SLIDES: Lower Arkansas Valley Super Ditch Company, Inc.: Water Leasing Program

Peter Nichols

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Historical Buy and Dry-up

- **Colorado Springs**
  - $$$$$$$
  - Share Holder
  - Share Holder
  - Share Holder
  - Share Holder

- **Aurora**
  - $$$$$$$
  - Share Holder
  - Share Holder
  - Share Holder
  - Share Holder

- **Others**
  - PBWW
  - Pueblo West
  - Fountain
  - Etc.

- **Colorado Canal**
  - Share Holder
  - Share Holder
  - Share Holder

- **Rocky Ford Canal**
  - Share Holder
  - Share Holder
  - Share Holder

- **Others**
  - Las Animas
  - Highline
  - Holsom
Historical Buy and Dry-up

- **One time deal**
  - Shareholders are paid off and water is transferred to municipal use

- **Land permanently dried up**
  - No more irrigation
  - Limited/no further agricultural productivity
  - Weed and erosion problems occur despite revegetation statute

- **Cities (purchasers) realize the appreciating value of the water**
Water Leasing

- **Colorado Springs**
  - $$$$$$$
  - $\text{H}_2\text{O}$

- **PPRWA**
  - $$$$$$$
  - $\text{H}_2\text{O}$

- **CDOW/Parks**
  - $$$$$$$
  - $\text{H}_2\text{O}$

- **Other/Ag**
  - $$$$$$$
  - $\text{H}_2\text{O}$

- **Ft. Lyon**
  - Share Holder
  - Share Holder

- **Rocky Ford Highline**
  - Share Holder
  - Share Holder
  - Share Holder

- **Catlin Canal**
  - Share Holder
  - Share Holder
  - Share Holder

Super Ditch Company
Super Ditch - Water Leasing

- Creates new crop - water
  - Additional source of revenue for farmers and ranchers
- Annual, multi-year short and long-term leases
- Land not permanently dried up
  - Agricultural productivity continues
  - Community/economic activity continues
  - Most water remains in irrigation use every year
- Shareholders realize the appreciating value of the water
What Super Ditch Company must do to succeed

- Maximize the short- and long-term value of irrigation water to the Lower Valley
  - For cities, provide a reliable, cost-competitive alternative source of water
  - For irrigators, provide an economically attractive alternative to farming or selling
“Super Ditch Company”

- Mechanism to lease water from irrigators who are willing to forgo irrigation to municipalities and other users
- Created, Controlled and Owned by participating irrigators
  - Managed by Board of Directors elected by participating irrigators
  - Collective negotiation levels playing field with municipal users
  - Irrigators may participate to extent they wish
  - All irrigators treated equally
    - % non-irrigated, lease revenue / ac-ft
- Responsible for leasing water, obtaining water court approval, and 1041 permits
- Determine which lands will not be irrigated each year based on supply, lease demand, and hydrology
Lower Arkansas Valley Super Ditch Company, Inc.

- Incorporated May 7, 2008
- Shareholders from 6 of 7 primary ditches
- Invited potential lessees to get acquainted meetings in June and July
- Negotiating with 2 potential lessees
  - One formal offer
  - Negotiations proceeding
- Operating with support of LAVWCD
  - Formal contract re: support, independence
Studies Completed

- Potential supply of irrigation water for lease
- Demand for water leasing (lease market)
- Existing and needed storage and conveyance
- Water quality
- Farm and regional economics
- Alternative legal structures for Super Ditch Co.
- “1041” permitting requirements
- Ditch company restrictions on participation
- Anti-trust issues
- Taxation of lease revenues
Primary Ditch Systems within Area of Interest

Arkansas River Ditch System Schematic
Water Rights Investigated
CU factors from the H-I model used in the most recent *Kansas vs. Colorado* litigation

CU Factor was multiplied by the diversion amount to obtain the consumptive use for each irrigation system

<table>
<thead>
<tr>
<th>#</th>
<th>Ditch/ Canal</th>
<th>Consumptive Use Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bessemer</td>
<td>0.5916</td>
</tr>
<tr>
<td>2</td>
<td>Rocky Ford Highline</td>
<td>0.5553</td>
</tr>
<tr>
<td>3</td>
<td>Oxford Farmers</td>
<td>0.4728</td>
</tr>
<tr>
<td>4</td>
<td>Otero</td>
<td>0.5675</td>
</tr>
<tr>
<td>5</td>
<td>Catlin Canal</td>
<td>0.4634</td>
</tr>
<tr>
<td>6</td>
<td>Holbrook</td>
<td>0.5771</td>
</tr>
<tr>
<td>7</td>
<td>Fort Lyon Storage Canal</td>
<td>0.5094</td>
</tr>
<tr>
<td>8</td>
<td>Fort Lyon Canal</td>
<td>0.5094</td>
</tr>
</tbody>
</table>
Yield Estimate at Headgate by Ditch by Year

Estimated Available Water for Lower Arkansas River Ditches of Interest

- ROCKY FORD HIGHLINE
- OXFORD FARMERS DITCH
- OTERO CANAL
- HOLBROOK CANAL
- FORT LYON STORAGE and CANAL
- CATLIN CANAL
- BESSEMER DITCH


Estimated Available Water (AF): 0, 50,000, 100,000, 150,000, 200,000, 250,000, 300,000, 350,000, 400,000.
### Summary of Annual Yields at Headgate

<table>
<thead>
<tr>
<th>Condition</th>
<th>AF/Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Year</td>
<td>329,000</td>
</tr>
<tr>
<td>Average Year</td>
<td>255,000</td>
</tr>
<tr>
<td>Dry Year</td>
<td>192,000</td>
</tr>
<tr>
<td>Extreme Dry Year (2002)</td>
<td>93,000</td>
</tr>
</tbody>
</table>
Potential water volumes (65 % participation)

- Assumed participation rate: 65%
  - Can be different for each ditch

- Assumed fallowing rate: 25%
  - Can be different for each ditch

- Assuming no additional storage and 65% participation:

<table>
<thead>
<tr>
<th>Market</th>
<th>Tier Volume</th>
<th>Total Volume Available</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Year</td>
<td>14,020 AF</td>
<td>14,020 AF</td>
<td>Very Reliable</td>
</tr>
<tr>
<td>Average Year</td>
<td>14,609 AF</td>
<td>28,629 AF</td>
<td>Full delivery in 16 of 29 years; deliveries made in 27 of 29 years</td>
</tr>
<tr>
<td>Wet Year</td>
<td>16,787 AF</td>
<td>45,417 AF</td>
<td>Inconsistent, but deliveries will occur</td>
</tr>
</tbody>
</table>
Water available for lease, based on 65% participation rate, frequency, exchange factors, and no additional storage.
Marginal analysis of additional storage (for illustration only)
# Exchange Potential

## Percent of Consumptive Use realized in Pueblo Reservoir

### Exchange Potentials

<table>
<thead>
<tr>
<th>Reach</th>
<th>Below Pueblo Reservoir (Bessemer)</th>
<th>Below Rocky Ford Highline Canal</th>
<th>Below Oxford Farmers Canal</th>
<th>Below Otero Canal</th>
<th>Below Catlin Canal</th>
<th>Below Holbrook Canal</th>
<th>Below Fort Lyon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average (1979)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.00</td>
<td>0.77</td>
<td>0.74</td>
<td>0.71</td>
<td>0.62</td>
<td>0.52</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>Wet (1980)</td>
<td>1.00</td>
<td>0.82</td>
<td>0.80</td>
<td>0.77</td>
<td>0.71</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>Dry (1981)</td>
<td>1.00</td>
<td>0.68</td>
<td>0.65</td>
<td>0.62</td>
<td>0.46</td>
<td>0.42</td>
</tr>
</tbody>
</table>
Pipeline Feasibility Study

- Based on delivery to point in Northeastern El Paso County for PPRWA *et al.*
  - Diversion near Boone
  - Diversion at Ft Lyon headgate
    - Pipeline to Boone, then North
  - Diversion fr Timber Lake on Ft Lyon
    - Pipeline to headgate, then West to Boone
Pipeline Alternatives
Lower River Pipeline Alternatives
Water Quality Diminishes Downstream

- Average Specific Conductance (μS/cm) vs. Approximate miles downstream of Pueblo Reservoir

- Locations: Fountain Creek, Avondale, Fowler, La Junta, John Martin Res.
What’s lease water worth?

One measure: avoided costs

$/AF/year

<table>
<thead>
<tr>
<th></th>
<th>Water</th>
<th>Infrastructure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado Springs Utilities, SDS</td>
<td>$1,200</td>
<td>$1,200</td>
<td>$1,200</td>
</tr>
<tr>
<td>Pikes Peak Regional Water Authority</td>
<td>$500</td>
<td>$500</td>
<td>$500</td>
</tr>
<tr>
<td>Aurora</td>
<td>$300</td>
<td>$300</td>
<td>$300</td>
</tr>
<tr>
<td>Power generation</td>
<td>$300</td>
<td></td>
<td>$300</td>
</tr>
<tr>
<td>Windy Gap Firming Project</td>
<td>$500-$1,100</td>
<td>$500-$1,100</td>
<td>$500-$1,100</td>
</tr>
<tr>
<td>Reuter-Hess Reservoir (Parker)</td>
<td></td>
<td>$800</td>
<td>$800</td>
</tr>
<tr>
<td>Colorado-Big Thompson</td>
<td>$500</td>
<td></td>
<td>$500</td>
</tr>
<tr>
<td>Northern Integrated Storage Project</td>
<td></td>
<td>$510</td>
<td>$510</td>
</tr>
<tr>
<td>Denver Moffat System Expansion</td>
<td>$350</td>
<td>$350</td>
<td>$350</td>
</tr>
<tr>
<td>ECCV/ACWWA/South Metro</td>
<td>$533</td>
<td>$750</td>
<td>$1,283</td>
</tr>
<tr>
<td>Aurora Prairie Waters</td>
<td>$1,200</td>
<td></td>
<td>$1,200</td>
</tr>
</tbody>
</table>
Issues to work through with potential participating irrigators

- Variation in yield and water value among ditches
  - More reliable, more easily delivered, and/or higher quality water is worth more
- Delivery issues to irrigated land with less water in ditch (laterals)
- What land will be not be irrigated and when
  - Whether irrigator can permanently dry up some poor land, or whether there must be rotational fallowing
- Farmer concern about diminished productivity after fallowing
Example of cooperation leading to increased bargaining power and higher contract prices

<table>
<thead>
<tr>
<th></th>
<th>Individual, one-to-one transactions</th>
<th>Rocky Ford Highline and Fort Lyons work</th>
<th>Rocky Ford Highline, Fort Lyons, and Bessemver</th>
<th>The four ditch companies work cooperatively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rocky Ford Highline</td>
<td>$1.10</td>
<td>$1.20</td>
<td>$1.26</td>
<td>$1.35</td>
</tr>
<tr>
<td>Fort Lyons</td>
<td>$2.35</td>
<td>$2.94</td>
<td>$3.33</td>
<td>$3.92</td>
</tr>
<tr>
<td>Bessemer</td>
<td>$0.86</td>
<td>$0.86</td>
<td>$0.95</td>
<td>$1.00</td>
</tr>
<tr>
<td>Catlin</td>
<td>$1.21</td>
<td>$1.21</td>
<td>$1.21</td>
<td>$2.02</td>
</tr>
</tbody>
</table>

Total discounted revenues over the hydrologic period 1976-2004 (million)

Revenue from individual one-to-one transactions with incrementally higher prices:

- Rocky Ford Highline: $1.10, $1.20, $1.26, $1.35
- Fort Lyons: $2.35, $2.94, $3.33, $3.92
- Bessemer: $0.86, $0.86, $0.95, $1.00
- Catlin: $1.21, $1.21, $1.21, $2.02

Benefit of additional operational efficiencies

- Additional revenues to be allocated among cooperators: $0.00, $0.18, $0.35, $0.52

Total lease revenues: $5.53, $6.39, $7.10, $8.81

% revenue increase resulting from cooperation: 15.5%, 28.3%, 59.4%
Municipal Water Supply Considerations

- Increasing resistance to large new water projects and trans-basin projects
- “Buy and dry” increasingly culturally, socially, and politically unacceptable
- Rotational fallowing could become a favored water supply alternative
  - “win-win”
  - Least environmental impact
  - Ag/commercial community benefits
  - Path of least resistance
Hypothetical Purchase vs. Lease

Assumptions
- Shares of Bessemer Ditch purchased (51%)               19,000
- Average cost per share                                  $10,000
- "Real" rate of return on municipal investment (inflation-free)  3.00%
- "Real" discount rate (inflation-free)                    3.00%

Results
Case I: Assuming PBWW only needs additional water in dry years
Net discounted cost of buying shares                        $73,811,000
Net discounted cost of leasing water at $740/AF, reserving at $100/AF $36,835,000
Savings from Super Ditch Co. lease 2007-2086                $36,976,000

Case 2: Assuming PBWW needs water in dry and 1000+ AF in avg years
Net discounted cost of buying shares                        $61,260,463
Net discounted cost of leasing ($740 dry yr; $500 avg; $100 reservation; $10 revenue from leasing unused water) $46,905,724
Savings from Super Ditch Co. lease 2007-2086                $14,354,739
Issues to work through with potential municipal lessees

- **Lease terms and conditions**
  - Municipal demand(s)/need(s)
  - Delivery schedule(s)

- Reliability
- Price
- Payment terms
- Length of lease(s)

- Competition from non-participants, e.g., other municipalities who want to buy and dry
Regional Economic Impacts

- Changes in spending by participating irrigators when fallowing
  - (seed, fertilizer sales; farm equipment repairs and sales; on-farm improvements, etc.)
- Impacts to industries and users of Lower Ark irrigated crops. e.g., local feedlots
- Impacts related to how and where water lease proceeds are spent
Economic Impact of Buy and Dry

- “Business as usual” thru 2030 (SWSI)
  - Add’l 22,000 to 72,000 acres dried up in Lower Ark on top of 60,000 acres now dry

- Total economic value of Lower Ark irrigation
  - $430/ac/year (Thorvaldson et al.)

- $9.5 million to $31 million / year lost
Legal Issues Analyzed

- Alternative legal structures for company
- Taxation of lease revenues
- Anti-trust issue
- Ditch company restrictions on participation
- County 1041 permitting requirements
- Water court change case
  - Applications structured to allow fallowing-leasing only (not buy and dry) to address “Trojan Horse” concern
Summary
Super Ditch Water Leasing

- **Advantages**
  - Municipalities/other users get water they need at competitive cost
  - Irrigators realize value of water currently
    - Plus realize appreciated value over time
  - Supports long-term regional economy

- **Challenges**
  - Willingness of users to negotiate Fair Market Value water leases
  - Cooperation among ditch companies + shareholders
    - End municipal predation + manipulation
Conclusion

- Simple idea, great potential, success depends upon willingness of users to adopt a new paradigm to meet water needs.
- Moving forward to make concept a reality
- Confident that challenges can be met