Agenda and presentation material for NDWR stakeholder workshop on Conjunctive Management concepts and ideas for the Humboldt River Region

September 6, 2023 meeting:

Presenter/ Comment by	Type	Title	Approximate time
	NDWR Welcome		1:00 PM - 1:10 PM
Carlson, Severin	Presentation	NGM - Future conjunctive management in the Humboldt River region	1:10 PM - 1:35 PM
Hooper, Mark	Comment	Options to consider for conjunctive management	1:35 PM - 1:45 PM
Dixon, Jay and Mahannah, Chris	Presentation	Dixon et al. - Implications of PY based curtailments and CO style augmentation	1:45 PM - 2:20 PM
Ure Stix, Therese	Comment	SLO - USCID & other papers on conjunctive management	2:20 PM - 2:25 PM
Saito, Laurel	Presentation	TNC - Water rights retirement on the Humboldt River	2:25 PM - 2:50 PM
	Break		2:50 PM - 3:05 PM
Hodges, Bennie	Presentation	SLO - Conservation measures on the Humboldt River using retirement of water rights and seeking recommendations from schools of water management and conservation	3:05 PM - 3:25 PM
Hodges, Bennie	Presentation	SLO - Groundwater duty management as a conjunctive management tool	3:25 PM - 3:40 PM
Smith, Dwight	Presentation	SLO - Potential for ASR in Lovelock Valley	3:40 PM - 4:05 PM
Thiel, Tamara	Presentation	Taggart - ASR using floodwater in Paradise Valley/Winnemucca Farms	4:05 PM - 4:30 PM
	General Comment and Discussion session		4:30 PM - 4:45 PM

FUTURE CONJUNCTIVE MANAGEMENT OF THE HUMBOLDT RIVER REGION

ON BEHALF OF NEVADA GOLD MINES LLC

BY: KAEMPFER CROWELL

SEVERIN A. CARLSON

ALEX J. FLANGAS

ELLSIE E LUCERO

THE CORE OF CONJUNCTIVE WATER MANAGEMENT

- NRS 533.025: "The water of all sources of water supply within the boundaries of the State whether above or beneath the surface of the ground, belongs to the public."
- Although hydrologic connections can exist, it is important to remember that Nevada has recognized surface and groundwater as legally and hydrologically distinct sources for over 100 years.
- Conjunctive water management **aims to enhance overall water supplies and guard against drought**.
    - Private real property rights, water rights appropriations, and differing stakeholder interests complicate conjunctive water management, *but need to be considered and addressed*

THE PROPOSED CONCEPT

- Nevada's consideration of: **(1) social and economic, (2) legal, and (3) hydrological factors** to determine the operation of conjunctive ground-surface water systems.
- There is no advantage in using a model of a conjunctive ground-surface water system that includes considerable hydrologic detail but neglects legal and economic factors. Output from such a model is essentially worthless from the standpoint of obtaining an optimal (or even good) total system operation policy. Reza Maknoon et. Al, *Conjunctive Use of Ground and Surface Water*, 70 J. American Water Works Ass'n 419, 421 (1978).

IDENTIFY DESIRED OUTCOMES AKA GOALS

- The ultimate objective of successful conjunctive management is to coordinate water resource use in ways that **reduce exposure to drought, maximize water availability, protect water quality, and sustain ecological needs and aesthetic and recreational values** (See Bloomquist at 654).
- Achieve **equity among users** and enhance social well being (See Maknoon at 423). This necessarily requires consideration of economic and social goals and value.
- A zero sum approach where only one or a few stakeholders prevail does not result in conjunctive water management – the maximizing of all water resources while protecting against drought.
- Interested stakeholders in Nevada are numerous and include: mining, agricultural, municipal, industrial, tourism, environmental, wildlife, and aesthetic uses, among others – each with unique goals that need to be harmonized to achieve meaningful conjunctive water management.

NECESSARY STEPS & CONSIDERATIONS

- **First,** the State Engineer should engage stakeholders to identify their interests and desired outcomes (e.g. social and economic goals) for the Nevada Legislature's ultimate consideration.
- Of the many interacting parts of a conjunctive water management system, the physical characteristics are often relatively well understood – economic and legal aspects less so (*See* Maknoon at 421). Determining stakeholder goals is therefore imperative to this process and for a conjunctive water management to work.
- Without proper stakeholder engagement and consideration of goals, conjunctive water management could theoretically result in the knee-jerk curtailment of existing water rights, and thereby destroy economic and social well being of many (or even the majority) of stakeholders.
- The State Engineer should directly notice this process to all potentially affected holders of water rights (nearly 1000 permitted/certificated groundwater holders) in the Humboldt River Region.
- The State Engineer (as well as the Nevada Supreme Court) has a long history of obtaining stakeholder input and encouraging broad and direct notice to interested water rights holders. This is imperative to property identify stakeholder interests and desired outcomes.

NECESSARY STEPS & CONSIDERATIONS

- **Second,** in addition to identifying and harmonizing stakeholder desired goals, the State Engineer should wait until the long-promised regional groundwater models from the USGS/DRI, which have been described as "an important tool that will be used to demonstrate the effectiveness of different management strategies and possible administrative actions," have been published and are available for scrutiny, study and comment. See Order 1329.
  - It will be necessary to develop an efficient method to continue updating the model once it is published.
- The State Engineer should incorporate observed impacts (real world data) on a regular basis to enhance model accuracy.
  - Establish a process to revisit determinations after the model has been updated or enhanced with observed impacts.

NECESSARY STEPS & CONSIDERATIONS

- **Third**, after addressing stakeholders' social, economic, and hydrologic interests and goals, the Nevada Legislature would then have the necessary information to properly study and consider the issues.
- The Legislature may seek to amend the existing statutory framework to balance and meet those interests and goals, particularly since surface and groundwater have been managed as separate resources both scientifically and legally for over 100 years.
- The Nevada Legislature may consider how science should be applied to achieve the desired social, economic, and hydrologic goals in a manner that benefits all stakeholders, and direct the State Engineer accordingly.
- The Legislature may consider delegating authority to the State Engineer to enact conjunctive management regulations once it has set statutory social, economic, and legal goals.

OTHER CONSIDERATIONS

- Considerations that may aide in managing and developing the framework for conjunctive management include:
  - Tax Incentives to encourage behavior to support conjunctive water management
  - Mitigation – providing wet water mitigation and/or financial mitigation to avoid futile calls or curtailment
  - Incentives and/or penalties to encourage water efficiency and avoid waste
  - Voluntary agreements among stakeholders
  - Federally funded voluntary programs
  - Aquifer recharge/recovery storage
  - Water banking
  - Integrated planning

CONJUNCTIVE MANAGEMENT IN OTHER STATES

- None have successfully enacted a statewide system or policy of conjunctive management that could be inserted into Nevada's current statutory framework that would address the Humboldt River Region without further direct input from Nevada's Legislature.
- But in most cases, those states have spent years studying and understanding the complexity of their hydrologic resources and then designing their state systems to include transition tools to meet the needs of both surface and groundwater water users.
    - States, however, are unique when it comes to social and economic goals and priorities. As such, Nevada, through the legislative process needs to identify those social and economic goals and priorities in a manner that provides benefits to all stakeholders.

APPENDIX

- 1978 article *Conjunctive Use of Ground and Surface Water* from the Journal of American Water Works Association.
  - Dr. Reza Maknoon is a faculty member of the Civil and Environmental Engineering Department at Amirkabir University. Dr. Maknoon dedicates his teaching, research and ideas on sustainable water resource management. He holds a PhD from university of Washington, MS from University of Illinois and BS from Amirkabir University of Technology.
  - Steven J. Burges is a Professor Emeritus of Civil and Environmental Engineering at the University of Washington. His main focus is on hydrology, and hydrologic and water resources engineering. His work has covered the spectrum of surface water hydrology. He has worked on many topics of societal concern in water resources planning and management, particularly concerning uncertainties associated with flood and drought magnitudes, and water supply.
- 2001 article *Institutions and Conjunctive Water Management among Three Western States* from the Natural Resources Journal.
  - William A. Bloomquist is a Professor of Political Science and Adjunct Professor of Public and Environmental Affairs at Indiana University. He received his PhD from Indiana University. His academic interests focus on water resource management, institutional analysis, and public policy.
  - Tanya Heikkila is a Professor and Co-Director for Policy and Democracy at the University of Colorado, Denver. Professor Heikkila's research and teaching focus on policy processes and environmental governance. She is particularly interested in how conflict and collaboration arise in policy processes, and what types of institutions support collaboration, learning and conflict resolution. Some of her recent research has explored these issues in the context of interstate watersheds, large-scale ecosystem restoration programs, and unconventional oil and gas development.
  - Edella Schlager is a Professor at the University of Arizona. Her research focuses on comparative institutional analyses of water laws, policies, property rights, and compacts in the western US. She is particularly interested in the design and performance of polycentric systems of water governance and how well such systems of water governance adapt to changing environmental, legal, and social circumstances.

From: mark and kim hooper <markandkimh@gmail.com>
Sent: Friday, July 14, 2023 8:35 AM
To: Levi Kryder
Subject: Conjunctive Management Comments July…

Follow Up Flag: Follow up
Flag Status: Flagged

Conjunctive Management Comments July 14, 2023

Dear Sirs,

I am writing regarding the current discussions as to how to resolve/manage the ground water/surface water conflicts on the Humboldt river-the issue of "Conjunctive Management".

I am speaking only of the portion of the ground water withdrawal that is in conflict with surface water rights. I do believe that the concept of balancing perennial yield to groundwater withdrawal is sound, and if the well is geologically isolated from surface water flow, and therefore not impacting surface water flow, and therefore not generating any conflict, there does not need to be any further regulation, as long as the aquifer remains sound.

I have been involved in many discussions regarding this issue. These discussions include many meetings with the Humboldt River Basin Working Group, in Winnemucca Nevada, and as a alternate member from Elko County of the Humboldt River Basin Water Authority.

I am a surface water right holder myself, and have irrigated under the priority water right system that governs the surface water use.

Under the priority water right system, on some years I have enjoyed irrigation while water rights junior to mine in priority have not been able to irrigate.

On other years, I have been the one unable to irrigate, while watching other neighbors irrigate, because their rights were superior to mine.

Whether or not I get to irrigate is solely determined by the quantity of water available on any given year, and how far up the priority ladder that quantity will serve.

When this method of irrigation was established by the Bartlett and Edwards decrees, groundwater withdrawals were minimal. As groundwater withdrawals have increased, so has conflict, between groundwater withdrawals that affect surface water flow, and the existing surface water right holders. Acknowledging this conflict, and quantifying it, and remedying it have been the subject of the discussions that I have attended. I believe that the Division of Water Resources is earnest and well-meaning in their attempts to remedy this issue, and conversations have been productive.

However, the hard fact is, that the surface waters (the water "pie") were already fully adjudicated before groundwater withdrawals began, and there is no way to make more "wet water", than what mother nature provides on an annual

basis. Another hard fact is, with the current complete adjudication of the surface water, any individual wishing to obtain another/more surface water rights, would certainly be denied.

Therefore I believe, that to the extent that groundwater withdrawal impacts surface flow, and creates conflict, that groundwater withdrawal must be acknowledged, and accounted for.

Individual Actions-

I believe that an irrigator, who is junior on the priority table, such as a groundwater user, could address this conflict with the surface water right holders, by buying and transferring surface water rights to his operation. I believe the law already calls for this, in a similar fashion, with land developers, who must provide a source of water to serve the proposed subdivision.

I also believe that conservation could play a role. More efficient irrigation methods could be used, by either surface or ground water users. The water saved by the investments of these individuals could then be traded/sold to other individuals who need better water availability or to reduce their conflict.

Adjustments between individuals would allow reduction of conflict in an economically efficient manner.

Collective Action-

Given the large flow variation on the Humboldt River from one year to the next, water storage is always discussed. Due to the cost/environmental/evaporation problems with surface water reservoirs, underground water banking seems to be the preferred method. By storing a portion of excess water in years when it occurs, the water “pie” could be kept more constant from one year to the next.

To a large extent, the value of land is affected by the quality of its water right, and this quality includes the priority date of the water right, since the earlier Water Rights enjoy irrigation on a more consistent basis than later Water Rights. Allowing ground water wells to simply “siphon off” some of the surface flow affects the existing surface rights holders, and should be acknowledged and remedied.

Thank you for the opportunity to comment.

Sincerely,

Mark Hooper

Mark

Colorado Style Augmentation & Implications of Perennial Yield Based Curtailments in Nevada

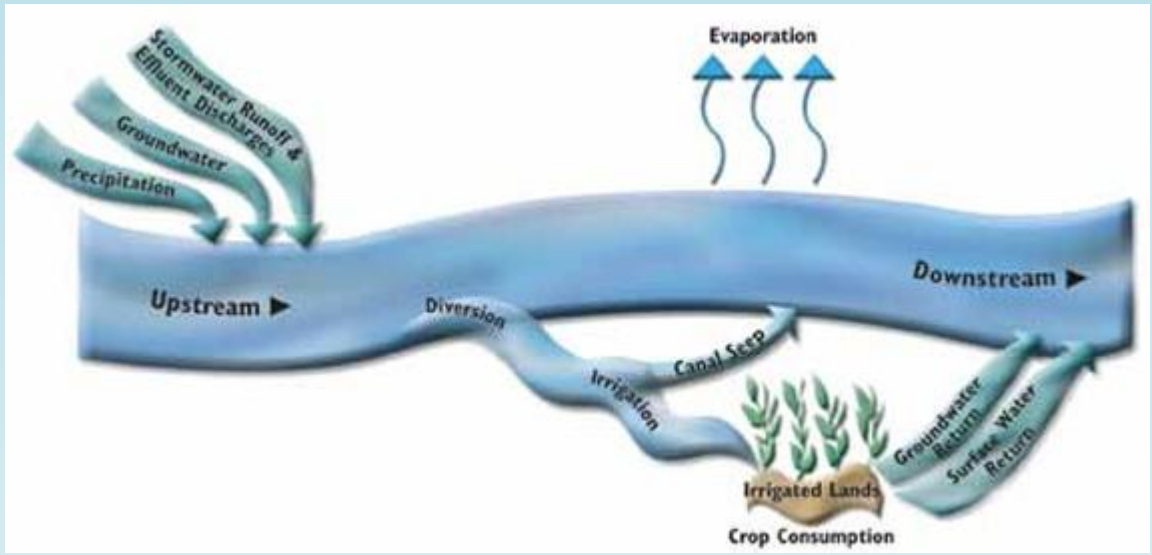
JAY DIXON, PE, WRS
CHRIS C. MAHANNAH, PE, WRS

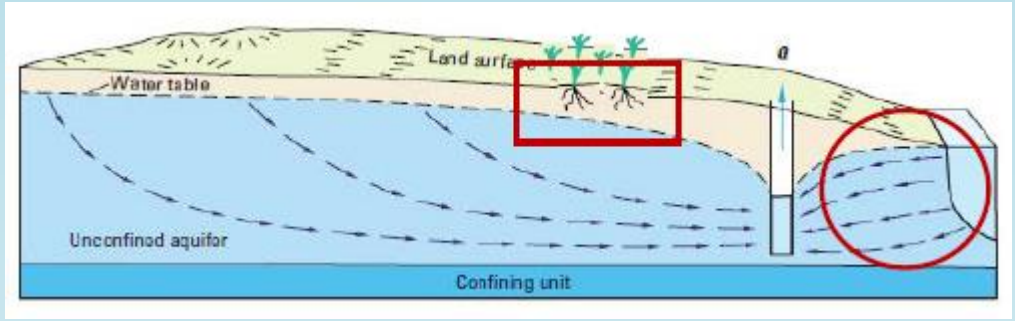
Q&A WITH: JON ALTENHOFEN, PE
NORTHERN COLORADO WATER CONSERVANCY DISTRICT

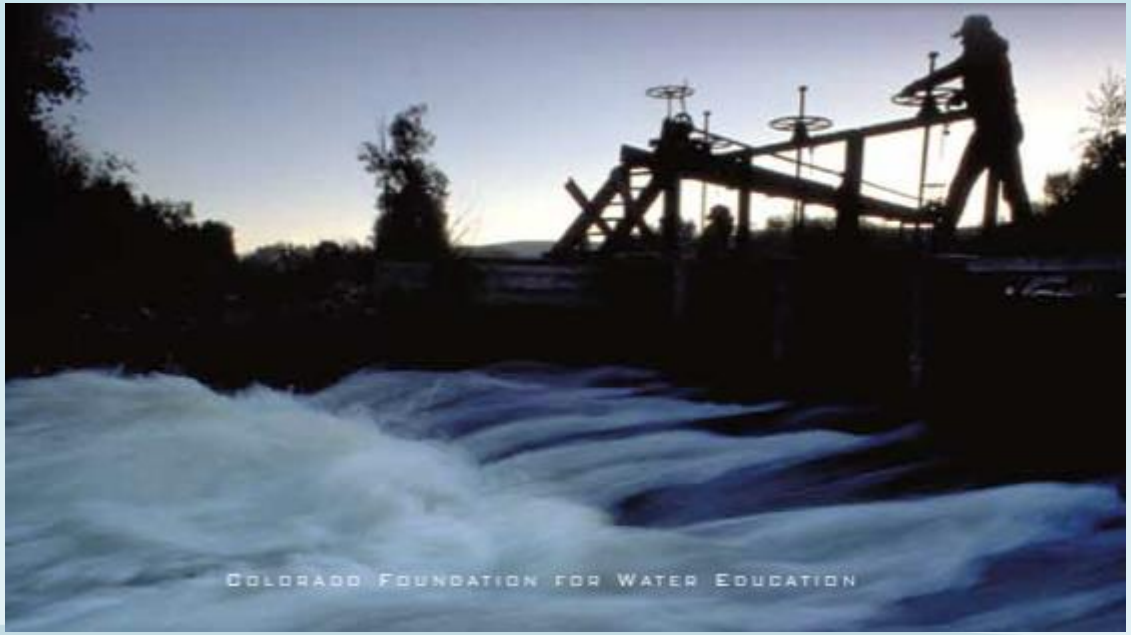
September 6, 2023

NDWR Conjunctive Management Workshop

Colorado







Colorado Foundation *for* Water Education

Colorado Conjunctive Use Simplified Definition:

"Conjunctive use is the maximum utilization of surface water and tributary groundwater without injury *to other water rights."*

Maximum is always paired with non-injury

What is a Colorado augmentation plan?

- *Allows the junior priority diversion to operate without injury to senior water rights*
- *Augmentation plans allow for flexibility & maximum utilization of water while protecting senior water rights in over appropriated stream systems throughout Colorado*
- *Plans must be approved by a decree of the water court*

Colorado Water Law and Water Courts

- 1969 Water Right Determination and Administration Act integrated tributary/alluvial groundwater and surface water use.
  - ✓ **Tributary defined as > 1/10th of 1% surface water capture after 100 years of pumping**
- 1969 Act allowed Plans for Augmentation—a plan to replace the out-of-priority depletions of a junior water right in **time, place and amount**[1].
- During the 2000 decade (while experiencing severe drought), process and requirements for groundwater augmentation plans expanded.

[1] Same criteria is in CNRWA & HRBWA Conjunctive Management Policy: https://cnrwa.com/wp-content/uploads/2022/07/CNRWA-conjunctive-management-policy-6_17_22.pdf

Colorado Alluvial Wells & Augmentation Plans

- Primarily drilled between 1930's and 1970's
- Large capacity wells pumping from alluvial aquifer
- Made part of "Priority System" in 1969
- Must be part of Court approved Augmentation Plan – per Supreme Court Ruling

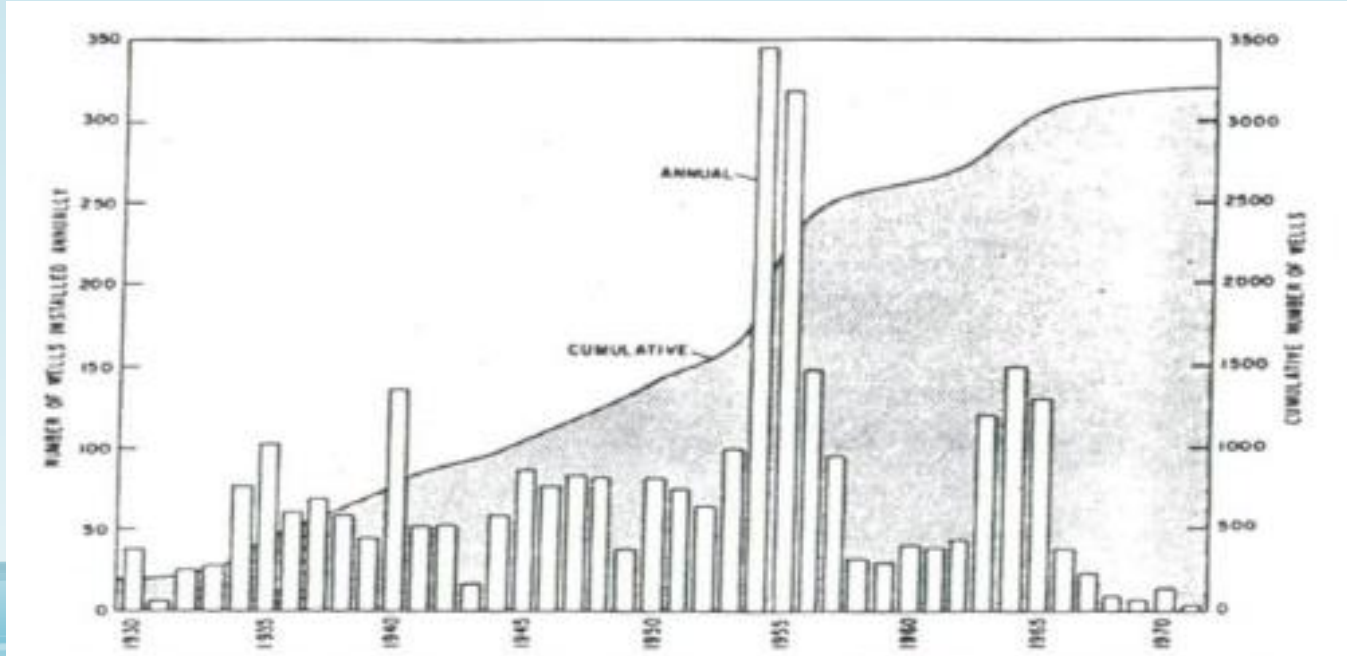
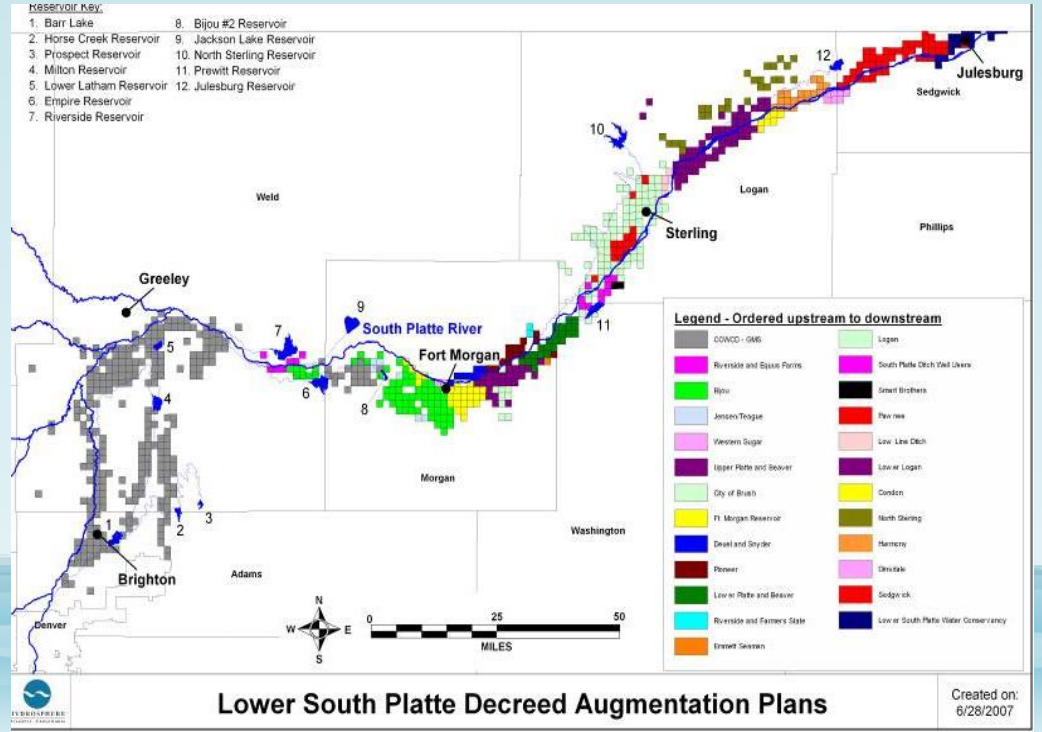
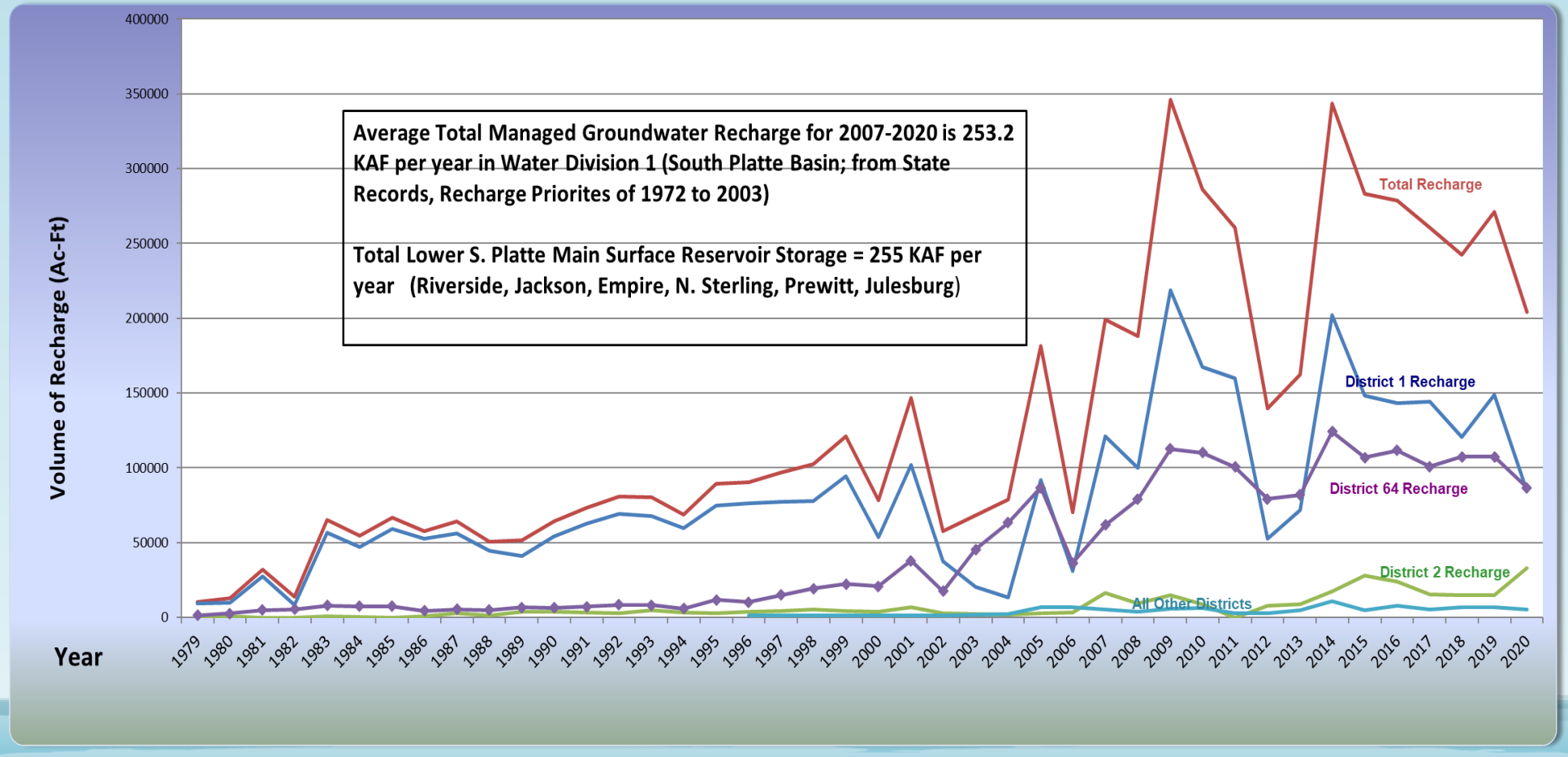


Fig. 2. Annual installation and cumulative number of irrigation wells in the South Platte River valley study area



South Platte Recharge Volumes:

- ~1,000 recharge ponds



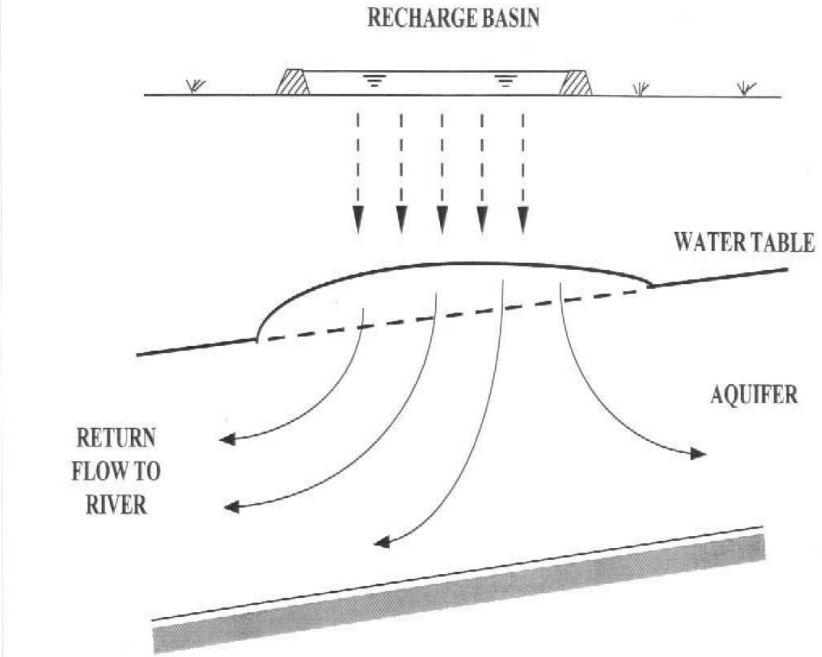
Augmentation Challenge – Maintenance of Historic Return Flows

Replacement of "out of priority" junior well depletions to a downstream senior (calling) right in time, location, and amount

- Passive Augmentation Supply – Less Control on augmentation credit at the river
  - Managed Groundwater Recharge

- Active Augmentation Supply – More Control over augmentation credit at the river – BUT cause an additional depletion/return flow replacement
  - Augmentation Wells
  - Reservoir Release to River
  - Ditch Bypass at River Headgate

Managed Groundwater Recharge

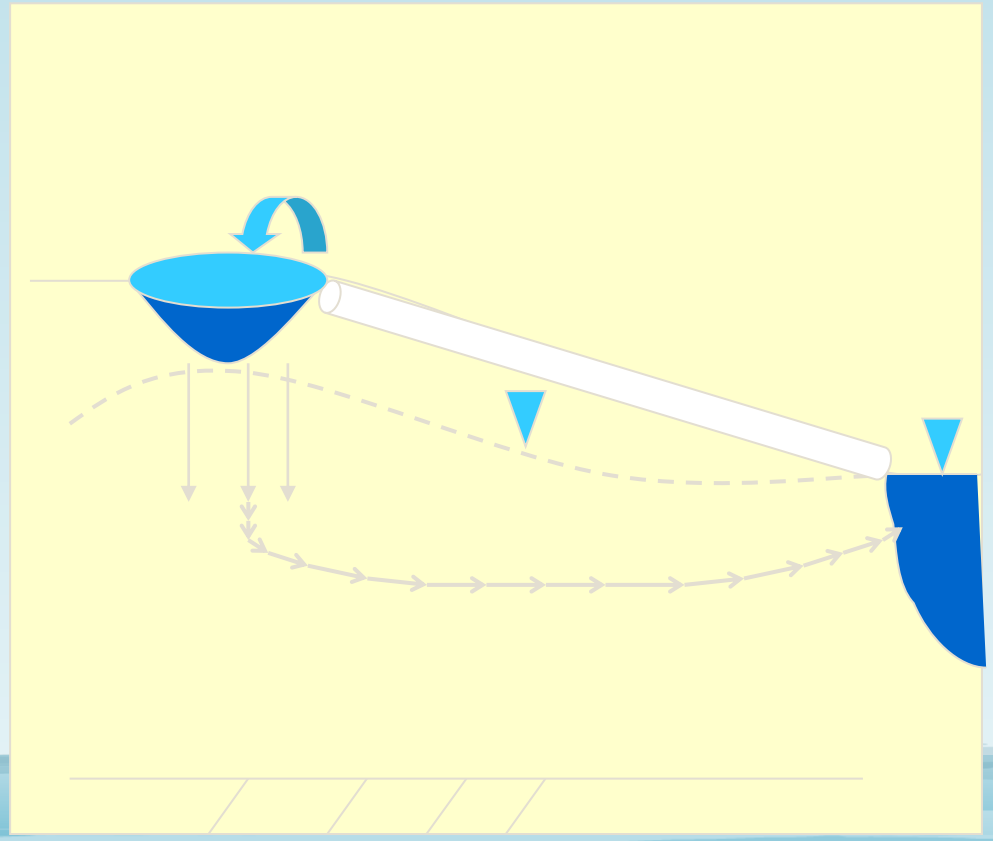


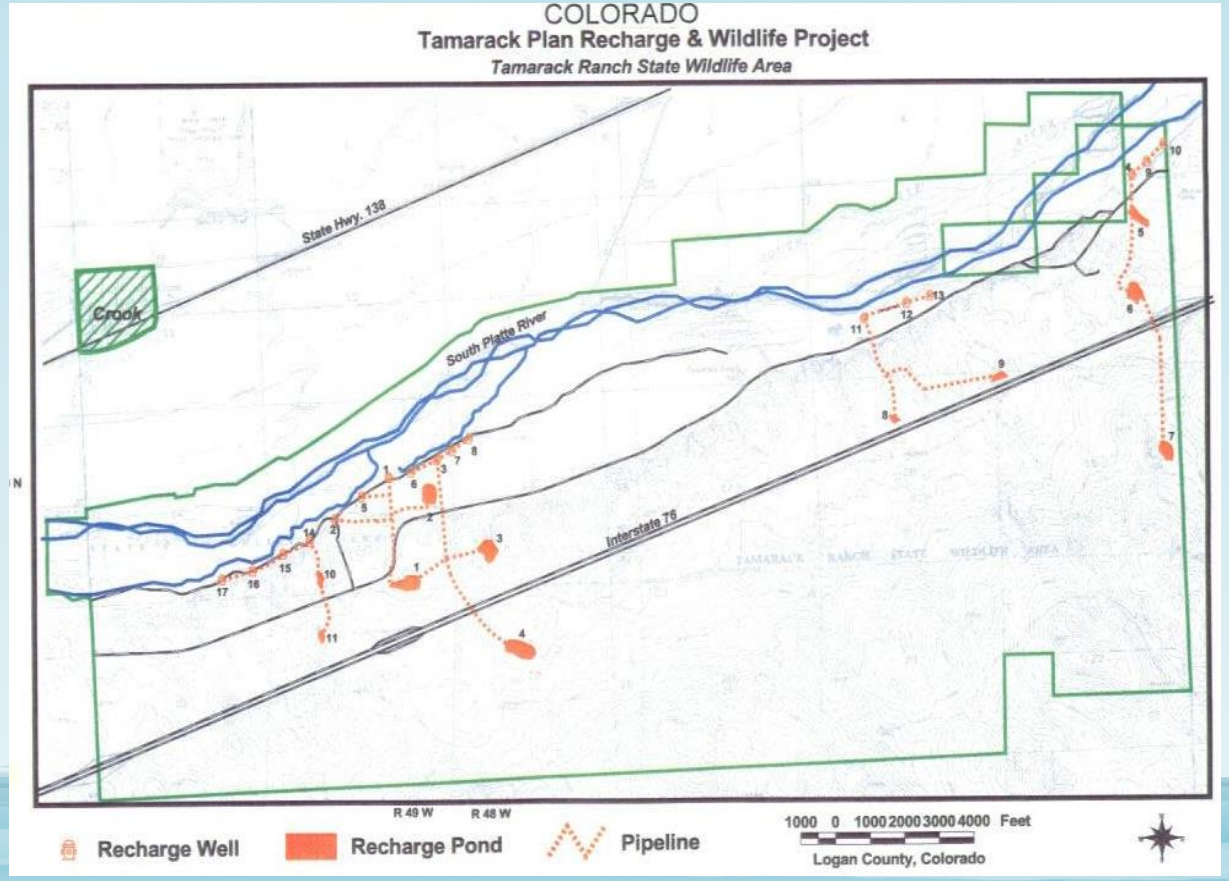
Effects of Groundwater Recharge
(both managed and unmanaged)

Managed Groundwater Recharge Site

How Groundwater Recharge for Stream Augmentation Works:

Retiming of excess river flows through aquifer storage, and return flows to the river during low river flows when increased demands.



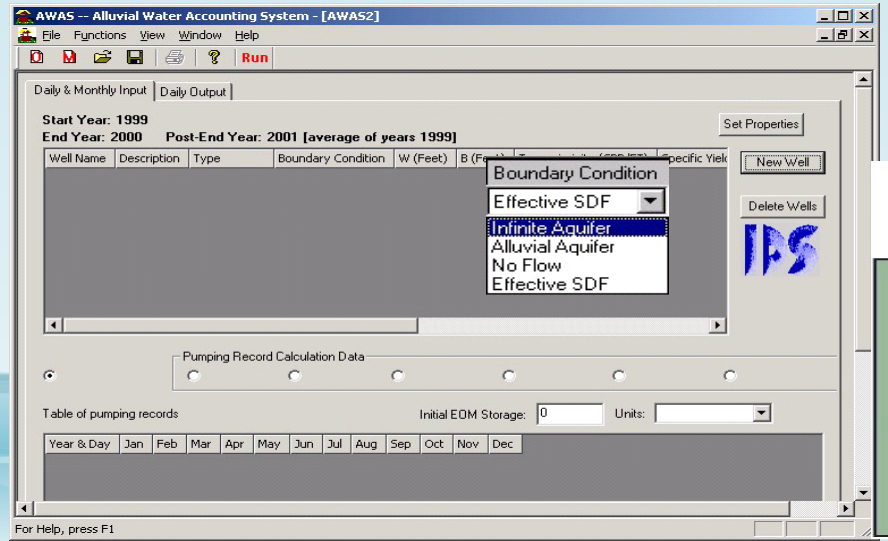


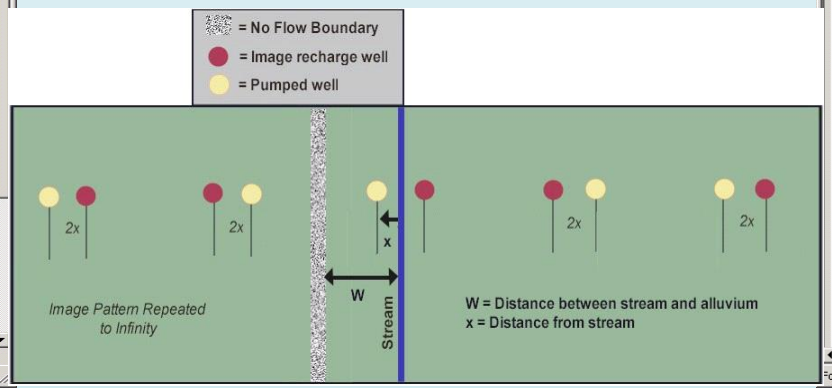
Active Augmentation Wells

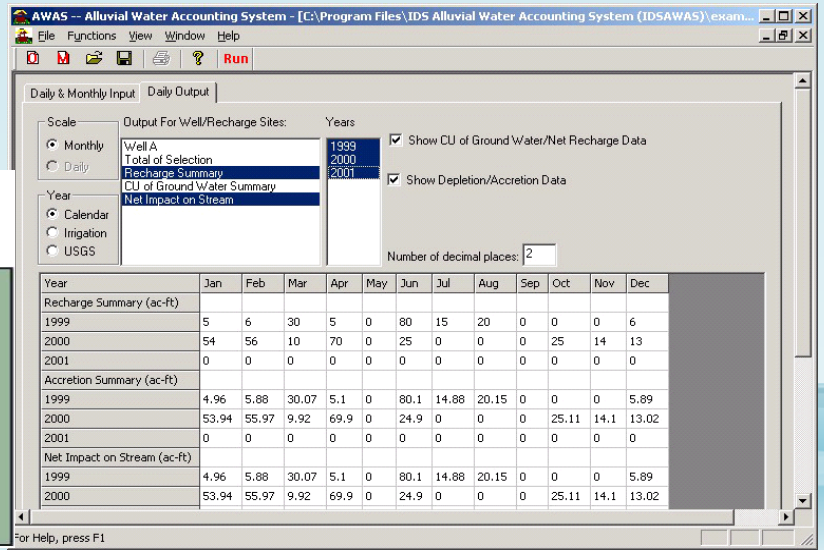
- Implement augmentation wells that are far from the river, which pump by pipeline or ditch/stream that flows back to the river for immediate augmentation and …
- Take on a future depletion obligation, but that's a small amount spread out over decades into the future where these augmentation wells are distant from the river.
- Republican River Conservation District: $72M locally funded 42 in – 13 mi pipeline to comply with CO, KS & NE compact & delivers 25,000 AFA to river: Compact Compliance Pipeline - Republican River Water Conservation District

Timing of Groundwater Capture and Return Flows from Augmentation

- Glover Method – analytical solution
- Stream Depletion Factors (SDF) – analytical w/ GW modeling to account for varying boundary conditions & aquifer properties
- Unit Response Functions (URF) – depletion curve for 100 AF of pumping developed from GW modeling
- Alluvial Water Accounting System (AWAS): http://www.ids.colostate.edu/projects.php?project=awas/awas.html Recharge_as_Augmentation_in_SP.pdf (colostate.edu) – 1994, Altenhofen, et al







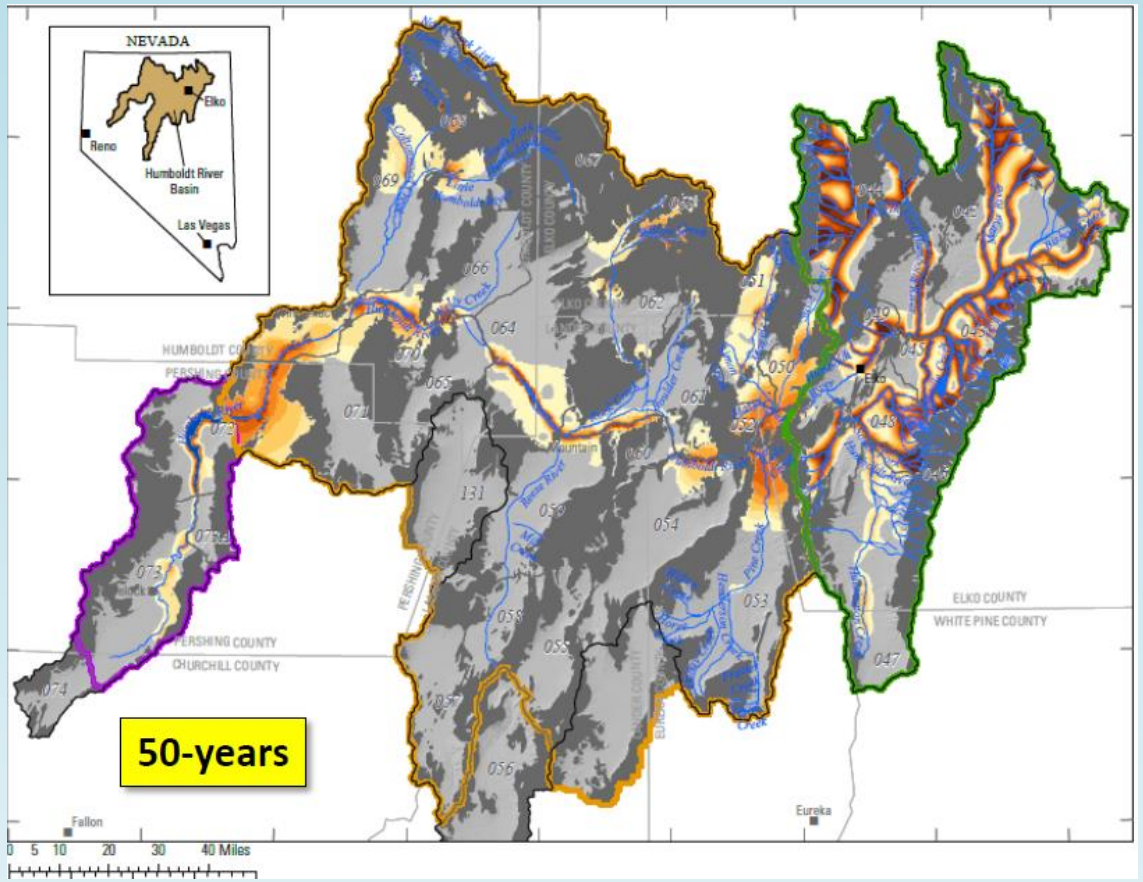
Deficit Irrigation

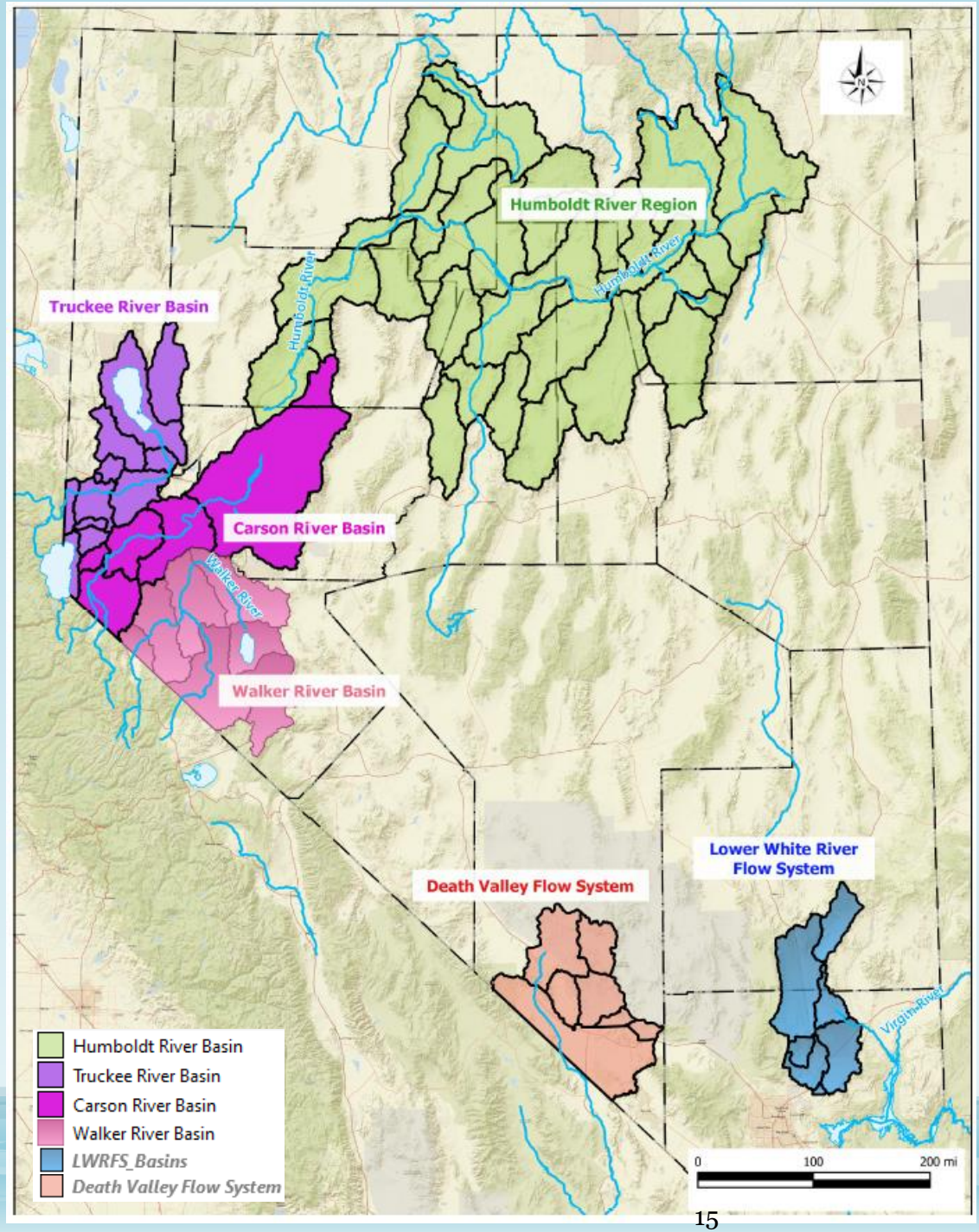
- Augmented Deficit Irrigation (ADI) reduces CU/ET
  - Need Augmentation plan to maintain historic return flows
- Saved Consumptive Use (CU) conserves existing water supplies for trade/exchange/storage/recharge
- Conserved CU firms water supply & can be likened to new water storage
- Viable option to 'buy & dry' or fallowing
- Works on grain crops:
  - Growth periods where water stress is tolerated thru vegetative stage: Grain Corn: 80% yields w/ 60% of ET
  - Doesn't work on vegetative crops (alfalfa) where a direct relationship between ET and yield
- Agronomic practices:
  - Drought tolerant varieties
  - Low frequency deficit irrigation (LFDI)
  - Tillage practices: increased organic matter / sponge effect
  - Twin row planting

Colorado User Organizations

- Central CO Water Conservancy GW Management District
- GW Appropriators of the S. Platte River Basin (GASP)
- Charge membership fees to develop augmentation plans:
  - Admin Fee: $150/ well
  - Well Depletion Fee: $30/AF
  - Recharge Accretion Fee: $25/AF
- Recharge Accretion fees paid to individual farmers or ditch companies doing the recharge

Nevada


NEVADA
Elko
Reno
Humboldt River Basin
Las Vegas
50-years
ELKO COUNTY
WHITE PINE COUNTY
PERSHING COUNTY
CHURCHILL COUNTY
Fallon
Eureka
0 5 10 20 30 40 Miles


Humboldt River Region
Truckee River Basin
Carson River Basin
Walker River Basin
Lower White River Flow System
Death Valley Flow System
Humboldt River Basin
Truckee River Basin
Carson River Basin
Walker River Basin
LWRFS_Basins
Death Valley Flow System
0 100 200 mi

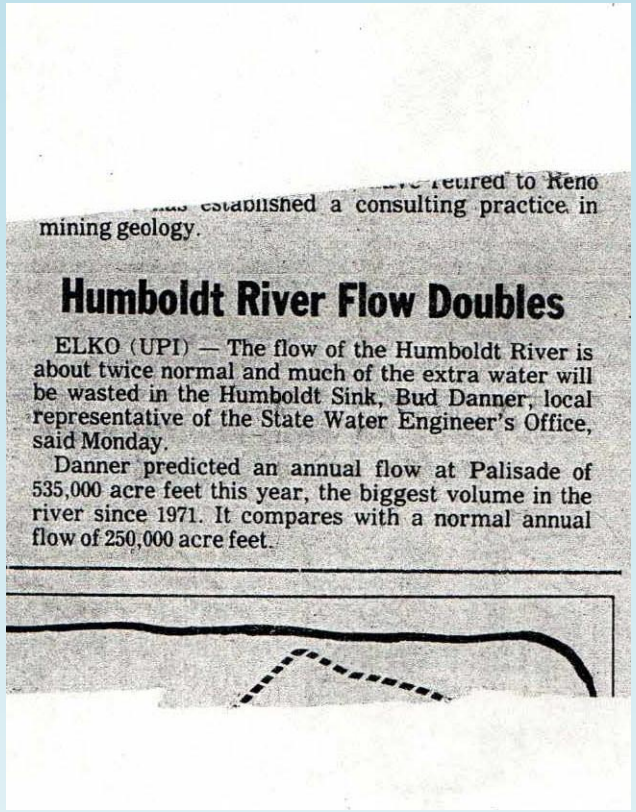
Snapshot of the Problem…

~206 pivots x 1000 gpm/pivot = 206,000 gpm ~ 460 cfs

or

~206 pivots x 130 ac/pivot x 3.4 af/ac NIWR ~ 91,000 afs

Is There Any 'Excess' Water for Augmentation in the Humboldt Region??

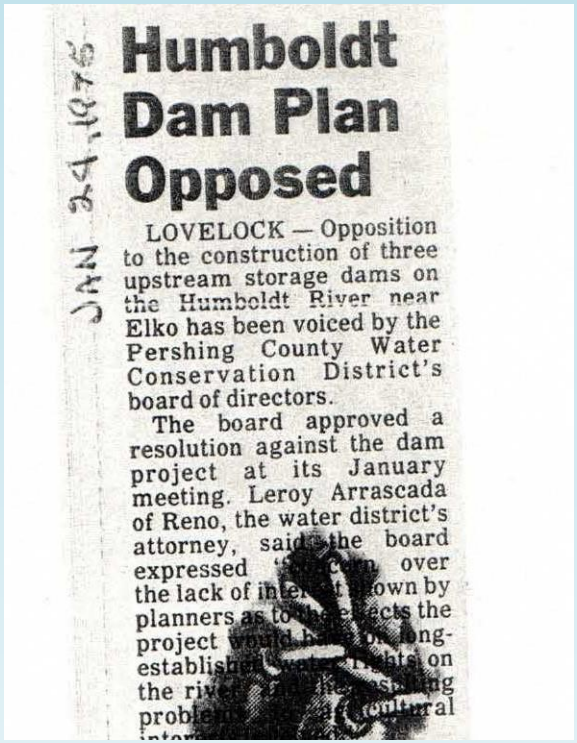


...retired to Reno ...established a consulting practice in mining geology.

Humboldt River Flow Doubles

ELKO (UPI) — The flow of the Humboldt River is about twice normal and much of the extra water will be wasted in the Humboldt Sink, Bud Danner, local representative of the State Water Engineer's Office, said Monday.

Danner predicted an annual flow at Palisade of 535,000 acre feet this year, the biggest volume in the river since 1971. It compares with a normal annual flow of 250,000 acre feet.

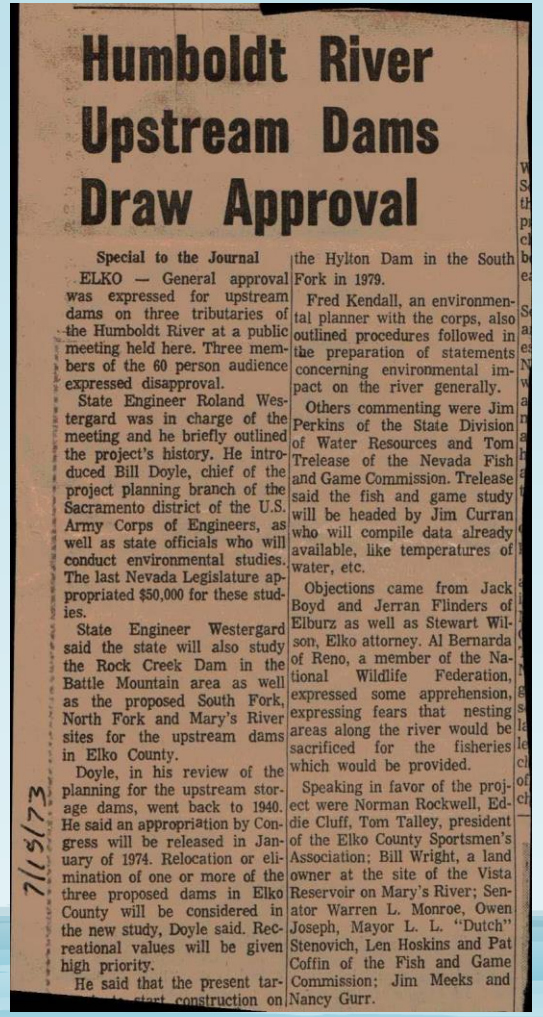


JAN 24 1975

Humboldt Dam Plan Opposed

LOVELOCK — Opposition to the construction of three upstream storage dams on the Humboldt River near Elko has been voiced by the Pershing County Water Conservation District's board of directors.

The board approved a resolution against the dam project at its January meeting. Leroy Arrascada of Reno, the water district's attorney, said the board expressed ... over the lack of in... shown by planners as to ... affects the project would ... long-established ... rights on the river ... problems ... cultural



7/5/73

Humboldt River Upstream Dams Draw Approval

Special to the Journal

ELKO — General approval was expressed for upstream dams on three tributaries of the Humboldt River at a public meeting held here. Three members of the 60 person audience expressed disapproval.

State Engineer Roland Westergard was in charge of the meeting and he briefly outlined the project's history. He introduced Bill Doyle, chief of the project planning branch of the Sacramento district of the U.S. Army Corps of Engineers, as well as state officials who will conduct environmental studies. The last Nevada Legislature appropriated $50,000 for these studies.

State Engineer Westergard said the state will also study the Rock Creek Dam in the Battle Mountain area as well as the proposed South Fork, North Fork and Mary's River sites for the upstream dams in Elko County.

Doyle, in his review of the planning for the upstream storage dams, went back to 1940. He said an appropriation by Congress will be released in January of 1974. Relocation or elimination of one or more of the three proposed dams in Elko County will be considered in the new study, Doyle said. Recreational values will be given high priority.

He said that the present tar... start construction on the Hylton Dam in the South Fork in 1979.

Fred Kendall, an environmental planner with the corps, also outlined procedures followed in the preparation of statements concerning environmental impact on the river generally.

Others commenting were Jim Perkins of the State Division of Water Resources and Tom Trelease of the Nevada Fish and Game Commission. Trelease said the fish and game study will be headed by Jim Curran who will compile data already available, like temperatures of water, etc.

Objections came from Jack Boyd and Jerran Flinders of Elburz as well as Stewart Wilson, Elko attorney. Al Bernarda of Reno, a member of the National Wildlife Federation, expressed some apprehension, expressing fears that nesting areas along the river would be sacrificed for the fisheries which would be provided.

Speaking in favor of the project were Norman Rockwell, Eddie Cluff, Tom Talley, president of the Elko County Sportsmen's Association; Bill Wright, a land owner at the site of the Vista Reservoir on Mary's River; Senator Warren L. Monroe, Owen Joseph, Mayor L. L. "Dutch" Stenovich, Len Hoskins and Pat Coffin of the Fish and Game Commission; Jim Meeks and Nancy Gurr.

Implications of Perennial Yield Based Curtailments…

'… half of our basins are over appropriated, half of those are over pumped, wouldn't it be beneficial in easing conflicts if we brought those basins back into alliance with their PY, maybe we should start looking at the easiest fix first and foremost…'

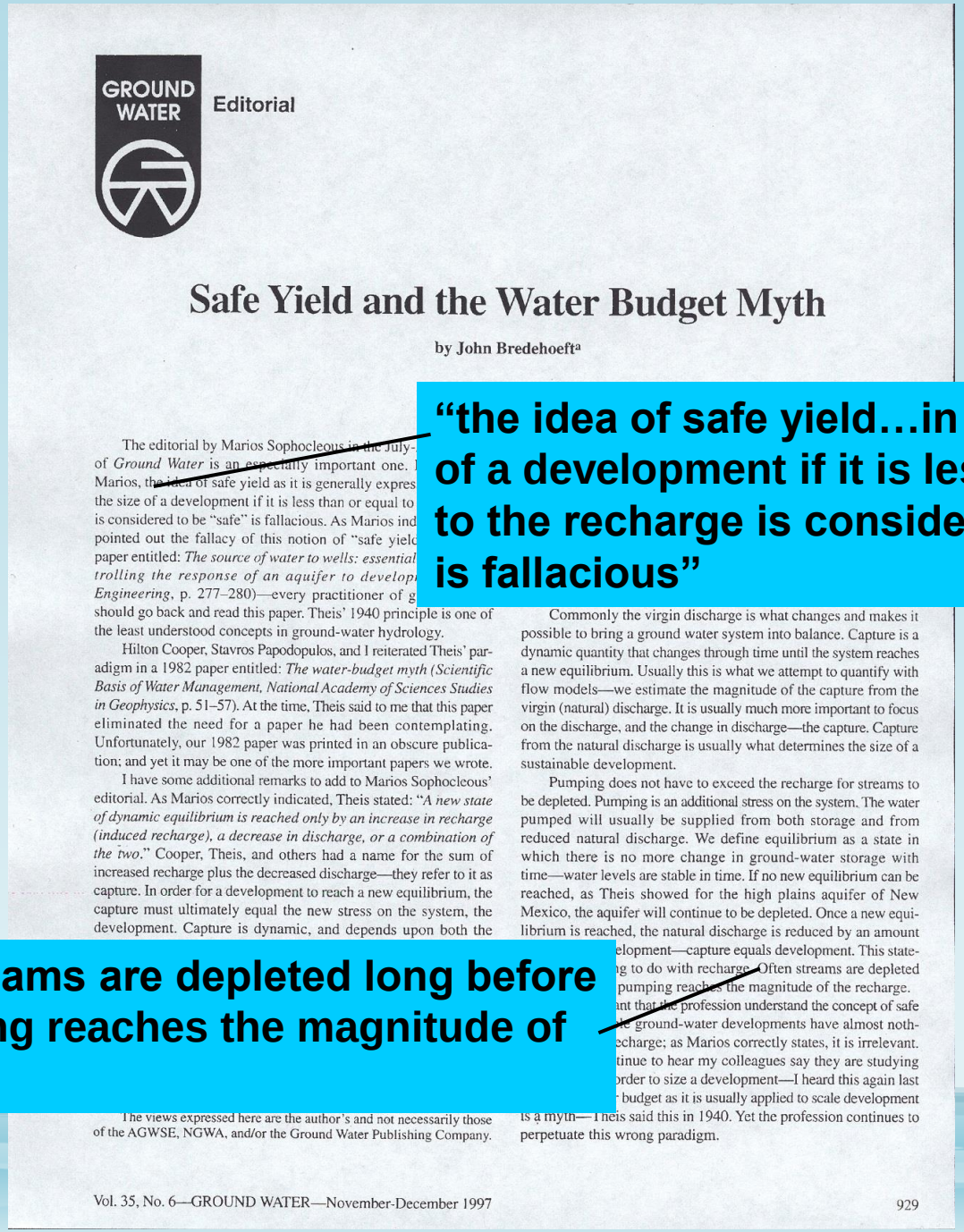
What type of <u>conflict</u> are we trying to resolve?

1. Basin-wide, well-to-well conflict or declining water levels?
2. **GW/SW interactions & capture of SW from GW pumping …?**

Safe Yield

"Because of the connection between the ground-water and surface-water systems,

...the amount of pumping allowed <u>without adverse consequences</u> has <u>little</u> to do with annual recharge." USGS



GROUND WATER Editorial

Safe Yield and the Water Budget Myth

by John Bredehoeft[a]

The editorial by Marios Sophocleous in the July- of *Ground Water* is an especially important one. Marios, the idea of safe yield as it is generally expres the size of a development if it is less than or equal to is considered to be "safe" is fallacious. As Marios ind pointed out the fallacy of this notion of "safe yield paper entitled: *The source of water to wells: essential trolling the response of an aquifer to develop Engineering*, p. 277–280)—every practitioner of g should go back and read this paper. Theis' 1940 principle is one of the least understood concepts in ground-water hydrology.

Hilton Cooper, Stavros Papodopulos, and I reiterated Theis' paradigm in a 1982 paper entitled: *The water-budget myth (Scientific Basis of Water Management, National Academy of Sciences Studies in Geophysics*, p. 51–57). At the time, Theis said to me that this paper eliminated the need for a paper he had been contemplating. Unfortunately, our 1982 paper was printed in an obscure publication; and yet it may be one of the more important papers we wrote.

I have some additional remarks to add to Marios Sophocleous' editorial. As Marios correctly indicated, Theis stated: "*A new state of dynamic equilibrium is reached only by an increase in recharge (induced recharge), a decrease in discharge, or a combination of the two.*" Cooper, Theis, and others had a name for the sum of increased recharge plus the decreased discharge—they refer to it as capture. In order for a development to reach a new equilibrium, the capture must ultimately equal the new stress on the system, the development. Capture is dynamic, and depends upon both the

The views expressed here are the author's and not necessarily those of the AGWSE, NGWA, and/or the Ground Water Publishing Company.

Commonly the virgin discharge is what changes and makes it possible to bring a ground water system into balance. Capture is a dynamic quantity that changes through time until the system reaches a new equilibrium. Usually this is what we attempt to quantify with flow models—we estimate the magnitude of the capture from the virgin (natural) discharge. It is usually much more important to focus on the discharge, and the change in discharge—the capture. Capture from the natural discharge is usually what determines the size of a sustainable development.

Pumping does not have to exceed the recharge for streams to be depleted. Pumping is an additional stress on the system. The water pumped will usually be supplied from both storage and from reduced natural discharge. We define equilibrium as a state in which there is no more change in ground-water storage with time—water levels are stable in time. If no new equilibrium can be reached, as Theis showed for the high plains aquifer of New Mexico, the aquifer will continue to be depleted. Once a new equilibrium is reached, the natural discharge is reduced by an amount elopment—capture equals development. This state- g to do with recharge. Often streams are depleted pumping reaches the magnitude of the recharge. nt that the profession understand the concept of safe e ground-water developments have almost noth- echarge; as Marios correctly states, it is irrelevant. tinue to hear my colleagues say they are studying rder to size a development—I heard this again last budget as it is usually applied to scale development is a myth—Theis said this in 1940. Yet the profession continues to perpetuate this wrong paradigm.

Vol. 35, No. 6—GROUND WATER—November-December 1997 929

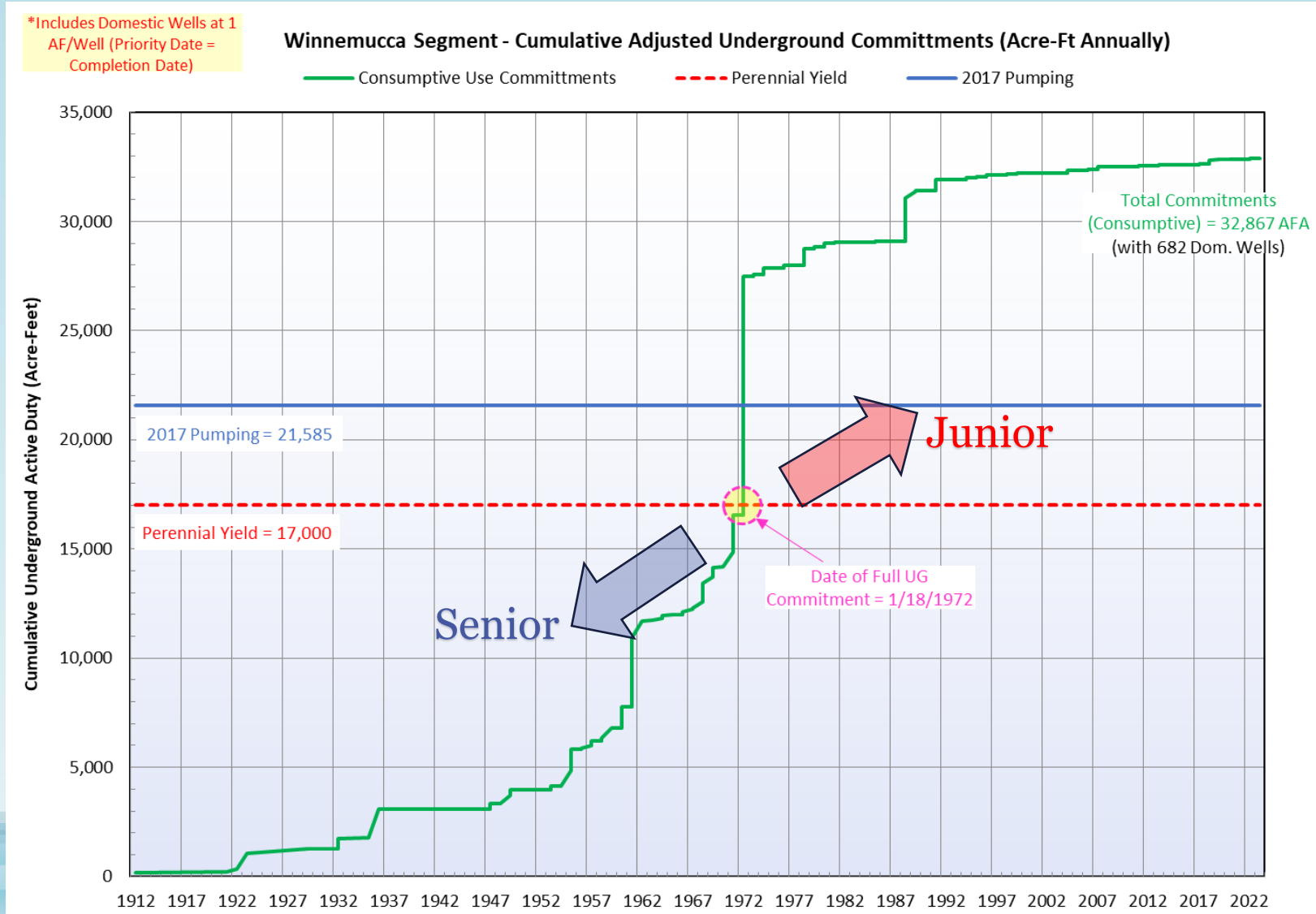
"the idea of safe yield…in which the size of a development if it is less than or equal to the recharge is considered to be 'safe' is fallacious"

"Often streams are depleted long before the pumping reaches the magnitude of recharge."

Issues with Basin-Scale PY-Based Curtailments

Example Basin: Winnemucca Segment (#070):

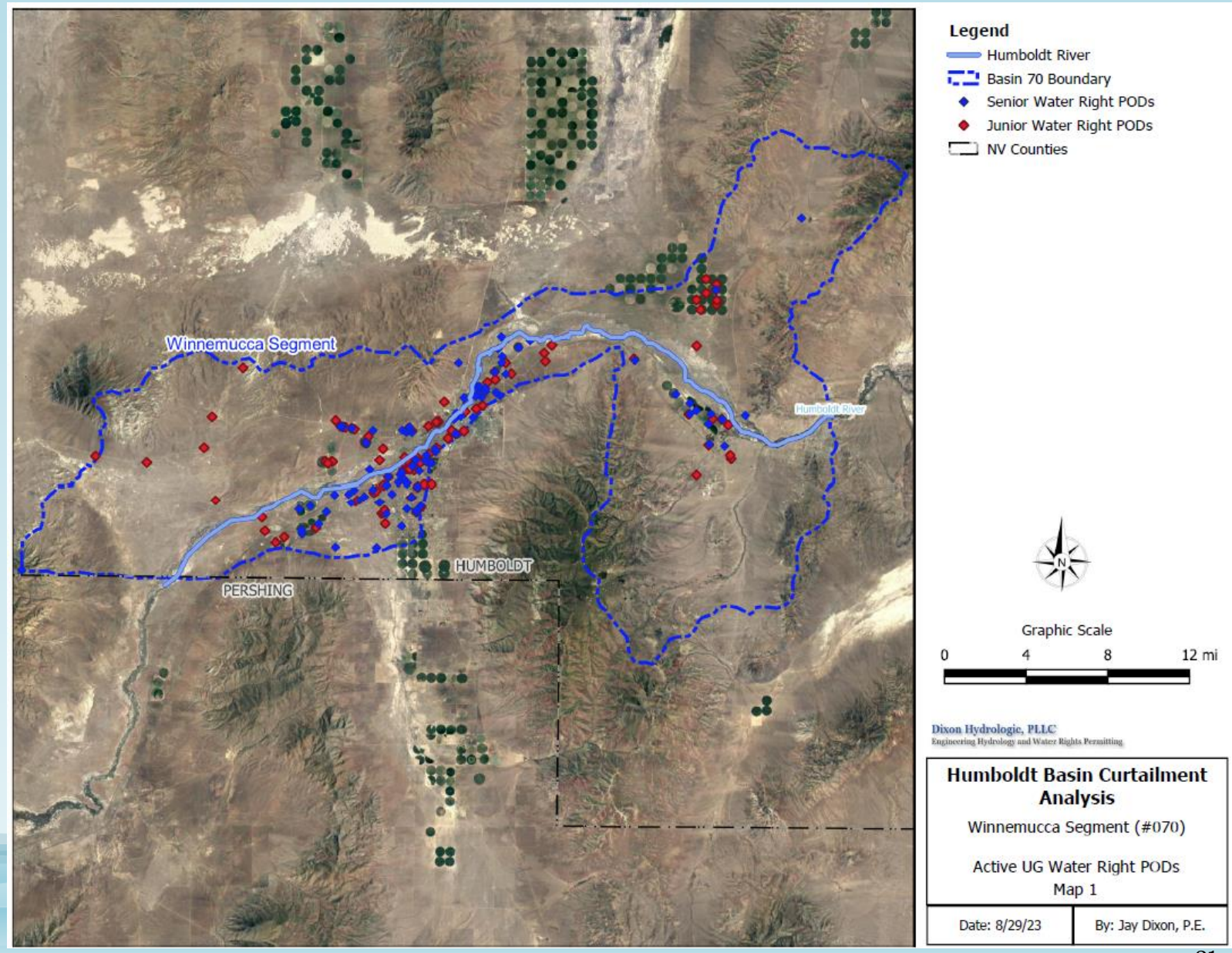
- NDWR Groundwater Commitments (NRS 532.167) = 36,489 (as of 7/31/23)
- Adjustments made to account for supplemental and consumptive uses, incl. domestic wells @ 1 afa.
- Basin is over-pumped based on PY
- All commitments prior to 1/18/1972 are SENIOR.
- Total JUNIOR commitments = 15,867 afa (includes 642 domestic wells)



Issues with Basin-Scale PY-Based Curtailments

Curtailment Analysis – Basin 70:

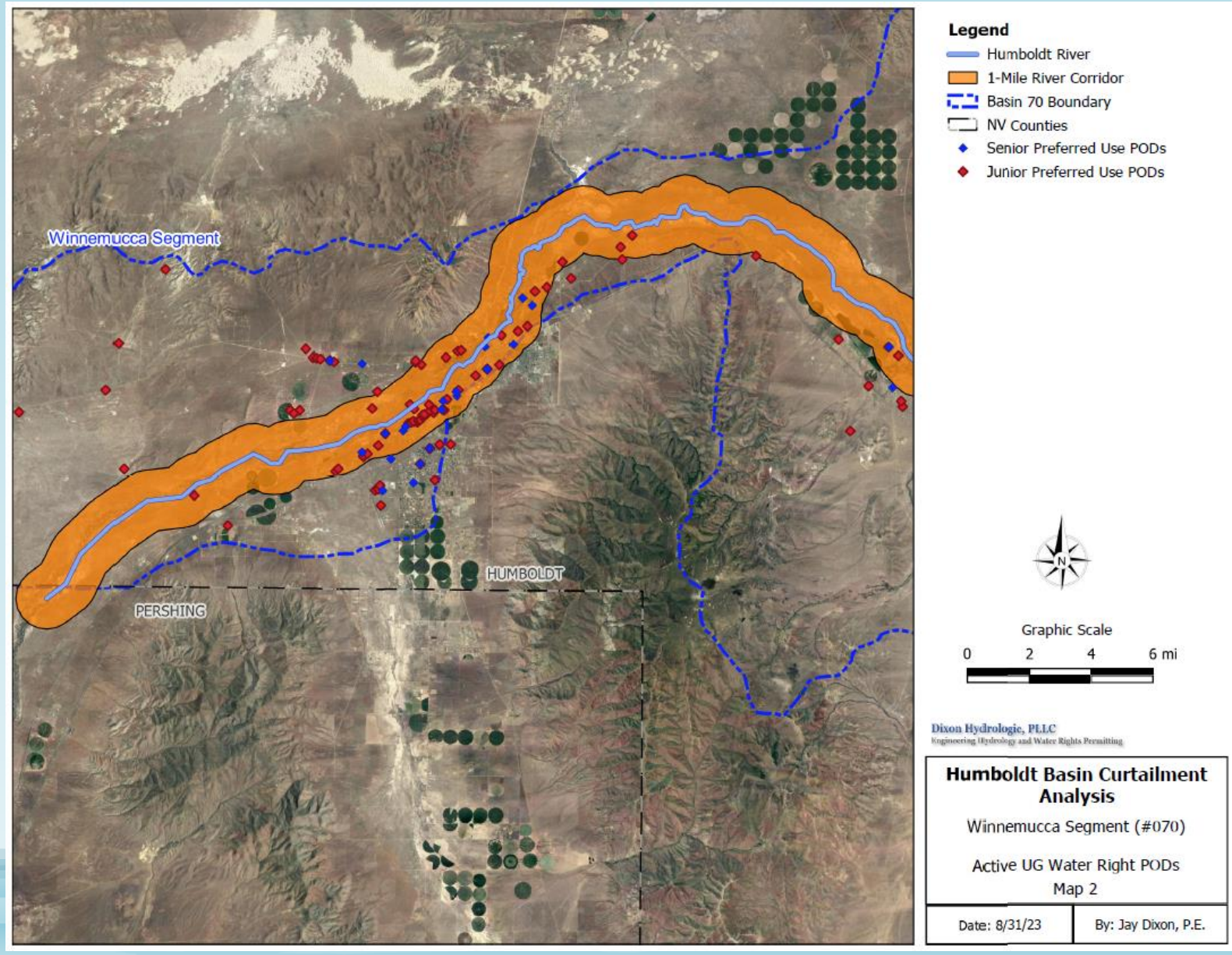
1. Role of NRS 534.110
2. Analysis focused on PODs close to the river.
3. How much of this capture might be exempt from a basin-wide PY curtailment due to priority status?
4. How much existing groundwater commitment might be subject to curtailment but would not reduce river capture over a reasonable time?



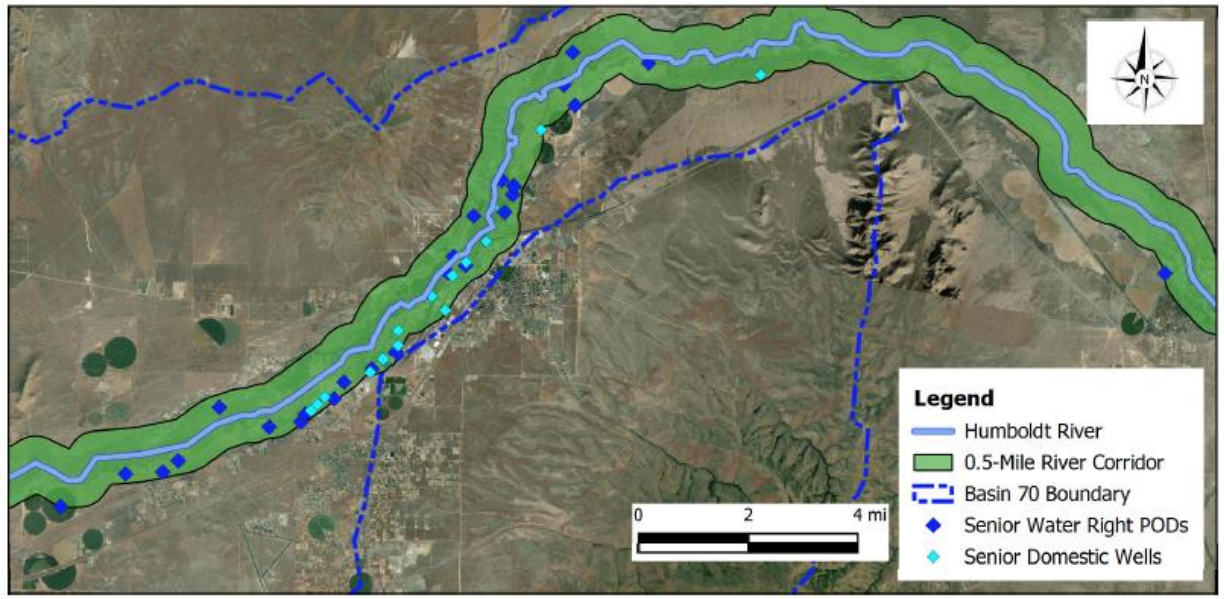
Issues with Basin-Scale PY-Based Curtailments

Curtailment Analysis – Basin 70:

1. Map shows 'Preferred Use' PODs (not including domestics)
2. Total 'Preferred Use' duty = 11,299 afa
3. 'Preferred Use' PODs = 130
4. 78% of 'Preferred Use' PODs have junior priorities
5. Most are within 1-mile of the River

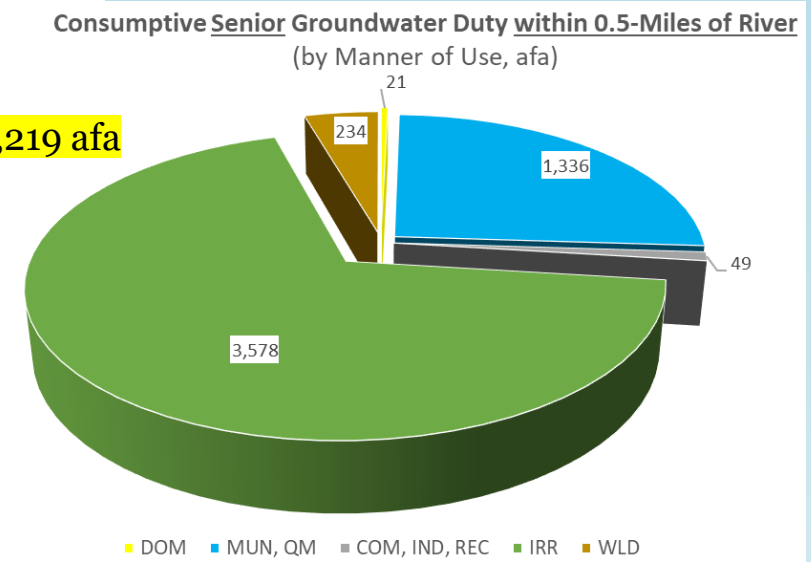


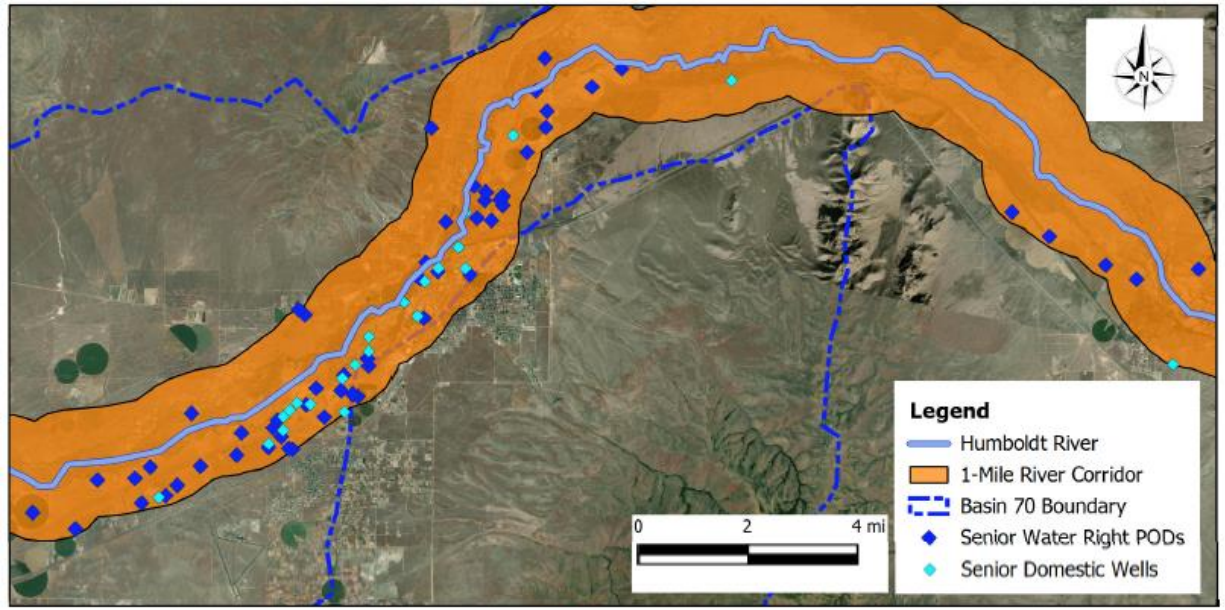
Issues with Basin-Scale PY-Based Curtailments



- 31% of senior commitments are within 0.5-mile of the river.

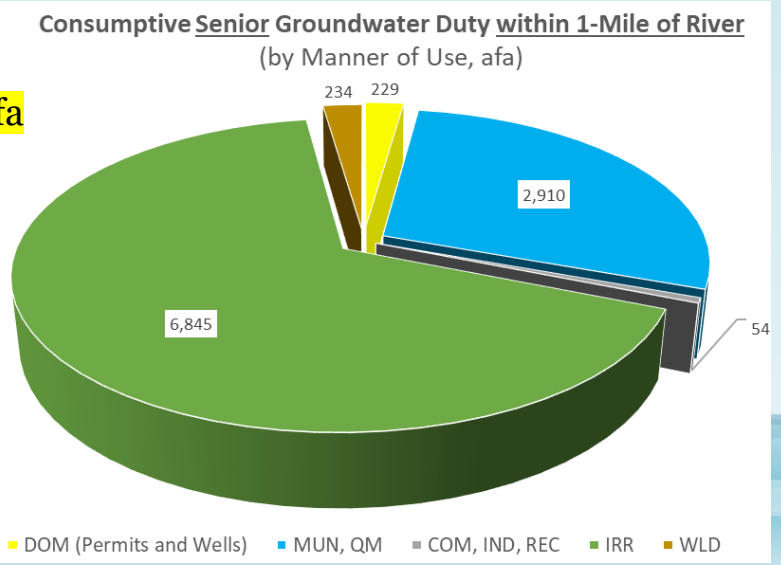
Total Duty = 5,219 afa





- 60% of senior commitments are within 1-mile of the river.

Total Duty = 10,273 afa



Dixon Hydrologic, PLLC
Engineering Hydrology and Water Rights Permitting

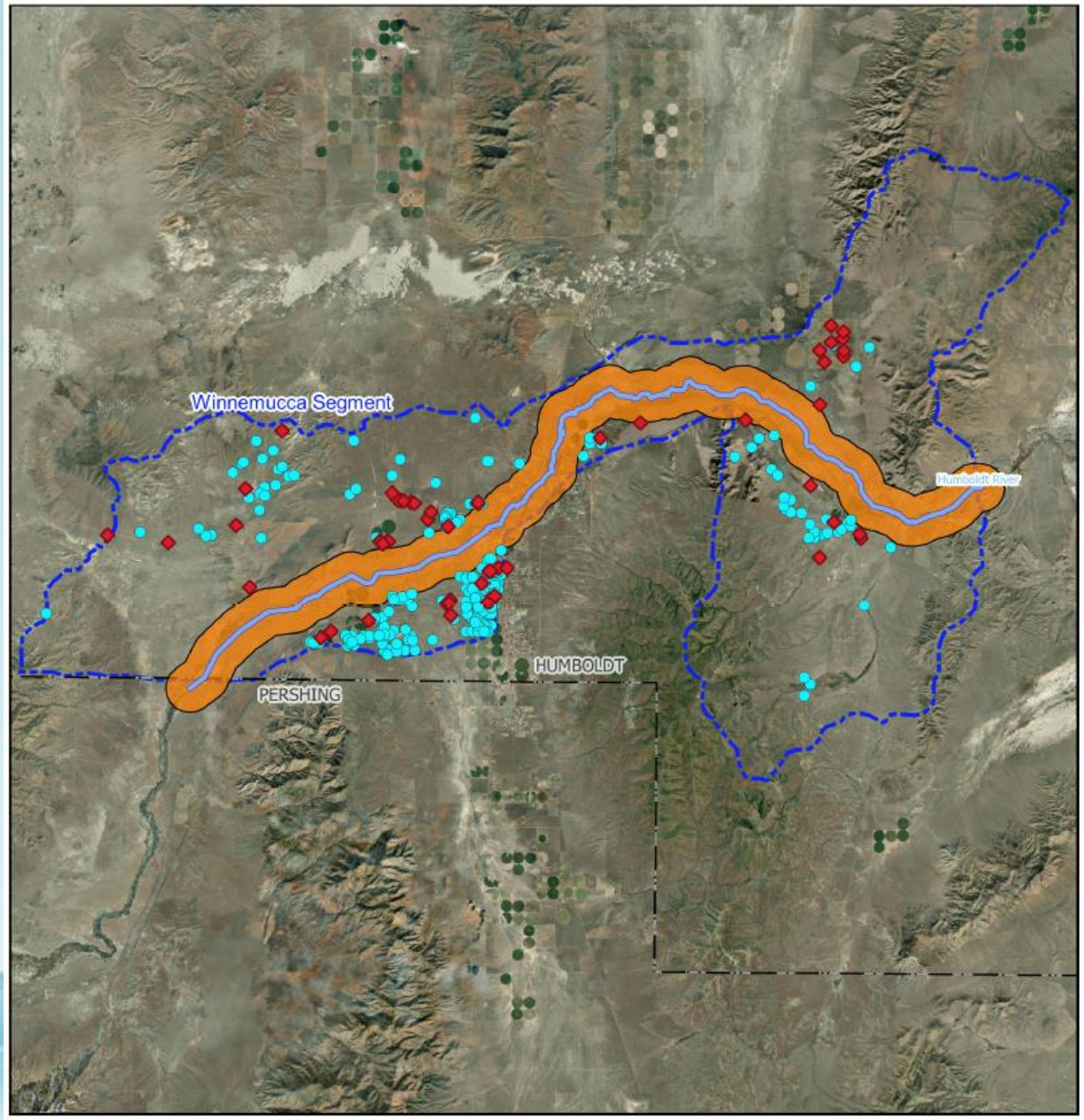
Humboldt Basin Curtailment Analysis

Winnemucca Segment (#070)

Active UG Water Right PODs
Map 2

Date: 8/30/23	By: Jay Dixon, P.E.

Issues with Basin-Scale PY-Based Curtailments



Legend
- Humboldt River
- 1-Mile River Corridor
- Basin 70 Boundary
- Junior Water Right PODs
- Junior Domestic Wells
- NV Counties

Total Duty = 13,066 afa

Graphic Scale
0 4 8 12 mi

Dixon Hydrologic, PLLC
Engineering Hydrology and Water Rights Permitting

Humboldt Basin Curtailment Analysis

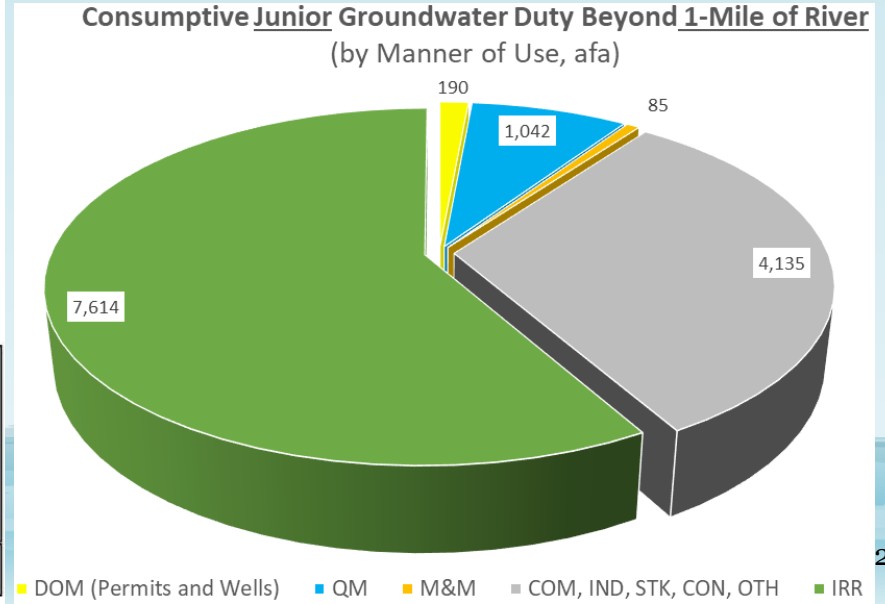
Winnemucca Segment (#070)

Active UG Water Right PODs
Map 3

Date: 8/30/23	By: Jay Dixon, P.E.

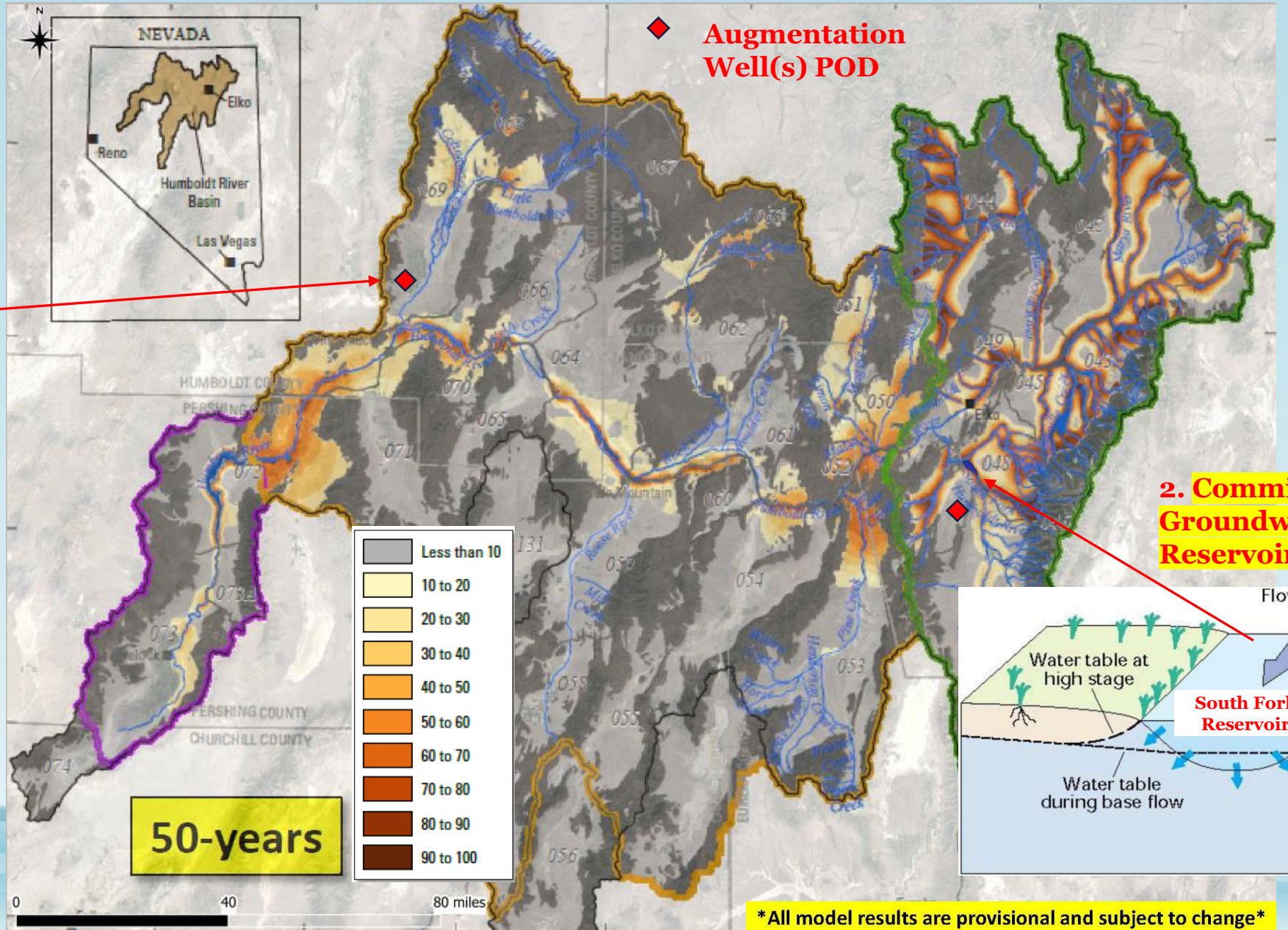
Junior commitments are 77% of the PY, and:

- Beyond 1-mile from river
- Less responsible for most of the capture
- Would be subject to curtailment under NRS 534.110, and
- May NOT resolve conflict for decades, if at all.

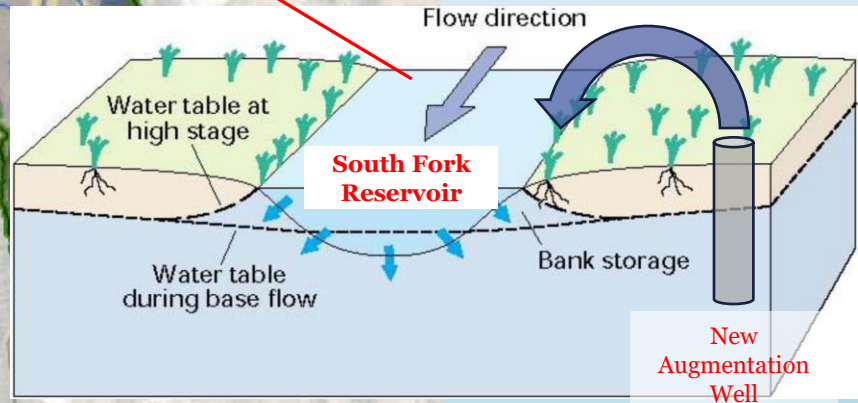


Potential Augmentation Well(s) Examples in the Humboldt

1. Paradise Valley



2. Committed & Unused Groundwater @ South Fork Reservoir



All model results are provisional and subject to change

Take Home Messages

1. No silver bullet – will take a creative combination of solutions:
   a) Augmentation plans based on acquired surface and/or flood waters
   b) Augmentation wells
   c) Surface water acquired for replacement water
   d) Strategic (Capture Management Zone) buyouts of UG rights causing conflict: $$$$
   e) Deficit irrigation practices, crop changes & efficiency improvements
   f) Focused curtailment of UG rights causing conflict (CMZ)
2. Decades of pumping created problems, may take decades to reverse – CO addressed the issue >half a century ago
3. Order 1329 is a good start, but doesn't address legacy capture from ongoing pumping
4. Capture conflicts should apply to all uses with certain limited exemptions:
   a) Augmentation plans allow for flexibility and maximum utilization of water while protecting priority rights

Questions?

dixonjm@gmail.com
chris@mah20.com
jaltenhofen@northernwater.org

ABSTRACT SUBMISSION

August 1, 2023 Humboldt Conjunctive Management Stakeholder Meeting

USCID & Other Papers on Conjunctive Management

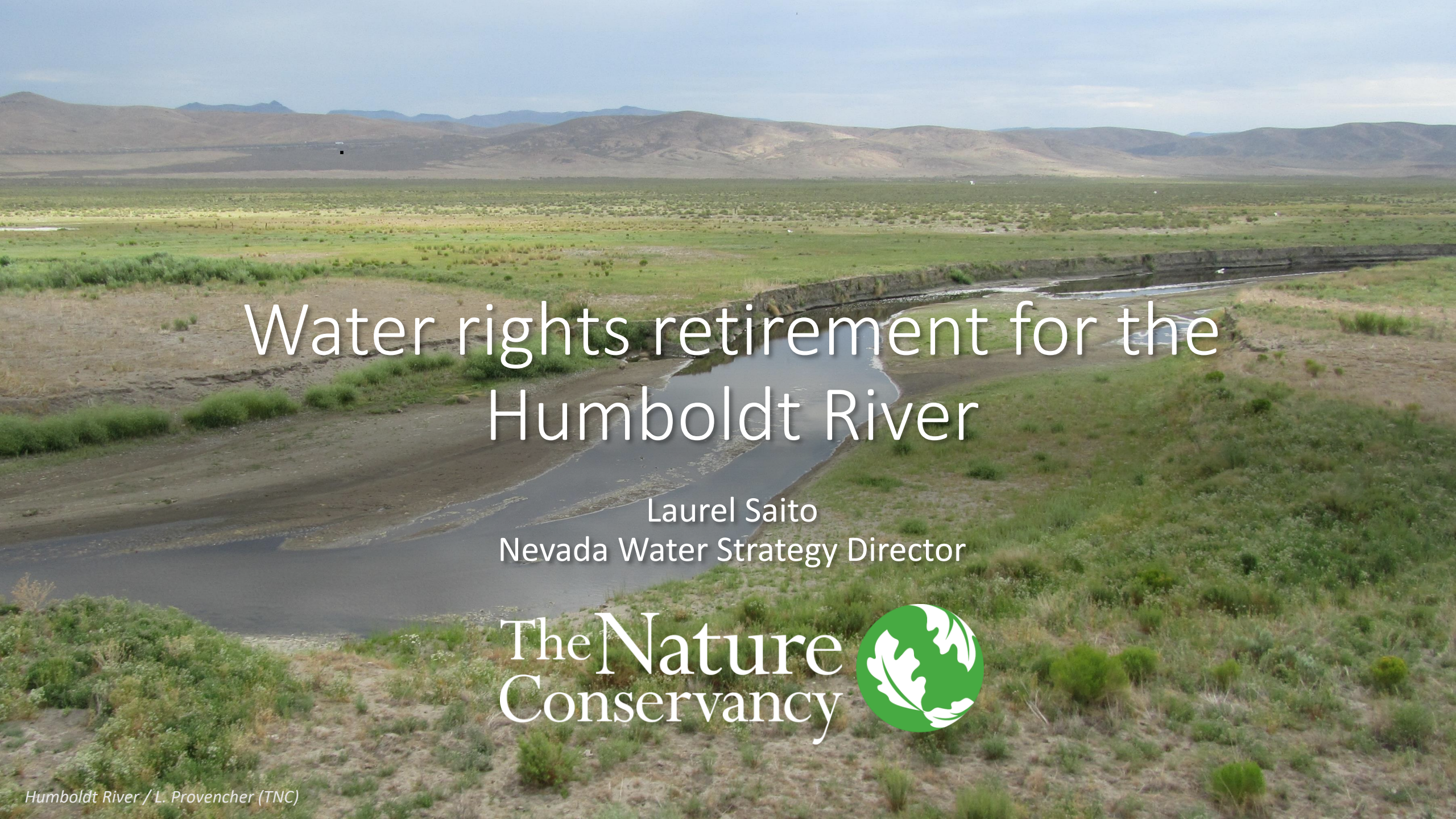
Schroeder Law Offices, P.C.
Therese A. Ure Stix
10615 Double R. Blvd. Ste 100, Reno, NV 89521
775-786-8800; counsel@water-law.com

This abstract is not an offering for a presentation, but for research to provide to NDWR electronically.

The U.S. Committee for Irrigation and Drainage ("USCID") has held conferences in the past that focus on conjunctive management issues. We are offering to research the past USCID conference proceedings to locate and provide to NDWR copies of papers and research projects related to conjunctive management issues in other states and/or internationally. For example, in 2006, the organization held a conference on "Ground Water and Surface Water Under Stress: Competition, Interaction, Solutions". Likewise, in Colorado along the South Platte River, conjunctive management papers have analyzed how different hydrological approaches have been used to increase water supplies.[1]

Thus, we are offering to locate and review the papers submitted for these types of conferences and provide them to NDWR. This may provide insight as to other conjunctive management schemes and strategies.

[1] https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1068&context=ucowrconfs_2006
http://southplatte.colostate.edu/files/Conjunctive%20Management%20in%20Idaho--The%20Water%20Report.pdf



Water rights retirement for the Humboldt River

Laurel Saito
Nevada Water Strategy Director

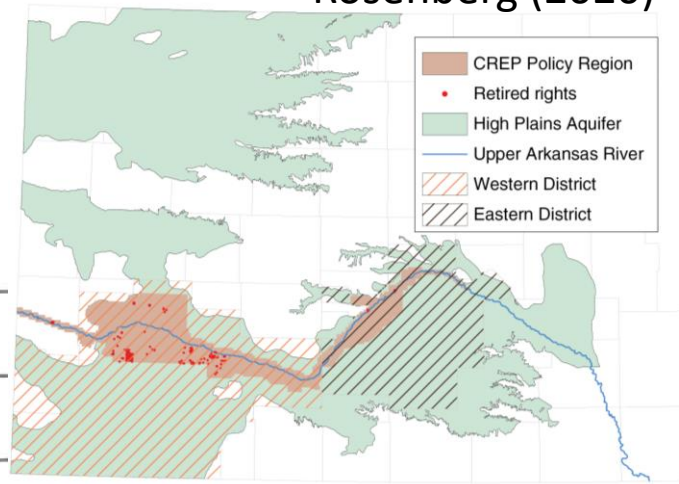
The Nature Conservancy

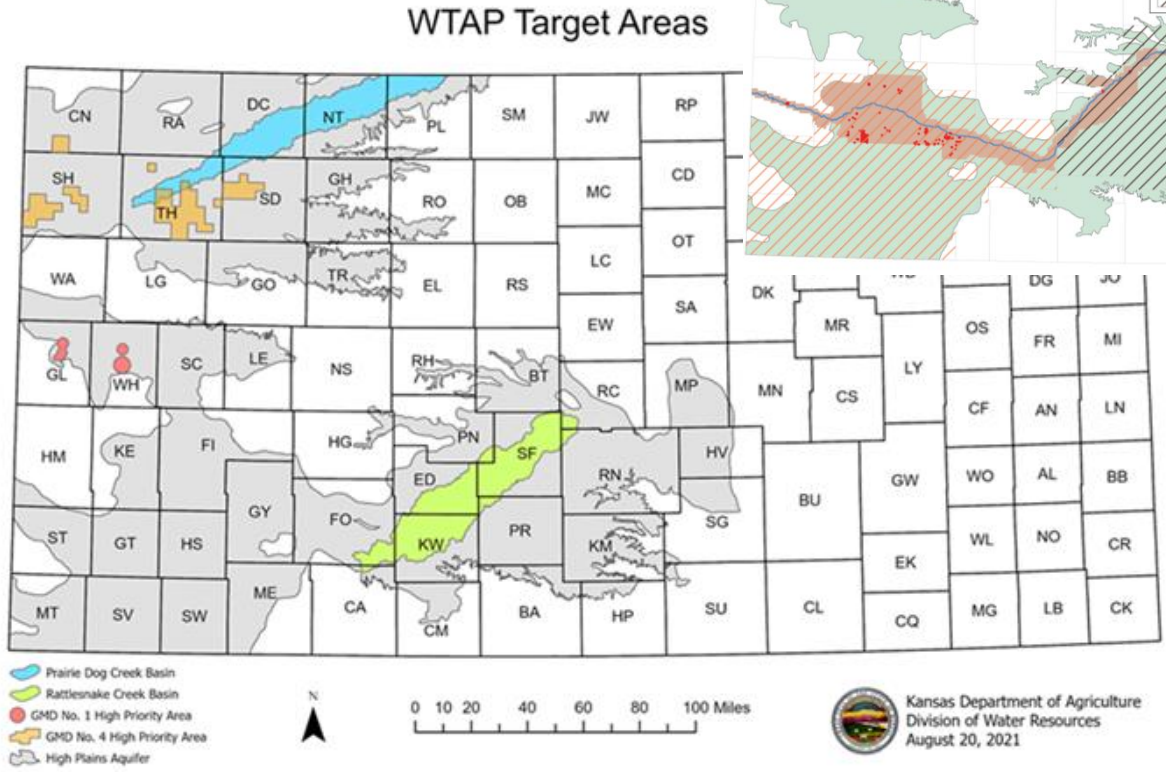
Humboldt River / L. Provencher (TNC)

Where this has been applied successfully

- KS: Upper Arkansas River and Rattlesnake Creek Conservation Reserve Enhancement Program (CREP)
  - Since 2007
  - Payments over 14-15 yrs w/upfront bonus
  - Financial assistance for seeding and well plugging
  - As of 2021 – 47,653 AF of water retired which cost state $1.6M
- KS: Water Right Transition Assistance Program (WTAP)
  - Since 2007
  - As of June 2023, $3.9M of state funds have been matched w/federal and NGO funds
  - Retired 8,239 AF at $1,413/af

Rosenberg (2020)



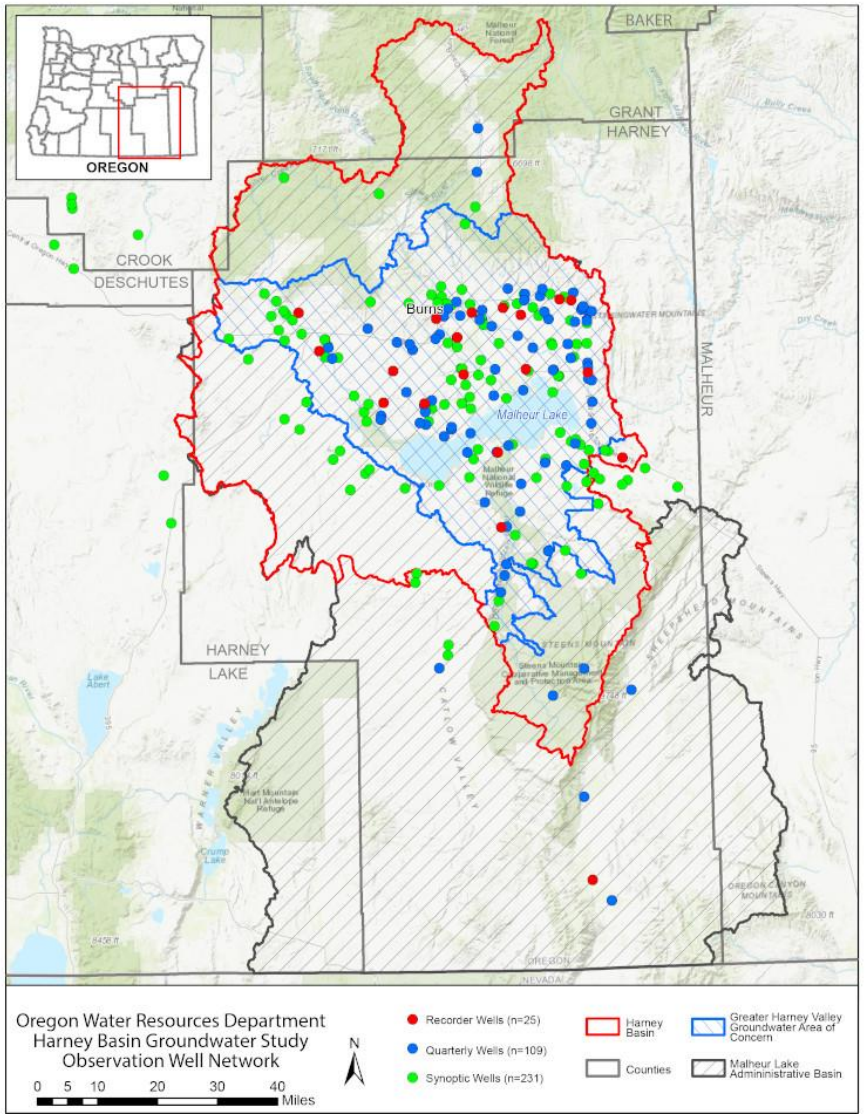


https://agriculture.ks.gov/divisions-programs/division-of-conservation/water-conservation-programs

The Nature Conservancy Nevada

Where this has been applied successfully

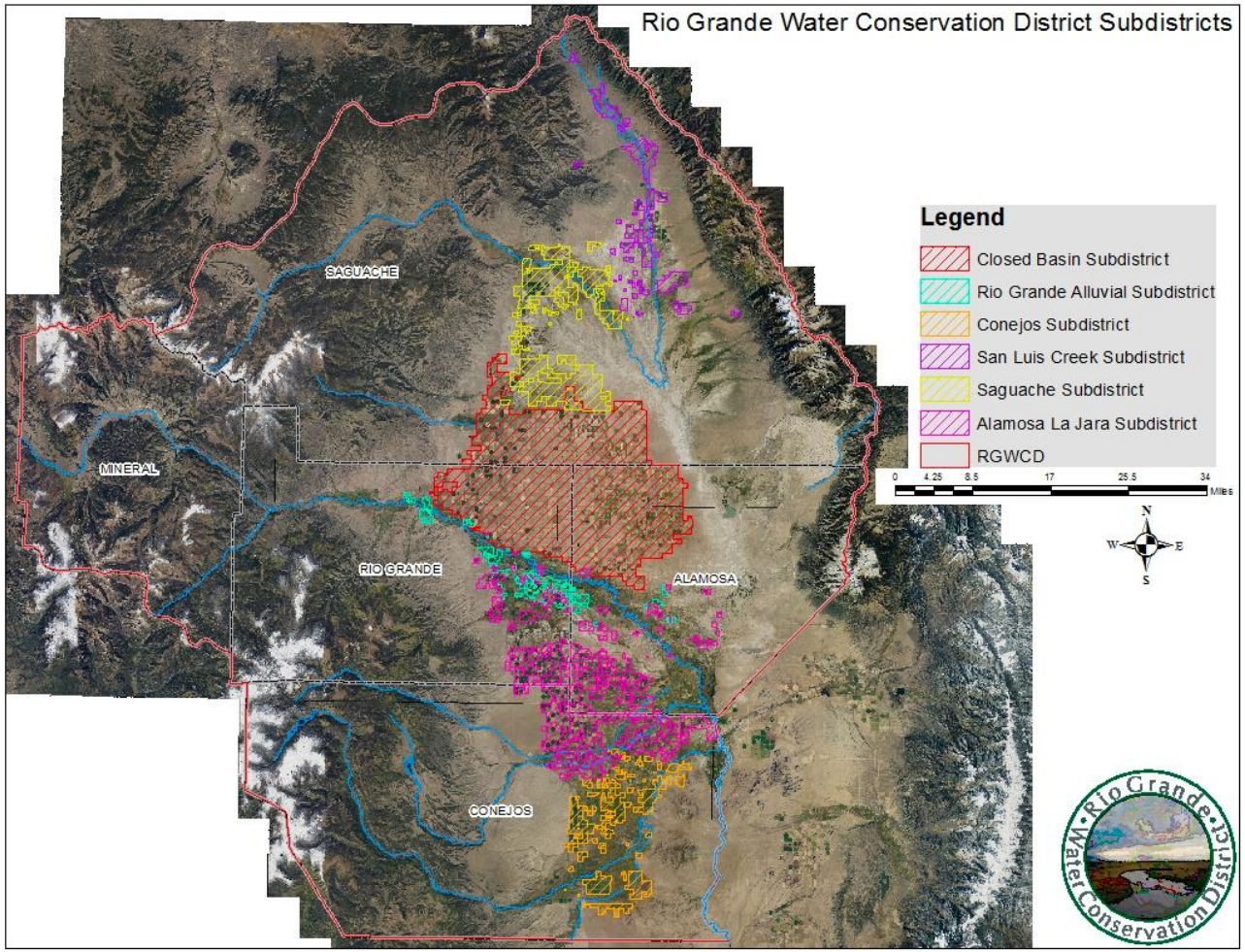
- OR: Harney Valley Groundwater CREP
  - Approved November 2022
  - $65M (20% from state; 80% from Farm Services Agency)
  - Payments over 14-15 years
  - Incentives for lands impacting groundwater-dependent ecosystems
  - Cost share for well abandonment



https://www.oregon.gov/owrd/Documents/CREP%20Handout.pdf

Where this has been applied successfully

- CO: Rio Grande Water Conservation District
  - Using ARPA Funds
  - Must have irrigated with the well for 5 yrs between 2013-2022 at least 50 af/yr
  - Compensation of $3,000/af based on average withdrawals over 5 highest years reported
  - Maximum total payment of $650,000
  - Application must include a re-vegetation plan
  - Program opened June 29, 2023
  - Applications close September 29, 2023
  - They may have a second application cycle
  - Funds must be committed by June 2024



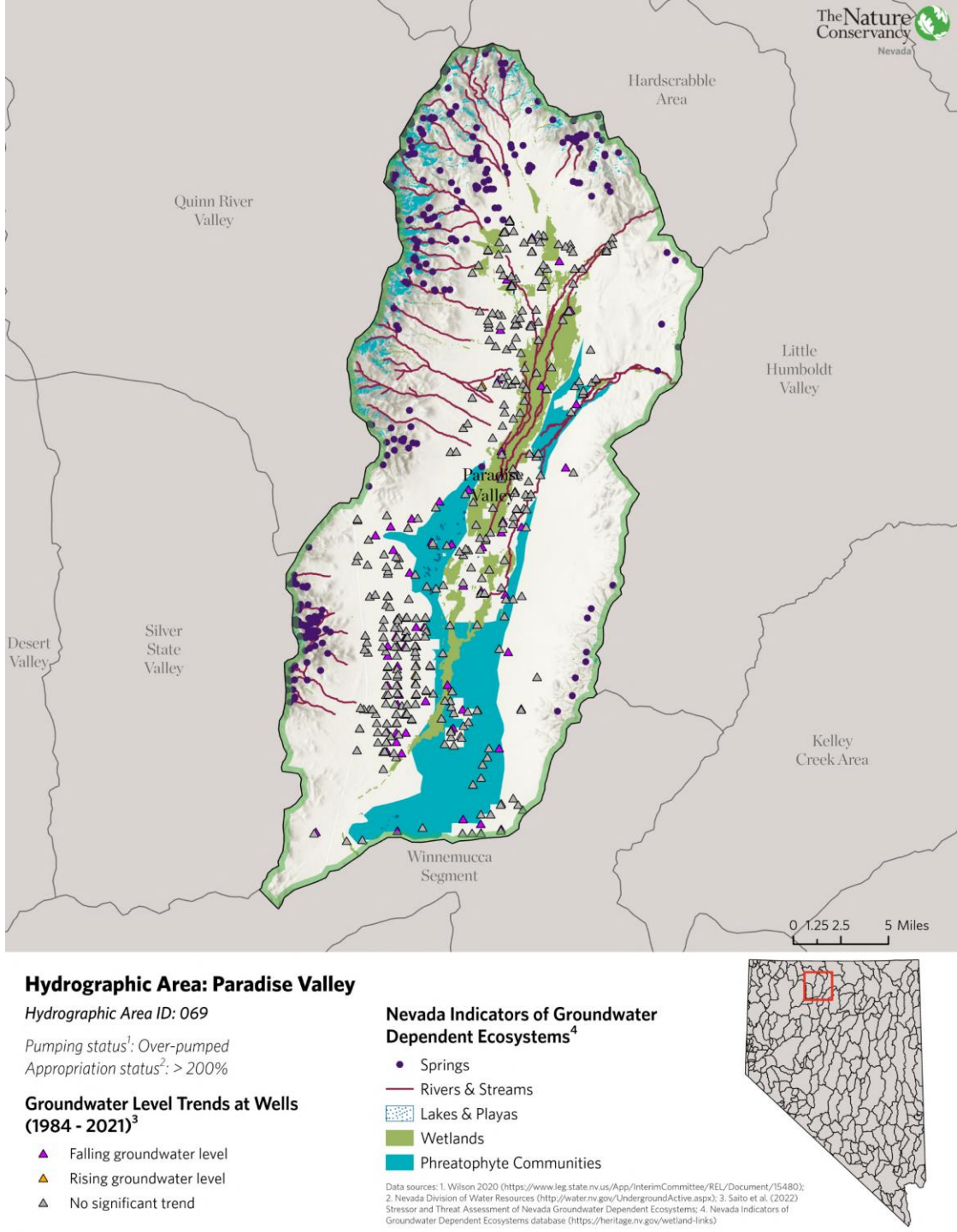
https://www.rgwcd.org/senate-bill-22-028-the-groundwater-compact-compliance-and-sustainability-fund-has-officially-opened

The Nature Conservancy Nevada

Concept description

- Permanent water rights retirement through “buy-backs”
- Voluntary
- Priorities
  - Conflicts with existing water rights
  - Detriments to natural resources
  - Benefits to ecosystems
  - “Wet” water rights
  - Overpumped or overappropriated basins
- Expected outcomes
  - Reduced water use
  - Reduced impact to communities
  - Maintained rural economies
  - Reduce conflict with existing rights
  - Benefits to ecosystems

Indicators of groundwater dependent ecosystems database available at https://heritage.nv.gov/wetland-links



Steps/considerations to implement

- Establish a program to permanently retire groundwater rights in the Humboldt River Basin
- Identify where curtailment/retirement of groundwater rights would reduce capture of flow to Humboldt River
  - Use Humboldt River Basin capture models (capture management zones?)
  - Consider benefits to ecosystems
- Secure funding to compensate voluntary and permanent retirement of these water rights
- Legislation in 2025:
  - State in statute that retired water rights are not to be appropriated again
  - Set up a permanent program for retiring groundwater rights across the state that can accept funds for that purpose

The Nature Conservancy Nevada

Steps/considerations to implement (cont.)

- Considerations
  - How to value the water rights
  - Payments over multiple years to allow transition to another use of land
    - Dryland agriculture
    - Crop switching (possibly native seed cultivation?)
    - Grazing
    - Solar energy
  - Vegetation/weed management
  - Well abandonment
  - Compliance measures
  - Supplemental water rights

The Nature Conservancy Nevada

Funds needed/potential sources of funding

- Lots of funding needed
- Use of basin assessments / State appropriations
- USDA – CREP
- Nevada Water Conservation and Infrastructure Initiative (NWCII)
  - Using American Rescue Plan Act (ARPA) funds
- Bureau of Reclamation WaterSMART Drought Resiliency Projects
  - Task B: Increasing the reliability of water supplies through groundwater recovery
  - Up to $5M for 3-yr project with 50% non-federal cost share
  - Deadline: October 31, 2023
- Fundraised dollars could be used for leverage (e.g., match, pilot projects)

The Nature Conservancy Nevada

Timeline

- NWCII – using ARPA funds
  - Deadline for applications October 1, 2023
    - Humboldt River Basin Water Authority is planning to submit an application
  - Set up program and identify willing sellers by February 1, 2024
  - Funds must be committed by September 30, 2024
  - This program could pilot the approach for establishment of a permanent program through legislation
- NWRA 2024
  - Session on retiring groundwater rights in NV on February 1, 2024
- 2025 Legislative Session
  - Stakeholders work together on drafting needed legislation well before session and find bipartisan bill sponsors

The Nature Conservancy Nevada

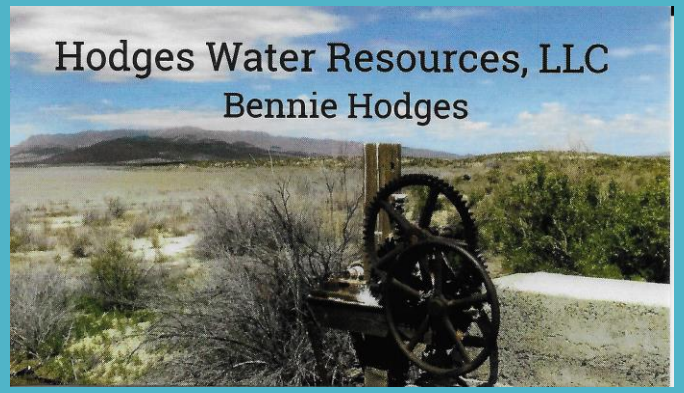
Thank you!

laurel.saito@tnc.org

The Nature Conservancy

Humboldt River / L. Provencher (TNC)

Conservation Measures on Humboldt River using Retirement of Water Rights and seeking Recommendations from Schools of Water Management and Conservation



PO Box 1282
Lovelock, Nevada 89419
775-770-4018
hodgeswaterresources@gmail.com

One of the problems affecting surface water deliveries is that approximately 22 of 33 Basins in the Humboldt River Basin are *over appropriated*.

Over the last 60 years, ground water use in the Basins has only ***increased,*** and often times, over the perennial yields.

When this happens, the basin's ground water resource declines as storage is used without recharge.

As a way to offset this decline, P.C.W.C.D. recommends implementing conservation measures including, but not limited to the following:

I. A system where ground water users could retire water rights on marginal ground in exchange for future tax credits of other lands still operated by that water user, i.e.

- Alkali Ground
- Sandy Ground
- Any poor producing lands

II. A system created by the State of Nevada to purchase water rights from willing sellers or retire water rights that are junior in priority and any other water rights along the main stem of the Humboldt River and its tributaries in over appropriated basins.

a. Nevada Legislature should create a Rural Assessment on underground users to go toward retiring these types of water rights.

b. Seek funding from “Nevada Water Conservation and Infrastructure Initiative Grant”

- Very fast-tracking grant that would give 10 million dollars to retire water rights from willing sellers in over appropriated basins along the Humboldt River.

III. A system of voluntary relinquishment of surface Rights in favor of ground water rights as a tool for mitigation.

- Retire surface water rights that produce meadow hay in exchange for ground water rights that produce higher dollar crops such as alfalfa.

IV. State Engineers Office could look at other states for ideas for conjunctive management.

- Also, could look at National Institute for Water Resources of Irrigation Cal Poly S.L.O., etc. for ideas in water conservation.

Disparities between Surface Water and Ground Water on the Humboldt River and How to Address It

Bennie Hodges
PO Box 1282
Lovelock, Nevada 89419
775-770-4018
hodgeswaterresources@gmail.com

- Pershing County Water Conservation District believes there are disparities on the Humboldt River and its tributaries as to how surface water users and ground water users are treated regarding per acre duties of water rights and "*in priority*" allocations limiting duties.

Historically, surface water users were and are currently delivered water based on their year of priority.

- A Harvest Right is entitled to 3.0 ac/ft/ac
- A Meadow Pasture Right is 1.50 ac/ft/ac
- Diversified Pasture Right is .75 ac/ft/ac

There are a very small number of surface water rights that receive 4.0 ac/ft/ac due to poor or sandy soils. These duties are established by the Humboldt River Adjudication (1923 – 1938).

- In the past 20 years, surface water users have rarely received a full allotment, especially below the Palisade gauge where the year of priority for delivery is established. Yet, ground water users with irrigation permits receive a 100% allotment of 4.0 ac/ft/ac, although most all ground water permits are junior in priority to all surface decreed rights on the Humboldt River.

In 2017 the Nevada Legislature made a declaration that all water, regardless of the source, is to be managed conjunctively. Therefore, any new applications and change applications to ground water should be limited to duties established by the Humboldt River Decree like surface water users are, because ground water users are junior to surface water users, and yet they receive 100% allotment. A system of allocation priority for underground users should be established that is similar to, or at minimum, follows the surface water user allocations. This would put surface and ground water users on a more equitable playing field.

This system could be established administratively to maintain the paper water right, but reduce the season duty allocation based on the water year.

Create a distribution table or chart that follows the Humboldt River Priority Chart

Surface Priority	Underground Priority
1861	1945 - 1948
1862	1949 - 1952
1863	1953 - 1956
1864	1957 - 1960
1865	1961 – 1964
1866	1965 - 1967
1867	1968 - 1970
1868	1971
1869	1972
1870	1973
1871	1974
1872	1975
1873	1976
1974	1977

Surface Priority	Underground Priority
1875	1978
1876	1979
1877	1980
1878	1981
1879	1982
1880	1983
1881	1984
1882	1985
1883	1986
1884	1987
1885	1988
1886	1989
1887	1990
1888	1991

Surface Priority	Underground Priority
1889	1992
1890	1993
1891	1994
1892	1995
1893	1996
1894	1997
1895	1998
1896	1999
1897	2000
1898	2001
1899	2002
1900	2003
1901	2004
1902	2005

Surface Priority	Underground Priority
1903	2006
1904	2007
1905	2008
1906	2009
1907	2010
1908	2011
1909	2012
1910	2013
1911	2014
1912	2015
1913	2016
1914	2017
1915	2018
1916	2019

Surface Priority	Underground Priority
1917	2020
1918	2021
1919	2022
1920	2023
1921	2024

Implementation of this conjunctive management priority chart

- Must be always serving same surface priority above and below Palisade
- Underground users would have that right to accumulate water like surface water users do
- During 1st 5 years underground users could not be curtailed more than 1 ac/ft

How to begin the water season and create a starting point

- Establish a beginning priority date to be served based on current snowpack for that year

River Commissioners would look at the Snotel Reports and early streamflow forecasts to establish beginning season water deliveries

- Set a beginning priority to start the season and do not change it until all beginning season surface priorities have been served or met

Last But Not Least

- Most underground water users have a 4.0 ac/ft/ac right.
- They should be no different than a Humboldt River Decreed Harvest Right of 3.0 ac/ft/ac!

Implementation of these steps would be a big start to conjunctive management of all water in the Humboldt River System.

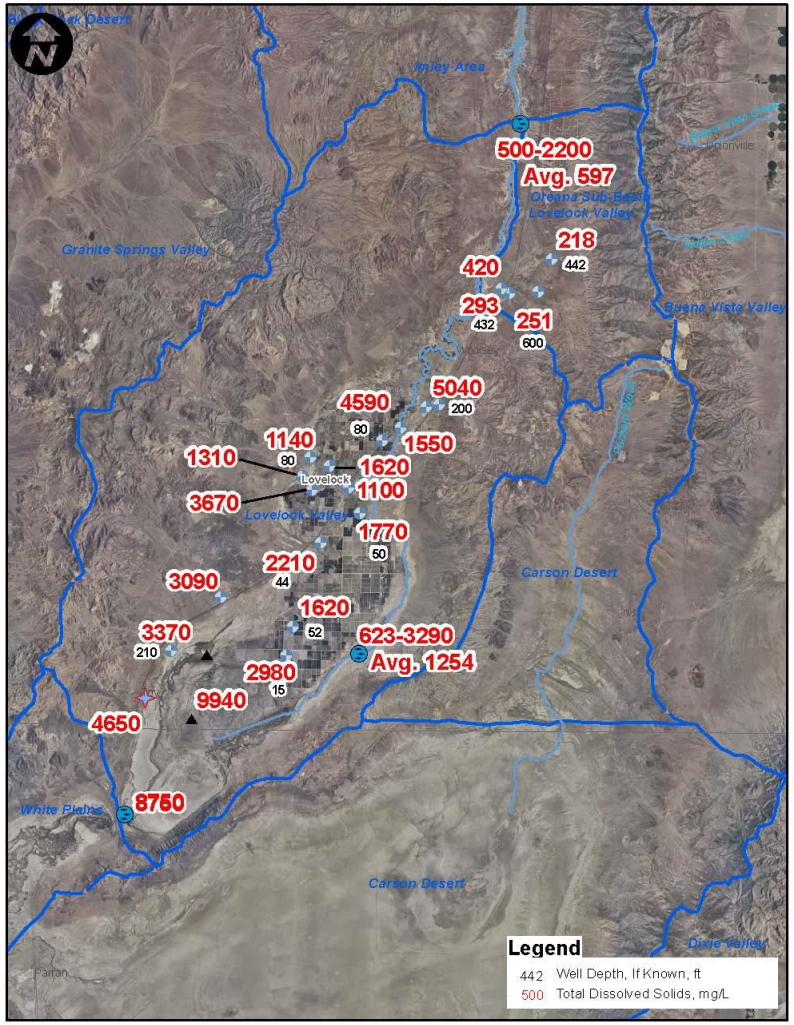
Potential for Shallow Aquifer Recharge, Storage and Recovery in the Lovelock Agricultural Area

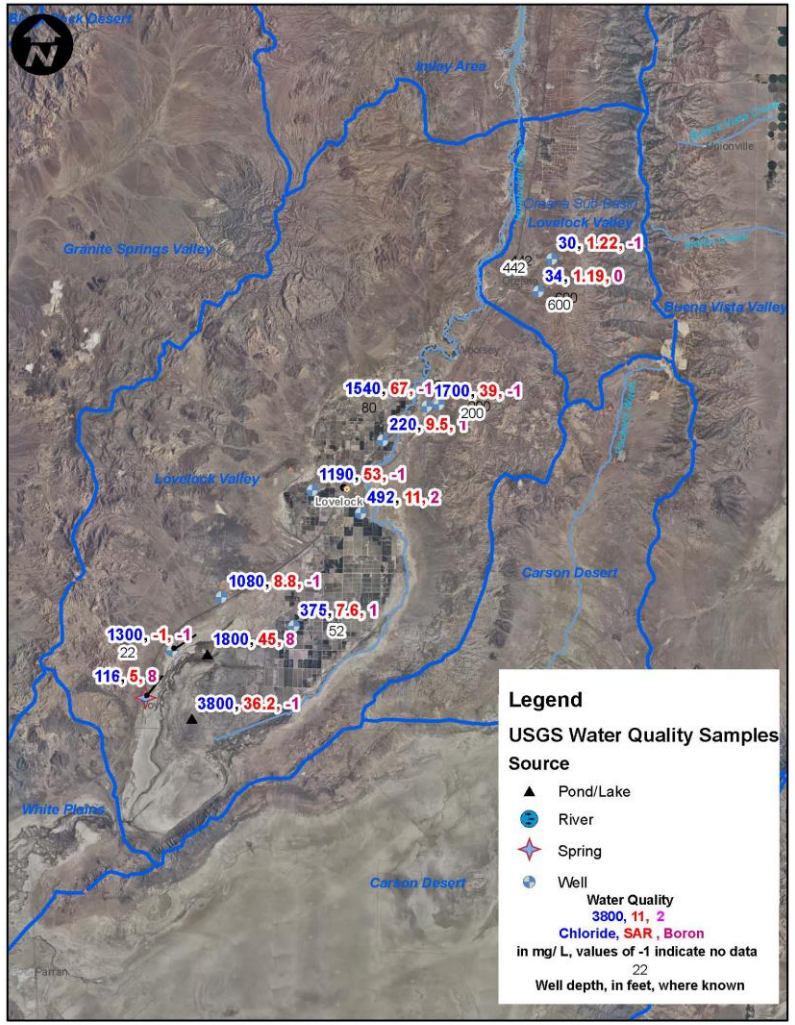
Dwight L. Smith, PE, PG, CHg
Principal Hydrogeologist at UES/McGinley & Associates
6995 Sierra Center Pkwy, Reno, NV 89511
dsmith1@teamues.com

Salinity of Groundwater in Lovelock Valley

- Salinity of groundwater – TDS average = 3,100 mg/L (median 2,600 mg/L)
- Average TDS at Rye Patch Reservoir is ~600 mg/L, increases to ~1250 at Big Dam (drain and evaporation influenced)
- TDS, chloride and SAR of groundwater exceeds thresholds for alfalfa
- Note: General agricultural research indicates that boron can be tolerated by crops like alfalfa up levels of around 4 mg/L; chloride up to around 875 mg/L; and SAR levels up to about 10. TDS values in irrigation water of 1,400 to 2,100 mg/L are reported to become problematic for crops such as alfalfa.
- High salinity has prevented development of supplemental groundwater to support irrigation from the Humboldt River

Source: Interflow Hydrology, 2013

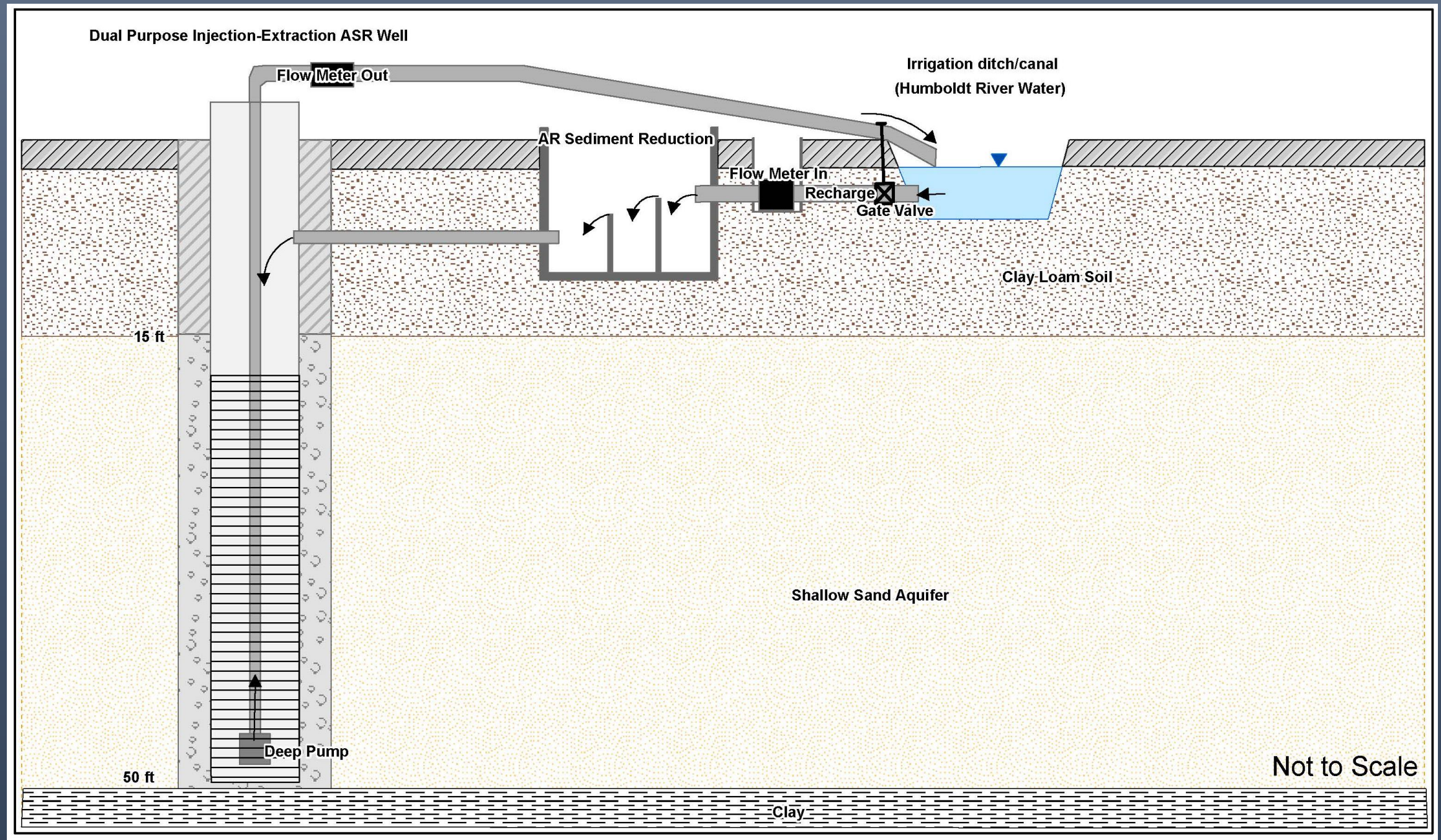




CONCEPT:

Utilize the Shallow Aquifer as a Source of Supplemental Groundwater for Irrigation in **Dry Years**

Replenish and Enhance Quality of Groundwater in the Shallow Aquifer by Recharge of Decreed Surface Waters in **Normal to Wet Years**


Dual Purpose Injection-Extraction ASR Well
Flow Meter Out
Irrigation ditch/canal
(Humboldt River Water)
AR Sediment Reduction
Flow Meter In
Recharge
Gate Valve
Clay Loam Soil
15 ft
Shallow Sand Aquifer
Deep Pump
50 ft
Not to Scale
Clay

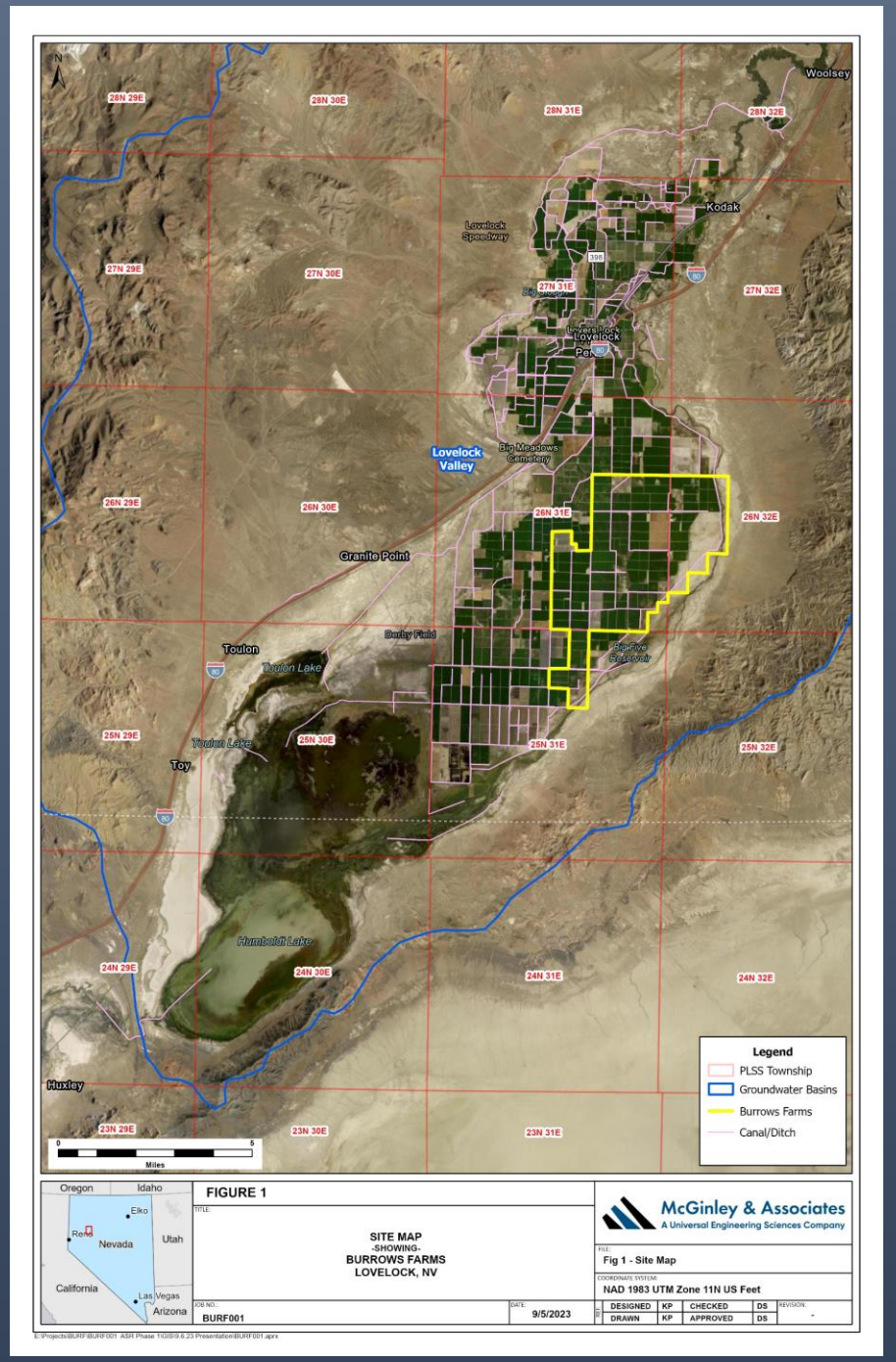
Concept Evaluation Approach

A phased feasibility approach of analysis is being implemented to:

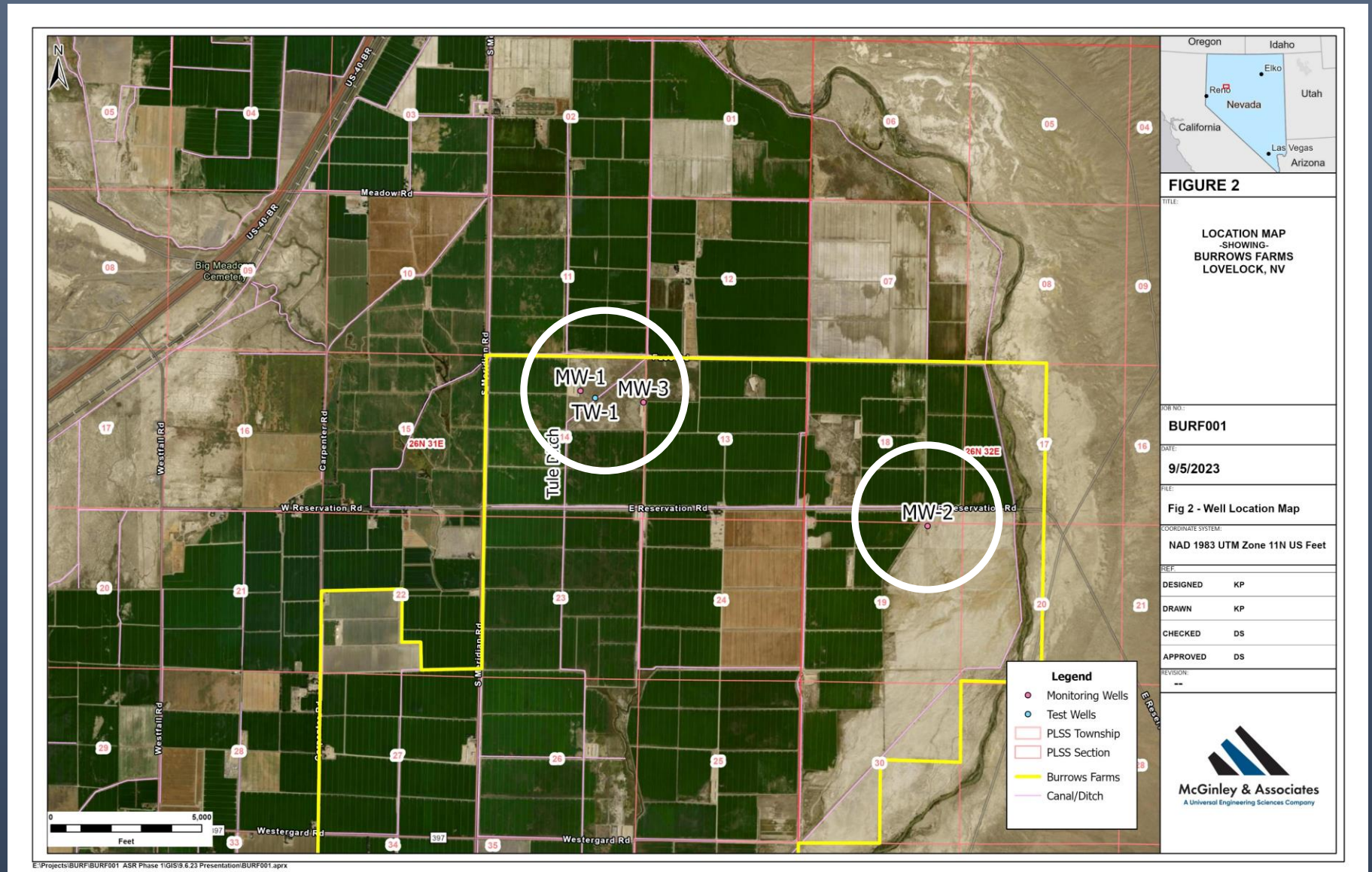
1. Verify existence and determine the extent and thickness of the shallow aquifer
2. Determine the existing groundwater quality in the shallow aquifer
3. Understand Hydraulic properties of the shallow aquifer, and if potential exists for completion of high-capacity shallow wells
4. Determine if there exists, or can be created by pre-ASR pumping, sufficient aquifer storage capacity to operate an ASR
5. Determine/estimate the water quality to expect from an operational ASR and determine if suitable for agricultural uses
6. Conduct preliminary engineering and cost feasibility reviews for capital expenditures and O&M for a supplemental irrigation water source
7. Produce technical evaluations and applications for ASR permitting, including UIC injection for recharge wells

Burrows Farms

- Former Nevada Nile Farm
- Approximately 8,000 acres
- Over 20,000 AF of Decreed Humboldt River water rights



Initial Soil Borings and Monitoring Wells

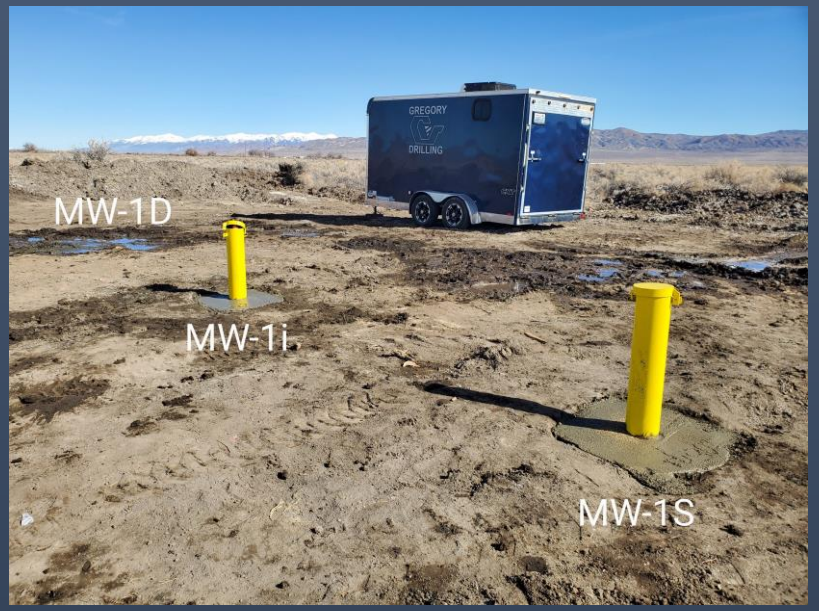


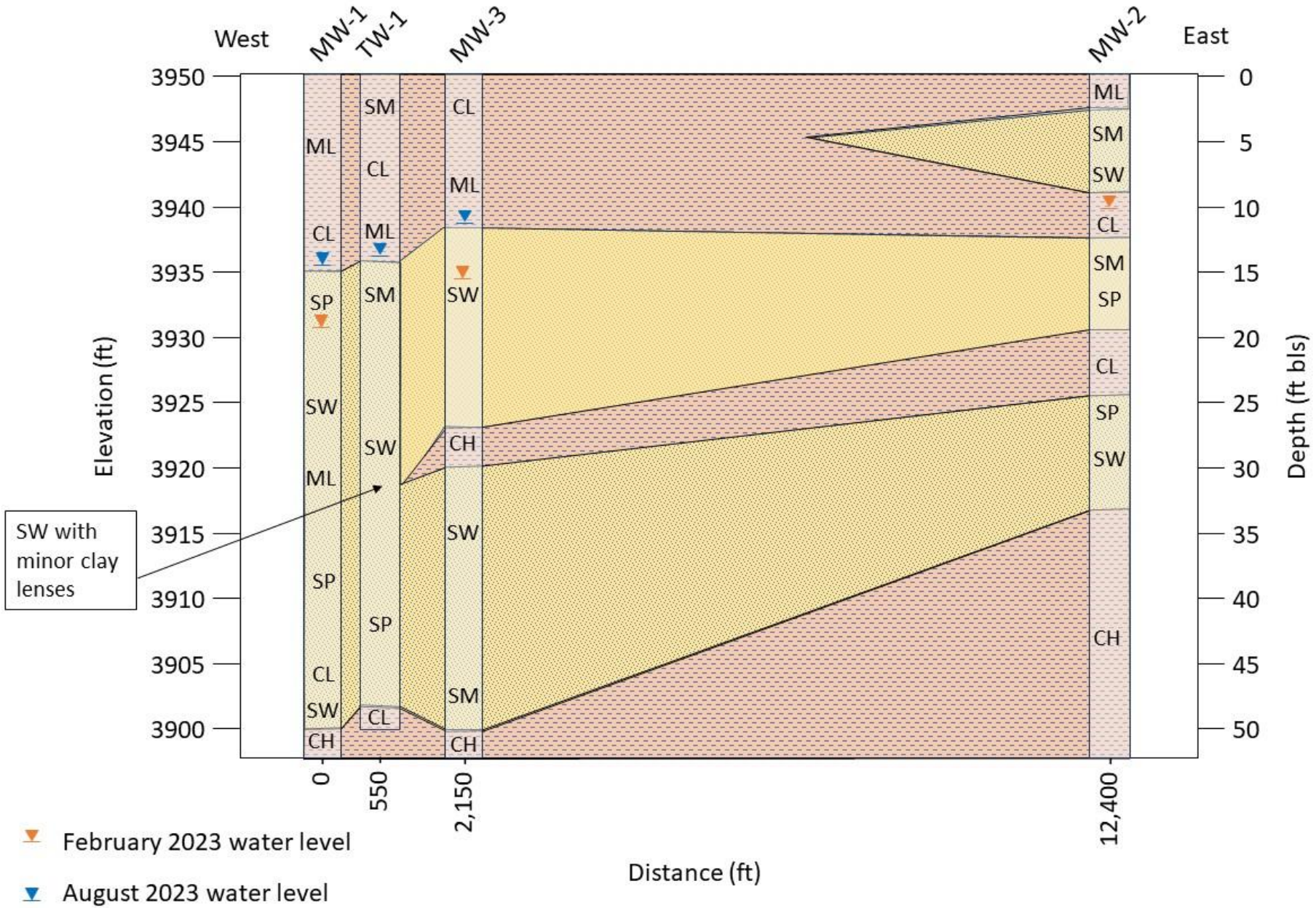
Soils Borings and Monitoring Wells

MW-1 encountered thick clays below 50 ft
MW-1 Sands from approximately 15-50 ft
TDS = ~1,500 mg/L
Cl = 410 – 560 mg/L
SAR = 12.5 – 16.6

Similar conditions encountered at MW-3

MW-3 TDS = 5,100 mg/L
TOO SALINE




West
MW-1
TW-1
MW-3
MW-2
East
Elevation (ft)
Depth (ft bls)
Distance (ft)
SW with minor clay lenses
February 2023 water level
August 2023 water level
0
550
2,150
12,400

Test Well between MW-1 and MW-3

TW-1

- Located between MW-1 and MW-3
- Adjacent to the Tule Canal
- Large diameter (24-inch) – high efficiency test well
- 50 ft in depth
- Seal from 0 to 15 ft
- 9-day pumping test @ ~500 gpm

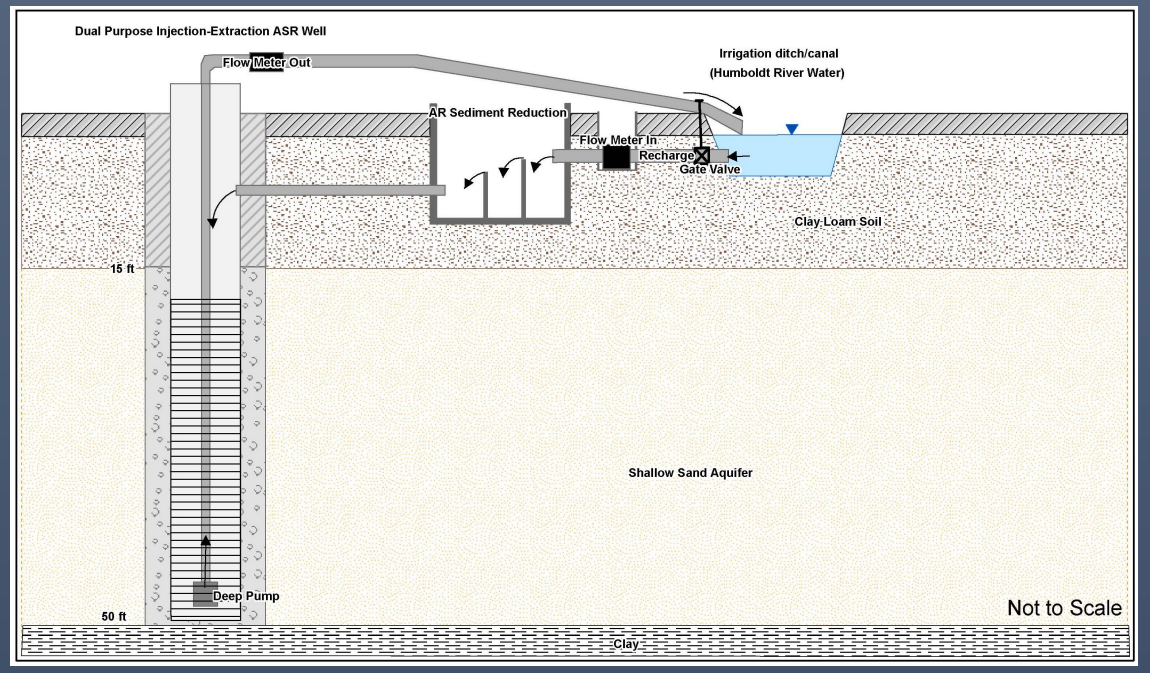
Next Steps to Advance the ASR Concept

- Review of pumping test data
- Preliminary estimate of number and spacing of ASR wells that might be required to deliver 25 cfs (function flow needed to accomplish a cycle of flood irrigation).
- Preliminary cost review – potential cost for infrastructure (wells, power, water conveyance) and O&M costs.

Subject to Concept Advancement:

- Additional borings / monitoring wells to the south to confirm extent and properties of the shallow aquifer
- Refined evaluation and modeling of the ASR concept – volumes and capacity, retention time of stored water, anticipated water quality (blended natural groundwater and Humboldt River recharged water)
- Primary Permitting:
  - NDWR: ASR permit for Humboldt River decreed water rights (possible excess river flow when occurs)
  - NDWR: Possible temporary (1-yr) permit to initially withdraw groundwater from aquifer storage
  - NDEP: UIC permit to operate “injection” wells

Questions



Dwight L. Smith, PE, PG, CHg
Principal Hydrogeologist at UES/McGinley & Associates
6995 Sierra Center Pkwy, Reno, NV 89511
dsmith1@teamues.com

WINNEMUCCA FARMS

Winnemucca Farms
1 Potato Place
Winnemucca, Nevada
89445
+1-775-830-4711

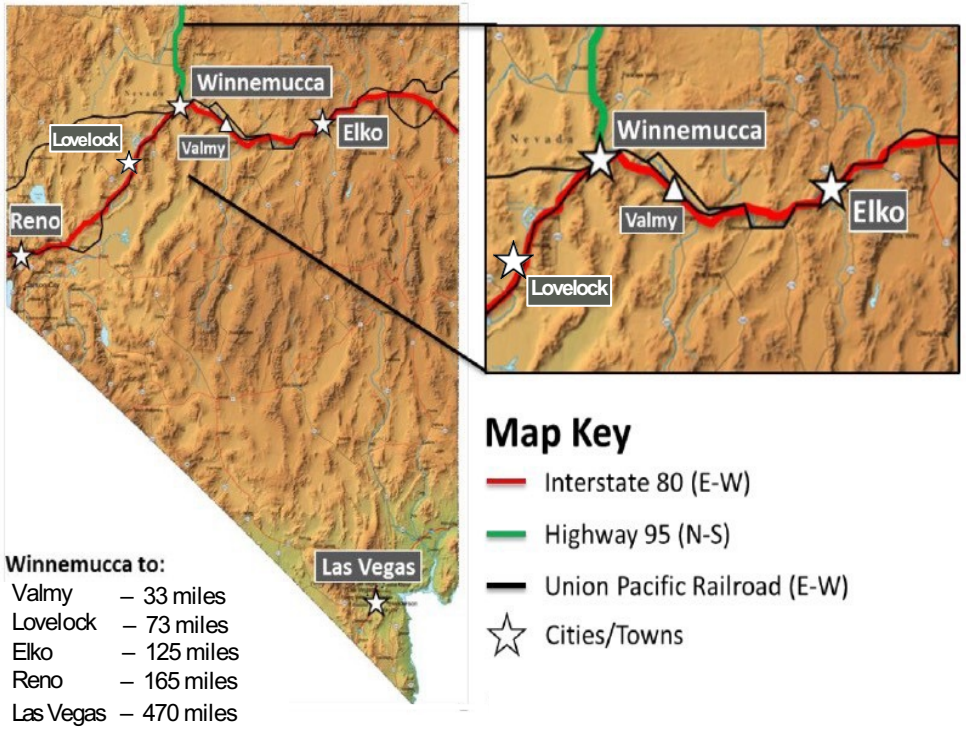
September 6, 2023

Nevada Division of Water Resources
Aquifer Storage and Recovery Project

Presentors

- Jodi Stephens, Stephens Consulting, LLC - Winnemucca Farms
- Leo Drozdoff, Perkins and Company
- Tammy Thiel, Taggart & Taggart Law

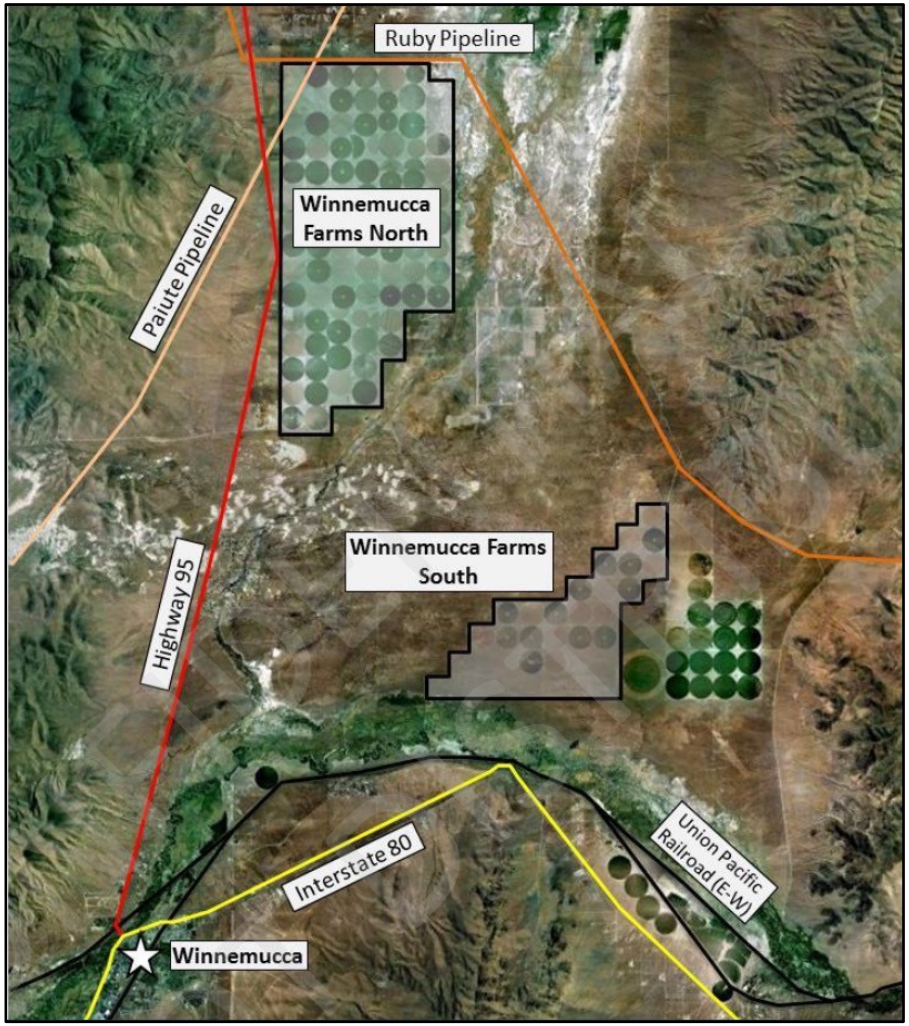
Nevada Operations: U.S. Water and Land (USWAL)



- Winnemucca Farms is located 11 miles outside of Winnemucca, Nevada.
- 91 Miles East of Lovelock, Nevada
- 127 Miles West of Elko, Nevada
- USWAL has long-standing ties to Nevada.
- USWAL has been the owner of Winnemucca Farms since 2011, with the majority of our principals investing in Nevada agriculture since the early 1970s.
- Winnemucca Farms has become the largest single irrigated farming operation in Nevada and one of the top 100 Farms in the United States.
- The Farm is now being transitioned to become one of the largest organic and regenerative farms in the US

Winnemucca Farm Operations

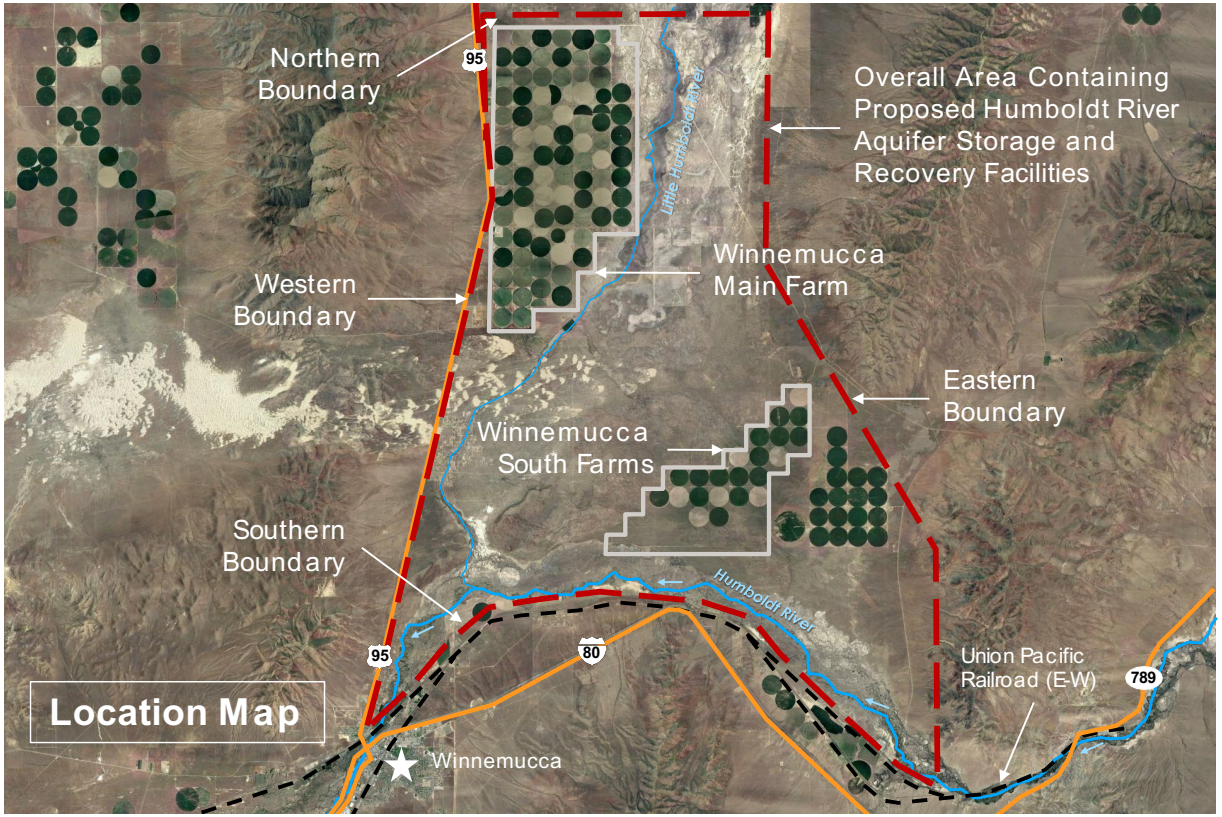
- 22,747 gross acres with 13,987 irrigated acres
- 11,195 acres are leased to CSS Farms ("CSS") through 2024
- The acreage not farmed by CSS is being transitioned to regenerative farming by USWAL
  - A 3-year transition to organic farming begins in 2021
- 650,000 square feet of on-farm and in-town industrial real estate.
- 36,261 acre-feet ("AF") of adjudicated annual senior groundwater rights
- Filings in place for an additional 300,000 AF of Humboldt River junior water rights



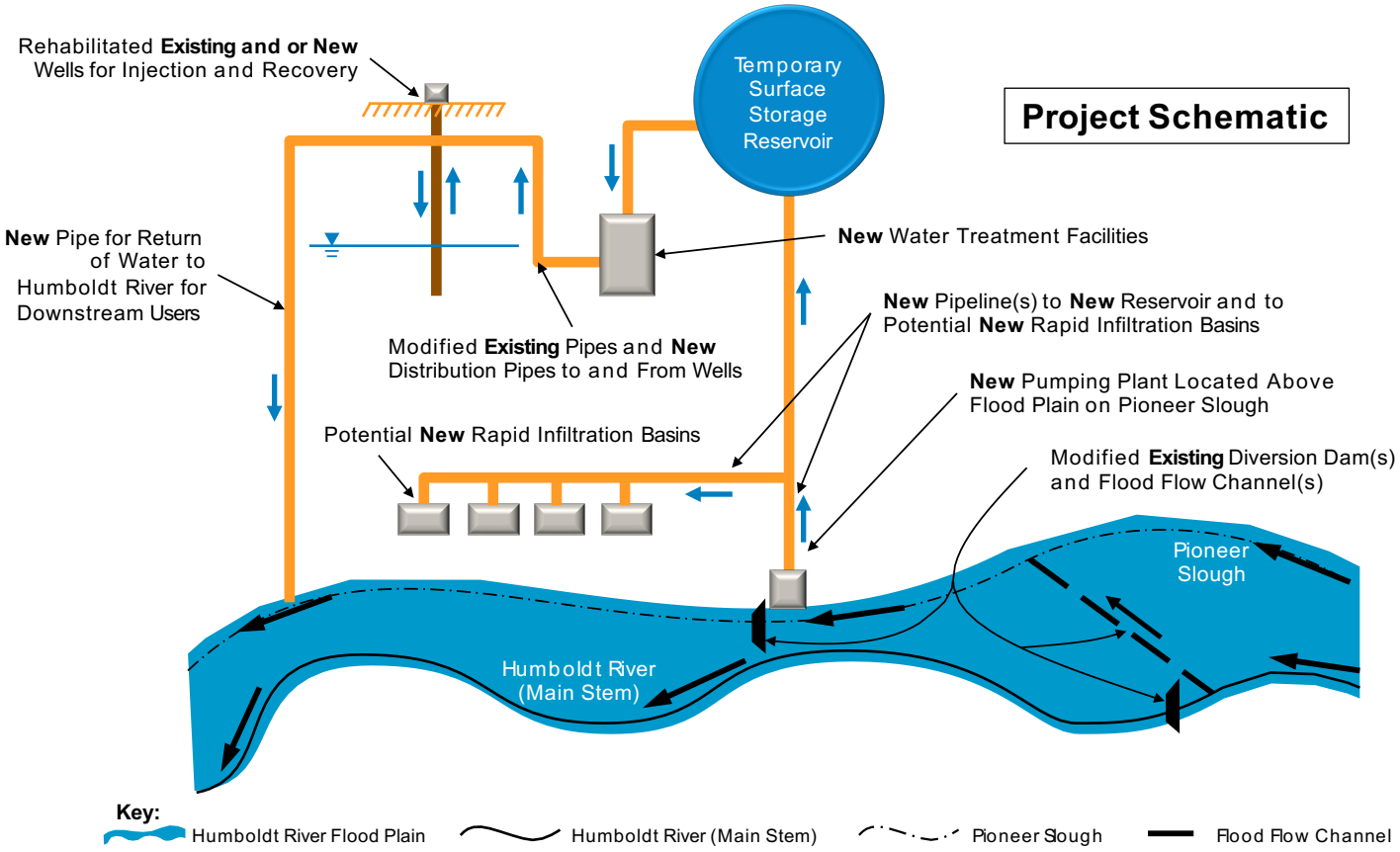
Humboldt Basin Solution

- With the ongoing conflict on the Humboldt River Basin, an innovative storage and recovery program is needed to protect the variety of interests in the region.
- As the owner of Winnemucca Farms, USWAL is in a unique position to successfully plan and implement an aquifer storage and recovery project that will benefit all the water users of the Humboldt River system.
- USWAL has both the motivation of protecting its investments in Winnemucca Farms as well as the resources to accomplish the aquifer storage project.
- This artificial recharge will reduce any impacts that upgradient groundwater pumping in the basin may be having on the river.
- The stored water can also be used to augment supplies in low flow years to protect senior surface rights as part of a potential augmentation program.
- ASR system losses of 8-15% compare very favorably to evaporation losses in the Pitt Taylor and Rye Patch Reservoirs of 40%-80%.

Aquifer Storage and Recovery Project Overview



Aquifer Storage and Recovery Project Overview



Property Rights: Senior Water Rights

- USWAL understands that its application to appropriate the excess flows of the river will be the most junior right on the river. As a junior right, all existing rights will have priority and the right to divert and use water before USWAL.
- USWAL's Application for a Permit to Appropriate the Public Waters of the State of Nevada (Application No. 87492) is limited to diverting water from the Humboldt River only when the river is experiencing flood conditions.
- Whenever all senior water right holder's instantaneous water diversion rights have been satisfied according to the Humboldt River Water Master, it is only then that USWAL will be able to divert flood waters from the Humboldt River for use in the proposed HR ASR
- USWAL recognizes that the Humboldt River surface water and ground water system must be modeled and analyzed in an open and transparent manner; as well as USWAL securing the approval of the Nevada Department of Water Resources prior to subject water right being formally issued to USWAL.
- USWAL also recognizes that the other senior water rights holders in the basin will be participants in the public process that will review USWAL's applications.

Questions?

Disclaimer

This presentation is being furnished by US Water and Land, LLC and its affiliates (collectively, "USWAL") in relation to the property/project commonly referred to as "Winnemucca Farms." The information in this presentation was compiled from sources believed to be reliable for informational purposes only. Any and all information contained herein is not intended to constitute financial or legal advice and accordingly, you should consult with your own advisors and attorneys when making decisions in relation to the content of such. USWAL does not guarantee the accuracy of the information presented nor any results and further assumes no liability in connection with the information contained herein. This presentation is to be treated as confidential information and may not be distributed or reproduced or used for any purpose other than the evaluation of this investment opportunity by the person to whom this document has been delivered without the prior written consent of USWAL.

RENO OFFICE
50 West Liberty Street, Suite 700
Reno, NV 89501
T: 775.852.3900
F: 775.327.2011

KAEMPFER
CROWELL

RENO OFFICE
info@kcnvlaw.com

July 7, 2023

VIA EMAIL

Levi Kryder
Chief, Hydrology Section
Dept. of Conservation and Natural Resources
Nevada Division of Water Resources
901 S. Stewart Street, Suite 2002
Carson City, NV 89701
lkryder@water.nv.gov

Re: Abstract – Future Conjunctive Management of the Humboldt River Region

Dear Mr. Kryder:

Kaempfer Crowell submits this abstract on behalf of our client, Nevada Gold Mines LLC ("NGM"). As this public process unfolds and as we learn from other stakeholders, NGM reserves its right to offer additional perspectives or to alter components of this abstract.

Sincerely,

KAEMPFER CROWELL

Severin A. Carlson
Alex J. Flangas
Ellsie E. Lucero

SAC/AJF/EEL/sas

Enclosure: Abstract

cc: Client

Nevada Gold Mines LLC: Future Conjunctive Management of the Humboldt River Region

Preliminarily, a one-page abstract is insufficient to meaningfully summarize the legal, social and practical steps necessary to fundamentally modify Nevada's 100-year history of surface and groundwater as separate resource systems.[1] The development, distribution, and protection of water resources are among the most important *political* and *public policy* issues in the western United States (emphasis added). *See* William Blomquist, et. al., *Institutions and Conjunctive Water Management among Three Western States*, 41 NAT. RESOURCES J. 653, 653–83(Summer 2001). As observed nearly 50 years ago by two prominent civil engineers involved in the American Water Works Association (considered the largest organization of water supply professionals in the world), far more than the application of hydrologic principles is involved in successful conjunctive management:

> [P]hysical, social, legal, and economic factors determine the operation of conjunctive ground-surface water systems…Of the many interacting parts of a system, the physical characteristics are often relatively well understood—economic and legal aspects less so… The major difficulty lies in transferring laws and regulations into quantitative measures... Economic characteristics are major constraints in constructing any mathematical representation of a conjunctive use system…There is no advantage in using a model of a conjunctive ground-surface water system that includes considerable hydrologic detail but neglects legal and economic factors. Output from such a model is essentially worthless from the standpoint of obtaining an optimal (or even good) total system operation policy.

Reza Maknoon et. al, *Conjunctive Use of Ground and Surface Water*, 70 J. AMERICAN WATER WORKS ASS'N 419, 421 (1978). The authors correctly conclude that only when the physical, economic and legal variables have been properly identified, and the complete *objectives* of the conjunctive management system to be implemented have been fully established and agreed upon (legally through regulation/law or in combination with commercial transactional elements), is it even possible to systematically approach implementing an operational solution.

Recognizing this, the successful development of a regulatory scheme, or even a combined regulatory/stakeholder transactional commerce system, to conjunctively manage surface and groundwater involving the Humboldt River Region (the "Region") should not commence until the State Engineer has jurisdiction to do so as the State Engineer's Order 1329 is subject to pending judicial review proceedings. *See Westside Charter v. Gray Line Tours*, 99, Nev. 456, 664 P.2d 351 (1983) ("It is the general rule that when an order of an administrative agency is appealed to a court, the agency's power and authority in relation to the matter is suspended as to questions raised by the appeal."). If the reviewing court determines that the State Engineer does not currently have statutory authority to conjunctively manage surface and groundwater, then the State Engineer must seek authority from the Nevada Legislature.

Additionally, stakeholders within the Region (which may include nearly 1,000 permitted/certificated groundwater holders and vast numbers of domestic well users) are still awaiting publication of the long-promised regional groundwater models from the USGS and DRI, which the State Engineer has described as "an important tool that will be used to demonstrate the effectiveness of different management strategies and possible administrative actions." *See* Order 1329 (Dec. 7, 2021). As of March 2023 the State Engineer indicated that the model Report would be completed in June 2023. (March 28, 2023 Humboldt River Region Water Management Informational Update). Without that, one aspect of this "abstract" process that remains incomplete is public input on the model. The State Engineer should also heed his own legal counsel's position and directly notice this process to all potentially affected holders of water rights in the Humboldt River Region rather than small groups of stakeholders (as was done here) because any conjunctive management system could result in the curtailment of existing groundwater rights. Consistent with the State Engineer's own prior statements, such result requires notification as a matter of *due process* to those potentially affected water rights holders so that they can provide input on a new water management system. *See* State Engineer's Motion to Dismiss in *Pershing County Water Conservation District v. State Engineer* (Case No. CV15-12019); *see also Eureka Cty. v. State Eng'r,* 131 Nev. 846, 853, 359 P.3d 1114, 1118–119 (2015).

The ultimate objective of successful conjunctive management is to coordinate water resource use in ways that reduce exposure to drought, maximize water availability, protect water quality, and sustain ecological needs and aesthetic and recreational values, (*see* Bloomquist at 654), as well as achieve equity among users and enhance social well being (*see* Maknoon at 423). The State Engineer must recognize that the legal and economic aspects of that objective have not been addressed, and legislative action is necessary to implement changes to the separate-resource system currently embodied in Nevada law and policy to address those aspects. Therefore, the State Engineer should embark on a long-term process of engaging in stakeholder and public input designed to propose statutes to address that objective and those various elements (the legal and economic, as well as hydrologic impacts). Until that process is undertaken in a meaningful manner, likely over the next few years (not condensed into a few months), this highly complex, systemic overhaul of Nevada water law, policy and management is unworkable.

Finally, as for direction from other states—none have successfully enacted a statewide system or policy of conjunctive management that could be inserted into Nevada's current statutory framework that would address the Humboldt River Region without further direct input from Nevada's Legislature. The specifics of the physical system itself (the hydrology of the Region's basins), and the institutional framework (the legal and economic system in place) will dictate whether any recommended "management" that implicates both surface and groundwater rights, conjunctively, will be operationally successful. However, a systematic approach to analyzing the problem, the variables, the significant physical elements of the system, and the true *objectives* to be obtained through conjunctive management, can provide direction to reach the goal (*see* Maknoon at 424).

[1] As this public process unfolds and as we learn from other stakeholders, NGM reserved its right to offer additional perspectives or to alter components of this abstract.

From: mark and kim hooper <markandkimh@gmail.com>
Sent: Friday, July 14, 2023 8:35 AM
To: Levi Kryder
Subject: Conjunctive Management Comments July…

Follow Up Flag: Follow up
Flag Status: Flagged

Conjunctive Management Comments July 14, 2023

Dear Sirs,

I am writing regarding the current discussions as to how to resolve/manage the ground water/surface water conflicts on the Humboldt river-the issue of "Conjunctive Management".

I am speaking only of the portion of the ground water withdrawal that is in conflict with surface water rights. I do believe that the concept of balancing perennial yield to groundwater withdrawal is sound, and if the well is geologically isolated from surface water flow, and therefore not impacting surface water flow, and therefore not generating any conflict, there does not need to be any further regulation, as long as the aquifer remains sound.

I have been involved in many discussions regarding this issue. These discussions include many meetings with the Humboldt River Basin Working Group, in Winnemucca Nevada, and as a alternate member from Elko County of the Humboldt River Basin Water Authority.

I am a surface water right holder myself, and have irrigated under the priority water right system that governs the surface water use.

Under the priority water right system, on some years I have enjoyed irrigation while water rights junior to mine in priority have not been able to irrigate.

On other years, I have been the one unable to irrigate, while watching other neighbors irrigate, because their rights were superior to mine.

Whether or not I get to irrigate is solely determined by the quantity of water available on any given year, and how far up the priority ladder that quantity will serve.

When this method of irrigation was established by the Bartlett and Edwards decrees, groundwater withdrawals were minimal. As groundwater withdrawals have increased, so has conflict, between groundwater withdrawals that affect surface water flow, and the existing surface water right holders. Acknowledging this conflict, and quantifying it, and remedying it have been the subject of the discussions that I have attended. I believe that the Division of Water Resources is earnest and well-meaning in their attempts to remedy this issue, and conversations have been productive.

However, the hard fact is, that the surface waters (the water "pie") were already fully adjudicated before groundwater withdrawals began, and there is no way to make more "wet water", than what mother nature provides on an annual

basis. Another hard fact is, with the current complete adjudication of the surface water, any individual wishing to obtain another/more surface water rights, would certainly be denied.

Therefore I believe, that to the extent that groundwater withdrawal impacts surface flow, and creates conflict, that groundwater withdrawal must be acknowledged, and accounted for.

Individual Actions-

I believe that an irrigator, who is junior on the priority table, such as a groundwater user, could address this conflict with the surface water right holders, by buying and transferring surface water rights to his operation. I believe the law already calls for this, in a similar fashion, with land developers, who must provide a source of water to serve the proposed subdivision.

I also believe that conservation could play a role. More efficient irrigation methods could be used, by either surface or ground water users. The water saved by the investments of these individuals could then be traded/sold to other individuals who need better water availability or to reduce their conflict.

Adjustments between individuals would allow reduction of conflict in an economically efficient manner.

Collective Action-

Given the large flow variation on the Humboldt River from one year to the next, water storage is always discussed. Due to the cost/environmental/evaporation problems with surface water reservoirs, underground water banking seems to be the preferred method. By storing a portion of excess water in years when it occurs, the water “pie” could be kept more constant from one year to the next.

To a large extent, the value of land is affected by the quality of its water right, and this quality includes the priority date of the water right, since the earlier Water Rights enjoy irrigation on a more consistent basis than later Water Rights. Allowing ground water wells to simply “siphon off” some of the surface flow affects the existing surface rights holders, and should be acknowledged and remedied.

Thank you for the opportunity to comment.

Sincerely,

Mark Hooper

Mark

ABSTRACT SUBMISSION
August 1, 2023 Humboldt Conjunctive Management Stakeholder Meeting

Implications of Perennial Yield-Based Curtailments and Colorado-Style Augmentation in the Humboldt River Region

Jay Dixon, PE, WRS
Dixon Hydrologic, PLLC
dixonjm@gmail.com

Chris Mahannah, PE, WRS
Mahannah & Associates, LLC
chris@mah2o.com

This abstract and potential discussion will focus on two specific topics of interest pertaining to conjunctive management policy in Nevada. First, we will discuss Colorado-style augmentation plans and then explain why basin-wide curtailments to estimated perennial yield might not work as well as some have indicated.

It is well-established that Nevada is one of the only western states to not fully recognize the administration and utilization of groundwater and surface water as one system (conjunctive use). At least not to the extent of other states such as Colorado, New Mexico, Oregon, Idaho, and California, where conjunctive management has been clearly codified and implemented for several decades in many cases. Of particular interest for the purposes of this analysis is the Colorado framework for augmentation plans. Colorado augmentation plans are based on the 1969 Water Right Determination and Administration Act, which integrated tributary/alluvial groundwater and surface water use and allowed for plans to replace out-of-priority depletions of junior water rights in time, place, and amount. Our discussion will explore how a Colorado-style augmentation framework might work in Nevada with the objective of providing increased protection of senior priority decreed surface water rights from upstream groundwater appropriations based on the State Engineer having clear statutory authority to administer the conjunctive use of groundwater and surface water, thereby enabling increased beneficial use of the total water resource. This framework is summarized based on the following primary issues:

1. Utilization of a reliable method and tools to quantify capture and timing,
2. Providing an equitable funding mechanism,
3. Continued and, in some cases (where appropriate), providing for increased utilization of groundwater by utilization of one or a combination of augmentation and replacement water tools successfully implemented by Colorado.

A proposed second topic for discussion is the misleading notion in Nevada that simply curtailing by priority, entire hydrographic basins based on the estimated perennial yield will eliminate conflicts with hydrologically connected surface water sources throughout the basin. While it is recognized that reducing groundwater appropriations within basins where pumping exceeds the perennial yield will reduce well-to-well conflicts or water level declines, it may only help reduce

river capture in some areas, and it could take years or decades to reverse the capture. The amount of pumping allowed without adverse consequences to surface water has little to do with recharge. "*Often streams are depleted long before the pumping reaches the magnitude of recharge"*[i] Furthermore, if a curtailment order or water right purchases are based upon strict adherence to priority within the entire basin, there will be instances where the most senior right(s) that are immediately adjacent to the surface water source will be allowed to continue pumping (with significant capture) while a junior right miles away, with potentially minimal or no river capture at all, is curtailed. This type of scenario is likely to occur in the Humboldt River basins unless focused curtailments or water right purchases in sub-areas where demonstrable impacts are occurring or could occur in the future. The authors will use one or two two hydrographic basins in the Humboldt River Region to graphically demonstrate the potential issues with basin-wide curtailment based on estimated perennial yield.

[i] Groundwater, J. Bredehoeft, Vol 35, No. 6, Nov-Dec, 1997

HUMBOLDT RIVER ABSTRACT SUBMISSION

Participant: The Nature Conservancy, Nevada

Title: **Water Rights Retirement on the Humboldt River**

a. Brief description of the concept/method/idea and how it would work.

The voluntary and permanent retirement of water rights causing conflict or detriments to natural resources could be a means to provide long-term solutions for conjunctive management on the Humboldt River that should also benefit ecosystems.

b. Discussion on how to implement this concept and what is needed.

The capture models for the Humboldt River Basin could be used to identify where curtailment and the retirement of groundwater rights could benefit flows to the Humboldt River. The State, willing water right holders, or other facilitating entities could apply for grants to compensate the voluntary and permanent retirement of these water rights. We know that a lot of water users are good stewards of nature as well as the land, so keeping land productive while using less water is important. Some of the federal programs can help with transitioning land to other uses like dryland agriculture, crops that use less water (including native plants that might provide native seed, which is another program that TNC is working on), or grazing.

c. If this concept has been implemented successfully in other states, provide additional information on how it was implemented and examples.

Voluntary water rights retirement programs have been tested in other states. Kansas has had two programs in place since 2007 that have successfully retired water rights. Information about these programs are available at https://agriculture.ks.gov/divisions-programs/division-of-conservation/water-conservation-programs. The Upper Arkansas River and Rattlesnake Creek Conservation Reserve Enhancement Program has used funds from both the State of Kansas and the Natural Resource Conservation Service (NRCS) Conservation Reserve Enhancement Program (CREP) to retire 47,643 AF of water as of 2021, and the Water Right Transition Assistance Program has retired 2,663 AF. A CREP Program in the Harney Basin in Oregon has also just begun that will retire groundwater rights with additional compensation available for retiring water rights near groundwater-dependent ecosystems (see https://www.oregon.gov/owrd/Documents/CREP%20Handout.pdf) with funding from Oregon and the US Farm Services Agency. Using American Rescue Plan Act funds, the Rio Grande Water Conservation District has just implemented a Groundwater Compact Compliance and Sustainability Fund to retire groundwater rights in Colorado that was enabled by Senate Bill 22-028 in 2022.

d. Any pitfalls or issues (funding concept, additional needs by public or State Engineer's office)?

It is important that any conjunctive management regulations or legislation does not preclude the ability of water users to permanently retire water rights. As noted in the examples from other states, grant funding opportunities may be available to implement water rights retirement.

Additional information about water rights retirement in other states:

- Oregon - House Bill 3357: https://olis.oregonlegislature.gov/liz/2023R1/Measures/Overview/HB3357
- Colorado - Senate Bill 22-028: https://leg.colorado.gov/bills/sb22-028

ABSTRACT SUBMISSION

August 1, 2023 Humboldt Conjunctive Management Stakeholder Meeting

USCID & Other Papers on Conjunctive Management

Schroeder Law Offices, P.C.
Therese A. Ure Stix
10615 Double R. Blvd. Ste 100, Reno, NV 89521
775-786-8800; counsel@water-law.com

This abstract is not an offering for a presentation, but for research to provide to NDWR electronically.

The U.S. Committee for Irrigation and Drainage ("USCID") has held conferences in the past that focus on conjunctive management issues. We are offering to research the past USCID conference proceedings to locate and provide to NDWR copies of papers and research projects related to conjunctive management issues in other states and/or internationally. For example, in 2006, the organization held a conference on "Ground Water and Surface Water Under Stress: Competition, Interaction, Solutions". Likewise, in Colorado along the South Platte River, conjunctive management papers have analyzed how different hydrological approaches have been used to increase water supplies.[1]

Thus, we are offering to locate and review the papers submitted for these types of conferences and provide them to NDWR. This may provide insight as to other conjunctive management schemes and strategies.

[1] https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1068&context=ucowrconfs_2006
http://southplatte.colostate.edu/files/Conjunctive%20Management%20in%20Idaho--The%20Water%20Report.pdf

Conservation Measures on Humboldt River using Retirement of Water Rights And Seeking Recommendations from Schools of Water Management and Conservation

Bennie Hodges
PO Box 1282
Lovelock, Nevada 89419
775-770-4018
hodgesresources@gmail.com

Approximately 22 of the 33 Basins in the Humboldt River Basin are over appropriated. This is one of the Problems affecting surface water deliveries.[1] Over the last 60 years or so, groundwater use in the Basins has only increased, and often times over perennial yields. When this happens the basins groundwater resource declines as storage is used without recharge. As a way to offset this decline, Pershing County Water Conservation District recommends implementing conservation measures, including but not limited to the following:

- A system where groundwater users could retire water rights on marginal ground in exchange of future tax credits on other lands still operated by that water user.
- A system created by the State of Nevada to purchase water rights from willing sellers or retire water rights that are most junior in priority in basins that are over appropriated.
- As system of voluntarily relinquishment of surface water rights in favor of groundwater rights as a tool for mitigation.
- The State Engineer's Office could look at National Institute for Water Resources for new ideas in water conservation.

[1] While it is argued by some that the over appropriation of groundwater basins has nothing to do with conjunctive management, how can it not? By bringing each basin back into a sustainable yield the water levels should increase, and cones of depression soften. Thereby, portions of these basins next to the surface water system should in turn capture less of the senior surface water rights. Regardless of the debate, bringing the basins into a sustainable annual yield should be a goal for the State Engineer in responsibly administering the waters of the state.

Groundwater Duty Management as a Conjunctive Management Tool

Bennie Hodges
PO Box 1282
Lovelock, Nevada 89419
775-770-4018
hodgeswaterresources@gmail.com

Pershing County Water Conservation District believes there are disparities on the Humboldt River and its' tributaries as to how surface water users and ground water users are treated regarding per acre duties of water rights and "in priority" allocations limiting duties. Conservation tools in conjunctive management should include an equitable administration of duties among all sources of water.

Historically, surface water users were and are currently delivered water based on their year of priority. (1861 – 1921)

- A Harvest Right is entitled to 3.0 ac/ft/ac
- A Meadow Pasture Right is 1.50 ac/ft/ac
- Diversified Pasture Right is .75 ac/ft/ac

There are a very small number of surface water rights that receive 4.0 ac/ft/ac due to poor or sandy soils, but this number is very small. These duties are established by the Humboldt River Adjudication (1923 – 1938).

In the past 20 years, surface water users have rarely received a full allotment, especially below the Palisade gauge where the year of priority for delivery is established. Yet ground water users with irrigation permits receive a 100% allotment of 4.0 ac/ft/yr although most all ground water permits are junior in priority to all surface water decreed rights on the Humboldt River.

In 2017 the Nevada Legislature made a declaration that all water, regardless of the source, are to be managed conjunctively. Therefore, any new applications and change applications to ground water should be limited to duties established by the Humboldt River Decree like surface water users are, because ground water users are junior in priority to surface water users, and yet they receive 100% allotment every year and surface water users rarely receive 100% allotment. A system of allocation priority for underground users should be established that is similar to, or at minimum, follows the surface water user allocations. This would put surface and ground water users on a more equitable playing field.

This system could be established administratively to maintain the paper water right, but reduce the season duty allocation based on the water year.

ABSTRACT SUBMISSION

August 1, 2023 Humboldt Conjunctive Management Stakeholder Meeting

Potential for Shallow Aquifer Recharge, Storage and Recovery in the Lovelock Agricultural Area

Dwight L. Smith, PE, PG, CHg
Principal Hydrogeologist UES/McGinley & Associates
6995 Sierra Center Pkwy, Reno, NV 89511
dsmith1@teamues.com

The potential for aquifer recharge, storage and recovery (ASR) is being evaluated in an incremental approach at a farm in lower Lovelock Valley. The farm utilizes Humboldt River decreed water rights to irrigation approximately 8,000 acres of land for alfalfa cultivation. The ASR concept revolves around recharging the shallow aquifer with a portion of the farm's decreed Humboldt River water rights during average or above average water-year conditions, for future subsequent withdrawal during drought years. A phased feasibility approach of analysis is being implemented to: 1) determine the extent and thickness of the shallow aquifer; 2) determine the existing groundwater quality in the shallow aquifer; 3) determine the hydraulic properties of the shallow aquifer, and if potential exists for completion of high-capacity shallow wells; 4) determine if there exists, or can be created by pre-ASR pumping, sufficient aquifer storage capacity to operate an ASR; 5) determine/estimate the water quality to expect from an operational ASR and determine if suitable for agricultural uses; 6) conduct engineering and cost feasibility reviews for capital expenditures and O&M, and 7) produce technical evaluations and applications for ASR permitting, including UIC injection for recharge wells.

Drilling of nested monitoring well groups at the farm has identified potentially favorable shallow aquifer conditions on the northern portion of the farm, with a shallow sand aquifer present from 15 to 50 feet below land surface. Groundwater present in the shallow aquifer contains total dissolved solids (TDS) concentrations of 1800 to 2000 mg/L, which is marginal for crop irrigation, but could be diluted to an acceptable salinity with recharge water from the Humboldt River water. High clay content in the near-surface soils would be prohibitive for implementing a rapid infiltration basin recharge concept, however, a dual-purpose injection and recovery well concept may be feasible. Unfavorable shallow aquifer conditions for ASR were found on the northwestern side of the farm, owing to a thinner section of sand comprising the shallow aquifer and TDS concentration exceeding 5000 mg/L.

Preliminary findings on the northern portion of the farm have been favorable enough to advance to a test well drilling phase of evaluation planned for the summer of 2023. This effort will involve drilling a 24-inch diameter test well to 50 ft in depth, screening the shallow sand aquifer from 15 to 50 ft, and conducting a 10-day constant-rate pumping test. In order meet an acceptable condition, the test well will likely need to have a production rate of at least 2 cubic feet per second, or 1000 gallons per minute. If well yield is less, then the number of wells required to implement the ASR would likely be cost-prohibitive. Pending a favorable test well outcome, the next phase of evaluation will entail drilling of additional shallow monitoring wells on the farm to further define the extent of the shallow aquifer and existing salinity in groundwater in the aquifer.

PAUL G. TAGGART
SONIA E. TAGGART

TAGGART & TAGGART, LTD.
A PROFESSIONAL CORPORATION
108 NORTH MINNESOTA STREET
CARSON CITY, NEVADA 89703
www.nvwaterlaw.com

DAVID H. RIGDON
TIMOTHY D. O'CONNOR
THOMAS P. DUENSING
TAMARA C. THIEL

July 14, 2023

VIA: Hand Delivery and Email
Levi Kryder
Chief of the Hydrology Section
Nevada Division of Water Resources
901 S. Stewart St., Suite 2002
Carson City, NV 89701
lkryder@water.nv.gov

Re: Submission of Abstract Regarding Conjunctive Use Management Strategies for the Humboldt River Region

Dear Mr. Kryder:

The attached one-page abstract is being submitted on behalf of US Water and Land, LLC. The attached conjunctive use proposal is currently authorized for implementation under existing law, and is consistent with the foundations of prior appropriation and beneficial use. *See* NRS 533.055 (water may be stored for beneficial use), NRS 534.250-NRS 534.340 (Aquifer Storage and Recovery ("ASR") permitting statutes).

Thank you for the opportunity to present this proposed conjunctive management concept for the Humboldt River. If you have any questions, or require any additional information, please feel free to contact my office.

Sincerely,

Tamara C. Thiel, Esq.
Partner
TAGGART & TAGGART, LTD.

Encl.: Brief abstract of Artificial Storage and Recovery (ASR) Project

Brief abstract of Artificial Storage and Recovery (ASR) Project

Brief description of the concept/method/idea and how it would work.

As referenced in a presentation to the Nevada Legislature's Public Land Committee by the Humboldt River Basin Water Authority ("HRBWA") in 2014, there is a need for additional storage within the Humboldt River Basin to ensure adequate water supply during years of below average runoff.[1] In its 2014 presentation, HRBWA identified Paradise Valley as a desirable storage area, and specifically referenced that opportunities for aquifer storage and recovery may exist there.

US Water and Land, LLC, a Delaware limited-liability company ("USWAL") is the owner of Winnemucca Farms in Paradise Valley. USWAL is exploring the implementation of an aquifer storage and recovery ("ASR") project in Paradise Valley Basin.

The State Engineer's management of Humboldt River water resources should include use of the ASR project in Paradise Valley Basin. This project will divert excess flood waters of the Humboldt River (under pending Application 87492) and reinject this water into the aquifer for future use. When needed, the water reinjected into the aquifer could be utilized for replacement "wet water" requirements or other replacement needs. At a minimum, replacement water produced from USWAL's ASR project could be allowed to offset to any alleged capture from pumping.

Discussion on how to implement this concept and what is needed.

In a wet year, when Rye Patch Reservoir and Pitt-Taylor Reservoir reach capacity, and senior rights are met, excess flood water is available for an ASR project. In past conversations with former Humboldt River Water Master, Steve Del Soldato, he indicated that in 7 of the last 25 years, Humboldt River flows exceeded the flows needed to meet senior rights, and in those 7 years, an aggregate of almost 1.3 million acre-feet in excess water was available, and unappropriated. Under the ASR project, the excess water would be diverted to storage in the groundwater aquifer when it is available through rapid infiltration basins or injection wells. The flood water would be stored underground to improve the health of the groundwater aquifer, and subject to adjustment for system losses, would be available to divert from storage as needed or desired.

If this concept has been implemented successfully in other states, provide additional information on how it was implemented and examples.

Augmentation plans in Colorado, and water banking throughout the West, are examples of how ASR-type projects have been used in other states.

Any pitfalls or issues (funding concept, additional needs by public or State Engineer's office)

An ASR project will be costly, and funding is needed from any available source. Also, approvals from the State Engineer and the Division of Environmental Protection are needed. Existing protests against the ASR project must be resolved. USWAL has engaged in discussions with stakeholders to develop an ASR project management plan that will protect all senior rights and create a bank with water that is available for augmentation of the Humboldt River.

[1] *See* Humboldt River Basin Water Authority, *Overview of Organization, Key Issues and Recommendations*, Presentation To Nevada Legislature's Natural Resources, Agriculture And Mining Committee at page 10. Available at https://www.leg.state.nv.us/App/NELIS/REL/78th2015/ExhibitDocument/OpenExhibitDocument?exhibitId=9895&fileDownloadName=h0219_Humboldt%20River%20Basin%20Water%20Authority%20Presentation.pdf

Sept. 6, 2023

Conjunctive Management Stakeholder Workshop
Sign-in Sheet

Name:	Organization:	Phone Number:	Email:
ROUTSON, Sam	Crawford Farms		greatsambig@gmail.com
MAHANNAH, Chris	MAHANNAH & Assoc.	775-323-1804	Chris@mahzo.com
James, Ed	CWSD	775-887-7456	edjames@cwsd.org
CARLSON, SEV	KAEMPFERCROWELL	775-852-3900	scarlson@kcnvlaw.com
FLANGAS, ALEX	KAEMPFERCROWELL	775-852-3900	aflangas@kcnvlaw.com
Dixon, Jay	Dixon Hydrologic	702-249-5223	dixonjm@gmail.com
Collins, Ryan	PCWCD	775-273-2293	PCWCD@Irrigation.Woodcrk.NV.US
Ryan Hume	VWC	775 885 5065	rhoar[illegible]
Caitlan McCarth	NDWR		
Jen Kramer	NDWR		
Laurel Saito	The Nature Conservancy	~~775~~ 453 6903	laurel.saito@tnc.org
TAMARA THIEL	TAGGART	775-882-9900	tammy@legaltnt.com
Dwight Smith	UES	775-848-2366	dsmith1@teamues.com
Tim O'Connor	Taggart	775 882 9900	Tim@legaltnt.com
Colton Bamson	DWR	775-304-0596	cdbamson@water.nv.gov
Landon Harris	DWR		
JAMES EASON	GBWC		james.eason@greatbasinwater.co.com

Sept. 6, 2023

Conjunctive Management Stakeholder Workshop
Sign-in Sheet

Name:	Organization:	Phone Number:	Email:
Therese Stix	SLO	775-786-8800	
Shaylee Hudson	Pershing County	775-442-0242	
Steve DeSalvio	State NV	775 304 7726	
Jared McCrum	DWR		jmccrum@water.nv.gov
Jaya Garcia	VWC	775 431 3994	JNGarcia1@VidaWater.com
Jeff Fontana	WRBWG	775-443-7667	
Lee Drozdoff	DG	775-781-1889	
Jodi Stephens	SC	775-830-4711	jodi@SC-NV.com
WADE POLLSON	2CWD	775-962-1624	
Kip Allander	DWR		
Levi Kryder			
Malcolm Wilson			
Adam Sullivan			
Nicole Gehring			
Kelly McGowan			
Brian Rasmussen			
Eric Schadek			

1. Summary

Meeting title	Humboldt stakeholder workshop
Attended participants	41
Start time	9/26/23, 12:38:09 PM
End time	9/26/23, 7:39:37 PM
Meeting duration	7h 1m 28s
Average attendance time	2h 21m 19s

2. Participants

Name	Email
Kip Allander	kallander@water.nv.gov
DCNR Conf Rm Tahoe 2-E (TEAMS)	ConfRmTahoe@ndep.nv.gov
Greg Poh	
Colton D. Brunson	cdbrunson@water.nv.gov
Ridge Ricketts	rricketts@water.nv.gov
Lea Jacobsen-Guy	ljacobsen-guy@water.nv.gov
Melissa Strobel (Guest)	
Carl Savely	csavely@wingfieldnevadagroup.com
Leana. Carey	
Glenn King	Glenn.King@orlamining.com
Gary Moore	gmoore@water.nv.gov
Greg Pohll	
Jake Tibbitts (Guest)	
Ellsie Lucero	
Debra Struhsacker	debra@struhsacker.com
Sunshine Morgan	smorgan@water.nv.gov
Davis, Kyle W	kyledavis@usgs.gov
Tamara Baker (Guest)	
McHale, Brigid (NV Energy)	Brigid.McHale@nvenergy.com
Tom Driggs	tdriggs@nevadafirm.com
Camron Montoya	cmontoya@water.nv.gov
Annalise Porter	annalise.porter@snwa.com
Trevor Price	trevor@rci-nv.com
Chris Thorson	cthorson@water.nv.gov
Edmund, Quaglieri	EQuaglieri@tmwa.com
Bruce Scott	bruce@rci-nv.com
Jessica Joshi	jessica@rci-nv.com
Ellsie Lucero	
Sue Houts	shouts@water.nv.gov
Chris Facque	chris@facqueconsulting.com
Bob C.	
Terri West	twest@coeur.com
Dawn Aragon	dawn@rci-nv.com
Jeff Fontaine (Guest)	
Joe Davis	joe@moapawater.com
Jake Tibbitts (Guest)	
Kyle Davis	

Kyle Davis	
Kelly C. McGowan	kcmcgowan@water.nv.gov
Catherine Hansford	catherine@hansfordecon.com
Kyle Davis	kyle@nevadamining.org