page 26. The Executive Summary must accurately represent the full Plan.
    - New storage is a costly and ecologically destructive means to seek water security, in addition to the fact that current options for additional storage have yet to be determined feasible.

1. Introduction

- We support your "commitment to ongoing research, data collection, and analysis" of the hydrological functions of our water basin. Without this base of knowledge, a complete, accurate and effective management plan is impossible.

2. Background and Current Condition

Hydrology and Water Supply

- Indicating what the source of the 10% of water supply which does not come from the upper basin would increase understanding of this section. The paragraph is about surface water, so it's to be understood that 90% of surface water comes from the upper basin and 10% of the surface water comes from somewhere else.
- It would increase understanding for the Plan to include the location of the Boise River gaging station, explain why the stream flow is "near" the station and not at the station, and specify whether the flows are controlled or natural. The Boise River at Boise commonly refers to the Glenwood Bridge gaging station. It is important that the Plan clearly indicates the nature of figures included.
    - **Hydrogeology**
        - The Plan should provide more detail about the nature of varying "hydraulic communication between the various aquifers" to communicate the current understanding of the interaction between aquifer levels. [How does it differ from location to location? What interactions exist that are understood?]
        - The Plan should emphasize the uncertainty of interaction between surface water and aquifers and recognize further investigation into aquifer characteristics is necessary to meet Plan long-term management goals.
        - To avoid confusion, don't use the term "deeper aquifer." Stick to the term "deep aquifer."
        - The Plan should emphasize that existing models of the Treasure Valley aquifer are not adequate to address management needs and goals of the Plan. The Plan should state that there is a need for further research and investigation before management action can be scientifically justified.
    - **TVAS Ground Water Budget**
        - The Plan would promote a better understanding of the hydrology if stated clearly that the source of the stunning amount of groundwater (881,600 acre-feet) that flows directly or indirectly into the Boise River (primarily below Middleton) starts as clean cold water that's diverted from the river

(primarily above Middleton), travels miles through unlined irrigation ditches to be poured onto fields all the while picking up pollution and soaking into the ground before re-entering the Boise River.

- **Surface Water Flows**
  - For preciseness, augment the first paragraph by indicating that 925,900 acre-feet flows into the aquifer each year and only 675,000 acre-feet are used for agriculture each year.
  - For accuracy, make it clear that of the 1.1 MAF of annual basin outflow, 881,600 AF come from aquifer discharge.
  - The Plan should make it clear that a massive aquifer charging program is currently in place, but very little of the aquifer water is pumped out and used before it re-enters the Boise River or a surface tributary.
  - Page 9, the top paragraph needs to be rewritten for accuracy and clarity. Natural flow commonly means the flow that would be available without storage. Given the current irrigation delivery system, there is not enough natural flow to meet irrigation demands from Lucky Peak all the way to Parma, not just to Middleton. The water that enters the Boise River below Middleton through drains and seepage is not natural flow – it's a result of the diversion of both natural and stored water.
  - While the Plan indicates that "310,000 acre-feet" of flow enter the river between Middleton and Parma, for a complete understanding it should be noted where the 881,600 acre-feet of aquifer discharge enters the river and how much surface water that wasn't groundwater enters the river and where.
  - To increase reader understanding, the terms "base flow" and "return flow" need to be defined, and their relationship to the groundwater needs to be explained.
- **Climate Variability**
  - It would be helpful if the Plan provided the location for where the "lower summer stream base flows" discussed on page 9 occur.
- **Drought**
  - To avoid confusion, the definition of drought should be provided. Is a drought a dry year or period of years or a supply shortfall? With good management a drought should not cause a supply shortfall. The sentence would make more sense written as follows, "The most severe *supply shortfalls* occur when there are two or three consecutive dry years…"
  - If the Plan included a description of the "major impact" the 1987-1992 drought had on water users and the Boise River ecosystem, the reader would have a much better understanding of drought-associated risks. What were the conflicts? Where were the shortages? Etc. As the Plan aims to analyze challenges, it requires that quantifiable impact analysis be included.
  - The Plan needs to address why no drought plan exists and make fully visible the challenges associated with establishing one.
  - It would help if the Plan explained how "additional stress on ground water supplies" occurs during drought years through surface water irrigation

supplementation. Clarify what the existing stress is and how and why and to what extent this this stress increases during drought. Provide as much detail as possible on reduced groundwater levels, reduced aquifer charging, groundwater contamination, reduced return flows to the Boise River, reduced ecological function of the Boise River, etc.

- **Challenges Associated with Water Supply**
  - As previously noted, because "supplies in some areas" may not meet future demand, a key component of water management planning should be development restrictions in areas where water availability cannot meet demand. The role of water management in growth planning should be highlighted and advocated in the Plan, realizing that water security is inextricably tied to growth and development.
  - In order the preserve reservoir carryover, more groundwater pumping can be used to offset reduced natural flow in the many areas that have excess groundwater.
  - Demand reduction actions/incentives should be discussed in this section as a potential means to make existing water supplies go further and protect reservoir carryover. Not doing so misses the opportunity to provide clear roadmaps to effective action.
  - Drought planning should be the highest priority of the Plan. A drought plan needs to be more than demand reduction because that doesn't address the comprehensive needs of the ecosystem and economy.

Distribution

- **Reservoir System**
  - The Boise River ecosystem relies upon natural flow fluctuations that are hampered by the current reservoir system and will be further compromised with additional water storage. Please discuss this important issue in the Plan.
  - Page 13, bottom left paragraph: "Presently, the flood control objective is to limit ~~flood~~ flows to 6,500 cfs at the Glenwood Bridge."
    - The draft language inaccurately interprets the listed flow level as a flood.
- **Drains**
  - Page 15, top paragraph: The term "low lying area" is vague. Drains capture water in Meridian and it's not low lying. The value of this section would be improved if it was more specific such as "Approximately 195 miles of drains channel water out of ~~low-lying areas~~ areas with excess groundwater and 11 principle drain systems discharge into the Boise River."
- **Challenges Associated with Distribution**
  - The "mechanisms to protect existing infrastructure" indicated in the first paragraph need to be explained fully to justify this comment.
  - Wells aren't mentioned in the delivery background information section. Wells serve as an important component of water use in the Treasure

Valley. If they are part of the distribution challenge, the document would be improved if the specific challenges associated with wells are explained.
    - Please expand upon the challenges associated with future management of water sources based on the interconnection between ground and surface water. Without expansion, the document does little to increase understanding of the future challenges associated with distribution, especially when no current challenges apparently exist. This challenge highlights the need for research on the interconnection as a crucial component for "effective management" of the aquifer.

Water Use and Needs

- The Plan would be more helpful and truthful if the term "aquifer recharge" wasn't used to describe incidental loss of water from the irrigation system into the groundwater. Water that is diverted for agricultural irrigation does flow into the aquifer, but it's more like putting water in an overflowing bathtub than like filling an empty bathtub. As already pointed out in the Plan, an incredible 881,600 AF flow through the aquifer and back to the river. Very little water is pumped from the aquifer for use, and only a fraction of pumped water comes from the shallow aquifer. Recharge means to replenish or renew, so the use of that word infers there is a shortage when just the opposite is true.
- The Plan would be improved if it listed the municipal and industrial systems currently implementing aquifer storage and recovery techniques currently? The use of the modifier, "some" is too vague for this important piece of information.
- The inclusion of "low-cost" as a modifier for hydropower electricity is undue editorializing. There are numerous costs of hydropower plants not reflected in consumer pricing, including the ecologically destruction caused by the facilities and operations.
    - **Water Quality**
        - The brief description of water quality is not sufficient and suggests that water quality is of low importance. The Plan would be a better framework for smart management if it included the results of the monitoring program, at least in summation, to inform the reader of the current state of water quality.
    - **Fisheries and Biological Flows**
        - How was it determined that the largest constraint on fish populations is stream flows? What about the impacts associated with water temperature and pollutants? A more comprehensive discussion is important to defining thresholds for species impacts meeting the goals of the Plan.
        - Page 19, bottom left paragraph: "The Boise River is generally a gaining reach from Star to its confluence with the Snake River and therefore has good stream flows *year round*, but *poor* water quality conditions can only seasonally support a cold-water fishery."
            - These edits present a more accurate accounting of the river conditions that support a cold-water fishery.
    - **Hydropower**
        - Who is the Arrowrock Dam (18,000kW) power contracted with?
    - **Anticipated Changes in Water Use**
        - Increased coordination between water and land managers would lessen the water supply challenges predicted to occur with growth on undeveloped

lands. To meet its goals, the Plan should promote growth that will produce the least stress on the aquifer.

- **Challenges Associated with Water Use and Needs**
  - The quality of life discussion is excellent.
  - The "difficulty in assessing" the impacts of water use is overstated. It does require funding for investigation but it is not extremely difficult to assess, as entire fields of research are dedicated to assessing these exact types of impacts. Assessing the impacts of water use on the natural environment should be emphasized in the implementation of the Plan as a means to ensure scientifically sound management of the aquifer.
  - Again, the challenge of "uncertain" future water demands can be lessened through land use planning and growth restrictions.

Management and Administration

- **State Law Associated with Requiring Continued Use of Irrigation Water for Landscaping**
  - This discussion is incomplete without a discussion of the problems that arise with the mandatory use of canal or ditch water on organic farms, organic homes and for other users for whom water contamination from pesticides, herbicides, sediment, nutrients and weeds is a problem.
- **Water Markets**
  - The fact that only 9% of Water Supply Bank rights were rented indicates that currently there is an excess of water supply. As drought (supply shortfall) is often emphasized in other parts of the Plan, this section should be expanded to point out that currently an excess of water exists that would help avoid shortfalls. This would increase balance in terms of the way issues are framed.
  - The Plan would be more helpful if the amount of water leased into the Rental Pool was provided in addition to the volume that is rented out. It should be made clear that an average of 6,236 AF is rented *annually* from the Pool.
- **Challenges Associated with Management and Administration**
  - The phrases "organizational structure for groundwater users" and "collaborative efforts," are too vague. The Plan would be improved if some details about the problem that the structure is intended to remedy were included as well as an explanation of why this lack currently exists.
  - What "technical capabilities" are needed to meet management challenges? Idaho Rivers United would argue that increased knowledge and understanding is the key challenge and research should be prioritized. If development and funding is allocated to technology while incomplete knowledge exists, the goals of the Plan will not be met.

3. Actions Needed

Enhance Water Data Collection, Analysis, and Planning

2nd Bullet: Water demand is at the center of water management and should be closely monitored and carefully modeled. The Plan will not meet its goals without a much better understanding of water demand (meaning water that is needed, not water that is wasted). Suggested edit: "Support water *demand and* supply modeling and stream flow monitoring;"

- 4th Bullet: In this critical area, the Plan should recommend actions for the Board, Department and other to take to ensure development of a drought management plan. Position taking isn't enough. Suggested edit: "*Initiate* drought planning to increase the resiliency of the water supply."
- 5th Bullet: This is an important action, but the effects of water management on quality of life, livability, must also be assessed to meet Plan goals. Suggested edit: "Support efforts at assessing potential effects of water management on the natural environment *and quality of life.*"
- 7th Bullet: This action is too vague and there is no discussion of this issue or challenge in the Plan. What is the challenge? What planning process does the Plan refer to? What does "increased transparency" look like? Who is responsible for accomplishing this?

Additional Storage and Supply

- Paragraph: The first sentence as drafted implies that additional storage or other sources of water supply are viable when this has not been established. Suggested edit: "Additional storage or other sources of water supply may *or may not be able* to offset the increased variability of water supply and additional water demand.
- A very short lead time is required for water supply projects based on conservation and efficiency, so that sentence should be amended to read, "…for initiating some storage and water supply projects…"
- 1st Bullet: No further study of potential surface water storage projects should be recommended because they are too expensive and environmentally damaging and because the U.S. Congress holds the purse strings.
- 2nd Bullet: Suggested clarification: "Investigate the feasibility of utilizing managed *ground water* recharge for meeting future water demands"
- 3rd Bullet: It is premature to support exchange of salmon flow augmentation space without understanding the full consequences to the Boise River ecosystem.

Reducing Demand through Water Conservation

- Water efficiency must be used to extend existing supplies of water as well as water conservation. Water conservation is a behavior that results in less water use and is often associated with less output or a sacrifice. For example, a shorter shower or less acres in production. Water efficiency means getting the same job done with less water, usually with the application of technology. For example using a low flow shower head or a buried drip irrigation system. The inclusion of efficiency as well as conservation is important for developing actions to extend existing water supplies. Language throughout this section should be changed to include both focuses.
- 1st Bullet: This action is too vague, and it's unclear who should do the educating, whom they should be educating, what the education will focus on, and how this will occur. The Plan should recommend action(s) for the Board, Department and others to take to provide sufficient direction for implementation.
- 3rd Bullet: The limits put on this action pander to a special interest, are prejudicial and will make it unnecessarily difficult to implement this action. We have to assume that the

Board, the Department, the State, and other players will only pursue viable opportunities for surface water conservation and efficiency and that all consequences will be considered. Suggested edit: "Encourage conservation and efficient use of surface water."
- 6th Bullet: This is crucial and should be strengthened by including water efficiency.
- 8th Bullet: This is a good recommended action, and the positive impact will be increased by considering conservation *and efficiency* requirements for new water appropriations, *and for modifications, transfers and rentals.*

Potential Conversion of Water Use from Agriculture to Other Uses

- This needs to be edited to read clearly and accurately, and additional information is needed. Suggested edit: "In many areas, urbanization has occurred on irrigated farm land resulting in a change of water use from agricultural irrigation to residential irrigation and other DCMI uses. This trend is expected to continue. The intent of these actions is to ensure low cost surface water is available for residential and other uses. Residential irrigation from surface water also reduces the amount of water that municipal and private drinking water systems need to provide and therefore reduces groundwater withdrawals. Significant concern has been expressed about the poor quality of some surface water and its use on organic food crops and in other sensitive areas. The following actions should be undertaken to ensure the transition of water use from agriculture to DCMI:"

Preserve and Protect Water Delivery Infrastructure

- 1st Bullet: To meet Plan goals, the Plan should recommend actions to eliminate contamination from irrigation water that is being used for residential irrigation systems.
- 2nd Bullet: This action must be clarified to specific exactly what the funding is for and explain why the Board would be seeking funding. This issue wasn't discussed in the background information.
- 4th Bullet: The inclusion of water quality is terrific. Due to the costs that water contamination poses for the Treasure Valley, water quality protection should be given more weight and priority in implementation and funding.
- 5th Bullet: IRU supports this.
- 6th Bullet: IRU supports this.

September 10, 2012

Idaho Rivers United Comments on the
DRAFT Treasure Valley Comprehensive Aquifer Management Plan

My name is Liz Paul. I'm the Boise River Campaign Coordinator for Idaho Rivers United. Idaho Rivers United is a statewide river conservation organization and we've been helping citizens protect Idaho's rivers and fish for over 20 years.

Thank you for the opportunity to speak this evening. I'd like to commend the Idaho Water Resource Board for tackling the challenge of planning for the future of the Boise River. There is nothing more important to the Treasure Valley than the Boise River and its companion aquifer. Recommendations and actions in this plan will shape the future of every community in the Treasure Valley.

I'd also like to commend the staff of the Idaho Department of Water Resources and all the citizen advisory committee members who worked on this draft plan. Thank you.

The Plan has three good goals, to provide water security, reduce water conflict and to determine future investment priorities, but a fourth goal is needed, protection of the Boise River.

Protection of the Boise River must be at the heart of the Plan because the Boise River is the heart of the Treasure Valley.

To protect the Boise River, the Plan's recommendations regarding drought planning, research, and water conservation need to be strengthened.

Dry years happen. Consecutive dry years happen. Climate science tells us that dry years are getting drier.

Dry years affect the river and water users. Lower stream flows and more groundwater pumping directly impact the river's water quality, the fishery, recreation, and habitat. Conflicts between water users are more likely to occur and economic impacts escalate during a drought. The

negative impacts of drought can be minimized or eliminated with good planning based on good science.

Drought planning should be the highest priority of the Plan. The Plan should recommend that a drought plan be developed within 1 year. It should recommend that research be undertaken to increase the understanding of how drought impacts the Boise River. And it should recommend establishment of monitoring that will allow IDWR to determine if the drought plan works as predicted.

More research on water need is also required for the Plan to meet its goals and protect the Boise River. Of particular note is the absence of local data about how much clean surface water is lost through leaking irrigation delivery and where that water resurfaces and how much water is needed for lawn irrigation when a farm is converted to a subdivision.

The Plan will not achieve any of its goals without a big investment in research and data collection.

The third area that needs to be strengthened to meet Plan goals and protect the Boise River is water conservation. IRU fully supports water conservation and water efficiency. We believe that wise use of water by all users is the key to water security in 2050.

Water conservation and efficiency programs are effective and predictable and they need to be given priority in implementation and funding. The Plan should recommend development of development of incentives for water conservation and efficiency and adoption of penalties for wasting water.

Finally, consideration of new water storage will waste limited State tax revenue and without meeting Plan goals or protecting the Boise River.

IRU doesn't believe there will be a water shortage in 2050 and we don't believe that new surface water storage will solve any water problems. With the exception of drought, existing supplies are more than enough to meet needs. Modern water planning and management can decrease water use and meet the goals of the Plan.

New surface water storage will not provide a reliable or an affordable supply of water.

It's a waste of money to plan for something we won't need and can't afford.

Diverting more water from the Boise River or its headwaters or blocking more flow with a new or higher dam will be bad for the river, and those impacts will be felt all the way to the Snake River and beyond. No one will like what happens to the Boise River if we decrease flows, including the fish. They'd be here tonight to tell you themselves if they could.

Let me take a few liberties with Kevin Richert's Sunday editorial in the Idaho Statesman about the potential mine in the Boise River headwaters.

The Boise River is invaluable and irreplaceable.

It is not subject to compromise.

It is not for sale.

When the Idaho Water Resource Board touts the economic impact of building a new dam on the Boise River, we're left with a very simple question.

At what cost?

For all the economic stakes — the environmental stakes are higher. They take precedent on the Boise River.

On Boise's river.

Submitted by Liz Paul, Idaho Rivers United, PO Box 633, Boise ID 83701

June 27, 2012

Liz Paul
PO Box 633
Boise, ID 83701

RE: Hydrologic Review of Lower Boise River Studies

Dear Liz,

We have completed a hydrologic review of the U.S. Army Corps of Engineers' ("Corps") Lower Boise River Interim Feasibility Study Water Storage Screening Analysis report ("Screening Analysis", Corps, 2010) and Preliminary Evaluation of Arrowrock Site ("Arrowrock Evaluation", Corps, 2011). We are providing general comments on the work that has been performed so far with emphasis on the potential expansion of Arrowrock Reservoir and recommendations for additional analyses that should be performed as part of the Feasibility Study for the Arrowrock Dam site or other sites that are considered for further study. We are also providing comments regarding the project screening process used in the Screening Analysis report. Additional documents reviewed as part of this effort included the following:

- Final Boise/Payette Water Storage Assessment ("Water Storage Assessment", Reclamation, 2006)
- Memorandum of Agreement between the Department of the Army and the Department of the Interior for Flood Control of the Boise River Reservoirs, Idaho ("MOA", 1953),
- Memorandum of Understanding for Confirmation, Ratification, and Adoption of Water Control Manual Boise River Reservoirs, Boise River, Idaho ("MOU", 1985).
- Telephone and E-mail Correspondence with Idaho Department of Water Resources ("IDWR") staff
- E-mail Correspondence with Bureau of Reclamation ("Bureau") staff
- E-mail Correspondence with Corps staff
- The Maximum Use Doctrine and its Relevance to Water Rights Administration in Idaho's Lower Boise River Basin ("Maximum Use Doctrine", 2010).
- Treasure Valley Future Water Demand Report (IDWR, 2010)

Hydrologic Analysis to Date:

Based on our review, two efforts have been made to quantify the amount of water that could be stored in an Arrowrock Reservoir expansion. These include MODSIM modeling that was performed by the Bureau of Reclamation for its Water Storage Assessment and modeling using historical data from a water rights accounting tool that was performed by IDWR and was summarized in the Screening Analysis.

An initial analysis for the full site list, which included over 200 sites in the Boise and Payette Basins in the Water Storage Assessment, included estimates of natural flow to determine refill frequencies at 50% and 80% thresholds. These estimates were based on USGS stream statistics obtained from the online StreamStats tool. The calculations and methodology were not provided in the report documentation. However, this approach was only used for initial screening purposes, so we did not find it necessary to evaluate the approach in detail at this time. We may provide additional comments on this approach if it is relied upon in the future.

Sites identified to carry forward in the Water Storage Assessment were clustered into eight "areas of opportunity" in order to evaluate potential projects occurring in the same stream reaches and subbasins. The MODSIM analysis was performed for 17 project sites occurring within the areas of opportunity that were assumed to represent conditions at all the remaining project sites. A list of twenty projects in the Boise River basin was further narrowed to twelve sites for future study.

The 12 sites identified to carry forward in the Boise River Basin were further assessed in the Interim Feasibility Study using a two-step approach consisting of first and second-level screening analyses. The study also added a new Arrowrock Reservoir expansion scenario in which the existing dam would be raised or a new dam would be built below the existing dam to provide a total additional storage volume of 317,000 acre-feet. This scenario rated highest in the report. Both levels of screening analysis in the report relied on the results from the MODSIM model in the Water Storage Assessment for refill volume estimates. IDWR refill analysis results based on a daily water rights accounting modeling tool were also summarized for seven project sites that were identified as priority sites through the screening process, including the Arrowrock Dam raise.

Additional Hydrologic Analysis Necessary for Arrowrock Dam Raise:

Descriptions of hydrologic analyses performed to date provide only rough estimates of actual refill volumes and are not adequate to understand the benefits or impacts of an Arrowrock Reservoir expansion. The existing studies have all identified the need for additional analysis, which has not yet been performed.

The Bureau, in its Water Storage Assessment (Appendix, pg. E-3), states:

> *In general, the level of detail provided by MODSIM is beyond a pre-appraisal, reconnaissance-level assessment. However, because Reclamation has invested considerable time in developing and calibrating MODSIM, the planning team utilized the model by making some general assumptions to obtain reconnaissance-level hydrologic yields. To ensure accurate results, subsequent hydrologic analysis using MODSIM should include the following:*
>
> - *Refined target volume*
> - *Flood control curves for new reservoirs*
> - *Estimate return flows*
> - *Channel conveyance analyses*
> - *Refined point of diversion and delivery*

The Corps, in its Screening Analysis (pg. 38), states:

> *"further consideration of water management legal constraints will be applied to any water storage concepts recommended for study, as necessary"*

Also (pg. 38):

> *"Engineering designs, cost estimates, and hydrologic analysis would be completed for the selected sites as part of the Interim Feasibility Study."*

The Corps, in its Arrowrock Evaluation (pg. 18), states:

> *"Hydrologic and hydraulic analyses are required to determine how a larger facility would be operationally integrated and coordinated with the other Boise River basin storage facilities. This analysis would evaluate the probability of refill to identify the volume of additional stored water that may be available for multiple purposes and the level of additional flood risk reduction that would be provided (Arrowrock Evaluation, pg. 18)."*

Generally, it is clear that more hydrologic analysis is needed for any specific project identified in the Screening Analysis, including Arrowrock Dam. While each study was intended to build on previous work, little hydrologic information has been provided other than the MODSIM results and IDWR water rights analysis. While these studies may have been useful for initial project screening purposes, the model assumptions are too poorly documented and/or too flawed to be used for in-depth feasibility studies. Refill probabilities, as well as other benefits and impacts of any proposed storage project cannot be accurately predicted without more detailed studies that include actual system operations and demands.

MODSIM Comments:

The MODSIM analysis was performed for 17 sites intended to represent the priority sites in the Boise and Payette basins. A total of eight areas of opportunity were identified in the Boise and Payette River basins. The Twin Springs location on the Middle Fork of the Boise River was chosen to represent the hydrologic potential at the Arrowrock location. Ninety percent probability refill volumes were estimated to be 50,000 acre-feet at the Twin Springs location and approximately 50,000-60,000 acre-feet at the Arrowrock and Lucky Peak sites; presumably the slightly higher volume at Arrowrock is attributed to its site location, which is downstream of the Twin Springs site.

1. The MODSIM model results were utilized for the first stage screening analysis. Annual Refill Volume is described as "*the volume of water that will arrive at a proposed storage site at least 90 percent of the time (Water Storage Assessment, pg. 9).*" Considering the complex water rights and operating agreements on the Lower Boise River, the amount of water that would arrive at a site has little actual bearing on the amount that could be reliably stored. The extent of downstream water rights considerations is unclear. If the refill estimates were actually based on the amount of water arriving at the site, then Annual Refill Volume is a flawed metric for refill volume.

2. The Water Storage Assessment Report (pg. 48) states:

   "A refined hydrologic analysis based on Reclamation's MODSIM model was conducted on the sites that were carried forward from the screening process. The refined analysis went beyond the StreamStats approach used in the screening process to include operating limitations associated with existing reservoirs (and their return flow estimates), water contracts, water rights, existing regulatory or administrative minimum flows, and other relevant aspects/realities of current operations. These existing operations were considered as givens in this analysis. That is, this modeling exercise assumed that any new storage could not negatively impact or affect existing system elements."

   Also, Appendix E (pg. E-1):

   "Natural flows (referred to as "gains" in the MODSIM model) for new storage sites in ungaged areas are based on the percentage of drainage area at the new storage site relative to the gains that are in the existing model. Return flows to the system from water stored at sites studied in this assessment are not estimated. This conservative assumption provides a conservative reinforcement to the intent of not impacting existing users, rights, contracts, or minimum flows."

   Operating limitations included in the models were not described in the Water Storage Assessment and have not been provided by the Bureau. When we requested this information, we were told that no one currently working at the Bureau had worked on the MODSIM models, so the assumptions could not be provided. Without an understanding of the actual model constraints, it is not possible to know whether there would be impacts to existing system operations , or whether the model incorporated operating conditions to protect future operations. The model should consider impacts to existing water rights. Specifically, downstream water rights including channel capacity and flow availability for diversion, flood control, and instream flow rights are critical components of existing reservoir operations, and ability to store water at a new facility is contingent on other demands being met. If existing operational limitations were modeled, the model assumptions used regarding the details of those assumptions (timing, location, quantity, etc.) were not stated in the report, and no discussion of possible changes to operations in the future was included. The Lower Boise River above Star Bridge is considered to be fully appropriated or possibly over-appropriated; therefore a detailed explanation of these assumptions is critical to understanding the applicability of any model.

3. Operational inefficiencies should be considered in storage yield estimates:

   Actual storage amounts would likely be lower than modeled amounts because future demands and downstream supplies cannot be predicted with exact accuracy. A representative operational safety factor should be added to the MODSIM modeling that reflects these operational inefficiencies.

4. The Water Storage Assessment, Appendix E (pg. E-2) states:

   "Finally, no flood control curves were applied to new storage sites because these curves are unknown at this time."

   Since one of the objectives of storage expansion is to provide additional flood control, flood control curves should be developed for any new storage project, and existing flood operating rules should be incorporated into the models. Flood releases are a key component of operations on the Boise River. Fill frequencies, impacts to existing water rights, instream flow rights, or any other water uses cannot be understood without including flood control operating rules, and storage refill estimates are likely to be overestimated without considering them.

5. The MODSIM refill volume appears to have been capped at approximately 100,000 acre-feet. Future detailed modeling efforts should include fill frequency analysis up to the proposed expansion volume of 317,000 acre-feet for the Arrowrock expansion project.

6. The Water Storage Assessment, Appendix E (pg. E-2) states:
   "In the MODSIM model, the delivery distribution curve (Figure E-1) is based on current release patterns from Lucky Peak, which reflect high summer integrated demands associated with either future DCM&I or irrigation uses (Figure E-1)."

   While the estimated deliveries are explained for each model, the total quantity of deliveries is not discussed. It is also unclear whether carryover storage is considered in any of the scenarios. For a feasibility level analysis, timing of deliveries from an Arrowrock expansion should be based on actual projected demands from the expanded facility.

Accounting Model Analysis

For this analysis, IDWR estimated the quantity of water that could have been diverted into a new storage project at seven potential project locations over an eleven year period from 1999 through 2009. This analysis was based on results from a historical accounting model that utilizes stream gage and diversion records to approximate flows within multiple reaches. The lowest excess flow in any reach was assumed to be available for diversion at the upstream project intake location. Estimates of potential storage at the new Arrowrock Dam project averaged approximately 114,000 acre-feet per year over an eleven year period. The results indicated that an expanded Arrowrock Reservoir could have filled approximately 35% of maximum storage on average, or a complete fill approximately once every three years.

The Corps acknowledged that the IDWR study provides *"a rough estimate of undiverted natural flow each year."* (Screening Analysis, pg. 37) We believe there are several flaws with the study approach as discussed below:

1. Calculations of lowest excess flows below Lucky Peak Reservoir (Screening Analysis, Table 15) rely on varying diversion rates, return flows and precipitation/runoff in the lower

basin. The analysis is essentially a point flow model that assumes that 100% of the lowest excess flow in the river could be captured. This would require instantaneous reservoir operations and streamflow measurement mechanisms or a highly accurate hydrologic model that could predict streamflows (and therefore excess flows) below Lucky Peak Dam. In reality, future storage volumes would have to be reduced to accommodate a factor of safety to offset operational inefficiencies.

2. Significant surface return flows accrue to the Boise River via large drain systems. Mass balance calculations may overestimate the uniformity of return flows accruing to the river. This can lead to overestimation of excess flows available in the river for diversion by new upstream storage. The IDWR study did not consider actual return flow locations and amounts. Instead, gains and losses were assumed to be evenly distributed across gaged stream reaches.

3. Documentation was not provided in the IDWR analysis to indicate times when excess flows occurred. The analysis was performed on an annual basis. If any excess flows occurred during times when water was not being released for flood control purposes, the accounting records should be evaluated more closely to determine why the excess water was not captured by existing facilities. In the analysis, excesses should be assigned first to available (non-flood) storage in existing facilities, and should not be considered available for new upstream storage if they are the result of system operational inefficiencies.

4. When considering the long-term viability of a large storage project, effects of future water rights changes are an important consideration. Water releases for flood control may have been necessitated as a result of water rights holders carrying over supplies in existing facilities. Future operations could be significantly different if irrigation rights are abandoned or put to beneficial use through transfer or reallocation.

5. The Screening Analysis (pg. 38) states:

   "It is important to note this analysis is based on historical accounting model output, and assumes all priority water right holders were diverting."

   This statement is confusing. Our understanding from discussions with IDWR personnel is that actual recorded diversions during the study period are reflected in the accounting model. If all priority water right holders were diverting, very little or no water would be available for diversion to a new project because the river is fully appropriated or possibly even over-appropriated. Effects on future water rights operations could be significantly different from current conditions, for example, if surface water development replaces groundwater use in some regions.

LRE Findings and Recommendations:

Historical annual inflows volumes above the proposed Arrowrock expansion project, measured as the sum of Twin Springs flows (USGS 13185000) and Anderson Ranch flows (USGS 13186000) were calculated for the period of record from 1945 through 2011. The results are shown in Table 1 below.

Year	TwinSprings (AF/yr)	Anderson Ranch (AF/yr)	Total inflows (AF/yr)	Year	TwinSprings (AF/yr)	Anderson Ranch (AF/yr)	Total inflows (AF/yr)
1945	811,121	340,702	1,151,822	**1979**	570,798	333,652	904,450
1946	1,035,016	605,735	1,640,751	**1980**	953,818	594,840	1,548,657
1947	900,497	487,114	1,387,611	**1981**	720,102	424,489	1,144,591
1948	846,776	476,647	1,323,423	**1982**	1,270,271	873,139	2,143,410
1949	847,476	492,652	1,340,128	**1983**	1,283,565	926,669	2,210,234
1950	1,061,274	669,425	1,730,699	**1984**	1,113,545	753,561	1,867,106
1951	1,091,429	738,106	1,829,535	**1985**	728,109	439,651	1,167,760
1952	1,096,677	748,795	1,845,472	**1986**	1,190,608	774,368	1,964,976
1953	989,080	574,178	1,563,258	**1987**	427,944	256,451	684,395
1954	987,499	556,130	1,543,629	**1988**	500,062	297,696	797,758
1955	808,972	413,568	1,222,540	**1989**	751,161	468,598	1,219,759
1956	1,291,284	816,020	2,107,304	**1990**	576,435	326,627	903,062
1957	1,036,426	622,182	1,658,609	**1991**	522,789	285,283	808,072
1958	1,067,252	692,359	1,759,610	**1992**	412,856	203,797	616,652
1959	785,605	444,467	1,230,071	**1993**	907,792	553,418	1,461,211
1960	745,058	415,051	1,160,109	**1994**	424,146	225,090	649,235
1961	591,258	310,620	901,878	**1995**	1,191,177	755,315	1,946,492
1962	876,981	556,378	1,433,358	**1996**	1,304,435	748,851	2,053,285
1963	837,180	503,184	1,340,364	**1997**	1,480,554	929,573	2,410,127
1964	872,476	502,250	1,374,726	**1998**	969,360	603,976	1,573,336
1965	1,362,323	974,825	2,337,148	**1999**	1,073,103	625,300	1,698,404
1966	552,385	356,439	908,824	**2000**	770,149	424,146	1,194,295
1967	807,981	572,795	1,380,776	**2001**	426,728	223,160	649,888
1968	688,687	383,537	1,072,225	**2002**	733,861	382,242	1,116,104
1969	1,024,648	736,343	1,760,991	**2003**	828,244	445,347	1,273,591
1970	1,006,940	572,605	1,579,544	**2004**	680,271	345,438	1,025,710
1971	1,359,086	888,860	2,247,946	**2005**	628,879	364,434	993,313
1972	1,257,190	721,419	1,978,609	**2006**	1,120,152	734,202	1,854,354
1973	659,565	362,687	1,022,252	**2007**	663,124	292,778	955,902
1974	1,402,529	826,493	2,229,022	**2008**	864,245	451,540	1,315,784
1975	1,025,965	698,732	1,724,697	**2009**	858,738	501,040	1,359,779
1976	901,836	549,055	1,450,891	**2010**	810,680	431,659	1,242,339
1977	344,486	177,658	522,144	**2011**	1,160,677	649,965	1,810,642
1978	1,011,583	628,526	1,640,109				

Clearly, without considering existing storage or downstream water rights, there would be adequate supply available to fill the 317,000 acre-foot Arrowrock expansion. However, significant portions of these inflows are already committed to existing storage rights, natural flow rights and instream flows. Slightly over one million acre-feet of storage already exists in

the Lower Boise basin. Ability to fill the Arrowrock expansion is highly dependent on existing system demands and water rights, which have not been accurately modeled for existing conditions, let alone future conditions. The Corps' Screening Analysis states (pg. 37) that "*the Boise River is considered fully appropriated, with active water rights for surface water that total more than 28,300 cfs during the irrigation season.*" Because the system is supply limited based on full utilization of existing water rights, a demand-based model is favorable to a past-performance type model when considering future demands and benefits of new storage.

1. **A Demand-Based Hydrologic Model Should Be Developed:**

   A demand-based model is likely to provide the best estimate of both new storage supply availability and actual storage needs for planning purposes. The model should include estimates of diversions and consumptive use from agriculture, municipal/industrial needs, recreation, hydropower, in-stream flow and flood control requirements. Such a model could be developed to accommodate multiple scenarios to evaluate uncertainty of future growth, water rights administration constraints, and possible conversion of irrigated agricultural lands.

   The model would provide many important answers for planning and administration needs. Important considerations for a model of this type would include the following:

   a. **Irrigation**

      Irrigation demands should be simulated either from historical diversion records or from basin evapotranspiration ("ET") estimates paired with irrigation efficiency estimates (ditch loss, on-farm efficiency). Estimates of monthly crop consumptive use and outdoor municipal use are readily available from IDWR's METRIC tool for 1996, 2000, 2002, and 2006. If diversion records are used, there must be adequate coding of records to ensure that diversions were used only for irrigation, so that municipal and industrial demand is not double counted. If an ET method is used, surface water demand estimates should be adjusted to consider demand met by well pumping, precipitation, return flows and re-diverted supplies, or interbasin transfers.

      ET data are available from the IDWR website:
      http://www.idwr.idaho.gov/GeographicInfo/METRIC/et.htm

   b. **Municipal/Industrial**

      Demands from the growing municipal/industrial sector can be estimated from historical use and assumptions regarding future growth. Multiple scenarios should be evaluated to determine impacts of varying growth projections and water conservation practices on demand.

c. Flood Control:

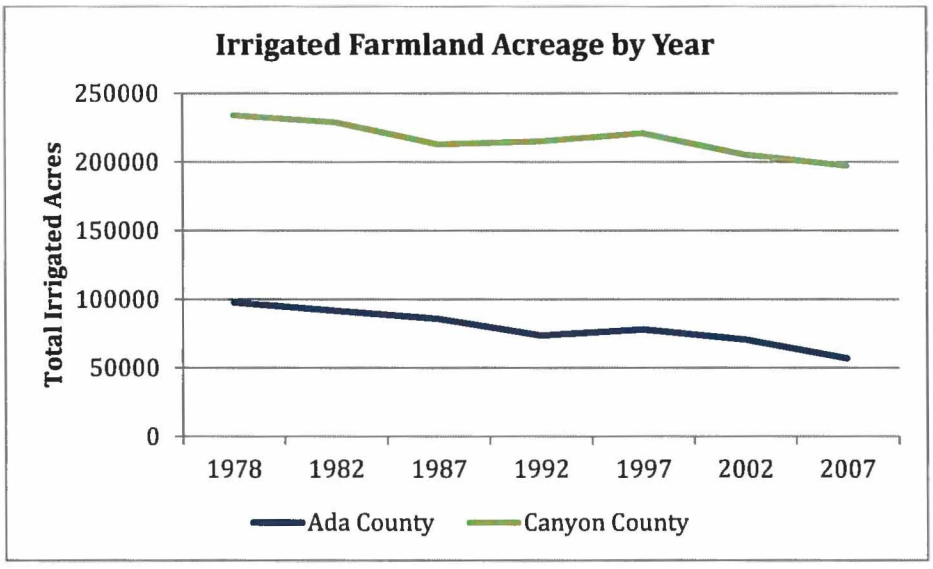
Flood control curves for existing reservoirs should be incorporated into the model in accordance with existing operating agreements. The Corps maintains applicable flood curves in its Water Control Manual.

d. Consider DMC&I and Agricultural Demand changes simultaneously

Any demand scenarios that contain assumptions regarding increases in municipal/industrial demand resulting from development should also consider related decreases in irrigated agriculture demands, where appropriate. IDWR estimates that municipal demand from new residential subdivisions is significantly less than that of irrigated crops (606 mm vs. 812 mm).
http://www.idwr.idaho.gov/GeographicInfo/METRIC/PDFs/water-planning.pdf

In the Treasure Valley Future Water Demand Report (pg. 6-1), it was estimated that for every acre of agricultural land converted to urban land, there is a 1.1 af/yr reduction in demand.

Irrigated agriculture lands in Ada County and Canyon County decreased by over 77,000 acres from 1978 through 2007 (Maximum Use Doctrine, pg. 83). **Figure 1** shows this decline. It is unlikely that this trend will reverse if the rapid rate of urban growth continues in the basin.



Despite this declining trend, the Water Storage Assessment assumed steady agricultural demand over its 50-year planning horizon. Additionally, while conservation was considered to meet a portion of domestic, commercial, municipal and industrial demand, it was not considered for agriculture despite modern innovations in irrigation and conveyance efficiency.

2. **Carryover Storage Should Be Modeled:**

   A full discussion of storage carryover practices and modeling assumptions should be included with any feasibility level analysis for Arrowrock Dam or other projects. Benefits resulting from additional storage capacity would be reduced for the percentage of time that the modeled storage is carried over, released without beneficial use, or otherwise unavailable for the intended use. Also, carryover storage should be explicitly modeled to determine the actual extent of refill volumes in any model simulations.

3. **Supply Reliability:**

   It is unclear whether new storage rights would be subordinated to other senior storage rights. If this is the case, reliability of supply could not be fully known until after the flood release and fill periods for existing storage facilities. This is especially problematic for municipal water supply, which must be reliable.

   The current administration of the Boise system already includes a subordination provision. The 1953 MOA states (pg. A-10):

   > *"In the event Anderson Ranch or Arrowrock Reservoirs are not filled by reason of having evacuated water for flood control, storage in Lucky Peak will be considered as belonging to Arrowrock and Anderson Ranch storage rights to the extent of the space thus remaining unfilled at the end of the storage season but not to exceed the amount evacuated for flood control."*

   If a similar provision is made for the allocation for the Arrowrock expansion (i.e. new Arrowrock storage is subordinated to old Arrowrock, Anderson Ranch, Lucky Peak storage), the water won't be a reliable supply for municipal uses since water managers may not know until the end of July how much supply is available for municipal use.

4. **Arrowrock Flood Control:**

   Being that it is upstream of Lucky Peak Dam, if the new storage in the Arrowrock expansion is not intended to be used for flood control, it will be necessary to provide gate capacity at the Arrowrock outlet to fill Lucky Peak at a high rate equal to the flood flow rate. Otherwise, a portion of Arrowrock storage would have to be dedicated for flood control.

5. **Future Water Rights Administration Effect on Demand Estimates:**

   Future demand estimates are likely to remain uncertain as a result of unresolved water rights administration. The Maximum Rights Doctrine (pg. 106) states:

   > *"As of this writing there has been no delivery call in the Treasure Valley pursuant to which senior surface water rights seek to shut off junior ground water diversions. However, if conjunctive administration were to be sought, the Department would be required, pursuant to its CM Rules, the opinion in American F alls, and the subsequent departmental and court rulings implementing the ESPA delivery calls, to determine several factors pertaining to the question of actual beneficial use. These would include, among other things, totaling the calling entities' reasonable in-season demand for irrigation water and disqualifying those*

acres that no longer are irrigated; calculating the amounts of "reasonable carryover storage" for which curtailment of juniors could be justified; evaluating the annual fluctuations in natural flow availability at the time the seniors' rights were established; and determining how to apply the Boise River's shared curtailment arrangement in the context of administering ground water rights."

The extent to which new storage could actually be utilized cannot be fully understood until the actual water use required by irrigated lands is determined by court decisions or other investigations. Costs and benefits of a new storage project could not be estimated accurately until this occurs.

Screening Analysis Flaws:

A number of flaws have been identified in the Corps' Screening Analysis methods.

- Basin Average Inflow Volume and Refill Volume are redundant metrics. Both include the same inflow component, but Basin Average Inflow Volume has no bearing on how much water may actually be stored. Refill Volume combines inflow and storage availability and is therefore an appropriate metric. The deficiency of using Basin Average Inflow Volume is demonstrated by the example of the Lucky Peak Project, which received a very high Basin Average Inflow Volume score despite very little storage potential.

- The 1-14 scoring system should be weighted by performance, not assigned on a linear scale. For example, on the Relative Residual Volume metric, 8 sites received the top score of 14, and the 9th site only received a score of 6. This disparity could be removed if the score was based on a weighting factor of relative residual volume/max relative residual volume.

- The Interim Feasibility Study (pg. 8) states that *"the reduction of system average runoff volume is an index that reflects relative flood benefit."* However, flood reduction is also dependent on timing and attenuation of flows. These other factors are not considered in the metric.

- The four evaluation criteria chosen are all weighted equally. Weights should be given based on the objectives of the project.

- The Residual Volume evaluation method should be ranked using residual volume as a percentage of total volume, rather than using Residual Volume directly. For example a project with 58/169 (residual/total) ranked better than a project with 47/52 (residual/total). This indicator is very poor for its intended purpose, which is as an indicator of sites most efficiently matched for maximum physical site storage and average annual inflow volumes. This criterion ranked a reservoir that in a best case would fill every 10 years better than one that would fill greater than every two years, because of relying on residual volume rather than inflows as a percent of volume.

- The Reduction of System Average Annual Runoff criterion does not appear to consider the size requirements for permanent pool. If environmental concerns or power generation needs would warrant a permanent pool, this volume should be removed from the indicator.

- If a smaller reservoir was built primarily for flood control, it could be emptied multiple times throughout the year to provide more flood control capacity. This would potentially weight reservoirs with low residual scores higher than they already are.

- Regarding Basin Average Annual Inflow Volume, the Screening Analysis (pg. 8) states: *"In general, the alternative intercepting the higher volume indicates a superior relative hydrologic performance."* Actual interception of flow is not considered in this criterion; it is dependent only on drainage quantity, not how much can be stored/intercepted

- It is unclear how dam heights/project sizes were determined. It seems that rankings for many projects could be increased by decreasing dam height, which would decrease residual volumes.

Conclusions:

In summary, we believe that additional hydrologic analysis is necessary for a feasibility level study of the proposed Arrowrock Reservoir expansion project or any other project in the Boise River Basin. Neither the MODSIM modeling or water rights accounting modeling performed in conjunction with previous studies provides conclusive information regarding the project's ability to meet future water supply or flood control demands. We believe that a hydrologic model that incorporates actual projected water supply and flood control demands coupled with existing system operations, and is adaptable to model future demand and water rights administration scenarios should be developed as part of a full feasibility study. Also, we recognize that the Arrowrock Reservoir expansion is just one of many possible solutions to meet future demand gaps, and we look forward to the chance to review other possible solutions, including non-structural options. We appreciate the opportunity to provide these comments and recommendations.

Sincerely,

LEONARD RICE ENGINEERS, INC.

Dan DeLaughter, P.E.
Project Engineer

DD/RMW
1407IRU01

February 8, 2012

MEMORANDUM

TO: Liz Paul, Idaho Rivers United
FROM: Melinda Kassen, WaterJamin Legal & Policy Consulting
RE: Lower Boise River Partial Interim Feasibility Study

Issue: While the US Army Corps of Engineers (Corps) has stated that the Lower Boise River General Investigation Interim Feasibility Study (IFS) "will not complete a decision document and [will] have no direct Federal implementation," why is the IFS not, and why should it not be used as a basis for making decisions, either at the federal or state level?

Short Answer: Federal law, and Corps policies, directives and precedent, require broader and more complete analyses of alternatives before studies can serve as decision documents. Idaho state requirements for loans to fund water supply projects require similar analyses. There is a real danger that the Corps' current approach to the IFS will result in a stranded investment of scarce federal resources.

Context:

Congress authorized a feasibility study for flood control in 1999 and expanded the authority to include ecosystem restoration and water supply as project purposes in 2007. The Corps, with the Idaho Water Resources Board (IWRB) as its non-federal partner began an IFS in 2009. In a December 2011 fact sheet about the IFS,[1] the Corps describes it as having four components:

1. Evaluate and document existing conditions on the Boise River,
2. Evaluate and update information about flood risk,
3. Analyze surface water storage opportunities in the basin, and
4. Develop a path forward to complete the feasibility study.

These components are roughly analogous to those set out in the Corps' Review Plan for the IFS, released six months earlier and also available on the web.[2] It listed:

1) Water resource problems, issues and opportunities
2) Existing conditions
2) Future without Project
3) Current flood risk
4) Engineering design and cost estimates for three possible surface water storage sites, and
5) PMP to complete the feasibility study

---

[1] US Army Corps of Engineers, Walla Walla District, Boise Outreach Office, "Lower Boise River General Investigation Interim Feasibility Study," updated December 2011 and available on line at: http://www.nww.usace.army.mil/boise/brifs/faq_sheets/FS_BoiseGIstudy111212.pdf ("12/11 IFS Fact Sheet").

[2] US Army Corps of Engineers, Walla Walla District, "Review Plan, Boise River, Idaho Interim Feasibility Report," June 2011, available on-line at: http://www.nww.usace.army.mil/html/pub/ReviewPlan/BoiseRrInterimFeasReviewPlan23June2011.pdf.

In this Review Plan, the Corps acknowledges that, "The interim feasibility phase will not complete a decision document and have no direct Federal implementation action."

If the IFS is not a decision document, then certainly neither are the smaller pieces of work product the Corps has produced so far as part of the IFS. For example, the Corps and IWRB Study Team released a surface water storage screening analysis in 2010, which sets out screening criteria for analyzing surface water storage and applies those criteria to potential sites in the basin.[3] In 2011, the Study Team released a preliminary analysis of one of these sites, Arrowrock Dam, an existing Bureau of Reclamation facility. That analysis considered raising the existing dam, as well as building a new dam in one of two downstream locations.

The Corps has proposed next steps, pending funding, in a December 2011 fact sheet:[4]

- Engineering design and costs estimates would be developed, and hydrologic and hydraulic analyses completed for up to three surface water storage sites,
- An economic analysis of infrastructure and land use values in the floodplain to assess flood damages prevented;
- An inventory of current resource conditions would be completed,
- A 'future without project' description would be developed to forecast conditions if no project were pursued,
- An interim feasibility report will be prepared, documenting the information and analyses developed during the interim feasibility phase and the analyses that would be conducted to complete the feasibility study in a later phase, and
- A public meeting to present draft interim feasibility report recommendations and obtain public comment before finalizing the report.

Analysis:

The constrained nature of work to date and the next steps demonstrates that, as the Screening Analysis states, "The interim feasibility study is focusing on water storage as one potential measure for water supply and flood risk reduction planning objectives."[5] Such an IFS will be a wholly insufficient response to Congress' three-part scope for the Lower Boise Feasibility Study.

The Corps is proceeding with an IFS that does not consider non-structural means to control flood damage. Yet, the Corps has policies going back to 1938 that address nonstructural flood damage reduction measures.[6] As early as 1966, HD 465 encouraged alternative and non-structural measures.[7] Since 1974, Congress has required the Corps to consider non-structural alternatives in its flood damage reduction studies:

---

[3] US Army Corps of Engineers, Walla Walla District, "Lower Boise River Interim Feasibility Study, Idaho, Water Storage Screening Analysis," August 2010, available on line at: http://www.idahorivers.org/pdf/BoiseGIScreenDoc_FINAL_100831.pdf. (Screening Analysis)

[4] 12/11 ISF Fact Sheet.

[5] Screening Analysis, p. 1.

[6] USACE National Economic Development Manuals, "Nonstructural Flood Damage Reduction Measures" available on line at: http://www.corpsnedmanuals.us/FloodDamageReduction/FDRID094NonstrucFldDmgMeas.asp, last updated August 2010.

[7] SUACE National Economic Development Manuals, "Nonstructural Flood Damage Reduction Measures," last updated 2010, available on line at: http://www.corpsnedmanuals.us/FloodDamageReduction/FDRID094NonstrucFldDmgMeas.asp.

> In the survey, planning, or design by any Federal agency of any project involving flood protection, such agency, with a view toward formulating the most economically, socially, and environmentally acceptable means of reducing or preventing flood damages, shall consider and address in adequate detail nonstructural alternatives, including measures that may be implemented by others, to prevent or reduce flood damages. Such alternatives may include watershed management, wetlands restoration, elevation or flood proofing of structures, floodplain regulation, relocation, and acquisition of floodplain lands for recreational, fish and wildlife, and other public purposes.[8]

This statutory directive is clear. The only way to ensure that a feasibility study arrives at a result which is "the most economically, socially and environmental acceptable" is to consider nonstructural flood control alternatives.

The next steps for the IFS that the Corps has proposed also fail to address non-storage, let alone non-structural, solutions for providing a safe and secure water supply for consumptive and non-consumptive demands in the Basin. Nor do the next steps include any proposed actions to address ecosystem restoration, which is one of the three primary objectives of the Study. For this reason, the interim study is not headed towards meeting the 2005 Congressional requirements for a Lower Boise River Feasibility Study. The Corps appears to have recognized the limitations of its approach insofar as the Screening Analysis describes what will be necessary to do a "full" Feasibility Study:

> Other measures, in addition to water storage, will be considered to address flood risk concerns, including bypass channels, levees, and nonstructural options. Measures to improve water quality, restore or improve riparian and aquatic ecosystems, and provide additional recreational opportunities will also be examined. During the second phase of the feasibility study, extensive environmental and technical analyses to address social, natural resource, cultural, and other effects will be conducted. The second phase will be crafted to meet the requirements of the National Environmental Policy Act, Endangered Species Act, and other environmental laws and regulations. The benefits, impacts, and costs of constructing storage facilities will be compared to the benefits, impacts, and costs of pursuing other actions, both structural and nonstructural.[9]

In this time of constrained federal funding, the question becomes **why** the Corps is front-loading its limited funds to look at only one component of what will be necessary to complete the Feasibility Study. As noted above, the Corps itself has recognized that the IFS, and thus all of its investment to date, cannot be used to support federal decision-making, because it is incomplete. Without substantial additional work to explore alternatives and consider the entire suite of objectives that Congress authorized, it will be no more than a stranded investment, and one that plays into all of the concerns expressed over the last decade that the Corps' planning process is biased towards construction. For example, Congressman Blumenthal, author of the 2007 WRDA amendments directing the Corps to update its 1983 Principles and Guidelines, has noted,

> In recent years, several government and private studies have found that the Army Corps of Engineers is often biased in favor of large projects, lacks adequate environmental safeguards in its planning process, and has manipulated data to secure approval for major projects. The Government Accountability Office (GAO), the National Academy of Sciences,

---

[8] 1974 WRDA, §73.
[9] Screening Analysis, p. 40.

internal Pentagon investigators, and the Office of Management and Budget (OMB) have all detailed serious problems with the Corps' current planning process.[10]

Thus, leading with a storage-focused IFS may well result in the Corps' spending more money in the future as it is forced to shift towards other alternatives for a complete, compliant Feasibility Study.

The IFS is inadequate to support Federal Decisions

A. Federal Statutes Define Feasibility Report Requirements for the Corps.

The Corps may undertake feasibility reports, where Congress has authorized them, only as prescribed by statute. 33 USC §2282(2) provides:

> A feasibility report shall describe, with reasonable certainty, the economic, environmental, and social benefits and detriments of the recommended plan and alternative plans considered by the Secretary and the engineering features (including hydrologic and geologic information), the public acceptability, and the purposes, scope, and scale of the recommended plan. A feasibility report shall also include the views of other Federal agencies and non-Federal agencies with regard to the recommended plan, a description of a nonstructural alternative to the recommended plan when such plan does not have significant nonstructural features, and a description of the Federal and non-Federal participation in such plan, and shall demonstrate that States, other non-Federal interests, and Federal agencies have been consulted in the development of the recommended plan.

Importantly, Corps Feasibility Reports also must contain a specific plan to mitigate fish and wildlife losses resulting from the project, or a determination that the project will have negligible adverse impacts on fish and wildlife.[11]

B. By law, the Corps' Feasibility Reports Must Include Mitigation

US law cautions the Secretary not to submit proposals or select projects without having a specific plan to mitigate fish and wildlife losses. This section goes on in great detail about what the mitigation plan must include, focused around having criteria for the success of mitigation "based on replacement of lost functions and values of the habitat including hydrologic and vegetative characteristics," monitoring to demonstrate success, the types of restoration activities, tied to what physical action will affect which functions and values, who's going to do what, monitoring and even a contingency plan for what happens if monitoring shows the mitigation isn't working.[12]

C. The Corps Has Long-Standing Policies That Guide Its Feasibility Studies

1. Principles & Guidelines

---

[10] Congressman Earl Blumenauer, "Environmental Issues," available on line at: http://blumenauer.house.gov/index.php?option=com_content&view=article&id=1802:environment-issues&catid=46.

[11] 33 U.S.C. § 2283

[12] 33 USC 2283(d).

The first section of interest in the Corps' 1983 Principles and Guidelines directs the Corps to establish a federal objective for any proposed project or study.[13]

> The Federal planning objective is to contribute to national economic development (NED) consistent with protecting the Nation's environment. (b) NED is increases in net value of goods & services. (c) Project objective is "expressed desire to alleviate problems and realize opportunities related to the output of goods and services or to increased economic efficiency." (d) So, problem statement should be expressed in terms of a desired *output*.

As set forth in recent Corps' documents noted above, the objective for its Boise River IFS is focused on assessing surface water storage opportunities in the basin, whereas Congress authorized the Corps to consider ways of addressing flood control, water supply and environmental restoration. The substantially more limited focus of the IFS means that it cannot serve as a Federal planning objective for the purposes of the Principles and Guidelines.

The next fundamental feature of the Principles and Guidelines for feasibility studies is the six-step Planning Process: [14]

(1) Specification of the water and related land resources problems and opportunities (relevant to the planning setting) associated with the Federal objective and specific State and local concerns.
(2) Inventory, forecast, and analysis of water and related land resource conditions within the planning area relevant to the identified problems and opportunities (that occur now and that would occur w/o a plan. See Section V)
(3) Formulation of alternative plans.
(4) Evaluation of the effects of the alternative plans.
(5) Comparison of alternative plans.
(6) Selection of a recommended plan based upon the comparison of alternative plans.

Again, from the work product released to date in the Boise River IFS, no analysis conforms to the scope of this methodical and comprehensive process. First, the problem set for the Corps' authorization for the Boise River Feasibility Study was to address three problems – flood control, water supply and environmental restoration – whereas the IFS is considering only one type of water supply (storage) and that same singular strategy to address flood control damages. Absent a full specification of all three aspects of the Basin's water-related problems and opportunities, and a complete consideration of alternatives (including non-structural ones), the IFS does not meet the requirements of the Corps Principles and Guidelines.

The Principles and Guidelines also emphasize that the planning process should be iterative in nature:

> Plan formulation is a dynamic process with various steps that should be iterated one or more times. This iteration process, which may occur at any step, may sharpen the planning focus or change its emphasis as new data are obtained or as the specification of problems or opportunities changes or becomes more clearly defined.[15]

---

[13] Corps, Principles & Guidelines, §1.2.1.
[14] Id, §1.3.2(a)
[15] Id., §1.3.2(b).

Someday, perhaps, the Corps will consider all three aspects of the problems that it was authorized to investigate, as well as a complete range of alternatives to solve those problems. The IFS is, by its own terms, not that moment. As a result, it cannot serve as the basis for any Corps decisions because it is incomplete.

2. Corps' Environmental Operating Procedures

The Corps' Environmental Operating Principles provide that the Corps should:

(1) Strive to achieve Environmental Sustainability. An environment maintained in a healthy, diverse, and sustainable condition is necessary to support life.
(2) Recognize the interdependence of life and the physical environment. Proactively consider environmental consequences of Corps programs and act accordingly in all appropriate circumstances.
(3) Seek balance and synergy among human development activities and natural systems by designing economic and environmental solutions that support and reinforce one another.
(4) Continue to accept corporate responsibility and accountability under the law for activities and decisions under our control that impact human health and welfare and the continued viability of natural systems.
(5) Seek ways and means to assess and mitigate cumulative impacts to the environment; bring systems approaches to the full life cycle of our processes and work.
(6) Build and share an integrated scientific, economic, and social knowledge base that supports a greater understanding of the environment and impacts of our work.
(7) Respect the views of individuals and groups interested in Corps activities, listen to them actively, and learn from their perspective in the search to find innovative win-win solutions to the Nation's problems that also protect and enhance the environment.[16]

An IFS that looks only at on-channel storage and does not consider either environmental protection or restoration – especially in the context of a study authorized to consider flood control, water supply and environmental restoration – cannot meet these operating procedures. Moreover, limiting the scope of the IFS risks wasting public funds if a future un-biased and complete alternatives analysis results in the conclusion that storage is not the most "economically, socially and environmentally appropriate means" to solve the water supply, flood control and ecosystem restoration challenges in the Lower Boise River watershed.

3. Other Legal Requirements

The Water Protection Network Handbook on the Corps points out that, as a matter of law, the Corps cannot recommend a flood damage reduction project unless the benefits of that project exceed the costs.[17] As a result, the Corps must determine that these types of projects have a positive benefit-cost ratio. The Corps must also determine that the recommended plan is "cost-effective."[18] Yet, there is no indication that the IFS will have put together a complete benefit-cost comparison. To date, and in the steps laid out to complete the IFS, the Corps appears only to be looking at relative costs of the storage projects it is analyzing. Therefore, if the Corps proceeds as planned, the Corps will not comply with these legal requirements and the IFS will not be able to be used as the basis to recommend any flood control projects.

---

[16] Available on line at: www.saw.usace.army.mil/wetlands/Policies/SOPI.pdf
[17] 33 U.S.C. § 701a.
[18] 33 U.S.C. § 2281.

D. Corps Precedent Does not Support that the Boise River IFS can Serve as the Basis for Federal Decision-Making

Some Interim Feasibility Studies can provide a basis for federal decision-making. However, in all such instances where the studies are available on-line, two aspects distinguish them from the work that the Corps has produced to date for the Lower Boise River. First, these interim studies cover only a portions of the larger geographic area for which Congress authorized a study. Ultimately, then, these interim studies may be gathered together into final studies that consider the entire geography authorized for study. Example, include interim studies for the Upper Mississippi Basin, the Delaware River Basin Study in New Jersey[19] and the San Francisco Bay Shoreline Study and the St Johns River (FL) study. Second these interim studies follow the Corps' six step planning process required by the Principles and Guidelines, and are subjected to peer review.[20],[21] Moreover, they lead into environmental assessments or impact studies as required by the National Environmental Policy Act (NEPA).

There is nothing in the Corps Lower Boise River IFS that suggests that it is worthy of serving as the basis for a decision document, given that none of the work product to date – and none of the work product described – meets the requirements of the Principles and Guidelines, is anticipated to go through peer review, or conforms to the Corps' Environmental Operating Procedures.

The IFS is also inadequate to support State Decisions

The Corps undertook the IFS, in part, to assist the Idaho Water Resource Board with development of the Treasure Valley Comprehensive Aquifer Management Plan (CAMP), a state planning effort to address future water supply and demand issues in the lower Boise River basin over the next 50 years.[22] The Draft CAMP describes current uses of water in the Boise River Basin as including fisheries, recreation and aesthetics.[23] The Draft CAMP identifies upcoming challenges in meeting water needs as avoiding conflict, but also maintaining quality of life, including the recreation and environmental values that the River and its tributaries provide.[24] As such, the Draft CAMP confirms the importance of the IFS providing a comprehensive analysis that includes nonstructural alternatives and fish and wildlife mitigation as required by Corps policy. Absent such analysis, the IFS will not support a final CAMP that addresses all water uses, including those that are non-consumptive.

---

[19] US Army Corps of Engineers, Philadelphia District, "Delaware River Basin Comprehensive Study, Interim Feasibility Study for New Jersey," available on line at: http://www.nap.usace.army.mil/Projects/delbasin/sprocess.htm.

[20] Id.

[21] The 2007 WRDA, 33 USC 2343(a), requires peer review for feasibility studies that cost more than $45,000,000.

[22] US Army Corps of Engineers, Walla Walla District, "Lower Boise River Interim Feasibility Study,"available on-line at: http://www.nww.usace.army.mil/boise/brifs/default.asp. See also, Idaho Water Resources Board, "Treasure Valley CAMP," available on-line at: http://www.idwr.idaho.gov/waterboard/WaterPlanning/CAMP/TV_CAMP/TVdefault.htm.

[23] Treasure Valley CAMP Advisory Committee, "Draft Treasure Valley CAMP," January 2012, pp. 22-23, available on line at: http://www.idwr.idaho.gov/waterboard/WaterPlanning/CAMP/TV_CAMP/PDF/2012/TV%20CAMP%20DRAFT%201-06-2012_CLEAN.pdf.

[24] Id, p. 25.

Moreover, in terms of state provisions for financing water projects, both structural and non-structural, Idaho's Loan Program Guidelines require that any project seeking state money conduct an alternatives analysis that includes consideration of structural, non-structural and operational components, evaluated, *inter alia*, based on impacts to the environment.[25] Because neither the already-produced work product for the IFS nor the IFS itself would appear to meet the requirements in these guidelines, the State will not be able to consider the IFS as the basis for financing any water storage project in the Boise River Basin, absent additional information.

[25] IDWR, Water Project Loan Program Guidelines, §2.4.1, available on line at: http://www.idwr.idaho.gov/waterboard/PDFs/LoanProgram_Guidelines.pdf.

READER'S VIEW THE BOISE RIVER

Plan for important resource needs some changes

The Water Resource board needs to make drought planning and conservation efforts a priority, and eliminate consideration of a new dam.

BY LIZ PAUL

The Statesman's editors are right, the Boise River is invaluable and irreplaceable. Outside Magazine just named Boise one of America's top 10 river towns, but we don't need Outside Magazine to tell us that. The Boise River is, quite literally, in our blood.

Liz Paul

Not only do we enjoy the best urban water playground in the world courtesy of the Boise River, we brew killer coffee and beer and make fine wine with water from the Boise River and its companion aquifer. We grow tomatoes, we golf and play soccer, we take showers, and we live in tree-shaded neighborhoods because of the Boise River.

There is nothing more important to the Treasure Valley than the Boise River and its companion aquifer which is why the Idaho Water Resource Board has drafted a water management plan for the Treasure Valley. The recommendations of this plan will shape the future of every community in the Treasure Valley.

Idaho Rivers United commends the board for tackling the challenge of planning for the future of the Boise River and offers three suggestions for improvement.

Drought planning should be the highest priority of the plan. Hard as it is to believe, there is no drought plan for the Treasure Valley. Drought happens, and climate science tells us that dry years are getting drier. When there's less water flowing in the river, more water is pumped from the aquifer. Because the aquifer and the river are connected, more pumping reduces river flows even more. All water users, including the fish and birds that live in the Boise River suffer during drought, but the negative impacts of drought can be minimized or eliminated with good planning based on sound science.

To protect the Boise River, the plan should be amended to recommend a drought plan be developed within one year.

The plan needs to put more emphasis on reducing the amount of water we need by using water more efficiently. The water needs of our communities will change as population increases and farms make way for houses, businesses and schools.

We can meet the future water needs of our communities without sacrificing the Boise River if all users get serious about using water efficiently.

To protect the Boise River, the plan should be amended to recommend development of incentives to encourage water efficiency and adoption of penalties for wasting water.

Consideration of a new water storage dam on the Boise River should not be part of the plan. Most years there won't be enough water to fill a new dam, and in high water years like this one, high flows perform vital channel work that's key to a healthy Boise River. No one will like what happens to the Boise River if we eliminate spring high flows. A new or higher dam on the Boise River will ruin our invaluable and irreplaceable river without providing a reliable or affordable supply of water.

To protect the Boise River, the plan should be amended to delete recommended study of a new water storage dam.

The Idaho Water Resource Board is accepting comment on the draft Treasure Valley water management plan until Sept. 30. Visit their website or go to www.idahorivers.org for more information.

Liz Paul is the Boise River campaign coordinator for Idaho Rivers United.

DARIN OSWALD / doswald@idahostatesman.com

The famous "rooster tail" water discharge from Lucky Peak Reservoir, in full plumage during the April Boise River runoff.

KATHERINE JONES/kjones@idahostatesman.com

The new Boise River Park produces waves for surfers, boaters and body-boarders, and has quickly become a local gathering place.

Miller, Neeley

From: Andy [andy@arroman.com]
Sent: Friday, September 28, 2012 2:11 PM
To: Miller, Neeley
Subject: CAMP Comments and Concerns

Importance: High

Dear Chairman and Members of the Idaho Water Resources Board:

I float the Boise River a minimum of two times a week. I have floated every section of the river from it's source all the way to the confluence with the Snake. In addition, I bike and walk the greenbelt several times a week.

Here are my comments and concerns:

- The highest priority should be funding for aquifer research and improvement of water planning and management tools. Insufficient information exists regarding the aquifer and surface water. Sound water management depends on a thorough understanding of the resources.
- Incentives and penalties are needed to insure changes are made to reduce water demand. Education and encouragement are not enough to reduce water demand. I participated in the Meridian Conservation Plan and recognized the importance of water conservation.
- Building a new dam on the Boise River is not a sensible choice because of the enormous economic and environmental cost. This would inundate free-flowing parts of the river above Arrowrock Dam. This would be a tragic mistake.

Thanks for taking my comments and concerns into consideration.

Regards,

Andrew R. Roman
4146 N Bryce Canyon Ave
Meridian, ID 83646-4959
Home: (208) 898-8908
Mobile: (208) 850-3402
Email: andy@arroman.com

September 28, 2012

Idaho Department of Water Resources
Attn: Neeley Miller
P.O. Box 83720
Boise, Idaho 83720-0098

Subject: Treasure Valley Comprehensive Aquifer Management Plan

Dear Idaho Water Resource Board:

This letter is in response to the Idaho Water Resource Board's (IWRB) request for comments on the Treasure Valley Comprehensive Aquifer Management Plan (TVCAMP). In general, the CAMP effort did a good job of bringing together stakeholders to discuss a variety of water-related issues in the Treasure Valley. One factor contributing to the success of the TVCAMP was prohibiting attorneys or consultants from representing stakeholders. The process was generally productive and helpful. The size of the approximately 40-member committee made the process slow and tedious at times, but it allowed for diverse interests to be represented. Getting to know representatives from these various groups helped build relationships and improve communications between the stakeholders. These relationships will pay dividends in the future.

The following is a list of a few issues the City of Meridian feels were not fully addressed in the TVCAMP. For the plan to provide the kind of comprehensive planning tool described in the CAMP goals, these issues must be more thoroughly addressed.

I. The makeup of the committee and the actions of the IWRB when Idaho Department of Water Resources (IDWR) staff presented the plan gave the appearance that surface water irrigation interests in the Treasure Valley are more important than interests of municipal or public water systems. This approach is ironic since the CAMP effort was promoted as an aquifer management plan, not primarily a surface water plan. The aquifer and public water systems provide the majority of water needed for human use in the Treasure Valley. The public water systems deserve fair consideration in the State's long range planning efforts.

   The City recommends that the IWRB create additional opportunities to discuss the TVCAMP issues in order to capture some of the creative ideas that didn't make the final cut in the official camp document.

II. The TVCAMP committee was asked to find consensus on all recommendations forwarded to the IWRB. In obtaining consensus, most recommendations were edited until they became very general in nature, and some of the most innovative ideas were omitted.

However, the committee did find consensus on all but one recommendation. The one outstanding issue revolved around a recommendation regarding the Water Rights Act of 1996. The committee was presented with information regarding the 1996 Act by the IDWR staff. It seems the Act was intended to aid public water systems in long range water supply planning. A significant number of CAMP committee members felt that improvements to the 1996 Act would help meet the goals of TVCAMP. The 1996 Act would also serve as a tool to help protect Treasure Valley's water from out-of-state interests. Debate over future water needs would take place before the demand reached critical levels. This promotes a proactive approach instead of a reactive one. The downside of the 1996 Act is that it lacks clarity about what a long range water supply plan application should be and how it should be evaluated and administered by the IDWR.

Surface water representatives involved with the TVCAMP effort opposed any language that suggested improvements to the 1996 Act. However, surface water representatives were not able to articulate why they opposed improvements to the act, other than to state that the Idaho Water Users Association would not support recommendations involving changes to the 1996 Act. Ultimately, the IWRB removed all language suggesting improvement to the 1996 Act before they voted to approve the TVCAMP recommendations.

The IWRB missed a great opportunity to further the goals of the TVCAMP when they chose to ignore recommendations to improve the 1996 Act. The City of Meridian recommends that the IWRB consider supporting efforts to revise and improve the 1996 Act to make it a more useful and effective tool. This might include defining acceptable application criteria, determining the planning horizon, and providing guidance to IDWR staff on application review and implementation.

III. One recommendation with very broad support involved the need for additional science and information regarding both surface and groundwater in the Boise River Basin. This is necessary in order to make accurate and informed decisions. Water is the life blood of the Treasure Valley. Decisions that affect various water users have significant consequences, and it is important that decisions be based on solid data and scientific information rather than supposition or speculation. Detailed accounting for all surface water and groundwater use and future water needs should be identified and documented.

The City of Meridian recommends the IWRB support additional efforts to collect data on surface water and groundwater use and interaction and develop accurate models to aid in decision making.

Overall, TVCAMP was a worthwhile effort and relationships were established that will be beneficial in the future. Unfortunately there were some missed opportunities as well. Although the formal TVCAMP recommendations represent only a very general description of what was discussed during the TVCAMP process, they do provide guidance to the Board on where to focus their effort. The TVCAMP process was the start of something that could be highly beneficial to stakeholders in the future.

Thank you for the opportunity to comment on the TVCAMP. I hope you will consider our comments as you move forward in this process.

Sincerely,

CITY OF MERIDIAN

FOR tom BARRY

Thomas H. Barry, P.E.G.
Director of Public Works

September 28, 2012

BY EMAIL

Idaho Department of Water Resources
Attn: Neeley Miller
PO Box 83720

Re: Irrigation Organizations' Comments on the draft Treasure Valley CAMP

Dear Mr. Miller:

The Idaho Water Users Association (IWUA) and the Treasure Valley irrigation districts, canal companies, drainage districts, lateral ditch users associations, businesses, individuals and other water users represented by the undersigned attorneys submit these comments and the enclosed proposed changes to the draft Treasure Valley Comprehensive Aquifer Management Plan (TV CAMP).

These water user organizations appreciate the work of the Department, the TV CAMP advisory committee, and the Idaho Water Resource Board in preparing the draft plan, as well as the opportunity to partici pate in the process and submit the following comments and proposed changes to the draft.

1. Length. The draft TV CAMP, particularly the "Background and Current Condition" section (22 pages), is unnecessarily long. In contrast, the Background sections of the Eastern Snake Plain Aquifer CAMP and the Rathdrum Prarie CAMP are each just 4 pages. In the enclosed draft, we have edited the draft to remove unnecessary discussion and redundancy to significantly shorten the document so that it is more succinct.

2. Focus on TVAS. The extensive discussions of surface water without context changes or distracts the focus of the TV CAMP from Treasure Valley Aquifer System (TVAS) to surface water management and planning. Concerns and conflicts over groundwater resources were the impetus for the statewide aquifer management planning authorized by the Idaho Legislature, and should remain the focus of aquifer management planning for the Treasure Valley. It should be clear in the document that surface water is considered as part of the plan because of the interconnection between surface water and ground water. Many of our proposed changes are designed to retain this focus.

3. Organization and Characterization of "Challenges". The inclusion of "challenges" in subsections throughout the "Background" section makes those subsections confusing, hard to find and created redundancy. Moving and consolidating the discussions of challenges to an independent section as proposed in the enclosed draft enables redundancies to be identified and removed. This section should be reworded as "challenges, priorities and opportunities" to more accurately and fully characterize the nature of this part of the CAMP.

4. Idaho Drought Plan. The Idaho Drought Plan referenced in the draft does not itself authorize IDWR to take action. It simply describes existing authorities. It provides sufficient guidance regarding those authorities, so that a Treasure Valley drought plan is unnecessary. Administration in accordance with Boise River water rights and decrees is the primary administrative tool for responding to drought.

5. TV CAMP Recommendations. The "Actions Needed" section should be entitled "Recommendations" consistent with the ESPA CAMP and RP CAMP documents, with objectives identified as in those documents. The reference in the draft "Actions Needed" section to RAFN does not state an objective, it merely references state law, so it should not be included in this section. Reconsideration of the 1995 moratorium should be among the objectives.

Please do not hesitate to contact any of the undersigned if you have any questions about these comments and proposed changes.

Norm Semanko, IWUA

Daniel Steenson, Ringert Law

Shelley Davis, Barker Rosholt

Andy Waldera, Moffatt Thomas

1.0 Executive Summary

In 2008, the Idaho Legislature passed House Bills 428 and 644, directing the Idaho Water Resource Board (IWRB) and the Idaho Department of Water Resources (IDWR) to conduct statewide comprehensive aquifer planning. The IWRB established the following goals for the statewide Comprehensive Aquifer Management Plan (CAMP) program:

- Provide reliable sources of water, projecting 50 years into the future
- Develop strategies to avoid conflicts over water resources
- Prioritize future state investments in water

In 2010, the IWRB appointed an Advisory Committee (Committee) to work with the IDWR to develop a plan to meet these goals for the Treasure Valley Aquifer System (TVAS), underlying Ada and Canyon counties and portions of Elmore, Boise, Gem and Payette counties in southwestern Idaho. A list of Committee members is included in Appendix 2. The TVAS is an integral part of the regional water resources that sustain economic growth and make the Treasure Valley an appealing place to live and work.

This Treasure Valley Camp has been developed with the following vision to meet the goals of the statewide CAMP:

- Respect for Idaho water law and water rights
- A sustainable framework of collaboration, cooperation, and stewardship, and
- A commitment to ongoing research, data collection, and analysis

2.0 Background

Meeting the demand for water, managing and improving water supplies, and avoiding and resolving disputes over water, are not new challenges in the Treasure Valley. The earliest and largest group of Boise River water rights were established during the late 1800's and early 1900's, have been adjudicated twice, and have been distributed by a Water Master for ___ years. Multiple water delivery organizations have been delivering water to lands throughout the Treasure Valley for 100 years or more. Surface water supplies have been improved through the construction and operation of a coordinated reservoir system that has extended the irrigation season and provided recreational opportunities to many generations of Treasure Valley residents. The distribution of surface water has created and sustained a ground water supply that provides water for domestic and other uses throughout the Treasure Valley.

While surface water distribution and administration have matured through this long history, extensive ground water development and management are relatively new in the Treasure Valley. Recent rapid population growth in the Treasure Valley has dramatically increased the uses and demands for ground water. Aquifer levels have declined in some areas of the Treasure Valley. Several ground water studies have been performed and, since 1995, a moratorium order issued by the Director of IDWR has been in effect, which requires that new ground water applications be denied unless they include an acceptable plan to mitigate or avoid injury to existing water rights. Stakeholders, water professionals and administrators recognize the continuing need improve the understanding, management and administration of the TVAS.

The Treasure Valley water system is a complex system of dynamic hydrologic interconnection. The connection between these waters is a critical element in the location and availability of water ~~forto~~ meet the needs of the Treasure Valley. Water use~~d~~ in ~~one~~ upstream location~~s~~ ~~will likely be the~~ contributes to ground and surface water supply~~ies~~ for ~~a different~~ other water ~~need~~ uses elsewhere in the basin. Although comprehensive studies have been undertaken, and continue today, the full extent of ~~when, how, and where the~~ ground and surface water~~s~~ interaction~~s~~ is not fully understood. The contribution of surface water to ~~recharge of~~ the ~~aquifer system~~TVAS and the importance of aquifer discharge to drains and the ~~Boise r~~Rivers does, however, require that ~~any discussion of the Treasure Valley Aquifer System (~~a management plan for the TVAS~~) will inevitably be a discussion about both~~ include consideration of the interconnection between ground and surface water.

2.1 Hydrology and Water Supply

The drainage area of the upper Boise basin is approximately 2,650 square miles and consists oftains four major tributaries, including the North, Middle, and South Forks of the Boise River, and Mores Creek. From Lucky Peak Dam, the lower Boise River flows about 64 (river) miles northwestward through the Treasure Valley to its confluence with the Snake River. ~~Most of the surface water used in the Treasure Valley originates as snow in~~ Snowmelt from the higher elevations of the upper ~~Boise~~ basin ~~where precipitation can be as high as 60 inches annually. This upper basin supplies~~provides an estimated 90 percent of the water supply for the Treasure Valley in the lower Boise Basin. ~~The snowpack is important to the Boise River as the March-July runoff season provides 77 percent of the annual stream flow at the Boise River near the Boise gaging station while only 23 percent of the natural flow occurs during the August-February season. The upper Boise basin is approximately 2,650 square miles and consists of four major tributaries, including the North, Middle, and South Forks of the Boise River, and Mores Creek. From Lucky Peak Dam, the lower Boise River flows about 64 (river) miles northwestward through the Treasure Valley to its confluence with the Snake River.~~

2.2 Hydrogeology

The TVAS underlies the lower Boise basin ~~in southwestern Idaho~~ (Figure 1). The TVAS ~~extends downstream from Lucky Peak Dam to the confluence with the Snake River and~~ serves as the primary source of drinking water for ~~the~~Treasure Valley communities ~~and residents within the Treasure Valley. Approximately 95 percent of the valley's drinking water is pumped from the TVAS.~~ The TVAS ~~can be conceptualized as~~ is a complex system of shallow, intermediate, and deep aquifers (Figure 2). The depths and thicknesses of the aquifers vary ~~spatially~~ and are controlled by geologic faulting, topography, and local land use characteristics (e.g., flood irrigation). The hydraulic communication between the various aquifers varies throughout the Treasure Valley adding to the complexity. Hydraulic connections to aquifers underlying areas to the north (Boise foothills to the Payette River) and to the east (Mountain Home Plateau) are currently not fully understood.

The Aquifer system in the Treasure Valley consists of:

- Shallow aquifers – These aquifers supply water to rural domestic and some irrigation wells. Shallow aquifers are generally in direct hydraulic communication with surface water features and form localized flow systems with the nearest surface water body. The shallow aquifers are generally unconfined (the water level represents the top of the

saturated zone), and water levels are typically controlled by topography (e.g., the elevations of canals or drains).

- Intermediate aquifers – These aquifers supply water for domestic, irrigation, and municipal uses. The hydraulic communication between the intermediate aquifers and the surface water features of the valley is unknown.

- Deep aquifers – Municipal, industrial, and some irrigation wells typically draw water from deeper aquifers. The hydraulic communication between the deeper aquifers and the surface water features of the valley is limited due to the depths below land surface where the deeper aquifers are found. The deeper aquifers are generally confined (water levels rising above the depth of the water bearing zone), and flowing artesian wells exist within the Treasure Valley. The hydrology of the deeper aquifers is not fully understood.

2.3 Ground Water Flow Direction and Water Levels

The ground water flow direction in the TVAS is generally east to west and follows the course of the Boise River. In the southern portion of the TVAS, ground water flows to the south and discharges into the Snake River. Locally, ground water flow directions are dependent on the location (spatially) within the valley. Water level trends are a good indication of a stable storage of water in an aquifer system. ~~Rising water levels indicate an increase in water stored, and declining water levels indicate a reduction in water stored.~~ Stable water levels generally indicate an aquifer storage that is in equilibrium.

In the ~~early~~late 1800s to the mid 1900s, water levels in the shallow aquifer rose significantly because of the development of the valley's surface water irrigation network and continued to rise until the aquifer system eventually reached equilibrium with the drains and river, as indicated by stable water levels. In general, water levels in the shallow aquifer system have remained stable and are controlled by the operation and elevation of the surface water features. Water levels in the intermediate and deep aquifers also appear relatively stable, but some areas of water level decline have been identified in the valley, particularly in the southeast Boise and Lake Lowell vicinities (Petrich and Urban, 2004).

There are existing mathematical models of the Treasure Valley aquifer of various ages and scopes; however they are not adequate to address aquifer management needs.

2.4 TVAS Ground Water Budget

The annual ground water budget for the TVAS varies from year to year ~~(Table 1)~~. For illustration purposes, estimates for water year 2000 are used to show the components of the annual water budget for the TVAS because total precipitation and temperature during the 2000 water year were near normal. (Table 1)

The shallow aquifers of the TVAS are generally in direct hydraulic communication with the Boise River and to a lesser extent the Snake River throughout most of the Treasure Valley. The shallow aquifers discharge~~s~~ directly to the river~~s~~ and the ground water drainage network constructed in the Treasure Valley to drain shallow ground water from low-lying areas. It is estimated that over 80 percent of the TVAS total discharge enters the rivers and the drain network. Some of the drain water is also re-diverted and used for irrigation by downstream users. The amount of water leaving the TVAS through discharge to the drains, tributaries, or the rivers in 2000 was over 881,000 acre-feet (Urban, 2004).

2.5 Surface Water Flows

Unregulated natural flow volumes in the Boise River basin have varied from a low of 676,000 acre-feet annually to a high of 3.6 million acre-feet (MAF) annually. The average unregulated natural flow (1929 –2010) is 1.9 MAF annually. These volumes were calculated at Lucky Peak and are published by the U.S. Bureau of Reclamation (USBOR). On average 1.6 MAF annually are diverted for irrigation ~~and serves as~~ providing a significant source of recharge to the TVAS (BOR, 2007). Table 2 displays a summary of historical Boise River (Nov 1 – Oct 31) runoff (at Lucky Peak), outflow (near Parma), and reservoir storage on November 1. Figure 3 shows the variation of runoff (at Lucky Peak) and November 1 storage from 1929 to 2010. The average annual basin outflow (1972 – 2010) is 1.1 MAF, with outflow volumes varying from 334,000 acre-feet annually to 2.8 MAF annually. The basin outflow is measured at the Boise River near Parma gage, which is operated by the U.S. Geological Survey (USGS) in cooperation with IDWR.

The remaining storage water left in the reservoirs (Arrowrock, Anderson, and Lucky Peak) at the end of an irrigation season is highly dependent on snowfall and irrigation demand for that season. The average reservoir storage on November 1 (1956 – 2010) is 390,000 acre-feet and has varied from a low of 65,000 acre-feet to a high of 665,000 acre-feet. The availability of this "carry over" water reduces the risk of a shortage of irrigation water in the succeeding year. Wise and efficient use of water from year to year helps to ensure better carryover storage for the next year, especially during consecutive dry years.

The hydrograph below (Figure 4) summarizes the historical data from the Boise River at Glenwood Bridge for the period of record (1982 – 2010). The U.S. Army Corps of Engineers (USACE) utilizes the Boise River gage at Glenwood Bridge to monitor and evaluate flood impacts on the river. Currently, flood stage as measured at the Glenwood Bridge gage is 10.01 feet (approximately 7,000 cfs). The maximum discharge since the completion of the reservoir system was 9,840 cfs on June 13, 1983 (USGS, 2011). Typical winter flow out of Lucky Peak (November – March) is approximately 250 cfs. Typical flow at Glenwood after the spring runoff and during the irrigation season (July – September) is approximately 1,000 cfs.

To meet irrigation demand, flows past Lucky Peak Dam average approximately 3,900 cfs during the irrigation season, which spans April through October. ~~During the irrigation season,~~Natural flow in the lower Boise River ~~from Lucky Peak Dam to Middleton does not have enough natural flow~~ is insufficient to meet irrigation demands throughout the irrigation season. ~~Irrigators rely on storage water to supplement the limited natural flow supplies.~~ The irrigation water supply ~~of the Treasure Valley relies upon a reservoir~~ is supplemented by a system of four reservoirs capable of storing approximately 1,000,000 acre-feet of water (as shown in Table 3)~~. This equals~~, about one-half of the average annual inflow of the Boise River. ~~Four reservoirs make up the reservoir system.~~Operation of the reservoir system, with the exception of Lake Lowell, is coordinated between the USBOR, which operates Arrowrock and Anderson Ranch, and the USACE, which operates Lucky Peak. By agreement between the two federal agencies, the storage system is operated as a unified system to maximize the storage and flood control capabilities of the reservoirs.

Extensive water distribution systems divert and deliver water from 75 diversions on the Boise River through approximately 1,170 miles of major irrigation canals (see Figure 8) to provide irrigation water to approximately 350,000 acres of land below Diversion Dam.

Approximately 195 miles of drains channel water out of low lying areas and 11 principle drain systems discharge into the Boise River. The drains were constructed to reclaim lands that became water-logged by seepage from canals and irrigated lands. Some of these drains were modified or expanded existing natural drainage systems that naturally flowed water only during the high spring runoff period. Some drains also serve as canals, providing additional irrigation water through re-diversion. Some drains flow year round because of ground water discharge. Ground water discharges to the drains fluctuate due seasonal changes, ground water withdrawals, irrigation practices, recharge, drought, and other changes in the water budget. Studies are currently underway to better understand the drainage system and quantify seasonal and annual flows.

Below Middleton, there are often enough return flows from drains or direct ground water seepage into the river to satisfy existing irrigation demands. On average, there are approximately 310,000 acre-feet per year of gain in flow between the Middleton and Parma gages. These gains, 310,000 acre-feet, make up 28 percent of the 1,112,000 acre-feet of outflow from the basin near Parma. ~~The return flows that increase river flows downstream are important and help to provide the necessary water and elevation head to deliver water in the lower Treasure Valley.~~ These base flows are an important part to efficiently deliver irrigation water in the Treasure Valley.

2.6 Climate Variability

Climate variability adds another element of uncertainty to planning for future water needs. The IWRB contracted with Boise State University to evaluate potential changes to water supply and demand that might result from climate variability on a watershed scale. There is a large range of uncertainty to climate model predictions; however, general trends are indicated. Multiple studies of climate change in the Pacific Northwest and northern Rockies estimate increases in mean monthly temperatures of 0.86 to 5.49 Fahrenheit for the 2040 irrigation season compared to the 1971 – 2010 temperature average (BOR, 2008, 2011).

Regional studies for the northwest United States indicate ~~greater~~ climate variability ~~conditions~~ (floods and droughts) will be more severe and change the flow regime on which current hydrologic operating procedures are based. For example, temperature increases ~~would allow more~~ may cause fall and winter precipitation to fall as rain instead of snow, ~~and will~~ result~~ing~~ in earlier snow melt~~. On average, higher~~ peak flows~~in the Boise River basin may be higher~~ that occur a few weeks earlier~~in the future than current historic high flows. Timing of spring runoff is complex and a function of climatic indexes (e.g., El Niño-southern oscillation, Pacific decadal oscillation), forest fires, and climatic change. Analysis of stream flow measurements shows peaks are occurring a few weeks earlier as also predicted by the climate change models. Peak flow and trends are also influenced by phenomenon such as El Nino and La Nina and other longer term climatic cycles. The earlier melting of snowpack will lead to~~and lower ~~summer~~ stream base flows ~~at a time when~~ during summers with increased temperatures and evapotranspiration~~is expected to increase with increases in temperature. Fall precipitation could occur more frequently as rain and less frequently as snow. Climate change projections indicate t~~The Boise River basin may experience wetter wet years and drier dry years~~. However because our~~ Unless water storage capacity in the basin is ~~fixed~~increased, the increased water supplies during the wet years cannot be captured and held over for use during the dry years. Consequently, wet years ~~do~~will not offset dry years under the basin's current storage capacity.

2.6 Drought

~~Drought is a significant concern for all Treasure Valley water~~ interests. During drought years surface water irrigation is supplemented with ground water by as much as 300,000 acre-feet, placing additional stress on the TVAS. The Natural Resource Conservation Service (NRCS) uses 1.5 MAF as the threshold for water supply shortages in the Treasure Valley. The most severe droughts occur when there are ~~two or three~~ consecutive dry years when annual runoff ~~is below average~~ and carryover storage ~~is minimal because of water use in previous dry years~~ are below normal. ~~The Boise reservoir system is designed to provide carryover storage to get through consecutive dry years.~~ During ~~T~~the drought that occurred from 1987-1992 ~~had a major impact on the Treasure Valley. During those six years~~, the Palmer Drought Severity Index (Figure 5) classified conditions as extreme drought for 28 of the 36 months that comprised the irrigation seasons in the Treasure Valley. ~~The series of dry, hot summers made the reservoir system response more difficult than the drought of 1977. Although 1977 set the record low flow for the upper Boise River, 1976 and 1978 had wet irrigation seasons that reduced the stress on water supply.~~

The primary response to drought in the lower Boise Basin is water right distribution and administration in accordance with the prior appropriation doctrine and the Stewart and Bryan Decrees. The Idaho Drought Plan (IDP) ~~encourages~~describes additional tools available to local communities to plan and mitigate for ~~future~~ droughts. The IDP describes ~~the~~local government authority ~~counties and cities have~~ to ~~restrict~~reduce their water use and raise funds ~~through ordinances, rules, regulations, proclamations, and short-term levies~~for drought response. It also ~~authorizes the IDWR to take~~ describes actions that can be taken by IDWR to ~~provide for full use of the available water supply in accordance with valid rights for its use during shortages by~~ increasinge water right supervision ~~of water distribution from adjudicated sources, increasing water right~~and enforcement ~~for non-adjudicated sources, and defining procedures,~~and to expedite processing of applications for replacement water supplies.

~~In conjunction with the IDWR's Drought Plan and Water Supply Committee, the Natural Resource Conservation Service (NRCS) compiles a monthly Surface Water Supply Index to illustrate the total seasonal water supply. NRCS uses 1.5 MAF as the threshold for when water supply shortages start to appear in the Treasure Valley. This is based on past years when shortages were realized by irrigation districts. For the period 1987 –1992, 5 of the 6 years had shortages and below normal carryover storage (Figure 6). Available records indicate that during drought years surface water irrigation is supplemented with ground water by as much as 300,000 acre-feet. This situation places additional stress on ground water supplies.~~

Challenges Associated with Water Supply:

Predicted future demand cannot be met solely by readily available ground water supplies are limited in some areas.

Ground water supplies are not infinite. There is potential for additional ground water development, however the Treasure Valley aquifer is not homogeneous. Characteristics vary locally and regionally (and by depth). This variation results in limited availability of ground water supplies to meet existing and future needs in some areas. Ground water supplies are especially limited in southeast Ada County and the Lake Lowell area. There are also concerns about ground water levels in the north foothills. (IDWR data was used.)

Uncertainty for meeting existing and future needs utilizing the existing water supply infrastructure will increase as annual precipitation variability increases TVAS management and planning will require continued data collection and analysis.

Historical hydrological records may not be sufficient for forecasting future conditions because of increased variability. Water supply solutions may include better monitoring to improve flow predictions, which allow better planning in the short-term while planning for future longerterm needs in the valley.

Natural flow in the summer and fall is predicted to be reduced.

Reduced natural flows will result in less water available to fill natural flow water rights. This phenomenon results in increased use of stored water from the reservoirs leading to less reservoir carryover. Warmer temperatures during the growing season would increase water demand for all

–

Currently there is no Treasure Valley drought plan.

Lack of a comprehensive regional response before the next drought will delay demand reduction actions needed to reduce the negative impacts of drought and increase the likelihood of conflict between water-right holders.

Distribution

Reservoir System

The irrigation water supply of the Treasure Valley relies upon a reservoir system of capable of storing approximately 1,000,000 acre-feet of water (as shown in Table 3). This equals, about one-half of the average annual inflow of the Boise River. Four reservoirs make up the reservoir system. Three of those reservoirs—Arrowrock, Anderson Ranch, and Lake Lowell—were constructed in the early to mid-1900s by the USBOR as part of the development of the Boise

Project Board of Control (BPBC). A fourth reservoir, Lucky Peak, was constructed in 1957 by the USACE for flood control, irrigation, and other congressionally authorized purposes. Combined, these reservoirs provide water supplies for congressionally authorized purposes. To meet irrigation demand, flows past Lucky Peak Dam average approximately 3,900 cfs during the irrigation season, which spans April through October. During periods of peak irrigation demand, flows past the dam are kept at about 4,500 cfs. Reservoir space is allocated to storage users according to terms set out in spaceholder contracts entered into between the various users and the Secretary of Interior through the USBOR. While the majority of the contracted reservoir space is used for irrigation storage, approximately 5,000 acre-feet in Anderson Ranch Reservoir is used to store water for municipal and industrial purposes. Arrowrock, Anderson Ranch, and Lucky Peak are operated as a unified system for flood control and refill purposes. Flood control operations are governed by flood control rule curves developed by the USACE. Taking into account various hydrological data, the rule curves attempt to fix the amount of empty reservoir space needed to intercept and capture peak spring runoff flows in order to minimize the effects of flooding downstream. Presently, the flood control objective is to limit flood flows to 6,500 cfs at the Glenwood Bridge.

Operation of the reservoir system, with the exception of Lake Lowell, is coordinated between the USBOR, which operates Arrowrock and Anderson Ranch, and the USACE, which operates Lucky Peak. By agreement between the two federal agencies, the storage system is operated as a unified system to maximize the capabilities of the reservoirs. Reservoir operations are generally defined by three operating periods, which are based on climatological patterns, runoff, and irrigation demand as shown below in Figure 7.

During the maintenance period, the system is operated primarily for carry over and storage as allowed by flood control requirements; however, storage releases continue for municipal and industrial and stream flow maintenance uses. During the flood control and refill period, operation is adjusted continually based on runoff forecasts to provide space for flood control and to assure storage refill for water users, while releasing water necessary to satisfy irrigation demand. The drawdown period is operated for release of irrigation storage water. To the extent possible, water is typically stored as high in the system as possible, although storage accrues to accounts in order of priority. During the summer, Lucky Peak is held near full pool for recreation purposes and water is released from Arrowrock and Anderson Ranch Reservoirs to meet irrigation demand. Lake Lowell is operated by the BPBC to store water and regulate water supplies for the lower end of the project. Lake Lowell is drawn down during the summer when irrigation demands exceed the capacity of the New York Canal.

Canals

An extensive distribution system carries water to 75 points of diversion and provides irrigation to 350,000 acres of land below Diversion Dam. Most large canals branch into sub-canals and laterals to distribute water throughout the valley. Irrigation districts and canal companies maintain their individual systems of delivery for their patrons. There are approximately 1,170 miles of major irrigation canals (see Figure 8).

Drains

Approximately 195 miles of drains channel water out of low lying areas and 11 principle drain systems discharge into the Boise River. Most drains were constructed to drain ground water from shallow aquifers and reduce the incidence of water logged soils. Some of these drains were modified or expanded existing natural drainage systems. Some drains also serve as canals, providing additional irrigation water through re-diversion. Some drains flow year round because of ground water discharge. Ground water discharge to the drains will fluctuate due to water table changes. These fluctuations can be caused by seasonal changes, ground water withdrawals, irrigation practices, recharge, drought, and other changes in the water budget. Studies are currently underway to better understand the drainage system and quantify seasonal and annual flows.

Challenges Associated with Distribution:

Ability of water infrastructure to meet existing and future needs

Mechanisms to protect the existing infrastructure of wells, canals, ditches and collection systems have existed for decades. It is important to retain this protection for the current and future benefit of the region. An additional challenge is the need to modernize existing infrastructure to optimize the beneficial use of water.

Management of interconnected sources

Surface water and ground water are hydraulically connected. This interconnection presents a challenge for future management of surface and ground water rights, which historically have been managed separately. Further complicating this challenge is the recognition that while we understand that a connection exists, our understanding of the timing, extent, and location of the interconnected sources is limited and needs further study in order to provide effective management.

2.7 Water Use and Needs

Ninety-five percent of the Treasure Valley water use falls into one of two major categories: domestic, commercial, municipal, and industrial use (DCMI), and irrigation. While not always included in water-use estimations (Figure 9), water is used to recharge the aquifer, support the river and tributary biological systems, and provide delivery head to convey irrigation water (including conveyance losses). Some municipal and industrial systems implement aquifer storage and recovery techniques to store treated water off peak and re-pump during summer demand. Water leaving the Valley passes through downstream hydropower plants that generate low-cost electricity used in the valley.

In the Treasure Valley, ~~the principal source of water for DCMI is ground water. For DCMI,~~ 94 percent of the water for DCMI comes from ground water sources and six percent comes from surface water sources. ~~For irrigation water, t~~Three percent of irrigation water comes from ground water sources and 97 percent comes from surface water sources. ~~Large and small community systems, as well as individual wells, all provide water for domestic use in the Treasure Valley.~~ Per Capita daily use is approximately 160 gallons (WRIME 2010, USGS 2005).

~~Individual homes that are not on a water supply system use ground water for drinking water, culinary uses, and irrigation.~~ There are over 23,500 domestic wells in the Treasure Valley. ~~This is a minimum number because there are domestic wells that have not been documented in IDWR records.~~ The single largest supplier of ground water is United Water Idaho, whose service area includes the City of Boise and part of Ada County. United Water is currently the only municipal supplier that also delivers treated surface water for DCMI uses. They serve a population of approximately 240,000. United Water produces about 45,000 acre-feet/year (32,000 acre-feet from ground water and 13,000 acre-feet from surface water) and regularly updates its water
demand projections based on records of customer usage and modeling future growth. The other large suppliers are the Meridian Water Department (78,000 people served), City of Nampa (81,000 people served), and the City of Caldwell (46,000 people served). These three systems use ground water exclusively for supply.

~~While surface water is the primary source of water for irrigation, ground water is also a source for irrigation. The annual demand varies because some irrigators rely on ground water every year and some use it to supplement surface water. Weather conditions strongly influence irrigation demand and therefore the necessity of using ground water in a particular year.~~

The IDWR records show there are almost 30,000 total wells in the Treasure Valley. Ground water quality in the Treasure Valley Shallow and Treasure Valley Deep hydrogeologic subareas

is regularly determined from data collected through the Statewide Ambient Ground Water Quality Monitoring Program. ~~The statewide program is administered by the IDWR in cooperation with the USGS.~~ The Treasure Valley Shallow and Treasure Valley Deep subareas are located primarily in Ada and Canyon Counties and generally correspond to the Treasure Valley CAMP study area. USGS in cooperation with the IDEQ has performed a comprehensive survey of existing wells in the Treasure Valley CAMP study area from 1992 to 2000.

2.8 Water Quality

Water quality is an important characteristic in meeting future water needs in the Treasure Valley. Ground water in the TVAS is generally of good quality for drinking and other uses. Surface water quality is variable and has been impacted by both natural and anthropogenic sources. ~~Public drinking water systems are required to monitor their water supply for compliance with drinking water regulations and report the results to their users. Individual private wells generally do not have this requirement.~~ Overall, the water quality throughout the system could constrain the availability of water supplies to meet current and future water needs if the water quality is degraded.

The IDWR has statutory authority for statewide administration of the rules regarding well construction, licensing of drillers, and proper abandonment of wells in Idaho. Well construction standards are designed to protect the quality of water in the aquifer. Additionally, the IDEQ administers the Idaho Wellhead Protection Program. ~~The purpose of this program is~~ to prevent the contamination of ground water that is used for drinking water. The Idaho Wellhead Protection Program is voluntary for local government and water purveyors to implement.

~~Degraded water quality can impact both supply as well as significantly increase costs for ground water providers and surface water users.~~

2.9 Fisheries and Biological Flows

Native coldwater species, including trout and whitefish, inhabit the middle and upper reaches of the Boise River from Lucky Peak Dam to Star. Winter stream flows below Lucky Peak Dam are the largest constraint on fish populations. Prior to the 1990s, winter flows were often 150 cfs or lower, providing only marginal overwinter habitat for wild trout and other sportfish.

The USBOR holds 152,300 acre-feet of uncontracted storage space that it has used in consultation with the IDFG to provide flows in the Boise River below Lucky Peak Dam during the non-irrigation season. Storage releases have increased typical winter flows to 240 cfs,

which requires approximately 86,000 acre-feet of storage for about 180 days. During drought periods, these flows have been reduced to avoid exhausting the winter storage supply. Since winter flows increased in the mid-1990s, wild trout populations have increased 17-fold, with an estimated 2,000 fish per mile in some reaches.

The Boise River is generally a gaining reach from Star to its confluence with the Snake River and therefore has good stream flows, but water ~~quality conditions~~temperatures can only seasonally support a cold-water fishery. This section of river supports a fair fishery for introduced sport fish, including largemouth bass, smallmouth bass, and channel catfish. The Lake Lowell fishery consists primarily of largemouth bass, smallmouth bass, yellow perch, black crappie, bullhead, bluegill, and channel catfish.

~~Some tributaries to the lower Boise were channelized and capacities have changed, which may have altered aquatic and riparian habitat. Functional riparian zones and wetlands adjacent to the Boise River and tributaries provide ecological services, such as water quality protection, storm water control, aquifer recharge, and ground water protection and provide important habitat for fish and wildlife. Riparian and wetlands support a disproportionately large number of species and diversity relative to other areas.~~

2.10 Recreation and Aesthetic Values

~~The Boise River contributes greatly to the quality of life in the Treasure Valley and is partly responsible for the growth in the area. Cultural attractions include a string of city parks and greenbelt trails, undeveloped areas within an urban setting, and sportsman's access areas. Natural attractions along the river range from basalt cliffs to a gallery of cottonwood forests and an extensive riparian zone.~~

There are water recreation opportunities available from the upper reaches of the Boise basin, on each of the reservoirs, and on the Boise River below Lucky Peak. Boaters, fisherman, and waterfowl hunters access the lower Boise River from Lucky Peak Dam to the confluence with the Snake River. Floating the five-mile reach from Barber Dam to the center of Boise is especially popular in the hot summer months. Likewise, water skiing is popular on Lucky Peak Reservoir.

2.11 Hydropower

Hydropower is generated below the reservoirs at both federal and non-federal hydroelectric power plants. Federal reclamation power plants were constructed at Anderson Ranch Dam

(40,000 kW) and Boise Diversion Dam (1,500 kW) as part of the development of the Boise Project. These power plants provide power to operate project facilities and to help reduce power costs to Project farmers who depend on pumping water for irrigation. In 1988, four of the five irrigation districts who make up the BPBC completed construction of a power plant at Lucky Peak Dam (101,250kW). Power generated at the facility is under contract with the Seattle Light Company. More recently in 2010, the BPBC completed construction of a hydropower facility on the Boise River at Arrowrock Dam (18,000 kW). Ada County owns a 3,700 kW power plant located at Barber Dam that is located just upstream of Boise. Upstream of the reservoir system the, Atlanta Power Company owns a 187 kW hydro power plant at Kirby Dam that supplies electricity to the town of Atlanta. A number of hydro plants have been constructed on canal drops in the Treasure Valley. Water leaving the Boise River basin enters the Snake River and continues to generate low-cost electricity at Idaho Power's Hells Canyon Complex for Idaho Power customers in the Treasure Valley.

2.12 Anticipated Changes in Water Use

Water demand in the Treasure Valley is expected to increase, although there is no consensus on the amount as demonstrated by three recent studies. The USBOR projected in a 2006 assessment level study that annual consumptive water demand in the Boise basin could increase by as much as 124, 085 acre-feet by 2050. WRIME's detailed 2010 demand study determined that annual demands for water in the Treasure Valley would increase by 82,880 acre-feet by 2060. The IDWR staff estimates that new water demands and shortfalls in water supply for existing demands could result in a need for new annual water supplies of approximately 170,000 acre-feet.

New water needs are difficult to quantify because there are areas of uncertainty, along with many variables that will determine actual water use and need. Changing land uses and social attitudes, as well as economic conditions, are all factors that will affect water use in the Treasure Valley.

~~Future water demand, driven mostly by increased population and economic growth, may be partially met by water conservation and land use and water use changes. Particularly difficult to anticipate is what proportion of growth will be on undeveloped land, rather than farm land, and what industrial or commercial uses might develop. Those changes are most likely to increase demand for water above current usage.~~

~~**Challenges Associated with Water Use and Needs:**~~

~~***Meeting water needs and uses associated with future development patterns in a manner that minimizes conflict***~~

The Treasure Valley population and economy has grown over the past decade and is expected to do so in the future. A recent study projects up to 650 KAF (WRIME 2010) could transition in use from agricultural to DCMI although a wide range of possible scenarios could occur.

The Treasure Valley must begin to evaluate how best to fulfill the anticipated new demand for water, actively planning for expansion, while encouraging conservation and protecting existing uses and benefits.

Maintaining quality of life

A challenge for the Treasure Valley will be to preserve the quality of life while being sensitive to the changing needs of the Treasure Valley into the future. Quality of life can include aesthetics, recreational needs, property values, socio-economic values, and influences economic development. Issues of quality of life are often subjective and water management decisions can affect quality of life in the Treasure Valley. How these issues influence water management will remain a challenge.

Meeting environmental needs

A challenge over the next 50 years will be to conserve and protect the water resources in the Treasure Valley's streams and aquifers and the riparian habitat it supports, while providing the water supplies for the current and future use. An incomplete understanding of the effect of water diversions for both consumptive and non-consumptive uses on the surface water and ground water leads to a difficulty in assessing their impact on the natural environment. Water managers and water users will be challenged to voluntarily and collaboratively provide functional habitats and mitigate the impacts of water diversions and discharges on the natural environment.

Meeting water supply needs

A challenge for the Treasure Valley will be to meet new and on-going water demands over the next 50 years. The size and location of future water demands, as well as projections for shortfalls in meeting current demands, is uncertain. Water supply solutions involve resolving difficult social and economic issues depending on form, size, and location. Some solutions, such as ground water and surface water storage proposals, require a long lead time to plan and construct so must be commenced long before there is consensus regarding the size and scope of future water demands. The challenge will be to conduct wise, proactive planning and marrying that with careful monitoring of demand increases and supply shortfalls to develop appropriate, timely, and economical water supply solutions.

2.13 Management and Water Right Administration

~~A long history of water development and legal decisions has led to a complex system of interaction among water managers in the Treasure Valley. Water right administration is under the authority of the Director of the IDWR. However, numerous organizations and agencies are involved in the practical management of water. The IWRB is a constitutionally created body responsible for formulating, adopting, and implementing a comprehensive State Water Plan for conservation, development, management, and optimum use of all unappropriated water resources and waterways of this state in the public interest. The State Water Plan is a guiding document for all state actions and activities. The IWRB undertakes water projects for a variety of purposes throughout the state. The IWRB also provides financing for local water entities, such as canal companies, irrigation districts, cities, and others to undertake water projects, including improvement, expansion, and reconstruction of facilities.~~

Water District #63 ~~was created by the Director of the IDWR to~~ administers the distribution of surface water rights from the Boise River ~~currently subject to administration. The administration is carried out under~~ to over 330,000 acres within the Treasure Valley in accordance with state water law and court decrees. ~~Water rights to more than 330,000 irrigated acres are administered in the Treasure Valley from the Boise River. In addition to irrigation, water rights for other uses are also~~ administered. Average summer flows at Star vary with irrigation demand but 250 cfs is the target flow for the administration of water deliveries below Star. Surface water in the Boise River and its tributaries upstream from Star is considered fully appropriated during the irrigation season and during much of the rest of the year.

In 1995, the Director of the IDWR issued a moratorium order stating that new applications for water would be denied unless it included an acceptable plan to mitigate or avoid injury to existing water rights. The order also describes an area in which applications for ground water shallower than 200 feet below the surface would only be processed if they included mitigation measures or could show no adverse impacts to existing water rights.

Downstream from Star, surface water (as well as ground water) is available for new appropriation, but the actual amount will vary from year to year and season to season.

~~Throughout the water year, the watermaster works closely with the NRCS Snow Survey, IDWR, the USBOR, and the USACE. The information provided by these agencies help the water users understand predictions for the total amount of water available each year. Water District #63~~

currently records 75 points of diversion weekly during the irrigation season. This information is used with the IDWR accounting program to track natural flow and storage use at each diversion. Data from the water district, the USGS, the USBOR, and Idaho Power Company are compiled to run the water rights accounting model. The IDWR operates the daily water rights accounting model, and the water master uses the model output to administer the water rights and storage water in the basin.

Ground Water Rights not Currently Administered (as of 2012)

The administration of water rights generally refers to the curtailment of junior water rights to satisfy senior water rights. Water rights are administered by a watermaster appointed by the IDWR. In order to administer water rights, they must be legally quantified through adjudication or other administrative action, such as a license.

In the Treasure Valley, only surface water rights are currently administered by the watermaster because ground water rights have not been fully adjudicated. Following the completion of the Snake River Basin Adjudication (SRBA), it is expected that ground water rights may be included in a water district and conjunctively administered in priority. Conjunctive administration is the term used to describe administration of both ground water and surface water under a common system. Administration of ground water rights, or the implementation of conjunctive administration in the Treasure Valley, is not currently underway.

The legislature adopted the Ground Water District Act in 1995 to create a mechanism to allow ground water users to organize and to formulate mitigation plans to provide protection for senior surface water rights that otherwise would be materially injured by ground water pumping. To date the ground water users in the Treasure Valley have not elected to form such a district.

Irrigation Districts/Canal Companies/Lateral Associations

There are 47 irrigation entities that operate within the Treasure Valley. These entities were created locally for the purpose of new irrigation development. Irrigation entities usually hold water rights and own diversion facilities and infrastructure. The majority of storage space in the reservoir system is used for irrigation by these entities that hold spaceholder contracts with the USBOR.

State Law Associated with Requiring the Continued Use of Irrigation Water for Landscaping

In 2005, the Idaho Legislature adopted Idaho Code 67-6537, which encourages the use of surface water for irrigation, a requirement directed at applications for land use changes, such as from agricultural land to residential subdivisions. The law amended the Local Land Use Planning Act and requires that if land has irrigation water appurtenant and is reasonably available, access and use of the surface water for irrigation will be used.

Flows Regulated to Star

Average summer flows at Star vary with irrigation demand but 250 cfs is the target flow for the administration of water deliveries below Star. Surface water in the Boise River and its tributaries upstream from Star is considered fully appropriated during the irrigation season and during much of the rest of the year. In 1995, the Director of the IDWR issued a moratorium order stating that new applications for water would be denied unless it included an acceptable plan to mitigate or avoid injury to existing water rights. The order also describes an area in which applications for ground water shallower than 200 feet below the surface would only be processed if they included mitigation measures or could show no adverse impacts to existing water rights.

Downstream from Star, surface water (as well as ground water) is available for new appropriation, but the actual amount will vary from year to year and season to season.

Salmon Flow Augmentation

The USBOR holds 40,932 acre-feet of storage space in Lucky Peak Reservoir to be used for downstream salmon flow augmentation. This is a component of the (up to) 427,000 acre-feet of storage water that USBOR delivers from the Snake River above Brownlee Reservoir every year for salmon flow augmentation, consistent with the Nez Perce term sheet and Idaho Code 42-1763B. If replacement water supplies could be found in another basin (consistent with the Nez Perce term sheet) and delivered for salmon flow augmentation, this 40,932 acre-feet in Lucky Peak could potentially be made available to help meet future water needs in the Treasure Valley.

2.14 Water Markets

The Idaho Water Supply Bank (Bank) ~~was legislatively recognized in 1979~~ (Section 42-1761, Idaho Code) ~~and~~ is operated under the authority of the IWRB. ~~The state program,~~ includes ~~two distinct programs,~~ local Rental Pools and the State Water Supply Bank~~, which are both essentially water exchange markets intended to assist in the marketing of natural flow and water stored in Idahoreservoirs. They also provide a mechanism by~~ through which natural flow and storage water rights ~~and stored water that is not being used~~ can be made available for use by others ~~through a lease and rental process~~.

~~The Bank includes water rights from surface water and ground water sources throughout Idaho. Surface and ground~~ Wwater rights not currently in use may be leased ~~(deposited)~~ to the Water Supply Bank ~~if not currently in use~~ and then rented ~~(withdrawn)~~ from the Bank by another water user for beneficial uses ~~such as commercial, industrial, irrigation, or mining~~. ~~In addition, w~~Water rights leased to the Bank are protected from forfeiture. ~~Applications to lease and rent water from the Bank are currently received and processed by the IDWR.~~ The Boise River drainage had the most activity ~~in the state~~ in 2010 for leasing water rights into the Bank, but only 9% of these rights were rented back out for actual use (2010 Water Supply Bank Annual Report, IDWR).

The Water District #63 Rental Pool (Rental Pool) ~~is a mechanism for~~enables reservoir spaceholders to make stored water available to other entities ~~in short supply in a given year. The Rental Pool also~~and provides a source of revenue for Water District #63 ~~to make improvements in water distribution while encouraging the maximum beneficial use of stored water. The Rental Pool is under the jurisdiction of and operated by the local committee appointed by the IWRB. The local committee develops the rules of procedure, lease pricing, and operation requirements for their Rental Pool, which then must be approved by the IWRB. The USBOR must also approve the rules and rates for Federal storage as a facility owner.~~ The watermaster administers the Rental Pool under the guidance of the local committee. The Water District #63 Rental Pool has rented an average of 6,236 acre-feet over the past 8 years, excluding the USBOR-held uncontracted space. Use of the Rental Pool appears to be low compared with other rental pools in the state despite the rapid growth of DCMI uses in the basin.

3. Challenges, Priorities and Opportunities

Available ground water supplies are limited in some areas.

~~Ground water supplies are not infinite.~~ ~~There is~~ potential for additional cost-effective ground water development~~, however~~in the Treasure Valley aquifer is ~~not homogeneous. Characteristics vary locally and regionally (and by depth). This variation results in~~ limited ~~availability of ground water supplies to meet existing and future needs~~ in some areas. Ground water supplies are especially limited in southeast Ada County and the Lake Lowell area. There are also concerns about ground water levels in the north foothills. ~~(IDWR data was used.)~~

~~***Natural flow in the summer and fall is predicted to be reduced***~~***Response to climate change***~~.~~

~~Reduced natural flows will result in less water available to fill natural flow water rights. This phenomenon results in increased use of stored water from the reservoirs leading to less reservoir carryover. Warmer temperatures during the growing season would increase water demand for all uses.~~Predicted ~~climate change will change the timing of snowmelt and the availability of natural flow, increase summer temperatures, evapotranspiration and demand, and create new challenges and opportunities for water storage. Potental responses to these changes include improved water use practices and increasing reservoir storage capacity.~~

Meeting water supply needs

~~A challenge for the~~ Treasure Valley stakeholders will ~~be~~continue to meet new and on-going water demands over the next 50 years. ~~The size and location of future water demands, as well as projections for shortfalls in meeting current demands, is uncertain. Water supply solutions involve resolving difficult social and economic issues depending on form, size, and location. Some solutions, such as ground water and surface water storage proposals, require a long lead time to plan and construct so must be commenced long before there is consensus regarding the size and scope of future water demands.~~ Predicted climate change will change the timing of snowmelt and the availability of natural flow, increase summer temperatures, evapotranspiration and demand, and create new challenges and opportunities for water storage. Potental responses to these changes include improved water use practices and increasing reservoir storage capacity. The ~~challenge will be to~~IWRB should support collaborative efforts to conduct wise, proactive planning ~~and marrying that~~ with careful monitoring of demand increases and supply shortfalls to develop appropriate, timely, and economical water supply solutions.

~~***Meeting water needs and uses associated with future development patterns in a manner that minimizes conflict***~~

~~The Treasure Valley population and economy has grown over the past decade and is~~are ~~expected~~

~~to do so in the future~~continue to grow~~. A recent study projects up to 650 KAF (WRIME 2010) could transition in use from agricultural to DCMI although a wide range of possible scenarios could occur. The Treasure Valley must begin to evaluate how best to fulfill the anticipated new demand for water, actively planning for expansion, while encouraging conservation and protecting existing uses and benefits.~~

Management of interconnected sources

Surface water and ground water are hydraulically connected. This interconnection presents a challenge for future management of surface and ground water rights, which historically have been managed separately. Further complicating this challenge is the recognition that while we understand that a connection exists, our understanding of the timing, extent, and location of the interconnected sources is limited and needs further study in order to provide effective management.

~~Existing w~~Water Management~~rketing~~ tools ~~that appear to be under-utilized could~~to ~~help provide solutions to meeting water needs in the future~~

~~Several water management tools exist that could be utilized to help meet future water needs, but currently appear to be under-utilized.~~ The Boise River (Water District 63) Rental Pool, which facilitates marketing of reservoir storage water, has a lower level of activity when compared with the Payette and Upper Snake Rental Pools, despite the Treasure Valley having rapidly growing water needs. The Water Supply Bank facilitates marketing of natural flow and ground water rights. Bank records show that in the Treasure Valley there is considerable activity to lease water rights into the Bank, but little demand to rent water rights out of the Bank even with the Treasure Valley having rapidly growing DCMI water needs. ~~Another tool is the Municipal Water Rights Act of 1996 which provides for growing municipalities to acquire water rights based on future growth projections.~~

Additional data and Advanced technical capabilities ~~are needed to meet increasingly complex water management challenges~~ better understand and manage the TVAS

Although we understand a great deal about the regional hydrology, our information does not provide a full understanding of the localized interaction between ground and surface water, and between the shallow aquifer and deep aquifer. Knowledge is not sufficient to fully characterize the hydrologic system which results in difficulty predicting system responses to management actions. Historical hydrological records may not be sufficient for forecasting future conditions. Existing ground water models do not incorporate newer information or forecasts.

~~Uncertainty for meeting existing and future needs utilizing the existing water supply~~

~~*infrastructure will increase as annual precipitation variability increases*~~

~~Historical hydrological records may not be sufficient for forecasting future conditions because of increased variability. Water supply solutions~~TVAS management and planning ~~may include~~require ~~better monitoring to improve flow predictions, which allow better planning in the short-term while planning for future longerterm needs in the valley.~~

Ability of water infrastructure to meet existing and future needs

Mechanisms to protect the existing infrastructure of wells, canals, ditches and collection systems have existed for decades. It is important to retain this protection for the current and future benefit of the region. An additional challenge is the need to modernize existing infrastructure to optimize the beneficial use of water.

Maintaining quality of life

A ~~challenge for~~continuing priority will be to preserve the quality of life in the Treasure Valley ~~will be to preserve the quality of life~~ while ~~being sensitive to the~~responding to changing water supplies and water needs of ~~the~~ Treasure Valley ~~into the future~~stakeholders. ~~Quality of life can include aesthetics, recreational needs, property values, socio-economic values, and influences economic development. Issues of quality of life are often subjective and water management decisions can affect quality of life in the Treasure Valley. How these issues influence water management will remain a challenge.~~

Meeting environmental needs

A challenge over the next 50 years will be to conserve and protect the water resources in the Treasure Valley's streams and aquifers and the riparian habitat it supports, while providing the water supplies for the current and future use. ~~An incomplete understanding of the effect of water diversions for both consumptive and non-consumptive uses on the surface water and ground water leads to a difficulty in assessing their impact on the natural environment. Water managers and water users will be challenged to voluntarily and collaboratively provide functional habitats and mitigate the impacts of water diversions and discharges on the natural environment.~~

~~3. Actions Needed~~4. Recommendations

Guided by the CAMP goals and vision, the Committee identified several recommended actions for addressing the challenges, priorities and opportunities discussed in the previous sections of this Plan. Understandably, these actions will need to be more fully refined during the implementation phase, but the Plan by adopting a mix of strategies represents a balanced approach ~~to addressing the future water challenges in the Treasure Valley~~. These actions have not been ranked or placed in order of priority.

Objective #1: Enhance ~~Water~~TVAS Data Collection, and Analysis~~, and Planning~~

Several types of data are needed to effectively manage the ~~water resource~~TVAS. Water planning and management tools should be developed and updated using accurate data and the best available science and analytical methods. ~~These tools are needed to reduce uncertainty and improve effectiveness and efficiency.~~ Taking the following actions will ~~contribute to~~ improve the information and understanding required for successful water management ~~that protects the public health and safety, minimizes conflicts, and promotes the economic and environmental health of Idaho~~ and planning for the TVAS:

- Improve ground water measurement, models and technical tools to meet administrative purposes and to facilitate decision making;
- Support water supply modeling and stream flow monitoring;
- ~~Measure water use changes and report demand trends to the IWRB;~~

Objective #2: TVAS Management and Planning

Improved data and understanding of the TVAS will facilitate the following management and planning actions:

- Reevaluation of the moratorium that has been in effect since 1995
- Support drought planning ~~to increase the resiliency of the water supply specific to the Boise drainage~~;
- Support efforts at assessing potential effects of water management strategies on the ~~natural environment~~TVAS;
- ~~Create a mechanism for coordination within the ground water community;~~
- Continue to increase transparency of planning process;
- Organize a periodic Water Forum ("Water Summit") to assess the state of

the aquifer and discuss emerging issues and opportunities.

Objective #3: Additional Storage and Supply

Additional storage ~~or~~and other sources of water supply may be needed in the future to offset the increased variability of water supply and additional water demand. Because of the extended lead time required for initiating storage and water supply projects, study of these projects should be continual. This will ensure the information is available when decisions need to be made. The following actions should be part of the evaluation of future supply options:

- Continue the study of the feasibility of potential surface water storage projects in a manner that comprehensively addresses supply options and avoids conflict;
- Investigate the feasibility of utilizing managed recharge for meeting future water demands;
- Support the exchange of the USBOR's salmon flow augmentation space in Lucky Peak (excluding stream flow maintenance) with replacement water supply consistent with the Nez Perce term sheet;
- Evaluate augmentation of existing cloudseeding programs as an option for increasing water supply.

Objective #4: Reducing Demand through Water Conservation

~~Reducing demand through water conservation should be adopted as one of the strategies for meeting future water needs in the Treasure Valley. Capital costs associated with new supply may be avoided through the reduction of per capita demand. Addressing these issues is a multijurisdictional responsibility; therefore the IDWR should work in cooperation with water users and water providers to collaboratively develop incentives to reduce demand.~~Consistent with state law supporting water conservation (section 42-250. Idaho Code) and protecting conserved water from forfeiture (section 42-223, Idaho Code), ~~T~~the following actions should be taken to conserve water and reduce~~d~~ demand for ground water from the TVAS:

- ~~Use~~Promote education to encourage conservation;
- Encourage conservation and efficient use of ground water;
- Encourage conservation and efficient use of surface water, where a viable opportunity exists, taking into consideration the benefits of incidental recharge;

- Support efforts for retrofitting neighborhoods with pressurized irrigation;
- Encourage and support wastewater/gray water reuse in appropriate circumstances;
- Encourage or support incentives for conservation;
- Develop guidelines for conservation programs;
- ~~Consider conservation requirements for new water appropriations.~~

Objective #5: Potential Conversion of Water Use from Agriculture to Other Uses

Urbanization has changed some water demand from agricultural irrigation to residential irrigation and other uses. This trend is expected to continue into the future as additional growth occurs. The intent of these actions is to ensure that irrigation water is available for residential use and irrigation entities continue to have financial viability and protection of infrastructure. Domestic irrigation provided through the canal systems is also beneficial because it reduces the amount of water that municipal water systems need to provide. The following actions should be undertaken to ensure orderly transition of water use from agriculture to DCMI and other uses:

- Continue to support the use of surface water on those lands that convert from agriculture to DCMI and other uses utilizing the existing irrigation entities;
- Support voluntary cooperative arrangements between irrigation entities and municipal providers to deliver surface water recognizing the long-term challenges associated with maintaining Homeowners Association-owned systems;
- Encourage the use of water marketing to meet current and future needs including the use of the Rental Pool and the Bank.

~~Municipal Water Rights Act of 1996~~

~~The Municipal Water Rights Act of 1996 is a tool available to municipal providers to secure water rights for growing municipal water demands based upon anticipated future needs.~~

Objective #6: Preserve and Protect Water Delivery Infrastructure

The integrity of the delivery system is vital to the optimal use of water in the Treasure Valley. The following actions recognize specific components of the water delivery

system that will ensure continued integrity
into the future:

- Support voluntary arrangements between irrigation entities and municipalities to ensure long-term maintenance of new residential irrigation systems;
- Seek funding from a diversity of sources;
- ~~Ensure~~Secure easements/access to canals for maintenance in face of growth;
- Continue to support considerations of security, both in terms of infrastructure and on water quality;
- Support the rehabilitation and modernization of water delivery infrastructure;
- ~~Explore opportunities to minimize fish entrainment in the canal systems;~~
- Inform ~~land-use entitlement and transportation authorities~~planning and zoning and road construction authorities at both the local and state level to help the irrigation community protect its easements and right- of-way to maintain the canals and ditches that provide irrigation water.

1.0 Executive Summary

In 2008, the Idaho Legislature passed House Bills 428 and 644, directing the Idaho Water Resource Board (IWRB) and the Idaho Department of Water Resources (IDWR) to conduct statewide comprehensive aquifer planning. The IWRB established the following goals for the statewide Comprehensive Aquifer Management Plan (CAMP) program:

- Provide reliable sources of water, projecting 50 years into the future
- Develop strategies to avoid conflicts over water resources
- Prioritize future state investments in water

In 2010, the IWRB appointed an Advisory Committee (Committee) to work with the IDWR to develop a plan to meet these goals for the Treasure Valley Aquifer System (TVAS), underlying Ada and Canyon counties and portions of Elmore, Boise, Gem and Payette counties in southwestern Idaho. A list of Committee members is included in Appendix 2. The TVAS is an integral part of the regional water resources that sustain economic growth and make the Treasure Valley an appealing place to live and work.

This Treasure Valley Camp has been developed with the following vision to meet the goals of the statewide CAMP:

- Respect for Idaho water law and water rights
- A sustainable framework of collaboration, cooperation, and stewardship, and
- A commitment to ongoing research, data collection, and analysis

2.0 Background

Meeting the demand for water, managing and improving water supplies, and avoiding and resolving disputes over water, are not new challenges in the Treasure Valley. The earliest and largest group of Boise River water rights were established during the late 1800's and early 1900's, have been adjudicated twice, and have been distributed by a Water Master for many years. Multiple water delivery organizations have been delivering water to lands throughout the Treasure Valley for 100 years or more. Surface water supplies have been improved through the construction and operation of a coordinated reservoir system that has extended the irrigation season and provided recreational opportunities to many generations of Treasure Valley residents.

The distribution of surface water has created and sustained a ground water supply that provides water for domestic and other uses throughout the Treasure Valley.

While surface water distribution and administration have matured through this long history, extensive ground water development and management are relatively new in the Treasure Valley. Recent rapid population growth in the Treasure Valley has dramatically increased the uses and demands for ground water. Aquifer levels have declined in some areas of the Treasure Valley. Several ground water studies have been performed and, since 1995, a moratorium order issued by the Director of IDWR has been in effect, which requires that new ground water applications be denied unless they include an acceptable plan to mitigate or avoid injury to existing water rights. Stakeholders, water professionals and administrators recognize the continuing need improve the understanding, management and administration of the TVAS.

The Treasure Valley water system is a complex system of dynamic hydrologic interconnection. The connection between these waters is a critical element in the location and availability of water to meet the needs of the Treasure Valley. Water use in upstream locations will likely be the contributes to ground and surface water supply for a different other water uses elsewhere in the basin. Although comprehensive studies have been undertaken, and continue today, the full extent of ground and surface water interactions is not fully understood. The contribution of surface water to the TVAS and the importance of aquifer discharge to drains and the Rivers does, however, require that management plan for the TVAS include consideration of the interconnection between ground and surface water.

2.1 Hydrology and Water Supply

The drainage area of the upper Boise basin is approximately 2,650 square miles and contains four major tributaries, including the North, Middle, and South Forks of the Boise River, and Mores Creek. From Lucky Peak Dam, the lower Boise River flows about 64 (river) miles northwestward through the Treasure Valley to its confluence with the Snake River. Snowmelt from the higher elevations of the upper basin provides an estimated 90 percent of the water supply for the Treasure Valley in the lower Boise Basin.

2.2 Hydrogeology

The TVAS underlies the lower Boise basin (Figure 1). The TVAS serves as the primary source of drinking water for Treasure Valley communities. The TVAS is a complex system of shallow,

intermediate, and deep aquifers (Figure 2). The depths and thicknesses of the aquifers vary and are controlled by geologic faulting, topography, and local land use characteristics (e.g., flood irrigation). The hydraulic communication between the various aquifers varies throughout the Treasure Valley adding to the complexity. Hydraulic connections to aquifers underlying areas to the north (Boise foothills to the Payette River) and to the east (Mountain Home Plateau) are currently not fully understood.

The Aquifer system in the Treasure Valley consists of:

- Shallow aquifers – These aquifers supply water to rural domestic and some irrigation wells. Shallow aquifers are generally in direct hydraulic communication with surface water features and form localized flow systems with the nearest surface water body. The shallow aquifers are generally unconfined (the water level represents the top of the saturated zone), and water levels are typically controlled by topography (e.g., the elevations of canals or drains).

- Intermediate aquifers – These aquifers supply water for domestic, irrigation, and municipal uses. The hydraulic communication between the intermediate aquifers and the surface water features of the valley is unknown.

- Deep aquifers – Municipal, industrial, and some irrigation wells typically draw water from deeper aquifers. The hydraulic communication between the deeper aquifers and the surface water features of the valley is limited due to the depths below land surface where the deeper aquifers are found. The deeper aquifers are generally confined (water levels rising above the depth of the water bearing zone), and flowing artesian wells exist within the Treasure Valley. The hydrology of the deeper aquifers is not fully understood.

2.3 Ground Water Flow Direction and Water Levels

The ground water flow direction in the TVAS is generally east to west and follows the course of the Boise River. In the southern portion of the TVAS, ground water flows to the south and discharges into the Snake River. Locally, ground water flow directions are dependent on the location (spatially) within the valley. Water level trends are a good indication of a stable storage of water in an aquifer system. Stable water levels generally indicate an aquifer storage that is in equilibrium.

In the late 1800s to the mid 1900s, water levels in the shallow aquifer rose significantly because of the development of the valley's surface water irrigation network and continued to rise until the aquifer system eventually reached equilibrium with the drains and river, as indicated by stable water levels. In general, water levels in the shallow aquifer system have remained stable and are controlled by the operation and elevation of the surface water features. Water levels in the intermediate and deep aquifers also appear relatively stable, but some areas of water level decline have been identified in the valley, particularly in the southeast Boise and Lake Lowell vicinities (Petrich and Urban, 2004).

There are existing mathematical models of the Treasure Valley aquifer of various ages and scopes; however they are not adequate to address aquifer management needs.

2.4 TVAS Ground Water Budget

The annual ground water budget for the TVAS varies from year to year. For illustration purposes, estimates for water year 2000 are used to show the components of the annual water budget for the TVAS because total precipitation and temperature during the 2000 water year were near normal.

The shallow aquifers of the TVAS are generally in direct hydraulic communication with the Boise River and to a lesser extent the Snake River throughout most of the Treasure Valley. The shallow aquifers discharge directly to the river and the ground water drainage network constructed in the Treasure Valley to drain shallow ground water from low-lying areas. It is estimated that over 80 percent of the TVAS total discharge enters the rivers and the drain network. Some of the drain water is also re-diverted and used for irrigation by downstream users. The amount of water leaving the TVAS through discharge to the drains, tributaries, or the rivers in 2000 was over 881,000 acre-feet (Urban, 2004).

2.5 Surface Water Flows

Unregulated natural flow volumes in the Boise River basin have varied from a low of 676,000 acre-feet annually to a high of 3.6 million acre-feet (MAF) annually. The average unregulated natural flow (1929 –2010) is 1.9 MAF annually. These volumes were calculated at Lucky Peak and are published by the U.S. Bureau of Reclamation (USBOR). On average 1.6 MAF annually are diverted for irrigation providing a significant source of recharge to the TVAS (BOR, 2007). Table 2 displays a summary of historical Boise River (Nov 1 – Oct 31) runoff (at Lucky Peak),

outflow (near Parma), and reservoir storage on November 1. Figure 3 shows the variation of runoff (at Lucky Peak) and November 1 storage from 1929 to 2010. The average annual basin outflow (1972 – 2010) is 1.1 MAF, with outflow volumes varying from 334,000 acre-feet annually to 2.8 MAF annually. The basin outflow is measured at the Boise River near Parma gage, which is operated by the U.S. Geological Survey (USGS) in cooperation with IDWR.

The remaining storage water left in the reservoirs (Arrowrock, Anderson, and Lucky Peak) at the end of an irrigation season is highly dependent on snowfall and irrigation demand for that season. The average reservoir storage on November 1 (1956 – 2010) is 390,000 acre-feet and has varied from a low of 65,000 acre-feet to a high of 665,000 acre-feet. The availability of this "carry over" water reduces the risk of a shortage of irrigation water in the succeeding year. Wise and efficient use of water from year to year helps to ensure better carryover storage for the next year, especially during consecutive dry years.

The hydrograph below (Figure 4) summarizes the historical data from the Boise River at Glenwood Bridge for the period of record (1982 – 2010). The U.S. Army Corps of Engineers (USACE) utilizes the Boise River gage at Glenwood Bridge to monitor and evaluate flood impacts on the river. Currently, flood stage as measured at the Glenwood Bridge gage is 10.01 feet (approximately 7,000 cfs). The maximum discharge since the completion of the reservoir system was 9,840 cfs on June 13, 1983 (USGS, 2011). Typical winter flow out of Lucky Peak (November – March) is approximately 250 cfs. Typical flow at Glenwood after the spring runoff and during the irrigation season (July – September) is approximately 1,000 cfs.

To meet irrigation demand, flows past Lucky Peak Dam average approximately 3,900 cfs during the irrigation season, which spans April through October. Natural flow in the lower Boise River is insufficient to meet irrigation demands throughout the irrigation season. The irrigation water supply is supplemented by a system of four reservoirs capable of storing approximately 1,000,000 acre-feet of water (as shown in Table 3), about one-half of the average annual inflow of the Boise River.Operation of the reservoir system, with the exception of Lake Lowell, is coordinated between the USBOR, which operates Arrowrock and Anderson Ranch, and the USACE, which operates Lucky Peak. By agreement between the two federal agencies, the storage system is operated as a unified system to maximize the storage and flood control capabilities of the reservoirs.

Extensive water distribution systems divert and deliver water from 75 diversions on the Boise River through approximately 1,170 miles of major irrigation canals (see Figure 8) to provide irrigation water to approximately 350,000 acres of land below Diversion Dam.

Approximately 195 miles of drains channel water out of low lying areas and 11 principle drain systems discharge into the Boise River. The drains were constructed to reclaim lands that became water-logged by seepage from canals and irrigated lands. Some of these drains were modified or expanded existing natural drainage systems that naturally flowed water only during the high spring runoff period. Some drains also serve as canals, providing additional irrigation water through re-diversion. Some drains flow year round because of ground water discharge. Ground water discharges to the drains fluctuate due seasonal changes, ground water withdrawals,

irrigation practices, recharge, drought, and other changes in the water budget. Studies are currently underway to better understand the drainage system and quantify seasonal and annual flows.

Below Middleton, there are often enough return flows from drains or direct ground water seepage into the river to satisfy existing irrigation demands. On average, there are approximately 310,000 acre-feet per year of gain in flow between the Middleton and Parma gages. These gains, 310,000 acre-feet, make up 28 percent of the 1,112,000 acre-feet of outflow from the basin near Parma. These base flows are an important part to efficiently deliver irrigation water in the Treasure Valley.

2.6 Climate Variability

Climate variability adds another element of uncertainty to planning for future water needs. The IWRB contracted with Boise State University to evaluate potential changes to water supply and demand that might result from climate variability on a watershed scale. There is a large range of uncertainty to climate model predictions; however, general trends are indicated. Multiple studies of climate change in the Pacific Northwest and northern Rockies estimate increases in mean monthly temperatures of 0.86 to 5.49 Fahrenheit for the 2040 irrigation season compared to the 1971 – 2010 temperature average (BOR, 2008, 2011).

Regional studies for the northwest United States indicate climate variability (floods and droughts) will be more severe and change the flow regime on which current hydrologic operating procedures are based. For example, temperature increasesmay cause fall and winter precipitation

to fall as rain instead of snow, resulting in earlier snow melt, higher peak flows that occur a few weeks earlier and lower stream base flows during summers with increased temperatures and evapotranspiration The Boise River basin may experience wetter wet years and drier dry years. Unless water storage capacity in the basin is increased, the increased water supplies during the wet years cannot be captured and held over for use during the dry years. Consequently, wet years will not offset dry years under the basin's current storage capacity.

2.7 Drought

During drought years surface water irrigation is supplemented with ground water by as much as 300,000 acre-feet, placing additional stress on the TVAS. The Natural Resource Conservation Service (NRCS) uses 1.5 MAF as the threshold for water supply shortages in the Treasure Valley. The most severe droughts occur when there are consecutive dry years when annual runoff and carryover storage are below normal. During the drought that occurred from 1987-1992, the Palmer Drought Severity Index (Figure 5) classified conditions as extreme drought for 28 of the 36 months that comprised the irrigation seasons in the Treasure Valley.

The primary response to drought in the lower Boise Basin is water right distribution and administration in accordance with the prior appropriation doctrine and the Stewart and Bryan Decrees. The Idaho Drought Plan (IDP) describes additional tools available to local communities to plan and mitigate for droughts. The IDP describes local government authorities to reduce their water use and raise funds for drought response. It also describes actions that can be taken by IDWR to increase water right supervision and enforcement, and to expedite processing of applications for replacement water supplies.

2.8 Water Use and Needs

Ninety-five percent of the Treasure Valley water use falls into one of two major categories: domestic, commercial, municipal, and industrial use (DCMI), and irrigation. While not always included in water-use estimations (Figure 9), water is used to recharge the aquifer, support the river and tributary biological systems, and provide delivery head to convey irrigation water (including conveyance losses). Some municipal and industrial systems implement aquifer storage and recovery techniques to store treated water off peak and re-pump during summer demand. Water leaving the Valley passes through downstream hydropower plants that generate low-cost electricity used in the valley.

In the Treasure Valley, 94 percent of the water for DCMI comes from ground water sources and six percent comes from surface water sources. Three percent of irrigation water comes from ground water sources and 97 percent comes from surface water sources. Per Capita daily use is approximately 160 gallons (WRIME 2010, USGS 2005).

There are over 23,500 domestic wells in the Treasure Valley. The single largest supplier of ground water is United Water Idaho, whose service area includes the City of Boise and part of Ada County. United Water is currently the only municipal supplier that also delivers treated surface water for DCMI uses. They serve a population of approximately 240,000. United Water produces about 45,000 acre-feet/year (32,000 acre-feet from ground water and 13,000 acre-feet from surface water) and regularly updates its water demand projections based on records of customer usage and modeling future growth. The other large suppliers are the Meridian Water Department (78,000 people served), City of Nampa (81,000 people served), and the City of Caldwell (46,000 people served). These three systems use ground water exclusively for supply.

The IDWR records show there are almost 30,000 total wells in the Treasure Valley. Ground water quality in the Treasure Valley Shallow and Treasure Valley Deep hydrogeologic subareas is regularly determined from data collected through the Statewide Ambient Ground Water Quality Monitoring Program. The Treasure Valley Shallow and Treasure Valley Deep subareas are located primarily in Ada and Canyon Counties and generally correspond to the Treasure Valley CAMP study area. USGS in cooperation with the IDEQ has performed a comprehensive survey of existing wells in the Treasure Valley CAMP study area from 1992 to 2000.

2.9 Water Quality

Water quality is an important characteristic in meeting future water needs in the Treasure Valley. Ground water in the TVAS is generally of good quality for drinking and other uses. Surface water quality is variable and has been impacted by both natural and anthropogenic sources. Overall, the water quality throughout the system could constrain the availability of water supplies to meet current and future water needs if the water quality is degraded.

The IDWR has statutory authority for statewide administration of the rules regarding well construction, licensing of drillers, and proper abandonment of wells in Idaho. Well construction standards are designed to protect the quality of water in the aquifer. Additionally, the IDEQ administers the Idaho Wellhead Protection Program to prevent the contamination of ground

water that is used for drinking water. The Idaho Wellhead Protection Program is voluntary for local government and water purveyors to implement.

2.10 Fisheries and Biological Flows

Native coldwater species, including trout and whitefish, inhabit the middle and upper reaches of the Boise River from Lucky Peak Dam to Star. Winter stream flows below Lucky Peak Dam are the largest constraint on fish populations. Prior to the 1990s, winter flows were often 150 cfs or lower, providing only marginal overwinter habitat for wild trout and other sportfish.

The USBOR holds 152,300 acre-feet of uncontracted storage space that it has used in consultation with the IDFG to provide flows in the Boise River below Lucky Peak Dam during the non-irrigation season. Storage releases have increased typical winter flows to 240 cfs, which requires approximately 86,000 acre-feet of storage for about 180 days. During drought periods, these flows have been reduced to avoid exhausting the winter storage supply. Since winter flows increased in the mid-1990s, wild trout populations have increased 17-fold, with an estimated 2,000 fish per mile in some reaches.

The Boise River is generally a gaining reach from Star to its confluence with the Snake River and therefore has good stream flows, but water temperatures can only seasonally support a cold-water fishery. This section of river supports a fair fishery for introduced sport fish, including largemouth bass, smallmouth bass, and channel catfish. The Lake Lowell fishery consists primarily of largemouth bass, smallmouth bass, yellow perch, black crappie, bullhead, bluegill, and channel catfish.

2.11 Recreation and Aesthetic Values

There are water recreation opportunities available from the upper reaches of the Boise basin, on each of the reservoirs, and on the Boise River below Lucky Peak. Boaters, fisherman, and waterfowl hunters access the lower Boise River from Lucky Peak Dam to the confluence with the Snake River. Floating the five-mile reach from Barber Dam to the center of Boise is especially popular in the hot summer months. Likewise, water skiing is popular on Lucky Peak Reservoir.

2.12 Hydropower

Hydropower is generated below the reservoirs at both federal and non-federal hydroelectric power plants. Federal reclamation power plants were constructed at Anderson Ranch Dam (40,000 kW) and Boise Diversion Dam (1,500 kW) as part of the development of the Boise Project. These power plants provide power to operate project facilities and to help reduce power costs to Project farmers who depend on pumping water for irrigation. In 1988, four of the five irrigation districts who make up the BPBC completed construction of a power plant at Lucky Peak Dam (101,250kW). Power generated at the facility is under contract with the Seattle Light Company. More recently in 2010, the BPBC completed construction of a hydropower facility on the Boise River at Arrowrock Dam (18,000 kW). Ada County owns a 3,700 kW power plant located at Barber Dam that is located just upstream of Boise. Upstream of the reservoir system the, Atlanta Power Company owns a 187 kW hydro power plant at Kirby Dam that supplies electricity to the town of Atlanta. A number of hydro plants have been constructed on canal drops in the Treasure Valley. Water leaving the Boise River basin enters the Snake River and continues to generate low-cost electricity at Idaho Power's Hells Canyon
Complex for Idaho Power customers in the Treasure Valley.

2.13 Anticipated Changes in Water Use

Water demand in the Treasure Valley is expected to increase, although there is no consensus on the amount as demonstrated by three recent studies. The USBOR projected in a 2006 assessment level study that annual consumptive water demand in the Boise basin could increase by as much as 124, 085 acre-feet by 2050. WRIME's detailed 2010 demand study determined that annual demands for water in the Treasure Valley would increase by 82,880 acre-feet by 2060. The IDWR staff estimates that new water demands and shortfalls in water supply for existing demands could result in a need for new annual water supplies of approximately 170,000 acre-feet.

New water needs are difficult to quantify because there are areas of uncertainty, along with many variables that will determine actual water use and need. Changing land uses and social attitudes, as well as economic conditions, are all factors that will affect water use in the Treasure Valley.

2.14 Water Right Administration

Water District #63 administers the distribution of surface water rights from the Boise River to over 330,000 acres within the Treasure Valley in accordance with state water law and court decrees. Average summer flows at Star vary with irrigation demand but 250 cfs is the target flow for the administration of water deliveries below Star. Surface water in the Boise River and its tributaries upstream from Star is considered fully appropriated during the irrigation season and during much of the rest of the year.

In 1995, the Director of the IDWR issued a moratorium order stating that new applications for water would be denied unless it included an acceptable plan to mitigate or avoid injury to existing water rights. The order also describes an area in which applications for ground water shallower than 200 feet below the surface would only be processed if they included mitigation measures or could show no adverse impacts to existing water rights.

Downstream from Star, surface water (as well as ground water) is available for new appropriation, but the actual amount will vary from year to year and season to season.

Following the completion of the Snake River Basin Adjudication (SRBA), it is expected that ground water rights may be included in a water district and conjunctively administered in priority. Conjunctive administration is the term used to describe administration of both ground water and surface water under a common system.

2.15 Water Markets

The Idaho Water Supply Bank (Bank) (Section 42-1761, Idaho Code), operated under the authority of the IWRB, includes **local Rental Pools** and the **State Water Supply Bank** through which natural flow and storage water rights can be made available for use by others.

Water rights not currently in use may be leased to the Water Supply Bank and then rented from the Bank by another water user for beneficial uses. Water rights leased to the Bank are protected from forfeiture. The Boise River drainage had the most activity in 2010 for leasing water rights into the Bank, but only 9% of these rights were rented back out for actual use (2010 Water Supply Bank Annual Report, IDWR).

The Water District #63 Rental Pool (Rental Pool) enables reservoir spaceholders to make stored water available to other entities and provides a source of revenue for Water District #63. The watermaster administers the Rental Pool under the guidance of the local committee. The Water District #63 Rental Pool has rented an average of 6,236 acre-feet over the past 8 years, excluding the USBOR-held uncontracted space. Use of the Rental Pool appears to be low compared with other rental pools in the state despite the rapid growth of DCMI uses in the basin.

3. Challenges, Priorities and Opportunities

Available ground water supplies are limited in some areas.

The potential for additional cost-effective ground water development in the Treasure Valley aquifer is limited in some areas. Ground water supplies are especially limited in southeast Ada County and the Lake Lowell area. There are also concerns about ground water levels in the north foothills.

Meeting water supply needs

Treasure Valley stakeholders will continue to meet new and on-going water demands over the next 50 years. Predicted climate change will change the timing of snowmelt and the availability of natural flow, increase summer temperatures, evapotranspiration and demand, and create new challenges and opportunities for water storage. Potental responses to these changes include improved water use practices and increasing reservoir storage capacity. The IWRB should support collaborative efforts to conduct wise, proactive planning with careful monitoring of demand increases and supply shortfalls to develop appropriate, timely, and economical water supply solutions.

Management of interconnected sources

Surface water and ground water are hydraulically connected. This interconnection presents a challenge for future management of surface and ground water rights, which historically have been managed separately. Further complicating this challenge is the recognition that while we understand that a connection exists, our understanding of the timing, extent, and location of the interconnected sources is limited and needs further study in order to provide effective management.

Water Marketing tools

The Boise River (Water District 63) Rental Pool, which facilitates marketing of reservoir storage water, has a lower level of activity when compared with the Payette and Upper Snake Rental Pools, despite the Treasure Valley having rapidly growing water needs. The Water Supply Bank facilitates marketing of natural flow and ground water rights. Bank records show that in the Treasure Valley there is considerable activity to lease water rights into the Bank, but little demand to rent water rights out of the Bank even with the Treasure Valley having rapidly growing DCMI water needs.

Additional data and Advanced technical capabilities to better understand and manage the TVAS

Although we understand a great deal about the regional hydrology, our information does not provide a full understanding of the localized interaction between ground and surface water, and between the shallow aquifer and deep aquifer. Knowledge is not sufficient to fully characterize the hydrologic system which results in difficulty predicting system responses to management actions. Historical hydrological records may not be sufficient for forecasting future conditions. Existing ground water models do not incorporate newer information or forecasts.

Ability of water infrastructure to meet existing and future needs

Mechanisms to protect the existing infrastructure of wells, canals, ditches and collection systems have existed for decades. It is important to retain this protection for the current and future benefit of the region. An additional challenge is the need to modernize existing infrastructure to optimize the beneficial use of water.

Maintaining quality of life

A continuing priority will be to preserve the quality of life in the Treasure Valley while responding to changing water supplies and water needs of Treasure Valley stakeholders.

Meeting environmental needs

A challenge over the next 50 years will be to conserve and protect the water resources in the Treasure Valley's streams and aquifers and the riparian habitat it supports, while providing the water supplies for the current and future use.

4. Recommendations

Guided by the CAMP goals and vision, the Committee identified several recommended actions for addressing the challenges, priorities and opportunities discussed in the previous section of this Plan. Understandably, these actions will need to be more fully refined during the implementation phase, but the Plan by adopting a mix of strategies represents a balanced approach. These actions have not been ranked or placed in order of priority.

Objective #1: Enhance TVAS Data Collection, and Analysis

Several types of data are needed to effectively manage the TVAS. Water planning and management tools should be developed and updated using accurate data and the best available science and analytical methods. Taking the following actions will improve the information and understanding required for successful water management and planning for the TVAS:

- Improve ground water measurement, models and technical tools to meet administrative purposes and to facilitate decision making;
- Support water supply modeling and stream flow monitoring.

Objective #2: TVAS Management and Planning

Improved data and understanding of the TVAS will facilitate the following management and planning actions:

- Reevaluation of the moratorium that has been in effect since 1995
- Support drought planning;
- Support efforts at assessing potential effects of water management strategies on the TVAS;
- Continue to increase transparency of planning process;
- Organize a periodic Water Forum ("Water Summit") to assess the state of the aquifer and discuss emerging issues and opportunities.

Objective #3: Additional Storage and Supply

Additional storage and other sources of water supply may be needed in the future to offset the increased variability of water supply and additional water demand. Because of the extended lead

time required for initiating storage and water supply projects, study of these projects should be continual. This will ensure the information is available when decisions need to be made. The following actions should be part of the evaluation of future supply options:

- Continue the study of the feasibility of potential surface water storage projects in a manner that comprehensively addresses supply options and avoids conflict;
- Investigate the feasibility of utilizing managed recharge for meeting future water demands;
- Support the exchange of the USBOR's salmon flow augmentation space in Lucky Peak (excluding stream flow maintenance) with replacement water supply consistent with the Nez Perce term sheet;
- Evaluate augmentation of existing cloudseeding programs as an option for increasing water supply.

Objective #4: Reducing Demand through Water Conservation

Consistent with state law supporting water conservation (section 42-250. Idaho Code) and protecting conserved water from forfeiture (section 42-223, Idaho Code), the following actions should be taken to conserve water and reduce demand for ground water from the TVAS:

- Promote education to encourage conservation;
- Encourage conservation and efficient use of ground water;
- Encourage conservation and efficient use of surface water, where a viable opportunity exists, taking into consideration the benefits of incidental recharge;
- Support efforts for retrofitting neighborhoods with pressurized irrigation;
- Encourage and support wastewater/gray water reuse in appropriate circumstances;
- Encourage or support incentives for conservation;
- Develop guidelines for conservation programs.

Objective #5: Potential Conversion of Water Use from Agriculture to Other Uses

Urbanization has changed some water demand from agricultural irrigation to residential irrigation and other uses. This trend is expected to continue into the future as additional growth occurs. The

intent of these actions is to ensure that irrigation water is available for residential use and irrigation entities continue to have financial viability and protection of infrastructure. Domestic irrigation provided through the canal systems is also beneficial because it reduces the amount of water that municipal water systems need to provide. The following actions should be undertaken to ensure orderly transition of water use from agriculture to DCMI and other uses:

- Continue to support the use of surface water on those lands that convert from agriculture to DCMI and other uses utilizing the existing irrigation entities;
- Support voluntary cooperative arrangements between irrigation entities and municipal providers to deliver surface water recognizing the long-term challenges associated with maintaining Homeowners Association-owned systems;
- Encourage the use of water marketing to meet current and future needs including the use of the Rental Pool and the Bank.

Objective #6: Preserve and Protect Water Delivery Infrastructure

The integrity of the delivery system is vital to the optimal use of water in the Treasure Valley. The following actions recognize specific components of the water delivery system that will ensure continued integrity into the future:

- Support voluntary arrangements between irrigation entities and municipalities to ensure long-term maintenance of new residential irrigation systems;
- Seek funding from a diversity of sources;
- Secure easements/access to canals for maintenance in face of growth;
- Continue to support considerations of security, both in terms of infrastructure and on water quality;
- Support the rehabilitation and modernization of water delivery infrastructure;
- Inform planning and zoning and road construction authorities at both the local and state level to help the irrigation community protect its easements and right- of-way to maintain the canals and ditches that provide irrigation water.

Miller, Neeley

From: David Monsees [dmmonsees@gmail.com]
Sent: Saturday, September 29, 2012 7:53 PM
To: iwrb-info
Cc: David the Elder Monsees
Subject: RE: State Planning Questions/Comments

Comment from David Monsees for the IWRB concerning CAMP:

I respectfully submit that the resolution on the last page of the Proposed Idaho State Water Plan be deleted from this document. A political resolution has no place in a planning document which should be based on good science and good management practices.

Also the document should not allow the construction of more dams which have done serious harm to the economy and ecological welfare of a state which once had a flourishing salmon industry. Dams are only temporary devices (they silt up) which cater to agriculture at the expense of other industries.

Water conservation should be a major priority which would include incentives and penalties. Encouragement never accomplished much of anything except to delay needed change. Efficient and enforced water conservation alone could take care of water needs for years to come, even with increased population.

Given global warming trends, a drought plan should be developed within one year from now.

Thank you for your consideration of these comments.

Dr. David M. Monsees
1123 N Watson Way
Eagle, Idaho 83616
ph: 202-669-6431

www.wildidaho.org
Idaho Conservation League
PO Box 844, Boise, ID 83701
208.345.6933

September 29, 2012

Idaho Water Resource Board
Submitted via email

Re: Comments on the Treasure Valley Comprehensive Aquifer Management Plan

Dear Chairman Uhling and members of the Board:

Thank you for the opportunity to submit comments on the Treasure Valley Comprehensive Aquifer Management Plan. Since 1973, the Idaho Conservation League has worked to protect Idaho's clean water, clean air, wilderness, and quality of life. As Idaho's largest state-based conservation organization, we represent over 20,000 supporters, most of whom live in the Treasure Valley. We submit these comments in the abiding belief that Idaho's water is arguably its most precious resource, and Idaho's future depends on proactive and smart water management.

ICL commends the Board for instigating the CAMP process in the Treasure Valley. Understanding that this collaborative process has meant years of long meetings and deep research, ICL is pleased to see that the outcome represents a multi-prong approach to securing the Treasure Valley's water future. More detailed written comments accompany this letter, however, we would like to emphasize our most important recommendations here.

First, ICL submits that the Implementation section of the TV CAMP should include a prioritized list of actions. Such direction is needed to keep the CAMP process moving and to prevent conflict.

Second, ICL submits that a definitive study of future demand be the CAMP's primary research priority. While it is accepted that we will have additional water use demands in fifty years, there is not consensus on the amount of water that will be needed. In order to meet its goal of providing reliable water sources fifty years into the future, the amount should be definitively determined. Other research priorities should include the hydraulic connection between ground and surface water, and the creation of a drought plan.

Finally, ICL submits that CAMP project priorities include mainstem diversion upgrades and automation, as well as local water conservation plans. Especially when contrasted against the construction of new storage projects, these projects are economical and easily implemented. Moreover, they will streamline water use, allowing Treasure Valley water managers and IDWR to know what our true water needs are.

Thank you again for the opportunity to comment on this very important process. Please feel free to contact me regarding any questions you may have regarding ICL's comments. I can be reached at mkellner@idahoconservation.org, or 208.345.6933 ext. 32.

Thank you,

Marie Callaway Kellner
Water Associate, Idaho Conservation League

Idaho Conservation League's Comments

ICL's comments are organized as follows: 1) overarching recommendations as related to the three CAMP goals, 2) substantive comments related to the body of the TV CAMP, and 3) suggested technical edits related to the body of the TV CAMP.

The Three General CAMP Goals

In keeping with the three general CAMP goals, ICL recommends the following:

Provide reliable sources of water projecting 50 years into the future

- As is highlighted in the CAMP at p. 20, anticipated future demand is not definitively known. In order to meet the CAMP's 50-year projection goal, a definitive study of anticipated future demand must be a priority of the CAMP. Arguably, this study should be the highest research priority of the CAMP as without a clear understanding of where and what our water needs are, the rest of our planning and management may be misdirected.

Develop Strategies to Avoid Conflicts over Water Resources

- Creation of a Drought Plan should be an utmost planning priority. Proceeding into an era of climate change without a written plan for how to proceed during drought begs for conflict between water users.
- Conjunctive management should be implemented. While conjunctive management will no doubt be a source of conflict between water users, it is the most accurate and responsible way to manage our water resources. The sooner it is implemented, the sooner water users can start to adjust to its implications. In order to implement conjunctive management, research of the hydraulic connection between our surface and groundwater should be a research priority.

Prioritize Future Investments in Water

- Funding for upgrades and automation of mainstem river diversions should be a priority. Diversion upgrades and automation will both result in the more efficient diversions and, thus, more efficient use of water.

Substantive Comments Related to the Body of the TV CAMP

Executive Summary

In its recommended actions section, the Executive Summary recommends the following action: "Investigate and support additional storage and supply." (p.2, col. 2) Especially as compared to the other stated recommended actions, the term "support" indicates that the storage option is the preferred alternative. This is not in keeping with the content of the Actions Needed section of the TV CAMP, which implies equal support for all the recommended actions. (p.26-31).

Executive summaries are intended to be brief introductions to the most important aspects of a report. By using the term "support" in this manner, the TV CAMP Executive Summary incorrectly leaves the reader with the idea that additional storage is the preferred alternative to all other conservation, planning and management measures.

Therefore, in order to properly reflect the tenor of the entire TV CAMP document, the term "support" should be deleted leaving the second recommended action on page 2 to read: "Investigate additional storage and supply."

Background and Current Condition

Drought, p. 10

In addition to the provided information about drought and its history in the Treasure Valley, the TV CAMP should 1) define drought, 2) provide anticipated drought plan details, 3) explain why no drought plan currently exists, and 4) make the creation of a drought plan a priority.

Challenges Associated with Distribution, p. 16

Ability of water infrastructure to meet existing and future needs.

- What are the mechanisms that have "existed for decades?" They need to be articulated.
- The statement: "It is important to retain this protection for the current and future benefit of the region" is not in keeping with the TV CAMP's other stated challenges. It is a value statement, whereas the other challenges are factual statements. This statement should be deleted, or, alternatively, the importance of retaining the current infrastructure should be explained.
- As the Treasure Valley grows and land use changes lead to more water use changes, ICL respectfully submits that water delivery needs will also change. What has served the valley for the past one hundred years may very well not be what best serves the valley in the next hundred years. Maintenance of the status quo should not be a goal unless it is determined that the status quo is truly the best option. As currently written, the TV CAMP and, particularly, this specific challenge do not sufficiently articulate why Treasure Valley water delivery should proceed under the status quo.

Challenges Associated with Water Use and Needs, p. 21

Meeting water needs and uses associated with future development patterns in a manner that minimizes conflict.

- This stated challenge highlights the need for a definitive study regarding future demand.

Maintaining Quality of Life.

- ICL commends the TV CAMP for acknowledging this challenge. While the Boise River's recreational and aesthetic values, along with the property value increases it provides, seem subjective, they are quantifiable. Statistical models exist which

quantify the relationship between rivers and real estate values, as well as rivers and their recreational benefits. In order to face this challenge head on, the enhancement to quality of life that the Boise River provides should be quantified.

Meeting Environmental Needs

- ICL commends the TV CAMP for acknowledging this challenge. However, while difficult to assess, the impact of diversions on the natural environment is arguably no more difficult to assess than any other challenge in the plan. This assessment should be a stated research goal.

Meeting Water Supply Needs

- While water storage proposals are a method of meeting water supply needs, they are not the only method. In order to meet the challenge of planning for currently unknown future water needs, we must efficiently manage our current water use as well as proactively plan for development. Voluntary measures will not be enough; local land use plans and planning & zoning commissions should be required to incorporate water use and development restrictions into their plans.

Actions Needed

Reducing Demand Through Water Conservation, p. 27

ICL is pleased to see this stated action and submits that it be the highest implementation priority. Not only would conservation measures result in the discovery of water to address anticipated future water needs, these efforts are cheaper, and more socially and environmentally palatable than the construction associated with storage reservoirs in the Boise basin. Additionally, all of these measures could provide opportunities for growth without requiring more overall water storage. Finally, many of the stated conservation measures can be implemented almost immediately.

Treasure Valley CAMP Implementation

In order to facilitate implementation, the Implementation section of the TV CAMP should have a list of project and research priorities. ICL submits that research priorities include 1) anticipated future demand in light of population and land use changes, 2) ground and surface water connections, and 3) creation of a Treasure Valley Drought Plan. ICL submits that project priorities include 1) mainstem diversion upgrades, 2) mainstem diversion automation, and 3) creation of local water conservation plans, including education and outreach ideas.

<u>Suggested Technical Edits to the Body of the TV CAMP</u>

p. 9, Col. 1, end of 1st paragraph: For readability and more accurate description, change "These base flows are an important part to efficiently deliver irrigation water…" to "These base flows play an important role in efficiently delivering irrigation water…."

p. 9 Col. 2, 2/3 down page: For accuracy of meaning, change "...evapotranspiration is expected to increase with increases in temperature." to "...evapotranspiration is expected to increase because of increases in temperature."

p. 13, Col. 2, 3d sentence, final paragraph: If I understand this sentence correctly, the term "create" seems more appropriate than "fix."

p. 14, Col. 1, 1st Sentence, 2d paragraph: For efficiency, delete the word "and" from the phrase "municipal and industrial."

p. 14, Col. 2, 1st full sentence: For clarity, insert a comma after the word "purposes"

p. 17, Col. 1, 1st sentence: For clarity, change comma to semi-colon after "(DCMI)"

p. 20, Col. 1, ½ down page:

- In the sentence which starts "In 1988, four of the five irrigation..." change the word "who" to either "which" or "that."
- For clarity and consistency in the next sentence, strike the phrase "More recently", leaving the sentence to read "In 2010, the BPBC completed..."
- Delete the comma in "Upstream of the reservoir system the, Atlanta Power..."

p. 22, Col. 1, 2d paragraph:

- The phrase that ends the first sentence--"currently subject to administration."--is superfluous and should be deleted.
- For clarity, in the second sentence, the word "under" should be changed to "pursuant to"

p. 22, Col. 2, top ½ of page:

- In the first full sentence, the word "help" should be "helps"
- In the second to last sentence, the word "are" should be "is"

p. 23, Col. 1, 1st full paragraph: For clarity and readability, insert a comma after the phrase "To date" in the final sentence.

p. 23, Col. 2, 1st full paragraph, 3d sentence: the word "it" should be "they"

p. 26, Col. 1, 1st paragraph, 2d sentence: For clarity, insert commas on both sides of the phrase "by adopting a mix of strategies"

p. 27, Col. 2, 1st paragraph: In the 3d sentence, which starts "The intent of these actions...", it is unclear what the word "these" refers to.

September 30, 2012

Idaho Water Resources Board
P.O. Box 83720
Boise, ID 83720

RE: TV CAMP

Dear Chairman Uhling and Idaho Water Resource Board Members:

Thank you for allowing the Sierra Club to participate in such an important process that could have far reaching affects upon the Treasure Valley.

The Boise River and the associated Treasure Valley aquifers are interrelated. What happens upstream and downstream on the Boise River is crucial to how the aquifers fare and consequently how they should be managed. An adequate amount of research has not been conducted to know the interrelationship between the River, the irrigation systems and the aquifers. Additional measuring, modeling, and monitoring should be conducted to better understand the complexities of the system.

The modeling should be carried a step further, and configure a drought plan for the Treasure Valley when sufficient surface water is not available. We live in a desert. The Plan should reflect what we, as a valley, are going to do when we have several years of inadequate precipitation in the nearby mountains. The Plan does not address a drought plan and should.

With such a valuable resource that water is, it should not be wasted. The Plan should provide more incentives for reducing water consumption and increasing efficiency of use by the general public, municipalities, industry and agriculture. Other cities and regions, often with higher annual precipitation values are way ahead of the Treasure Valley on their conservation and efficiency measures. Not that we have to keep up with other areas, but if the technology is out there, why not use it to better utilize our precious resource?

An adequate drought plan and conservation/efficiency measures would eliminate the need for additional surface storage. Dams are ecological disasters and extremely expensive to build and maintain. Conservation programs can be implemented much quicker and paid for at a mere fraction of the cost of a dam installation. Conservation/efficiency programs should be considered before dams. Dams considered on the Boise River would destroy prime bull trout habitat along with other riparian corridors. The Middle Fork of the Boise is a beautiful free flowing river for fishing, kayaking/rafting and enjoying time along the tree lined river. A dam constructed at Arrowrock would destroy miles of this prime river. Precipitation records indicate that only enough water would be available in one out of eight or ten years to fill such a structure. A dam being filled once every 8 or 10 years is not worth losing such a valuable resource upstream.

The Plan should be based on scientifically accurate information and ecologically sound principles to provide a clear path for future direction. More effort should be put into understanding the system, devising conservation and energy efficiency measures before a dam is considered.

Thank you for the opportunity to participate on the Advisory Committee and provide general comments.

Sincerely,

Idaho Chapter of the Sierra Club
503 W Franklin
Boise, ID 83702

Miller, Neeley

From: Aurele LaMontagne [aulamontagne@gmail.com]
Sent: Sunday, September 30, 2012 10:49 PM
To: TVCAMP
Subject: RE: Proposed Treasure Valley CAMP Public Comments

IDWR, I have read the CAMP document and there are a few things that stand out. It is clear that canal and irrigation companies greatly influence the flow of water in the valley and a portion of the IDWR budget. The Treasure Valley was no doubt named for its successful agriculture. However, the issue for the future is the lock-down on changing the use of water to municipal or any reduced usage. An example of this is the Municipal Water Rights Act of 1996 a piece of legislation that makes sense but it seams it may threaten a shift in control and the need for an irrigation company. In 2005 with Id. code 67-6537, it appears the need for irrigation ditches and canals will be maintained in the face of rampant speculative development that may otherwise change water rights into municipal water rights. IDWR has repeated in the CAMP that conversion of use is necessary and conservation is a good idea ("develop incentives to reduce demand"). However, with laws like 67-6537, concepts such as beneficial use (this is irrigation not environmental flows), and mandates such as full appropriation, conservation doesn't stand a chance and more storage will be required. Get tough on your own laws that limit IDWR's options for "adaptive management" and future water needs. Pass a law that is consistent with the development make sure that enough of the irrigation rights in new subdivisions and other developments match the municipal needs created by the development! If the Boise River is fully appropriated, and changing to domestic use actually reduces water use from irrigation as stated in CAMP, then we should have a declining need for water in the future!? Needs will change and exploration should be split between management, new sources, and changes to Idaho water law.

There is an interesting disconnect between the ground water and surface water on the use side but relative clarity on the recharge side as a contemporary and future water source in the water budget schematic; please hurry the adjudication so we can connect these sources on the use side and account for them properly.

As an avid fisherman I am encouraged by the amount of emotion, time, energy, and money that goes towards maintaining the quality of life in Boise; the Boise River being the keystone of it all. Word on the street is that if you want trophy trout, fish the New York Canal and if you cannot catch them, you can net them by the thousands when the canal is shut off. No screen on the new Whitewater Park diversion. Does IDFG know where its fish are? I think IDWR can can do more than "Explore opportunities to minimize fish entrainment in the canal system." Perhaps the CAMP could couple irrigation maintenance and expansion funding to include screens on future upgrades with a schedule to screen all existing canals.

The CAMP predicts about 80,000 AF more water will be needed by 2060. CAMP also shows 40,000 AF goes to salmon. The implication was clear, if the salmon get 40,000 then Boise needs more storage. Please do not propose a new storage facility under the veil of water for salmon. Just tell it like it is, and cite the laws that prohibit water conversion towards conservation and change of use. Then perhaps the public can try to change the laws and IDWR can add a very useful tool to its adaptive management toolbox.

In conclusion, irrigation and canal companies are an important part of the Treasure Valley's history and future. However, as Valley needs change so should the relationship with these companies. If they are to receive public (IDWR) support, legislative protections, and tax dollars, they need to become participants and partners in the change and IDWR needs to mandate it. Let's treasure the valley and make things like canal screens happen, provide flow related protections for the Boise River and advocating for laws that allow conversion of use from irrigation when and where it makes sense. Planning for more storage is necessary but construction is

inappropriate when it only feeds additional expanded "full appropriation" and is a work around for laws that do not allow water use to change and reduce in response to changing needs and sentiment.

Thank you for the opportunity to comment on CAMP.
Aurele Lamontagne

Comment # 26: IRU Recommendation card (w/o additional comment)

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

over

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments:

THE WATER BOARD NEEDS PAY ATTENTION TO THE WATER TO BOISE, WE NEED CLEAN WATER TO DRINK AND CLEAN FOR RECREATION.

Sincere ly,

Name: Bill Bennett

Address: 10589 N BLACKTAIL AVE

City: BOISE State: ID Zip: 83714

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments: My first memories of Boise involved the Boise River and the activities that surround it, center around it, and are supported by it. It brings joy to visitors and residents alike. It amazed me, compared to rivers I knew, how clean & bountiful it is.

Sincerely,

Name: Betsy Hamman

Address: 10601 Horseshoe Bend Road, #30

City: Boise State: ID Zip: 83714

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments:

The more I hear, the more I realize how important the Boise River is to the well being of all of us.

Sincere ly,

Name: Beth Heginbell

Address: 8268 W. Echo Falls Ln

City: Garden City State: ID Zip: 83714

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments:
Like to kayak the Boise.
Want to protect the river
at all costs.

Sincere ly,
Name: Liz McWhorter
Address: 2811 Hill Rd.
City: Boise State: Zip: 83703

16

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments:

Conservation should be emphasized through R+D, incentives &/or penalties & not supporting ~~for~~ a new dam!

Sincere ly,

Name: Marie Meyer

Address: 4201 N. ~~Boise~~ R Blue Wing

City: Boise State: Id Zip: 83714

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments: I have moved to Boise four times in my life and the river continues to get better. Do not let the progress stop. Mandatory conservation is the primary method to insure continued progress.

Sincere ly,

Name: Jerry Nielsen

Address: 4990 Lakes Edge Place

City: Garden City State: ID Zip: 83714

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments: United Water could offer incentives to reduce usage by offering rebates for low-flow toilets, showerheads or faucets. They could educate about Xeriscaping & have a Yard of the Month for low H_2O usage

Sincere ly,

Name: John & Anne Olden

Address: 6101 N Portsmouth

City: Boise State: ID Zip: 83714

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments: future

The economy of Boise must consider a sensible water management plan to protect the aquifer and the Boise River

Sincere ly,

Name: Marsue Smith

Address: 1311 Ada St

City: Boise State: ID Zip: 83702

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments:

This is NO JOKE!

Sincere ly, Harold L. Stiles

Name: Harold L. Stiles

Address: 506 No. 27th St

City: Boise State: ID Zip: 83702

Dear Chairman and members of the Idaho Water Resource Board,

Thank you for accepting this comment on the draft Treasure Valley Comprehensive Aquifer Plan. **The health of the Boise River and its companion aquifer are very important to me.**

Sensible water management will protect the Boise River and make our communities more resistant to drought and climate change.

- The Plan should put highest priority on research and the development of advanced water management and planning tools.
- The Plan should be strengthened by recommending adoption of incentives and penalties to reduce the waste of water.
- The Plan should not support continued study of a new water storage dam on the Boise River because a new dam would be unreliable and enormously expensive and damaging.

Additional comments: Since our Aquifer is the most important source of water for the Treasure Valley, please prioritize the research & development planning for a responsible water management plan :) I Do not support continued studies for future dams on the Boise River.

Sincere ly,

Name: Crystal White

Address: 1715 ½ Bannock

City: Boise State: ID Zip: 83702