Technical and Physical Feasibility Fact Sheet
Alternative 144: Conjunctive Management

Acknowledgements: This fact sheet was written by Susan C. Kery, Esq. of Sheehan Sheehan & Stelzner, P.A. as part of the "Evaluation of Alternative Actions for Technical, Physical, Hydrological, Environmental, Economic, Social, Cultural, and Legal Feasibility and Water Quality Issues and Legal Overview" contracted to Daniel B. Stephens & Associates, Inc. The format and organization of the fact sheet and the definition of the alternative were developed by the Water Assembly.

1. Definition of Alternative

A-144: Address groundwater/surface water interactions in the statutes for administering water rights.

2. Summary of Alternative Analysis

This alternative was more fully described by the Water Assembly as follows:

> There is a connection between surface water and shallow groundwater. That is, by extracting groundwater, surface water will percolate down to the shallow groundwater and "fill in" the volume of water that has been pumped. This interaction has a time lag, and will not be immediately observable. For groundwater wells near the river, the effect may take days or weeks depending on the separation distance. For groundwater wells further away, the effect could take weeks or years. One example of the need for this accounting of the interaction of surface water and groundwater is that a junior water rights holder who has pumped groundwater, could later "infringe' on the water supply to senior surface rights holders, particularly during a time of drought.

Thus, the primary focus of this alternative is to take full benefit of the priority administration of water, as mandated by the law of New Mexico.

3. Alternative Evaluation

Conjunctive management and priority administration are recognized in both the constitutional (priority administration) and statutory (conjunctive management and priority administration) law

of New Mexico. As such, this alternative is legally feasible. Nonetheless, conjunctive management could be strengthened through the passage of legislation which would allow for the augmentation of surface waters depleted by groundwater pumping. The State of Colorado presents a model for augmentation plans.

Description of conjunctive management. Conjunctive management allows water managers to use a combination of surface water and groundwater resources to meet demand. With conjunctive management, a water right owner who holds both surface and groundwater rights may rely entirely on surface water in a wet year while allowing the aquifer to recover through natural recharge. Conversely, in a drought year, the water supply could be obtained through reliance on ground water. This would benefit the river system and downstream users by leaving additional water in the river. As analyzed below, an issue that arises in conjunctive management is whether priority administration can be maintained in a conjunctive management system.

New Mexico Law on priority administration and conjunctive management. The State of New Mexico, like most western states, uses the doctrine of prior appropriation to allocate water use. This doctrine has these essential principles: (1) the first user (appropriator) in time has the right to take and use water and (2) that right continues as against subsequent users as long as the appropriator puts the water to beneficial use. [1]

The State Engineer has the power, through permit conditions, to allow the commingling of water rights and the conjunctive use of water. A water right is generally restricted to a point of diversion (either a well or a surface water diversion). For example, a groundwater right must be diverted from a well permitted by the State Engineer and cannot be taken from a surface water diversion. Surface water can be diverted at the surface point of diversion and as such, the supply may be limited in times of drought. In order to conjunctively manage these two rights, the water holder would apply to the State Engineer requesting permission to divert the total water right held from either (1) surface water, (2) groundwater, or (3) a combination of surface and groundwater. The type of diversion used would depend upon certain conditions, which would be described in the permit allowing conjunctive management. Prior to the State Engineer approving any application for conjunctive management, notice of the application would have to be published, and the applicant would have to show that the management tools requested would not impair existing water right users, be contrary to the conservation of water in New

Mexico, or be detrimental to public welfare.[2] Also, in permitting the conjunctive use of surface water and groundwater, the State Engineer may limit the amount of surface water available to such use to the historical supply of such surface water.

Conjunctive management can also be accomplished through the use of supplemental wells. By statute, surface water users may apply to supplement their use of surface water with a supplemental well. Such an application would be subject to publication and notice, and would be granted only upon a finding by the State Engineer that the drilling of a supplemental well would not impair existing water right users, be contrary to the conservation of water in New Mexico, or be detrimental to public welfare.[3]

Priority administration of conjunctively used water. One issue that may arise in the conjunctive management of water is that of priority administration of the surface and groundwater that is being conjunctively used. Although it is true that in New Mexico priority administration of water rights has not typically been enforced, the possibility exists that during times of extended drought, priority calls may occur.

In the Rio Grande Basin, groundwater is hydrologically connected to surface water. This presents a problem in priority administration because of the delayed hydrologic effects from pumping wells. When water is diverted from a well, thus depleting the aquifer that is interconnected with a stream system, the well initially draws water from underground storage and has no effect on streamflow. However, as groundwater is storage is depleted over time, the well eventually begins to draw water from the stream system, resulting in decreased surface flow. Conversely, when a groundwater appropriator stops pumping a well, there is also a delay in the impact on the hydrologically connected stream. The impact from prior pumping on the stream will continue until the depleted groundwater is replaced. The time in which the impacts of well pumping are realized on the stream system is variable, and depends upon the location of the well in relation to the stream. For example, pumping from wells adjacent to a stream may affect the river immediately.

The delay in impact from well pumping creates the problem in priority administration. When a senior surface water user is not receiving his full appropriation, and makes a “priority call” in which junior water users would have to curtail their water diversions, it would be expected that well appropriators with water rights junior to those of the senior user would cease pumping. But,

due to the delayed effects on the stream when groundwater pumping is stopped, such curtailment of groundwater use would not result in additional water reaching the senior user. This situation could occur often since, in the planning region, many groundwater users are junior to surface water users.[4] This set of hydrological facts brings the "futile call" doctrine into play. Since cessation of well pumping would result in no additional water for the senior user, the junior users could continue pumping. Such a result is contrary to the spirit of the prior appropriation doctrine, which requires that senior users fulfill their rights in times of shortage prior to junior users.

The Interstate Stream Commission recently proposed priority administration and water banking regulations on the lower Pecos River that would address this issue.[5] The two sets of regulations are designed to work hand in hand to assure that groundwater and surface water are diverted in priority. Under these regulations, a groundwater user depleting streamflows can continue to pump only by going to a water bank and obtaining replacement water and thereby offsetting surface depletions.

The State of Colorado has attempted to deal with the priority administration of surface and ground water through legislation regulating "tributary ground water" (water that is hydrologically connected to a surface water system) conjunctively with surface water. By statute, Colorado has attempted to balance priority administration with the maximum utilization doctrine. Colorado's 1969 Water Right Determination and Administration Act declared that "it is the policy of this state to integrate the appropriation, use, and administration of underground water tributary to a stream with the use of surface water in such a way as to maximize the beneficial use of all the waters of the state" (C.R.S. § 37-92-102(1)(a)(2002)).

In light of this policy, and further recognizing "that the use of underground waters as an independent source or in conjunction with surface waters is necessary to the present and future welfare of the people of this state, and that the future welfare of the state depends on a sound and flexible integrated use of all waters of the state," Colorado further declared that "the use of ground water may be considered as an alternate or supplemental source of supply" for surface water right holders (C.R.S. § 37-92-102(2)(c)(2002)). By these declarations, Colorado specifically recognizes the utility of conjunctive management, and that utilizing groundwater maximizes beneficial use because it uses stored groundwater that otherwise would not be beneficially used.

Although recognizing conjunctive use, Colorado protects senior surface users from junior groundwater users. "[T]he operation of this section shall not be used to allow ground water withdrawal which would deprive senior surface rights of the amount of water to which said surface rights would have been entitled in the absence of such ground water withdrawal. . ." (C.R.S. § 37-92-501(1)(2002)). Yet, the same statute codifies the futile call doctrine:

> [G]round water diversions shall not be curtailed nor required to replace water withdrawn, for the benefit of surface right priorities, even though such surface right priorities be senior in priority date, when, assuming the absence of groundwater withdrawal by junior priorities, water would not have been available by such surface right under the priority system.

Finally, Colorado provides for augmentation plans to offset depletions from wells. Wells that make out-of-priority diversions must replace their depletions through an augmentation plan. An essential component of an augmentation plan is to provide sufficient replacement water to prevent injury to senior users (C.R.S. § 37-92-305(5)(2002)). This provision is similar to New Mexico's requirement that senior water rights be retired to offset depletions to surface water caused by groundwater pumping.

Conclusion. Both conjunctive management and priority administration are recognized in New Mexico law. Nonetheless, the adoption in New Mexico of specific laws mandating that junior users replace water lost to seniors through out-of-priority groundwater pumping may ensure the orderly administration of priorities in times of shortage.

3.1 Technical Feasibility

Enabling New Technologies and Status

A change in water rights administration would be necessary to legally require junior users to replace water lost by senior users by out of priority groundwater pumping.

Infrastructure Development Requirements

If a water right holder has the right by license or permit to use both surface and groundwater points of diversion, no infrastructure development requirements would be necessary to implement this alternative. Conversely, if a surface water user applied for, and was granted

permission to use, supplemental groundwater points of diversion for conjunctive management purposes, new wells would be required.

Total Time to Implement

The time to implement this alternative would include (1) the time necessary to change the water rights administration policy described above, (2) the time necessary to train Office of State Engineer staff on priority management if out-of-priority pumping occurs, and (3) the time necessary to apply for supplemental points of diversion (application, notice, and hearing) to allow an individual water owner to conjunctively manage a water right.

3.1.1 Physical and Hydrological Impacts

Effect on Water Demand

Demands on groundwater and surface water would vary from year-to-year, depending on whether surface or groundwater is being used through conjunctive management. Overall depletions would remain consistent and would be determined by the water right permit.

Effect on Water Supply (surface and groundwater)

Conjunctive management would allow for there to be more equilibrium between surface and groundwater use; therefore, there is more likelihood that senior water rights can be met in drought years.

Water Saved/Lost (consumption and depletions)

None

Impacts to Water Quality (and mitigations)

No direct impacts. Switching to groundwater pumping in a year with low surface flows could mitigate water quality concerns associated with low flows.

Watershed/Geologic Impacts

Conjunctive management will allow for increased surface flows in drought years (when water is withdrawn from the aquifer) and aquifer recharge in wet years, when water is diverted from the river.

3.1.2 Environmental Impacts

Impact to Ecosystems

Conjunctive management would for increased surface flows in drought years and aquifer recharge in wet years. Increased surface flows would benefit the riparian ecosystem.

Implications to Endangered Species

This alternative could have a positive impact on the silvery minnow, since conjunctive management will allow for increased surface flows in drought years.

3.2 Financial Feasibility

3.2.1 Initial Cost to Implement

The costs to implement this alternative include costs associated with applying for a permit for a new point of diversion in order to conjunctively manage a water resource. This includes the costs related to the transfer process (application, notice, and hearing), such as attorney and hydrology costs, as well as the cost of the water right. The current cost of a pre-1907 surface water right is $5,000 per acre-foot (consumptive), which represents a one-time purchase price.

3.2.2 Potential Funding Source

This alternative would be funded through water rights purchasers (individuals and/or public entities).

3.2.3 Ongoing Cost for Operation and Maintenance

None.

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[1] N.M. Const Art. XVI, § 2; NMSA 1978 § 72-12-1 (1907)

[2] NMSA 1978 § 72-5-25 (1971); NMSA 1978 § 72-12-7 (1931)

[3] NMSA 1978 § 72-5-25 (1971); NMSA 1978 § 72-12-24 (1959)

[4] In New Mexico, groundwater pumping based on the priority of pre-1907 surface water rights transferred as offsets could be administered by the actual priority of the offset right, not just 1907.

[5] Two issues raised by the proposals to address the futile call doctrine are whether the proposed measures would (1) the curtail groundwater pumping down to the priority of the most senior surface water user that would have had water if there had never been pumping, or (2) the curtailment of pumping to the extent that such curtailment would lead to the immediate restoration of streamflow