

NEXT STEPS FOR THE ARKANSAS RIVER BASIN WATER BANK PILOT PROGRAM

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(and a "one pager" summary at the end)

As things stand in February 2005, people could be unfortunately deceived by the appearance of failure of the Water Bank Pilot Program. With no completed transactions, it does look bad from an outsider's perspective. But, consider the concerns discovered and progress made toward potential solutions. A great deal has been learned, and Colorado's leadership in water management should be advanced again with the next round of revisions. As demand increases, for everything from augmentation water for well users to new permanent municipal supplies, the goals for the Pilot Program are even more attractive. The next steps needed are clearer than before, and they are likely to be fairly low-cost, as well. Once the different issues are untangled, and separated from some of the most complicated water politics, several important next steps are easy and likely to be readily accepted. A person looking at a Swiss Army knife for the first time might think it was a flop, too, if most of the blades and tools had been broken. But a working model is a valued tool for most people, even if the first look might not give that impression.

The legislative purposes of helping agriculture realize value, as well as the other benefits of working water markets and the potential gains for agriculture call for understanding the problems with the pilot program. Beyond the very bad luck of getting started in a terrible drought, there are some understandable and curable problems. This note is to provide an observer's perspective on the problems and suggest some revisions of the current model of the water bank (or "water brokerage" authorization, as Southeastern General Manager Jim Broderick rightly says.) Some of the problems and suggestions were identified with Dr. Charles Howe's generous collaboration, Certified Appraiser William Milenski provided careful and thoughtful evaluation, and many issues were identified by other generous advisors in agriculture, and service agencies working to help improve water management, but errors and confusion in this work are solely from the author, and do not represent any organization's views.

The topics are organized around clusters of objections raised to the Pilot Program, privately and publicly, and numbered in order to help reduce discussion overlap. Any comments, criticism or suggestions will be very welcome. The State Engineer's office will be reporting to the Legislature in the fall of 2005, so the time is ripe for a careful evaluation of what we can learn and what's next.

1. Too Little Transferable Water? Did the limit to trading stored water only, not direct flow rights, exclude too many participants or too much water? If it didn't work with only stored water, would the administrative difficulties of handling direct flow be too great?

To simplify discussion, this point will be treated separately from points below about other problems. We can't know what effect this limitation would have had without the other problems, but it helps to untangle

the issues. The Arkansas was chosen for the Water Bank Pilot Program (WBPP) in part because of the high level of knowledge of the hydrology, diversions and return flows (given needs of Kansas litigation). The goals included simplifying and reducing the costs of short-term transfers of water using administrative authority instead of requiring adjudication with its expense and delays. The State Engineer and Attorney General had limited funding for creation of the WBPP. Much of that went to the rule-making, including substantial negotiation after the public participation phase (not the same as public education after the rules were set). Administrative burdens were a serious concern. Part of the idea was to take advantage of existing knowledge of the transferable fractions of major water rights in the Valley, and known volumes of water in storage, and to experiment with legal and administrative issues rather than engineering questions. But, the limit to stored water also limited the potential participants, and excluded some of the most reliable water, which meant little or no change to the reasons for buying out water rights in a permanent sale. Sale of options has continued on the Fort Lyon and the Amity Canals.

So, the simplicity of trading only stored water had its charms but also problems. However, almost all other water transfers involve negotiation over the value of rights which are inherently uncertain in volume. What will it take to allow parties to water bank operations to operate in the normal framework? The State Engineer should be asked to estimate the support needed for administration of some other transfers, involving exchanges, timing of flows, and "no-call contracts". Where expenses do not prohibit, parties to transfers might bear them, and still spend far less on the transactions costs than in a full-scale water court proceeding. The fundamental legislative idea of speeding and simplifying temporary transfers is still an important goal. The State might also provide a base level of support for administration of very low-cost simple transfers, just as it funds its own participation to represent the public interest in normal water transfer proceedings, and funding for water education.

One approach suggested by several others is some form of pre-qualification of transfers. That leads to concern that some amount of transfer or exchange could be possible without violation of water quantity or quality standards. Some aggregate level of potential exchanges or other transfers between water divisions, for instance, might be describable based on cautious estimate of thresholds of concern. Would that, however, amount to a quota within which "first comers" might get a cheap transfer, while later would-be transferors would not? We might take this far enough to see if such thresholds can be identified before dismissing the idea.

This also suggests some serious (but cheap) "thought experiments" as a logical next step to apply hypothetical transfers to consider how flexible the system can be, and when and how thresholds might be encountered. It is possible, for instance, that like-use to like-use transfers within a short distance and the same water division might be so much less costly to administer than long-distance transfers that categories may be appropriate. Above the "basic" level, the costs of using these special non-water court transactions could be fairly based on the costs to the State Engineer and Water Bank operators involved, especially where they are performing the public function of defending water rights and other public interests.

2. How Will The Water Bank Affect Water Rights Values? Easier transactions might reduce the value of water rights being permanently sold, or they might raise the value of all water rights since they could be used more flexibly – we don't know. This certainly warrants some efforts to find answers for basins outside the South Platte, where Colorado-Big Thompson water is traded as freely as possible. This trading occurs within the Northern Colorado Water Conservancy District, which is as sophisticated as any water management agency. The Northern may well have some information on how values are affected by the working market there, and if not we might start asking the question. The high volumes of water transferred "ag-to-ag" in the Northern District make it important to see how the market affects values as well as agricultural opportunity in the District.

And, we may have to simply keep on with the experiment. Under the "first version" (the original 2001 law), there was significant concern over out-of-basin transfers, leading to elaborate and time-consuming procedures to implement the statutory preference for In-basin transfers, and to provide an analogue of water court notice and objection procedures. By the time the rules were set and the bank was made operational, the Drought had seized everyone's attention, tradable water was quite limited, and several other important lease transfers were already "in the works" under different authority.

Starting in 2003, in the second version with prohibition of out-of-basin transfers, the apparent outcome may be to reduce the value of water rights by first preventing the most lucrative short-term contracts under Water Bank authority, and second, preventing the most lucrative long-term dry-year options, and leaving only the transactions with the highest impact on areas of origin. It may be the "defense" of Valley water by limiting the market leaves only the problems to which the legislature tried to respond, and by reducing the value of water forces more permanent sales rather than any alternatives. There are two important pieces of evidence so far: the very high-value leases to Aurora from the Rocky Ford Highline Canal as well as the lease from the Rocky Ford Ditch "Second Half" Sellers' Group, and the continuing accumulation of options for permanent sale from the Fort Lyon Canal, and the Amity Canal as well. So far, the Water Bank has not achieved its purposes, but it is not too late to do it better.

3. Need for Adequate Duration of Some Contracts: The sunset provision for Water Bank Pilot Program (WBPP) limits contracts to 2007, but municipalities want much longer terms for "dry-year options" to firm municipal supplies. Bankers also suggest that longer terms would be better for using options to support higher investments in farming (e.g. drip systems). Explicit authority for a long-term dry-year option (interruptible supply) contract should allow for good-faith negotiation by ag and cities with an "escape clause" built in to allow either party to cancel after some period of sufficient duration to gain experience; this might be 10 years, and the State should retain the right to modifications shown to be necessary. These contracts should go through water court; they are not the short-term deals that a water bank should facilitate. The goal is cushion the risks of an experiment in long-term contracts as an alternative to water sales. And, Colorado's water courts are particularly well-suited to expert supervision of cases.

This alternative to municipal purchase and lease-back would allow ag to retain the appreciation in value of the asset. The water rights subject to such a contract would be a saleable asset, which should have the increased value that a better market would capitalize into the asset before sales (in the author's opinion). Such contracts should be thoroughly negotiated with respect to signing bonus, deals for advance payments (e.g. to capitalize improvements), frequency of option and payment for additional exercise, schedule of payment for different timing of exercise, and other terms for maintenance of farm and community viability as the parties may agree. These contracts could also support the kind of long-term partnerships between areas of origin and transferees which are often mentioned as an ideal, but so far seem hard to achieve. The water court model allows for the kind of negotiation with all parties that seems appropriate, and should provide adequate certainty that long-term needs can be met for all parties. Good models are likely to appear, helping establish predictability. (Note: new CRS 37-92-309 limits interruptible supply agreements to operation 3 years out of 10 and might be held to limit agreements to ten years' duration due to ambiguity in subsec (3)(b) and (c); it may need amendment to clearly allow long-term contracts and the use limitation may not serve long-term purposes in protracted dry periods.)

4. Need for Quicker Deals: The rule-making compromises on notice and objection prevent quick "spot market" transactions. Without long-term deals, only an apparently unattractive "middle ground" is left. There are two big sources of delay in the rules and procedures that should be easily relieved. First, there is implementation of the in-basin preference, which adds at least a couple of weeks, and is no longer needed since out-of-basin transfers are not allowed. Second, there is a much longer delay added in because of the compromise on notice to any party requesting notification, and chances to inquire, object, and so forth. Although not entirely due to fears of out-of-basin transfers becoming permanent, the notice and objection compromise was strongly motivated by those fears, judging by comments both private and public. Many parties may be much more comfortable with dropping some of these delays if out-of-basin transfer is not allowed, and if the water bank is limited to short-term transfers.

Bear in mind the high volume of "ag-to-ag" transfer in the Northern Colorado Water Conservancy District, where the trades are sales and not time-constrained. That depends on Northern declining to exercise ownership of return flows from first use of trans-basin water. This may not be the only way to allow a market, but the point is that where institutions permit, "ag-to-ag" transfers seem common and desirable. As things ended up with the WBPP, there was neither fish nor fowl, after the beef was settled.

The Northern District's unusual non-exercise of rights to return flows from trans-basin water should be reviewed for applicability elsewhere, such as modifying the Southeastern District's Fry-Ark arrangements. Perhaps increased water values could compensate for lost revenues. This is not likely to be a simple issue, but expertise is certainly available. Inquiry now is timely while re-operation and reauthorization are discussed in connection with the preferred storage option plan and proposed legislation.

5. In-Basin Versus Out-of-Basin: The largest potential demands were from out of the Arkansas Basin but they were soon prohibited, in response to enormous social concern up and down the River that the

WBPP would just accelerate the loss of water forever. Statewide, the lack of mitigation requirements for economic, social and environmental impacts from out-of-area water sales is a major issue, and the fear of losing future opportunities in-basin is reasonably founded though not simple.

Unfortunately, the negative impacts on agriculture from foreclosure of choices (and perhaps resulting price effects) are also real. While the State-level discussions proceed, or stay in discussion indefinitely, the growth in demand proceeds without moderation, and the large claims of options sold on the Fort Lyon and now Amity Canals demonstrate the pressure to transfer. One immediate question posed by limitation of any cheap transfers is whether there is in-basin benefit in the short term from this disability, or in the long term from forcing out-of-basin transfers into the unmitigated form of permanent sales. Another question is who bears the cost of these limitations.

There is substantial reason to believe in the "loss of future" claims about permanently-transferred water, and serious question about the distribution of costs and benefits from different mitigation schemes. The idea of a water bank as means to facilitate short-term leases and sales of water (as opposed to water rights) does not substitute for a growth management policy, regionally or state-wide, but neither should the lack of growth management defeat all other goals.

6. Long-term Versus Short-term: Without resolution of the mitigation question, distinguishing short-term from long-term is the approach taken by the legislature in other acts, including the emergency authority and substitute water supply plan authority. This view is that long-term commitment to transfers should at least go to water court, and short-term infrequent transfers should be possible on an expedited basis. Such a view does not support evading the mitigation issue, but it suggests a practical present response to conditions. The motivations for trying the experiment in the first place are unfortunately stronger now than in 2001. The Statewide Water Supply Initiative has shown the demand for new water transfers, and the loss of agricultural lands has only increased, up to 270,000 acres per year in the last 5 years according to the Colorado Department of Agriculture (see website, work of Dr. Carlson).

In the longer view, we may want a mitigation approach allowing more regional investment in defense of water rights retention, as has been successfully begun by the Lower Arkansas Water Conservancy District. Could the "playing field" in rural areas and basins be more level if there was increased State support for local financing, such as by use of revolving funds like those for drinking water and water treatment? The strong endorsement by the voters in the City of Pueblo for the Lower Ark District demonstrated public concern and some will to provide financial support.

In the near-term, we should untangle the in-basin versus out-of-basin issue from the short-term leasing and long-term dry-year option or interruptible supply contracts for firming municipal supply from the potential agriculture-to-agriculture spot market. Although it sounds odd, long-term investments in higher-value agriculture may depend on the continuing availability of spot-market water as a way to firm agricultural supply. The least difficult step should be easy and cheap in-basin spot market leases; then,

we could consider out-of-basin short-term leases. For long-term in-basin commitments, and long-term out-of-basin contracts, water court procedures may be the best starting point, though one may hope for some simplification as argument over technical issues converges to lesser differences.

In support of making the distinction between long-term versus short-term transfers, it may be useful to note that reducing the cost and delay of short-term transfers may make a huge increase in agricultural water use efficiency possible. Whenever there is scarcity, one would expect higher-value or yield users to be willing to pay more for water, but without something like the water bank, hundreds of small but valuable opportunities are just too expensive, costing everyone a loss of the benefits markets should provide. And, it is just in such times when the least-productive users might benefit most from money for their water while others maintain their investments and both sellers and buyers stay in business. Well-functioning markets help realize the value of assets.

7. The Tool and Rules Need Tuning: Additional simple steps might improve things, as well as the bigger steps already mentioned. The first step is to drop the complexity from the in-basin preference, no longer needed since out-of-basin transfers are not authorized for water banks.

Rule-making one more time: To shorten the time needed for spot-market deals in-basin, to respond to the State Engineer's estimates of additional costs of allowing direct-flow into the new markets, and to clear away the complications from the unneeded in-basin preference, and to reconsider the notice and objections procedures, rule-making will probably be required. Given how much has already been learned, and adequate lead-time to get discussion going informally, the process could be expeditious and productive. Certainly, some of the recommended changes could be done quickly and easily. Rule revision could also be part of a public education campaign that would provide better understanding of what is being made possible, what is not being threatened, and what the issues are in the rule-making. This is not free but the status quo doesn't deserve blind support, either, given the failure to meet the legislative goals, the importance of what's at stake, and the chance to realize the value of agency and private investment in the water bank idea so far.

Dealing and Disclosing: First, many farmers are said to not use internet, and price negotiations seem to involve using telephone anyway. Conflicting impressions were reported about internet feasibility and desirability. The Northern District provides an internet bulletin board but not for making deals, only for advertising offers or wants. It was not clear to many in the Arkansas that people could, let alone should, pick up the phone to see if a deal could be made, partly because of the intent to make the whole thing as simple as possible for new internet users, and partly because of the in-basin preference implementation. Part of the problem with the preference was the procedural consequence of disclosing the prices being offered and bid, and that may have discouraged some parties. Minor no-cost modifications to the website could provide encouragement and explanation that negotiations over price could be conducted by telephone, as was not widely understood. This should not prevent posting the prices finally paid, however, which is another issue.

Disclosure of a deal could take place after the terms had been agreed, as is the common situation in real estate transactions where there is a strong recognized public interest in supporting a working market. It may be that some interests benefit from non-disclosure; for instance, some cities freely report what they have paid but others refuse to let the public know what the public has paid for a public resource. That surely seems like there must be some sense that some cities think they benefit from not telling. What benefit would that be if not a lower price paid, which is at the expense of the under-informed seller? Brokers would also benefit from being able to buy low and sell high, which usually depends on the seller not knowing the market value. There is reason to believe that price may not be the only factor in some transactions. Generally, however, disclosure seems likely to help sellers more than buyers, given the much larger number of sellers than buyers, and the huge differences in financial capacity. Markets and realization of value depend on information, and increasing water information was quite sensibly one of the legislatures purposes in the Water Bank Pilot Program.

Cleaning up which authority serves what needs: The variety and complexity of legal transfer authorities must be presumed to be more easily used by those with higher capacity to engage professional expertise. If the intent is to reduce the costs of transactions, the clearer the better, and where the intent is to facilitate certain kinds of transactions and establish working markets, the clearer and simpler the better. The balance between defense of the status quo versus facilitating the new was not shifted enough to make a difference. That implies re-design of the water bank to work with price discovery issues and short-term transfers, separately authorize long-term dry-year options per se, and ideally review and simplify the set of transfer tools. The limitations of transfers allowed are hard to even easily compare, looking under CRS 37-83-105, 37-92-302, 37-92-304, 37-92-305, 37-92-308 (five sets of transfers here – Arkansas rules ratified, South Platte legislative settlement; substitute plan if application filed; substitute plan if five years or less duration; emergency plan less than 91 days implementation) and the new 37-92-309 (interruptible supply limited to 3 of 10 years); legal evolution is necessarily ad hoc, but complexity inflicts differential levels of difficulty depending on capacity to cope.

8. Ditch Company Problems: Physically, maintaining hydraulic head and sand moving are obvious problems without obvious answers, and it is not clear if this can always be economically solved. But, ditches do cope with variable water supply, and always have. Some ditches may be able to participate in the Water Bank only "proportionally" – where all or a sufficiency of shareholders agree to lease some percent of their water, for example, keeping enough to work the system. Additional investments may be needed. E.g., Aurora provided additional check dams as part of its lease from the Highline. Some ditches have many headgates off a single lateral, and use fixed splitter or divider boxes while other ditches use adjustable headgates and have few turnouts, so some ditches can more easily transfer water using new institutions.

It is not immediately clear that there is a public interest involved in this issue.

It may be that there is a regional or local public interest which could support local government or water conservancy district activity to assist ditch companies in improving their facilities. There is now broad authority, though somewhat constrained capacity, for lending by the Colorado Water Conservation Board and Water and Power Resources Development Authority; it is not clear whether those authorizations should cover loans for capacity to increase marketing, but it is also not clear that such a purpose would be less legitimate than any other. Where there is a strong local or regional interest, partnerships may offer advantages through use of governmental borrowing capacity. Here, there may be a public interest in assisting local and regional rural governments to achieve financing terms comparable to those available to the large cities which can finance water purchases through relatively enormous revenue bonding capacity as well as absolutely and proportionally far larger tax bases.

In terms of accounting and management problems, by-laws, and allocations of assessment and cost have been said to be a "nightmare" where some but not all lease. Individual versus group problems could be real. Because these are private issues internal to business organization, perhaps no outside solution is appropriate. As we know from the Arkansas Valley leases and state-wide activity during the Drought centered on 2002 (so far), some outfits have solved these problems and made a good deal from them (e.g. the well-publicized Rocky Ford Highline to Aurora lease).

9. Farm Management Fears: Some farmers fear interrupting rotations, labor problems, weed problems and soil and salinity management problems and have said interruptible supply cannot work. Others have said drought already interrupts things now and then. Research support for intermittent irrigation practices and associated issues, including the biological and environmental consequences, is minimal, apparently due to the lack of demand for such information. Further efforts are being sought, and some additional support is appearing. There does not appear to be an issue here for water management per se, though there is probably an important public interest in knowing more about the consequences of new kinds of management.

10. Innovation Introduction in Agriculture: The introduction of this innovation was not in keeping with the century of extension and demonstration and commercialization experience. Not using the long-accepted channels of innovation diffusion in agriculture (extension, and local demonstration) may be partly responsible for disinterest or distrust in the WBPP, and perhaps largely responsible for the generally low level of public understanding which appeared to the author and colleagues as well as those advising them. There was simply no provision for outreach beyond that required for public participation in the rule-making process, likely because of severe fiscal constraints on the State, and the Southeastern District has limits on how much it can contribute to such an effort as "bank operator". New operators will also have limits, and the question is how best to help the legislative goals using the array of agencies and extension operations on hand, and the possible publicity over a revision and new rule-making for the next attempt. The introduction of this innovation was fine for professions that deal with managing changes in

rules, such as policy people, lawyers, and engineers, but there were many others involved who have very different approaches to risk management.

11. Lack of Market History (Price Discovery): The "market price" for water in short-term leases, long-term interruptible supply and other new situations is not yet known. This is a "chicken-and-egg" problem, but solutions exist, though they were not tried. This is a particularly important problem in the establishment of a market, and the legislated goal of increasing information about the value of water has been frustrated. MacDonnell, Howe and Miller (1994, Water Banks in the West, Natural Resources Law Center, U of Colorado) strongly recommended an explicit effort to establish the beginning prices through a specialized bidding technique that combines sincere offers from many participants to simulate a market-clearing price from the future activities will proceed. No one is asked to buy or sell at a price they are unwilling to accept, and the anonymity of bids is protected (given certain safeguards by bidders who might be inferred from the size of their bids). The difficulties include getting an adequate number of potential buyers and sellers together, operating the process, and the steps required ahead of time to establish bona fide capacity to sell or buy particular amounts of water. It may take some trial rounds with deliberately hypothetical cases in order to familiarize everyone with how it works. The expense of such an exercise would largely be borne by the participants, but they would in turn need assurance of the credibility and legitimacy of the process and the worth of their participation.

Without some sort of price discovery in the present, one must look to the past. One less-palatable approach might be to compel some sort of disclosure of terms, or for all public entities to pledge to reveal prices paid. So far, this has been avoided, for whatever reasons, making this seem unlikely. Similarly, all potential sellers might agree to disclose, but the history of cartels and groups suggests that this is unlikely, too. Still, some cities may be willing to disclose their purchases, if no better information is forthcoming.

One may wish to note that the absence of wide-spread knowledge of "going prices" may have benefit for buyers with multiple potential sellers and adversely impact sellers who are facing varying situations compelling sale or not. However, it is hard to think of how the Northern District's working market would operate without such general information, though it seems only informally available. Municipalities have not appeared unduly injured by general knowledge of prices.

Summary of Recommendations:

Rather soon:

- The legislature should separately authorize long-term dry-year option contracts (or, "interruptible supply contracts") which would go through Water Court. (Note: The limitations in HB05-1215 do not meet the goals here described, and would add another confusing authority and institution; there are also potential problems with 37-92-309 noted above.)

- The State Engineer should be funded to provide estimates of the costs of administration of revised forms of the Water Bank to meet the legislative goals of facilitating fast and cheap temporary transfers, including those involving direct flow, and considering different levels of complexity and cost.
- The potential operators of water banks and major institutions are asked to consider sponsoring (low cost) exercises to further price discovery for different potential water markets.
- The "spot market" for short-term in-basin transfers should be enabled, and rule-making for the revised version of the water bank pilot project should be funded.
- Funding improvements to support regional and local investments in water partnerships should be considered, possibly using the revolving fund model as well as other means.

Less urgently but still started soon:

- Prohibition of out-of-basin transfers that keep the water right in the area of origin should be examined to investigate the distributions of costs imposed through suspected depression of price and benefits achieved, if any, through limitation of forms of transfer.
- The model of the Northern Colorado Water Conservancy District should be examined for transferability for in-basin marketing water banks.
- The price effects of increased management flexibility and transferability should be examined.
- The suite of transfer tools and authorities should be comprehensively reviewed.

Please note: the opinions expressed here are those of the author and not those of any institution.

Following: a different summary:

PROBLEMS WITH THE ARKANSAS RIVER BASIN WATER BANK PILOT PROGRAM

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This outline notes problems learned about from many generous experts. The value of water increases with increased demand, and the theoretical benefits of water markets and potential gains for agriculture call for understanding problems with the pilot program, beyond the extremely bad luck of starting just as a record drought worsened. Some of the problems can be fixed easily, others will require developing new capacity.

1. What was transferable: Does the limit to stored water only, not direct flow rights, exclude too many participants or too much water? It may have been necessary to begin with stored water only until administration with more sophisticated water measurement is adequately funded. It is unclear if a functioning water bank or dry-year options would affect value of water

rights. The drought severely limited supply and with uncertainty about how the water bank would work and serious confusion over how deals would be made, there was little will to offer the stored water that was available.

2. Duration: The sunset provision for Water Bank Pilot Program (WBPP) limited contracts to 2007, but municipalities wanted much longer terms for "dry-year options" to firm municipal supplies. Bankers also suggest that longer terms would be better for using options to support new investments in farming (e.g. improved irrigation). Municipalities seek "permanence" but may want to avoid finance costs and revegetation requirements, which may be more difficult with changing climate. It is becoming clear that a mix of transfer forms will be wanted, and among them will be short-term spot market transfers.

3. Timing: The rule-making compromises on notice and objection prevented quick "spot market" transactions. Without long-term deals, only an odd "middle ground" was left. There is a high volume of ag-to-ag transfer in the Northern Colorado Water Conservancy District, where transfers are not time-constrained because of unusual legal circumstances in trading trans-basin water only. The complicating "in-basin preference" required in 2001 was removed in the 2003 law, but not in the rules.

4. Geography: The largest potential demands were from out of the Arkansas Basin but they were prohibited by the 2003 law. That may have prevented interest, despite the lucrative Highline Lease to Aurora. The lack of "mitigation" requirements produced strong social disapproval of sales, and the fear of losing future opportunities in-basin is reasonably founded. Lack of a working market inside the basin may prevent learning about the value of water in the basin, and depress prices paid for water transferred out of the basin.

5. The Tool and Rules: Many farmers are said to not use internet, and price negotiations seem to involve using telephone anyway. Conflicting impressions were reported about internet feasibility and desirability. Northern uses an internet bulletin board but not for making deals, only for advertising offers or wants. It was not clear how to work a deal and then use the WB authority, and it was not clear how to work the "in-basin preference" required by the 2001 law. The Highline-Aurora Lease showed some of the potential for support for agriculture, but it was under different authority and very limited in duration, too.

6. Lack of Market History (Price Discovery): The "market price" for water in short-term leases, long-term interruptible supply and other new situations is not yet known. Chicken-and-egg problem? Solutions exist, but were not tried. Markets depend on information and on affordable opportunity to deal. Lack of information helps some at the expense of others.

7. Ditch Company Physical Problems: Maintaining hydraulic head and sand moving are obvious problems without clear obvious answers. Each ditch has to address this for itself. May require some ditches to participate only "proportionally" – all agree to lease some small percent, for example, keeping enough to work the system. Additional investments may be needed. E.g., Aurora provided additional check dams as part of its lease from the Highline. Some ditches have many headgates off a single lateral, and use fixed splitter or divider boxes while other ditches use adjustable headgates and have few turnouts, so some ditches can more easily transfer water using new institutions.

8. Ditch Company Accounting and Management Problems: By-laws, and allocations of assessment and cost have been said to be difficult where some but not all lease. Individual versus group problems can be serious. Because these are private issues internal to business organization, no outside solution is appropriately imposed.

9. Farm Management Fears: Some farmers fear interrupting rotations, labor problems, weed problems and soil and salinity management problems and have said interruptible supply cannot work. Others have said drought already interrupts things now and then. Some research gaps have appeared, but no "show-stopper" problems have been discovered. BMPs would help.

10. Innovation Introduction in Agriculture: The introduction of this innovation disregarded the century of extension and demonstration experience. This was treated by the legislature as a legal innovation, but it was also an agricultural innovation. Also, there was little public participation in development of the rules as the negotiations were largely conducted with parties threatening litigation; this was a reasonable response to the situation, but further innovations should be better supported to include traditional innovation methods and more public involvement.