# Technical Memorandum

# Basin Roundtable Portfolio and Trade-off Analysis

## Introduction and Overview

In May 2011, Interbasin Compact Committee (IBCC) Director John Stulp developed the Colorado Water for the 21st Century Roadmap. The roadmap outlined short-term, mid-term, and long-term actions. One of the short-term actions included the following:

> *To ensure grassroots input in developing statewide solutions, each roundtable will be asked to develop one or more statewide portfolios using the portfolio tool. This should include at least one mid demand/mid supply portfolio, but some roundtables may choose to develop portfolios for other scenarios as well. CWCB will provide technical assistance in this effort, and IBCC members from one or more basins may go to other basins to support portfolio development.*

The purpose of this Technical Memorandum is to summarize the Basin Roundtables' efforts in developing statewide portfolios for meeting Colorado's 2050 Municipal and Industrial (M&I) demands. As part of this effort, they have examined different demand scenarios that were developed as part of the Colorado Water Conservation Board's (CWCB) Statewide Water Supply Initiative (SWSI) 2010. The Basin Roundtables have also identified ranges of Identified Projects and Processes (IPPs), conservation savings, Colorado River System supplies, and agricultural to M&I transfers that could be utilized to meet various demand scenarios. As part of portfolio development, the Basin Roundtables have examined trade-offs included in the Portfolio and Trade-off Tool. These trade-offs include: irrigated acres reduction, size of a rotational fallowing program, portfolio costs, nonconsumptive metric for the West Slope, and accretion/depletion analysis for the South Platte River.

This memorandum provides:

- An overview of the portfolio and trade-off analysis in the context of scenario planning
- A description of next steps
- A summary of each Basin Roundtable's status in developing portfolios
- An exploration of the commonalities and differences among the Basin Roundtable Portfolios

## Portfolio and Trade-off Analysis Overview

**Figure 1** on the following page summarizes the efforts that are underway statewide that will lead to development of the Governor's Water Plan and SWSI 2016. The Basin Roundtables have completed substantial work on developing portfolios based on the direction provided in Director Stulp's Colorado Water for the 21st Century Roadmap. This effort is the focus of the March 2012 Basin Roundtable Summit. After the summit, the Basin Roundtables will have an opportunity to further refine their portfolios based on what they have learned. During the May 2012 IBCC Meeting, IBCC members will begin to finalize the scenario planning effort and begin to address the future scenarios through an adaptive management framework. Once the adaptive management framework is underway, the Basin Roundtables will have another opportunity to provide feedback into the process. In addition, CWCB will work concurrently with the Basin Roundtables to identify what near-term and long-term implementation efforts are needed in their basins.

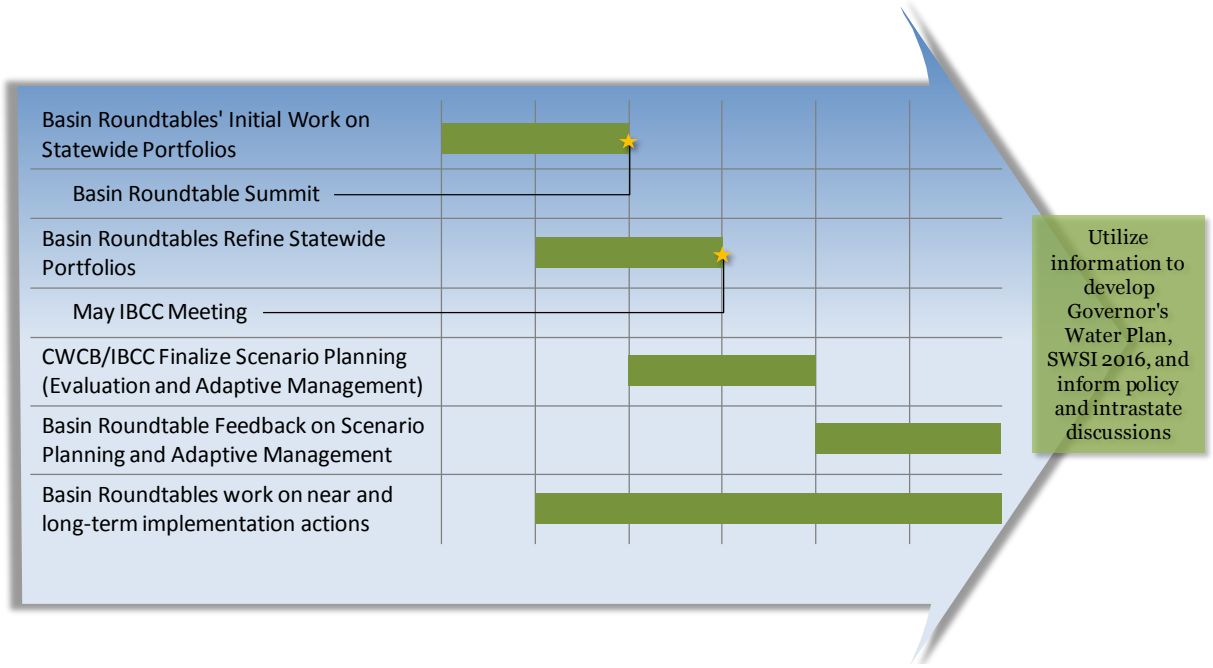


**Figure 1 Next Steps for Basin Roundtables, CWCB, and IBCC**

As the Basin Roundtables, CWCB, and IBCC have discussed, there are many uncertainties in addressing Colorado's water supply future. At their November 2011 meeting, the IBCC agreed that scenario planning would be the best way to address an uncertain water supply future. Scenario planning can be utilized in an adaptive management framework to address uncertainties as shown in **Figure 2**. Based on the work of the Basin Roundtables to date, the scenario planning effort will likely result in four to five future scenarios for Colorado's water supply future. Through an adaptive management framework, common implementation elements and their impacts and uncertainties will be identified. This will allow for an implementation plan that addresses a range of future outcomes.

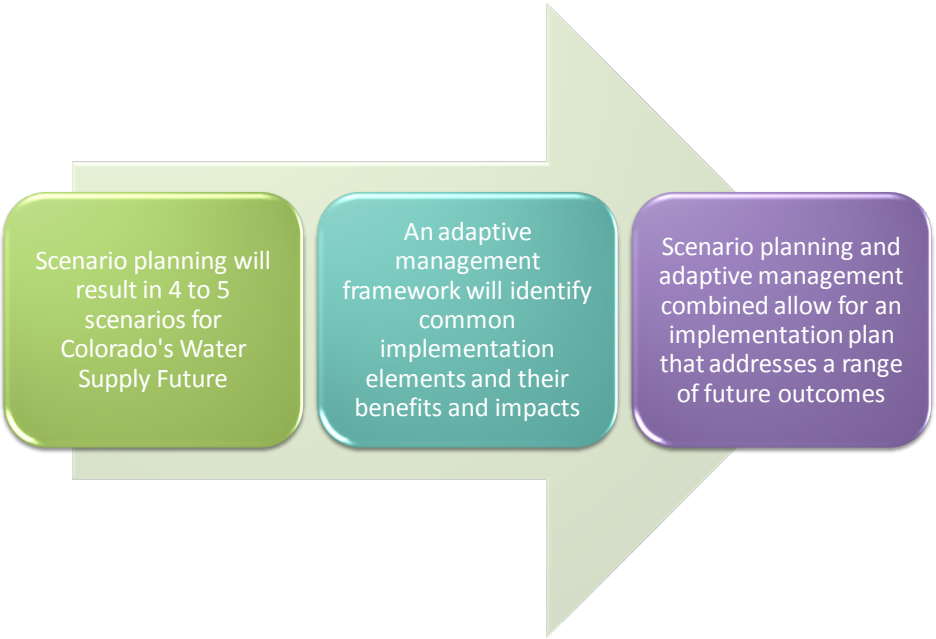


**Figure 2 Scenario Planning can be Utilized in an Adaptive Management Framework**

While many variations of adaptive management exist, the fundamental steps as they relate to Colorado's water supply future are shown in **Figure 3** and can be summarized as[1]:

1. Identify key decision points associated with uncertainties.
2. Quantify benefits and impacts such as environmental impacts, reliability benefits, or agricultural benefits/impacts.
3. Evaluate strategies for decision points focused on implementation for multiple options.
4. Monitor performance and keep records of critical variables.
5. Implement or re-evaluate strategies and monitor system reaction.


**Figure 3 Adaptive Management Framework**

# Portfolio and Trade-off Results

As discussed above, the Basin Roundtables have been asked to develop one or more statewide portfolios (see **Figure 4**). As part of this effort they have developed at least one portfolio focusing on mid-demands but they have also developed portfolios for other demand scenarios. In developing portfolios, the Basin Roundtables have explored IPP yield success, the level of active conservation and whether these savings can be used to address the M&I gap, new supply development in the Colorado River System, and agricultural transfers. When developing portfolios, the Basin Roundtables have also explored trade-offs associated with each portfolio.

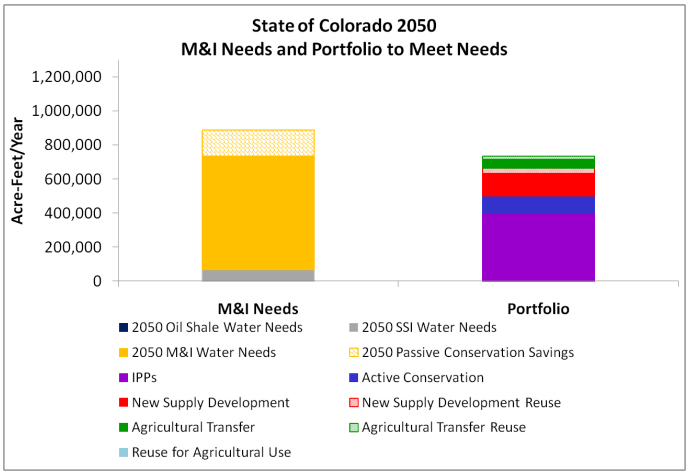


**Figure 4 Portfolio and Trade-off Tool Statewide Portfolio Page**

[1] U.S. Environmental Protection Agency Region 9 and California Department of Natural Resources. 2011. "Climate Change Handbook for Regional Water Planning".

## Basin Roundtable Portfolio Status

**Table 1** below includes a brief summary of the status of each Basin Roundtable's efforts in developing portfolios for Colorado's future M&I demands. The Basin Roundtables have developed 31 statewide portfolios. A summary of the common elements that have emerged from this effort is included in the next section of this Technical Memorandum. **Appendix A** summarizes the results of the portfolios developed by the Basin Roundtables to date. Some of the Basin Roundtables have developed summary documentation of their efforts and this information is included in **Appendix B** of this memorandum.

**Table 1 Status of Basin Roundtable Portfolio Development**

| Basin Roundtable | Status of Portfolio Development |
|---|---|
| Arkansas | ▪ A roundtable committee developed three initial portfolios for roundtable review.<br>▪ The roundtable developed two additional portfolios for a total of five portfolios focusing on low demands/low supply, low demands/high supply, mid demand/mid supply, high demand/low supply, and high demand/high supply.<br>▪ IPP yield success was set at about 80 percent statewide for all portfolios.<br>▪ The committee's initial portfolios increased conservation savings applied to the gap with increase in M&I demands.<br>▪ The Colorado River System developed for West and East Slope uses increases based on scenario.<br>▪ With exception of the high demand/low supply scenario, agricultural transfers were minimized in the Arkansas and South Platte basins. |
| Colorado | ▪ The roundtable held several committee meetings and the roundtable discussed portfolio development at several roundtable meetings.<br>▪ The roundtable has currently developed four portfolios focusing on mid demand/mid supply, mid demand/high supply, high demand/low supply, and high demand/mid supply.<br>▪ IPP yield success was set at about 80 percent statewide for all portfolios.<br>▪ The roundtable assigned the high conservation scenario for all portfolios with 60 percent of active conservation savings applied to the M&I gap for three portfolios and as an illustrative example 100 percent of active conservation savings applied to the M&I gap for the fourth portfolio.<br>▪ The roundtable defined the Colorado River low supply scenario as no use of Colorado River System water for West or East Slope use and the mid-supply scenario as 150,000 acre-feet per year (AFY) for use on the West Slope and no Colorado River water for use on the East Slope. For the high supply scenario, the roundtable assigned 150,000 AFY for use on the West Slope and 168,000 AFY for the East Slope.<br>▪ With exception of the low supply scenario, agricultural transfers were minimized in the Arkansas and South Platte basins. |
| Gunnison | ▪ A roundtable committee developed 10 portfolios through several webinars.<br>▪ The roundtable selected four portfolios to be included in the discussion at the Basin Roundtable Summit. The portfolios include a high demand/low supply (worst case scenario), low demands with 80,000 AFY of Colorado River System for East Slope use, climate change scenario (mid demands and 80,000 AFY Colorado River System for East Slope use), and mid demands with high conservation strategy (100,000 AFY Colorado River for East Slope use). All portfolios had 140,000 AFY for West Slope use except the worst case portfolio.<br>▪ IPP yield success was set at about 80 percent statewide for all portfolios.<br>▪ For three portfolios, the roundtable used the medium conservation strategy with 50 percent of the savings applied to the M&I gap and for the fourth portfolio they applied 36 percent of the high conservation strategy savings to the gap. |

**Table 1 Status of Basin Roundtable Portfolio Development**

| Basin Roundtable | Status of Portfolio Development |
|---|---|
| Metro | ▪ The Metro Basin Roundtable's committee developed four portfolios.<br>▪ The roundtable agreed to include all four portfolios as part of the Basin Roundtable Summit. The portfolios include low demand, mid demand, high demand, and high demand with climate change.<br>▪ IPP yield success was set at about 80 percent statewide for all portfolios.<br>▪ The roundtable completed an extensive analysis of conservation savings and used the medium conservation strategy with none of the savings specified in the portfolio tool applied to the gap. The basin's conservation analysis details the amount of passive savings being used for new growth and also discusses the demand reductions that have occurred since 2000.<br>▪ The basin did not determine whether and how much of that water should come from agricultural transfers or new supply development. CWCB staff, for comparative purposes and to better understand associated trade-offs with the Metro's portfolios, split the required water equally between new agricultural transfers and new supply development. This does not represent the viewpoint of the roundtable as they would like to work with other roundtables to determine the appropriate balance. |
| North Platte | ▪ The roundtable developed one portfolio focusing on mid-supply/mid demand.<br>▪ IPP yield success was set at about 70 percent statewide. All IPPs in the agricultural transfer category were set to zero percent yield success.<br>▪ The roundtable's objective in developing the portfolio was to minimize agricultural transfers.<br>▪ The roundtable used the medium conservation scenario and applied 30 percent of the savings for the Arkansas, Metro, and South Platte basins to the M&I gap.<br>▪ The roundtable assumed that 300,000 AFY of Colorado River System would be developed for combined West and East Slope uses. |
| Rio Grande | ▪ The Rio Grande Basin conducted a workshop on the portfolio and trade-off tool and the attendees developed four portfolios.<br>▪ The roundtable agreed to include all four portfolios in the summit discussion.<br>▪ IPP yield success was set at about 80 percent statewide for all portfolios.<br>▪ All four portfolios are for mid demand and vary the conservation strategy and new supply development for the East Slope between 150,000 and 300,000 AFY.<br>▪ For all of their portfolios, agricultural transfers were minimized in the Arkansas and South Platte basins. |
| South Platte | ▪ The roundtable discussed portfolio development at several of its roundtable meetings and formed a committee that developed the four portfolios that are in Summit materials.<br>▪ The roundtable developed two mid demand and two high demand portfolios and they varied the amount of Colorado River System development for the East Slope between zero and 175,000 AFY.<br>▪ IPP yield success was set at about 80 percent statewide for all portfolios.<br>▪ For all portfolios they utilized the low conservation strategy with 10 percent of the savings being applied to the M&I gap statewide. |

**Table 1 Status of Basin Roundtable Portfolio Development**

| Basin Roundtable | Status of Portfolio Development |
|---|---|
| Southwest | ▪ The Southwest Basin Roundtable conducted a workshop and the workshop attendees developed 17 portfolios. The roundtable conducted a facilitated session on the workshop results and used a dot voting exercise to narrow their portfolios to the three that are included in the Summit materials.<br>▪ The results of the facilitated roundtable meeting resulted in three portfolios with one low demand portfolio and two mid demand portfolios.<br>▪ IPP yield success was set at about 80 percent statewide for all portfolios.<br>▪ They varied the conservation savings applied to the M&I gap for all portfolios and used the high conservation strategy for one scenario and the medium conservation strategy for two scenarios.<br>▪ The two mid demand portfolios assumed Colorado River System development of 73,000 AFY for the West Slope and 150,000 AFY for the East Slope.<br>▪ For all of their portfolios, agricultural transfers were minimized in the Arkansas and South Platte basins. |
| Yampa-White | ▪ The Yampa-White Basin Roundtable formed a committee to develop an initial set of portfolios that were discussed at two basin roundtable meetings.<br>▪ The roundtable has included two portfolios for discussion at the Basin Roundtable Summit.<br>▪ These include two high demand portfolios with one that includes use of the Colorado River System and one that does not.<br>▪ IPP yield success was set at about 85 percent statewide for all portfolios.<br>▪ The roundtable utilized the high conservation strategy with 60 percent applied to the M&I gap. |

## Scenario Summary

As discussed above, the Basin Roundtables' efforts will be used by the CWCB and IBCC in developing four to five scenarios that will be used in adaptive management framework. **Table 2** provides a working summary of five potential scenarios based on the work of the roundtables. This table summarizes the type of 2050 M&I demands that may occur for each scenario and then generally describes each portfolio element. This table will be refined by the CWCB and IBCC after the Basin Roundtables finalize their portfolios in the coming months. The refined table will be used to identify potential "no regrets" planning opportunities and will be utilized in an adaptive management framework.

**Table 3** provides a summary of all 31 Basin Roundtable portfolios and an initial draft nonconsumptive portfolio. For each portfolio, the demand scenario is described along with noting whether the portfolio includes oil shale demands and replacement of Front Range nontributary groundwater. The conservation strategy and amount of the strategy applied to the M&I gap is described for each portfolio. Finally, the amount of Colorado River System and agricultural transfer used in each portfolio is summarized.

**Table 2 Summary of Basin Roundtable Portfolios into Five Scenarios**

| Scenario | Demands | IPPs Yield Success | Conservation Savings | Colorado River System | Agricultural Transfers |
|---|---|---|---|---|---|
| Scenario 1 | Low: State experiences lower population growth; oil shale is not developed or is developed in a way that does not utilize water | ~80% of IPP Yield is successfully implemented | Statewide we implement the low to medium conservation strategy and do not apply savings to the M&I gap | A Colorado River System project (between 50,000 to 100,000 AFY) is implemented | Statewide additional agricultural transfers beyond the IPPs and losses due to urbanization are not required |
| Scenario 2 | Mid: State experiences moderate population growth similar to recent growth rates; a smaller oil industry or one with limited water use is developed | ~80% of IPP Yield is successfully implemented | Statewide we implement the medium to high conservation strategy and apply between 30 to 60 percent of these savings to the M&I gap | A Colorado River System project (between 80,000 to 150,000 AFY) is implemented | On the East Slope, a small amount of additional agricultural transfers beyond the IPPs and losses due to urbanization are needed |
| Scenario 3 | Mid: State experiences moderate population growth similar to recent growth rates; a smaller oil industry or one with limited water use is developed | ~80% of IPP Yield is successfully implemented | Statewide we implement the low to medium conservation strategy and apply a small portion of the savings to the M&I gap | A Colorado River System project (between 150,000 to 300,000 AFY) is implemented | Statewide additional agricultural transfers beyond the IPPs and losses due to urbanization are not required |
| Scenario 4 | High: State experiences high population growth similar to rates experiences in the 1990s or climate change increases demands; full oil shale energy development occurs | ~80% of IPP Yield is successfully implemented | Statewide we implement the medium to high conservation strategy and apply between 30 to 60 percent of these savings to the M&I gap | No Colorado River System project is developed | On the West Slope, 15 to 35 percent of irrigated acres could be lost to meet M&I demands and on the East Slope, the Arkansas Basin could lose 5 to 20 percent of its irrigated acres and the South Platte Basin could lose 20 to 50 percent of its irrigated acres |
| Scenario 5 | High: State experiences high population growth similar to rates experiences in the 1990s or climate change increases demands; full oil shale energy development occurs | ~80% of IPP Yield is successfully implemented | Statewide we implement the low to medium conservation strategy and apply between 30 to 60 percent of these savings to the M&I gap | A Colorado River System project (between 130,000 to 230,000 AFY) is implemented | On the West Slope, 10 to 40 percent of irrigated acres could be lost to meet M&I demands and on the East Slope, the Arkansas Basin could lose 5 to 20 percent of its irrigated acres and the South Platte Basin could lose 20 to 45 percent of its irrigated acres |

**Table 3 Summary of All Portfolios Developed by the Roundtables and IBCC Nonconsumptive Committee**

| Basin | Demand Scenario | Oil Shale | Replace Front Range Non-Tributary Groundwater | Identified Projects and Processes (Statewide % of Yield Success) | Conservation | | | New Supply Development | | Agricultural Transfer | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Strategy | % to meet M&I Demands | Acre-Feet/Year to Meet M&I Demands | West Slope | East Slope | West Slope (AFY) | East Slope (AFY) |
| Arkansas | Low | yes | yes | 81% | Low | 0% | 0 | 25,000 | 0 | 27,000 | 140,000 |
| | Low | no | no | 81% | Low | 0% | 0 | 0 | 250,000 | 52,000 | 0 |
| | Mid | yes | yes | 82% | Medium | 25% | 83,000 | 150,000 | 50,000 | 0 | 78,000 |
| | High | yes | yes | 83% | Low | 0% | 0 | 25,000 | 0 | 197,000 | 237,000 |
| | High | yes | yes | 83% | Medium | 50% | 167,000 | 200,000 | 150,000 | 0 | 0 |
| Colorado | Mid | yes | yes | 78% | High | 60% | 278,000 | 150,000 | 0 | 0 | 27,000 |
| | Mid | yes | yes | 78% | High | 60% | 278,000 | 150,000 | 168,000 | 0 | 0 |
| | High | yes | yes | 81% | High | 60% | 278,000 | 0 | 0 | 183,000 | 92,000 |
| | High | yes | yes | 81% | High | 100% | 463,000 | 150,000 | 0 | 9,000 | 6,600 |
| Gunnison | Low | yes | yes | 82% | Medium | 50% | 167,000 | 140,000 | 80,000 | 0 | 0 |
| | Mid | yes | yes | 82% | Medium | 50% | 167,000 | 140,000 | 80,000 | 16,000 | 89,000 |
| | Mid | yes | yes | 83% | High | 36% | 167,000 | 140,000 | 100,000 | 0 | 0 |
| | High | yes | yes | 83% | Medium | 50% | 167,000 | 0 | 0 | 199,000 | 144,000 |
| Metro | Low | yes | yes | 80% | Medium | 0% | 0 | 200,000 | 83,000 | 0 | 82,000 |
| | Mid | yes | yes | 81% | Medium | 0% | 0 | 200,000 | 98,000 | 0 | 96,000 |
| | High | yes | yes | 82% | Medium | 0% | 0 | 200,000 | 130,000 | 29,000 | 130,000 |
| | High | yes | yes | 82% | Medium | 36% | 119,000 | 200,000 | 231,000 | 220,000 | 235,000 |
| North Platte | Mid | no | yes | 71% | Low | 30% | 36,000 | 90,000 | 210,000 | 0 | 0 |
| Rio Grande | Mid | no | yes | 83% | Low | 10% | 16,000 | 75,000 | 150,000 | 0 | 3,200 |
| | Mid | no | yes | 83% | Medium | 10% | 33,000 | 75,000 | 150,000 | 0 | 0 |
| | Mid | no | yes | 83% | Low | 10% | 16,000 | 75,000 | 300,000 | 0 | 0 |
| | Mid | no | yes | 83% | Medium | 10% | 33,000 | 75,000 | 300,000 | 0 | 0 |
| South Platte | Mid | yes | yes | 82% | Low | 10% | 16,000 | 175,000 | 0 | 0 | 205,000 |
| | Mid | yes | yes | 82% | Low | 10% | 16,000 | 175,000 | 175,000 | 0 | 30,000 |
| | High | yes | yes | 83% | Low | 10% | 16,000 | 175,000 | 0 | 86,000 | 279,000 |
| | High | yes | yes | 83% | Low | 10% | 16,000 | 175,000 | 175,000 | 86,000 | 104,000 |
| Southwest | Mid | no | yes | 83% | High | 50% | 231,000 | 73,000 | 0 | 0 | 42,000 |
| | Mid | no | yes | 83% | Medium | 10% | 33,000 | 73,000 | 150,000 | 0 | 14,000 |
| | Mid | no | yes | 83% | Medium | 30% | 99,000 | 73,000 | 150,000 | 0 | 0 |
| Yampa-White | High | yes | yes | 85% | High | 60% | 278,000 | 0 | 0 | 186,000 | 74,000 |
| | High | yes | yes | 85% | High | 60% | 278,000 | 263,000 | 150,000 | 0 | 0 |
| NCNA | Mid | no | yes | 77% | High | 60% | 278,000 | 50,000 | 0 | 0 | 33,000 |

## Basin Roundtable Portfolios Commonalities and Differences

The discussion below includes a summary of the commonalities and differences for each portfolio element based on the work of the basin roundtables.

### M&I Demands

Of the 32 portfolios developed by the roundtables and the nonconsumptive committee, 4 portfolios were developed using the low demand scenario, 17 using the mid demand scenario, and 11 using the high demand scenario. The major difference between portfolios on the demand side was inclusion of oil shale demands. One-third of the portfolios do not include oil shale demands. The main reasons stated by Basin Roundtables that chose not to include oil shale are: (1) that it is not feasible that oil shale will be developed due to current economic conditions, and (2) that other oil development through the Niobrara and Bakken formations may preclude development of oil shale in Northwest Colorado. The major commonality among the portfolios is that replacement of Front Range nontributary groundwater should occur in the future. Thirty-one of the 32 portfolios included this in the M&I demands to be met in the future. The one portfolio that did not include replacing Front Range nontributary groundwater was a high supply portfolio and it was assumed that under the high supply scenario this demand would not have to be replaced as there would be sufficient water supply that nontributary groundwater use would not be needed.

### Identified Projects and Processes

The IPP yield success rate statewide was relatively consistent for all 32 portfolios. The Basin Roundtables consistently used a statewide IPP success rate of around 80 percent. The exception was the North Platte Roundtable and their IPP success rate was about 70 percent statewide due to minimizing the amount of IPPs associated with agricultural transfers. All of the Basin Roundtables set their IPP success rate and held it constant for all of the portfolios they examined. Five of the nine roundtables set their own basin's IPP success rate based on the discussion described in Table 1 and deferred to what other basin's had developed to finalize a statewide success rate. **Table 4** summarizes the IPP success by IPP type as set by each Basin Roundtable.

**Table 4 IPP Success Rate by Basin and IPP Type**

| Basin | Agricultural Transfer | Reuse | Existing Supplies | In-Basin Project | Transbasin | In-Basin Firming | Total Success Rate |
|---|---|---|---|---|---|---|---|
| Arkansas | 75% | 75% | 100% | 100% | 75% | 80% | 86% |
| Colorado | 90% | 90% | 100% | 85% | 90% | 85% | 91% |
| Gunnison | 90% | 90% | 100% | 90% | 90% | 90% | 88% |
| Metro | 75% | 75% | 100% | 75% | 75% | 75% | 88% |
| North Platte | 0% | 90% | 100% | 90% | 90% | 90% | 100% |
| Rio Grande | 90% | 90% | 100% | 90% | 90% | 85% | 93% |
| South Platte | 50% | 80% | 100% | 50% | 85% | 50% | 65% |
| Southwest | 100% | 100% | 100% | 80% | 100% | 100% | 88% |
| Yampa-White | 100% | 100% | 100% | 50% | 100% | 100% | 67% |

### Conservation and Reuse

Seventy percent of the portfolios developed by the Basin Roundtables use the low to medium conservation strategy. **Figure 5** shows the distribution by conservation strategy and for each conservation strategy shows the average amount of conservation savings the roundtables assigned to meet the M&I gap. For the low conservation strategy, a lower quantity of water was set aside to meet the M&I gap (13,000 AFY statewide). Most of the portfolios using the medium and high conservation strategies had a higher amount of savings used to meet the M&I gap (82,000 AFY and 281,000 AFY,

respectively). The major difference among the portfolios is the amount of conservation savings that could be applied to the M&I gap. The following basins had a portfolio or portfolios that apply a smaller percentage of conservation savings to the Gap: Arkansas, Metro, Rio Grande, South Platte, and Southwest. These Basin Roundtables have concerns regarding the reliability of using conserved water for new growth and that using conserved water to meet new demands will impact their drought reserve and system flexibility.

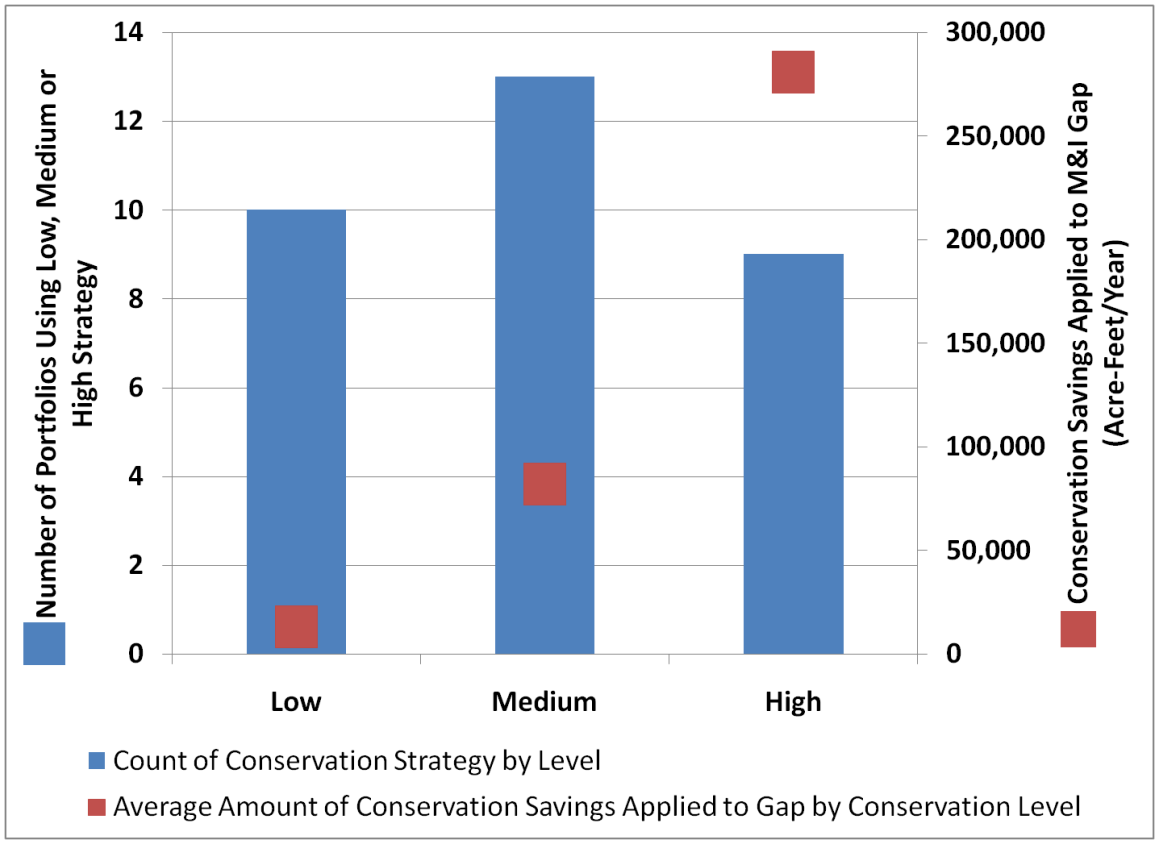


**Figure 5 Number of Portfolios by Conservation Strategy and Savings Applied to the M&I Gap**

The portfolios developed by the Basin Roundtables also include reuse of any future transbasin supplies and the consumptive use portion of future agricultural transfers. This is included in the portfolio tool as a ratio of reuse that could be achieved by reusing either a transbasin supply or the consumptive use portion of an agricultural transfer. The ranges of reuse ratio used by the Basin Roundtables is 1.4 to 1.7 with the majority of roundtables using between 1.5 and 1.6. The initial draft nonconsumptive portfolio used a reuse ratio of 1.9.

## Colorado River System

The amount of Colorado River System water developed in the portfolios ranges from zero to 431,000 AFY. All of the Basin Roundtables developed at least one portfolio that identified Colorado River System development for West and East Slope use. In addition, over 60 percent of the portfolios developed by the Basin Roundtables include Colorado River System water development and use by both the West and East Slope as shown in **Figure 6**.

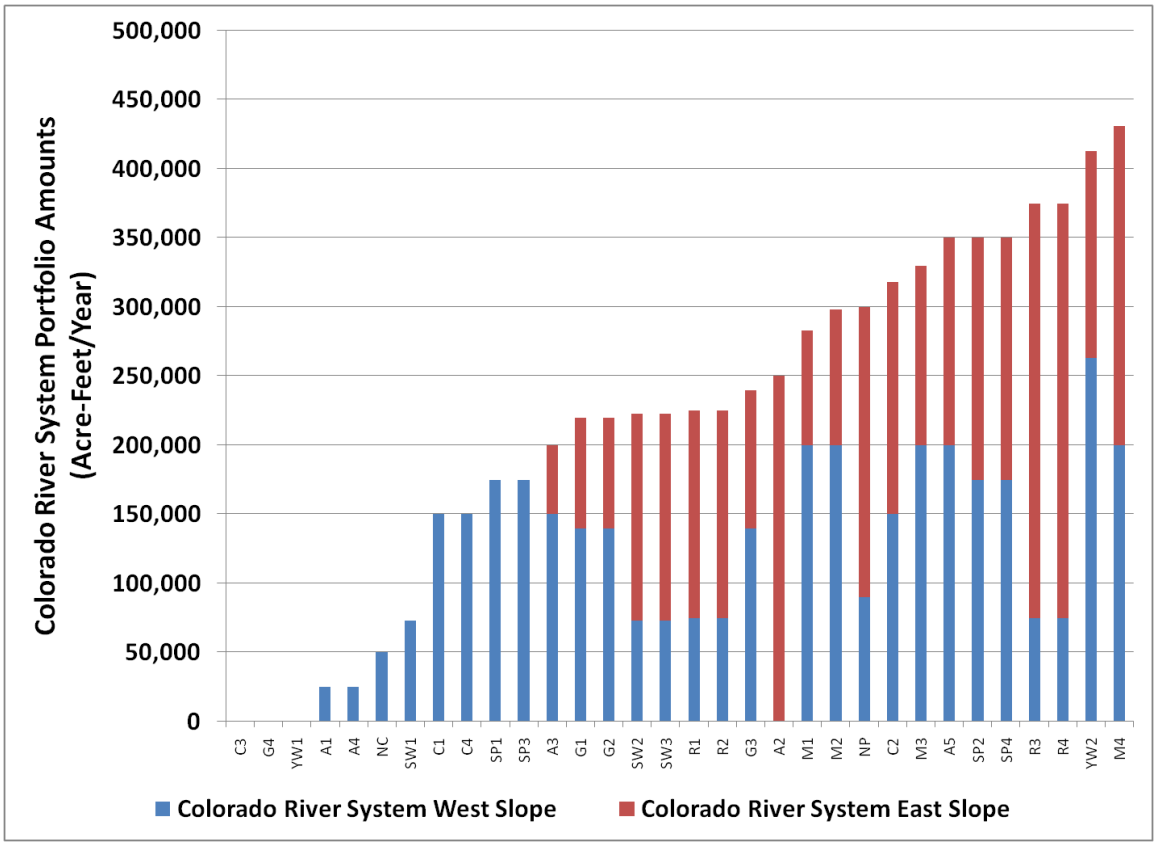


**Figure 6 Colorado River System Development Included in Basin Roundtable Portfolios**

## Agricultural Transfers

As shown in **Figure 7**, the majority of portfolios developed by the roundtables (55 percent) attempted to minimize additional agricultural transfers in the future. Based on results from SWSI 2010, approximately 260,000 acres statewide will be transferred to M&I use based on the information gathered on the IPPs or will be urbanized based on population growth estimates. Based on the portfolios developed to date, the South Platte could lose from 5 to 30 percent of additional irrigated acres above the 20 percent that will be lost to IPPs and urbanization. The West Slope could lose from 5 to 25 percent of additional irrigated acres more than the 10 percent that is expected to be lost due to IPPs and urbanization. Reducing the impacts to agricultural of meeting our future M&I water demands was discussed in detail by all of the Basin Roundtables when completing the portfolios exercise.

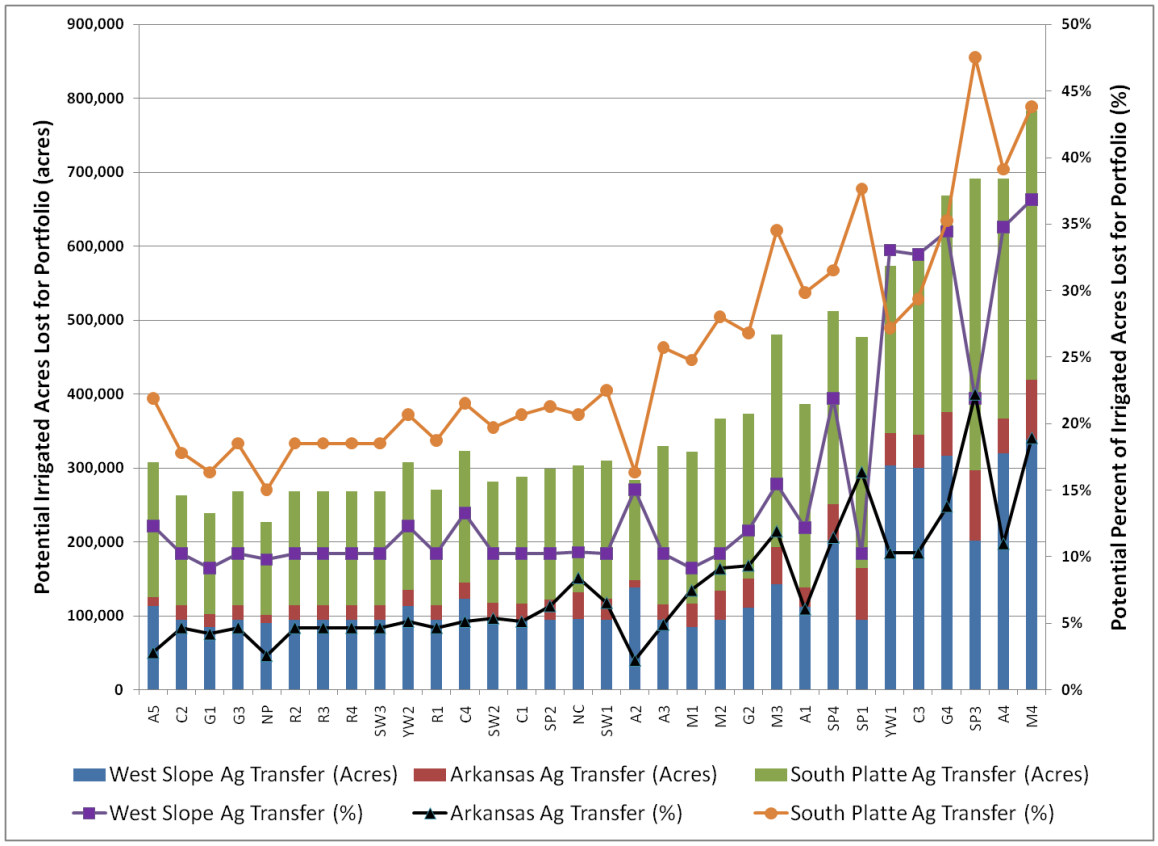


**Figure 7 Potential Irrigated Acres Lost by Portfolio**

## Trade-Offs

The Basin Roundtables examined all of the trade-offs in the Portfolio and Trade-off Tool when developing their portfolios. The trade-offs identified in the portfolios are summarized in Appendix A. As was discussed above, the trade-offs will be further explored as part of finalizing the scenario planning effort and developing the adaptive management framework. One step in the adaptive management framework is identifying ways during implementation to maximize benefits and minimize impacts. This is where the trade-offs currently included in the tool will be built upon in the future by the CWCB and IBCC.