



## WATER QUALITY / QUANTITY COMMITTEE (QQ)

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Post Office Box 2308 • Silverthorne, Colorado 80498  
970-468-0295 • Fax 970-468-1208 • email: qqwater@nwccog.org

### RESPONSE TO PERCEPTIONS INFLUENCING THE COLORADO WATER PLAN

In May of 2013, Governor Hickenlooper issued an executive order directing state agencies to develop the first Colorado Water Plan, which will be completed in 2015.<sup>1</sup> In response, the state has engaged in a planning process led by the Colorado Water Conservation Board.

Conversations surrounding the planning process are frequently summarized as: “We have a gap between water supply and demand, and we need to find new water supplies to meet this demand so that agricultural water rights are not converted to municipal use.”

Several perceptions, discussed here, are part of these conversations. To begin with, studies have predicted a gap of 500,000 acre feet of water, which assumes that the state’s population will double. Many believe that we cannot control the rate of growth and development in Colorado; people are going to continue to move here, even if water is not available. Concerns that agricultural lands will be dried up, and the idea that the Colorado River has ample water to spare, have led to proposals for one or more large water development projects to divert additional water from the Colorado River Basin on the West Slope to urban centers east of the Rocky Mountains. Many people do not see water conservation and reuse as viable alternatives to additional transmountain diversions for meeting the projected demand.

How we use water in Colorado is and always has been mightily contentious. Planning for the future is critical, and the Colorado Water Plan, including grassroots outreach efforts incorporated into Basin Roundtable Implementation Plans, are important steps toward conserving and optimally developing future water resources. But we need to identify and discuss some of the key perceptions so that water planning encourages a future where the natural environment and recreational resources that attract people to Colorado in the first place are not sacrificed to new development.

Here are some of the key perceptions with cited facts to support alternative perspectives to consider:

**Perception 1:**            *The demand for water results in a statewide gap between supply and demand of more than 500,000 acre feet per year.*<sup>2</sup>

**Response:** There is no statewide water supply/demand gap of 500,000 acre feet per year at the present time. The presumed gap is based on projections for *future* growth that may or may not

occur and demand figures that will be re-evaluated over the course of the water plan process to reflect the actual demands of different regions of the state.

As part of the water plan process, individual river basin roundtables will be instrumental in refining their own demand for water. Roundtables also will identify where and when water will be needed based on localized conditions. But presenting a statewide gap as a single large amount of water that will be needed every year drives solutions to filling the gap that may not be necessary or feasible.

Colorado's Statewide Water Supply Initiative (SWSI) projects that Colorado will need between 600,000 and 1 million acre feet of additional water supply for municipal and industrial use by 2050.<sup>3</sup> SWSI's finding is based on a projection of future population multiplied by a per person water use to estimate a future demand. Then, that value is compared to presumed available water supplies to arrive at a statewide future gap. SWSI estimates are by their very nature designed to portray a worst-case scenario of the future gap between supply and demand in which the lowest success rate for already planned water projects is compared to the highest population projections.

SWSI assumptions about conservation are similarly conservative. SWSI assumes that in the future, municipal and industrial water users will only achieve modest conservation levels - levels that actually are lower than the conservation goals set for some parts of the state today. For example, the metro area goal for water consumption is 129 gallons per person per day, while SWSI assumes the area will use 140 gallons per person per day.<sup>4</sup>

SWSI assumptions also do not account for the fact that much of the future development in Colorado will take place on agricultural land where water already is being used. Typically, that agricultural water will be converted to municipal and industrial use to supply the new development, rather than the new development demanding additional water.<sup>5</sup>

In addition, SWSI applied a single methodology statewide to develop per capita water use figures without considering unique circumstances, such as dramatic seasonal population swings in resort communities. For example, SWSI estimates water use in Pitkin County as 284 gallons per capita per day (gpcd) by dividing the total amount of treated water used in the county by the county's *permanent* population.<sup>6</sup> Local calculations of per capita water use in the City of Aspen, Pitkin County's largest water provider, resulted in 153 gpcd because the City of Aspen calculations accounted for visitors during tourist season that often double the permanent population and increase the amount of water used. Likewise, Summit County's year round population is around 29,000 but during peak visitor times, such as weekends or holidays, that number balloons to approximately 160,000.<sup>7</sup> Note that the calculation for Summit County's water usage at 246 gallons per person per day does not account for the population fluctuations.<sup>8</sup> This same dynamic occurs in many areas of the state and results in much higher per capita water use estimates than actual use. These examples demonstrate the need to focus on demand figures at the local level before applying statewide numbers to water planning.

Finally, SWSI presents future demand as a single volumetric number that represents a total volume of water that will be needed in the state each year. Depicting the gap as a single number ignores the reality that most water providers in the state use multiple sources for their supply,

and will be serving areas that will be growing at different rates in different locations. These localized needs do not overlap to add up to a single number at a single moment in time.

**Perception 2:**            *The population of Colorado is going to double by 2050.*

**Response:** Population growth projections used in SWSI already have been proven to be overly optimistic, and the methodology used to calculate long-term population growth is based on volatile economic patterns that make long-term growth projections unreliable. Also, population growth projections do not account for local planning and zoning efforts that can reduce the rate of population growth.

SWSI population growth projections through 2035 utilize data from the State Demographer’s Office that are revised annually based on the most recent data on economic conditions and population. Compared to these revised figures, SWSI growth projections already have been proven to be too high. A spot comparison shows that SWSI projections for 2035 made in 2010<sup>9</sup> exceed the State Demographer’s most recent projections for 2035 by 409,000 people.<sup>10</sup>

Where State Demographer information is not available from 2030 to 2050, SWSI used a modified version of the State Demographer’s approach. Growth projections for 2050 are based on assumptions about growth in certain economic sectors. For example, in the area of energy development the low growth projection is based on no oil shale production, whereas the high growth projection assumes 550,000 barrels/day.<sup>11</sup> Yet, Colorado’s economic growth patterns are very uneven, with periods of growth following recession. Colorado’s economic sector has been likened to a bumpy ski slope, with five (5) “false starts” since the 2008 recession.<sup>12</sup> This economic variability makes long-term projections unreliable and calls for their continued reevaluation.

SWSI acknowledges that Colorado’s population growth rate will slow down as communities approach buildout.<sup>13</sup> But SWSI predictions cannot take into account the influence on population growth from urban growth boundaries, clustered residential development surrounded by large areas of unirrigated open space, or sustainable community development initiatives that reduce the rate of residential growth and increase commercial growth so that the tax base is sound and employment opportunities are increased.<sup>14</sup>

**Perception 3:**            *We cannot control growth and development in Colorado; people are going to come anyway.*

**Response.** Colorado can influence the rate of growth and development; all that is lacking is the political will to do so. Municipal and county governments have broad land use planning and zoning authority that can have a significant impact on the rate of population growth and the ultimate population of the state. Importantly, local governments can condition the approval of development applications on whether water is available to serve the new growth.<sup>15</sup> In fact, local governments can deny development applications if sufficient water is not available for the proposed development.<sup>16</sup>

By designating areas where growth can and cannot occur, local governments also influence population growth patterns. The Land Use Control Enabling Act specifically gives local governments the authority to regulate the location of development.<sup>17</sup> Other statutes allow county and municipal master plans to identify areas most appropriate for growth.<sup>18</sup> These plans can be implemented when incorporated into zoning and other land use regulations.<sup>19</sup> Many counties have enacted regulations that encourage rural development to be clustered in a central area instead of spread out over a larger acreage to maximize water efficiency, to preserve agricultural land, and to promote open space and wildlife habitat.<sup>20</sup>

Control over the timing of development is another way that local communities can manage population growth. Municipalities and counties have the authority to require phased development in order to ensure adequate services will be available, such as water and sewer services, and to ensure that existing services will not be unduly burdened by new users.<sup>21</sup> There also is ample authority to make sure that growth pays its own way. Local governments can condition the issuance of a building permit on making or paying for necessary public improvements<sup>22</sup> and can assess impact fees to lessen adverse impacts from development.<sup>23</sup> Ensuring that new development mitigates the impacts it causes is a long-standing concept in Colorado land use planning.<sup>24</sup>

The rate of population growth can be regulated through growth management systems.<sup>25</sup> For example, municipalities and counties have successfully regulated population growth by establishing a set number of development permits available on a competitive basis,<sup>26</sup> a set number of water and sewer taps distributed to proposed developments on an as-available basis,<sup>27</sup> or a set rate of growth that limits the number of development permits issued per year.<sup>28</sup> Local governments may even place a moratorium on new development while figuring out how to regulate population densities to protect sensitive environmental areas and other resources before new development is approved.<sup>29</sup>

Local governments also can control the intensity of development based on impacts to the community or surrounding lands,<sup>30</sup> such as to prevent overcrowding or to avoid harmful concentrations of population, to encourage appropriate uses of land,<sup>31</sup> or to protect wildlife and wildlife habitat.<sup>32</sup>

Through these and other techniques, Colorado communities can have a profound effect on their own future and that of the state as a whole.

**Perception 4:**            *New water diversion projects are necessary to prevent “buy and dry” of agricultural land.*

**Response:** New water diversion projects are not the solution to the loss of agricultural land in Colorado, and in fact, these projects are likely to result in loss of agriculture on the West Slope. “Buy-and-dry” refers to the process in which a municipal water provider purchases agricultural water rights, or shares in a ditch company, and the formerly irrigated ranch or farmland is permanently dried up or converted to dryland farming. While the “buy-and-dry” practice is controversial, building more transmountain diversion projects is not the solution.

To begin with, we know from past experience that instead of saving agriculture, water diversion projects take agricultural lands out of production. For example, from 1968 to 1993, 22 ranches in Park County sold their water to municipalities - primarily Aurora, Thornton and Denver - causing dry up of 39,283 acres of irrigated hay land in the County to fuel Front Range growth.<sup>33</sup> In Grand County, over 12,372 acres of land, much of which was once used for ranching, are now owned by the Northern Colorado Water Conservancy District, Denver Water, and the Colorado River Water Conservation District - purchased for water supply reasons.<sup>34</sup> In Summit County, Denver Water owns 1,863 acres of land.<sup>35</sup>

Front range water providers have purchased upstream senior agriculture water rights and land on the West Slope over the past century to increase the firm yield of municipal transmountain water diversion projects, to allow for the siting of water storage projects, or to keep water in the Colorado River to protect endangered fish populations.

New transmountain diversion projects will further these impacts on West Slope agriculture. Due to legal and hydrologic uncertainties, water from the Colorado River and its tributaries (including the Green, Yampa, White, Gunnison, and San Juan Rivers) available to the state under the Colorado River Compact is highly variable, strongly disputed, and, simply put, unknown.<sup>36</sup> Most new projects would rely on water rights junior to the Colorado River Compact. For this reason, proponents of new transmountain diversion projects would almost certainly seek more "secure" water supplies by "buying and drying" pre-Compact West Slope agriculture water rights. Any new supply project from the West Slope would likely target the large irrigation rights in the Grand Valley and in the Gunnison River drainage that are currently used for highly productive farm and ranch operations.

The dry-up of agricultural land, wherever it occurs, can have obvious negative impacts to the local economy caused by the loss of agricultural production and the loss of businesses and jobs related to or relying upon agriculture. Also, acreage owned by governmental entities is tax - exempt so local governments' lost revenue can have negative fiscal consequences to local communities. On the West Slope, many of the ranches and farms have evolved to include fishing, hunting, boating, and wine tasting as part of their agricultural practices. If these lands are stripped of their water rights, the economic impact goes beyond the loss of agricultural production and related businesses; this also would negatively impact Colorado tourism.

Even if additional transmountain diversions were constructed, there is no guaranty that the loss of agriculture in eastern Colorado would stop. As Colorado continues to grow, buoyed by new water supply sources, new development will most likely occur on formerly agricultural lands. This trend is evidenced by the fact that less than 50 percent of the shares of the Colorado-Big Thompson project are agricultural shares, down from 80 percent in the 1950s when the Bureau of Reclamation constructed the project to bring water from the Colorado River to irrigate northeastern Colorado. Importantly, agricultural water rights are private property that can be freely bought and sold, and the viability of any agriculture operation is subject to national and international economic forces beyond the sphere of influence of the Colorado Water Plan.

The role of interstate compacts also has hastened the loss of agricultural land in eastern Colorado. For example, in the Republican River Basin, the Republican River Conservation

District in conjunction with the State of Colorado are drying-up farms to pump water to the North Fork of the Republican River, and retiring thousands of acres annually through the Conservation Reserve Enhancement Program to meet water delivery obligations to downstream states under the Republican River Compact.<sup>37</sup> In the San Luis Valley, lands irrigated by wells have been dried up to help Colorado meet its Rio Grande River Compact obligations to deliver water to downstream states and to help sustain the aquifer. On the Arkansas River, hundreds of wells went out of production to satisfy Colorado's obligation to deliver water to Kansas under the Arkansas River Compact.<sup>38</sup> A new transmountain diversion process will not solve these more global issues that have resulted in loss of agriculture.

Rather than identifying transmountain diversions as a necessary alternative to "buy-and-dry", water planning should continue to encourage temporary or rotational fallowing of agricultural land, increases in water storage, and the reuse of return flows within each basin as the first step to meeting a basin's water supply needs.<sup>39</sup>

**Perception 5:**            *There is extra water available for Front Range water supply from the West Slope and the Colorado River Basin.*

**Response.** No one knows whether there is enough additional water available from the Colorado River to supply projected population increases whether they are large or small.<sup>40</sup> Estimates vary from zero to one million acre-feet of water left in the Upper Colorado Basin for the whole state to develop.<sup>41</sup>

Many factors determine the amount of Colorado River water available for Colorado and downstream states.<sup>42</sup> Climate change will likely decrease available future water supplies from an estimated 5 percent to 20 percent or more by 2070.<sup>43</sup> Even without any future development that utilizes Colorado River water, climate change will also increase consumptive uses, such as agricultural and residential irrigation uses, as temperatures rise, evapotranspiration increases, and the growing season lengthens. Ongoing drought conditions may show us that the 20<sup>th</sup> century was in fact a relatively wet century, with future hydrology providing significantly less water.<sup>44</sup>

The Colorado River Basin Water Supply and Demand Study conducted by the U.S. Bureau of Reclamation over the entire seven-state Colorado River Basin identified an average *shortage* of 3.2 million acre feet of water by 2060 for the Colorado River basin.<sup>45</sup> Water levels in Lakes Powell and Mead are below 50 percent of capacity. As a consequence, water deliveries from Lake Powell to Lake Mead will be reduced in 2014 for the first time (8.23 million acre feet to 7.48 million acre feet).<sup>46</sup>

Under assumptions of an extended drought, modeling shows that Lake Powell would drop below the minimum power pool level of 3490 feet. To mitigate these risks, the basin states are discussing options for increasing the supply to Lake Powell, which include releasing water from reservoirs in the Upper Basin and reducing usage in the Upper Basin. That the Upper Basin states are considering such measures highlights the impact of drought on water supplies to *existing* users, even without considering the additive effects of depletions by new transmountain diversion projects.<sup>47</sup>

Stream shortages already occur regularly in the headwaters of the Colorado River due to existing transmountain diversions and local usage.<sup>48</sup> And additional water shortages are forecast for the upcoming years in the upper reaches of the Colorado River.<sup>49</sup> West Slope farmers and ranchers experience current seasonal water shortages as well.<sup>50</sup> Projected future water shortages will directly affect the recreational economy, with, for example, projected shortages of water for snowmaking at Keystone Ski Resort and reduced river flows below Dillon Reservoir that would prevent rafting and kayaking.<sup>51</sup> The water needs for healthy fisheries and riparian areas are even greater.

In 2013, American Rivers named the Colorado River the most endangered river in the United States, citing “outdated management” as the central reason for the environmental problems on the river.<sup>52</sup> At the same time, the Colorado River Basin in Colorado is home to a significant part of Colorado’s recreation-based economy, invaluable to the communities in the headwaters region and the state as a whole. Recreation and tourism generate \$13.2 billion in consumer spending, \$994 million in state and local tax revenue, and 125,000 jobs for Coloradans.<sup>53</sup> This economic driver depends on water, especially for fishing, rafting, kayaking, and snowmaking for Colorado’s world-renowned ski resorts.

The Colorado Water Plan should “not facilitate additional diversions that could threaten the [West Slope’s] environmental, social, and economic-well being.”<sup>54</sup> Relying on the Colorado River as a major source of supply for Front Range growth in light of these existing conditions is not the answer to Colorado’s projected water supply shortages. “[T]he notion that increased demands on the Front Range can always be met with a new supply from the Colorado River [is] no longer valid.”<sup>55</sup>

**Perception 6:**                    *Conservation is not able to solve our water problems; a major new water supply project is necessary to meeting the gap.*

**Response:** A major new water supply project is not inevitable because research indicates that the gap can be filled without a major new supply project with smart growth, conservation, reuse, and the successful development of water projects that have been identified during the Colorado Plan process. Rather than viewing a major new water supply project as a necessary component of meeting the gap, such a project - when considering the macro, statewide view - should be deemed a last resort measure.<sup>56</sup>

Water leaders from the Front Range have asked the state to preserve the option to build several 100,000 to 250,000 acre-foot projects to bring water east from the West Slope.<sup>57</sup> A large water supply project creates substantial environmental and economic cost, as well as many political and practical questions. Focusing efforts primarily on water supply project options needlessly draws resources away from less costly, less destructive and more attainable measures.

In 2010, a coalition of non-governmental organizations laid out a portfolio of tools to meet the projected municipal gap on the Front Range, the largest projected municipal gap statewide, without resorting to expensive new supply projects. The report looks at several alternative water supply strategies:

- Pursue only those projects that can be constructed and operated according to a set of “smart” principles delineated in the report.
- Implement more aggressive water conservation strategies. Conservation is often the cheapest, fastest, and smartest way to gain “new” water supply, and many Front Range utilities have significant opportunities to boost their existing water conservation efforts.
- Maximize the role of water reuse in meeting the future needs of Colorado’s residents, and work to improve public perception and acceptance of reuse projects.
- Cooperate with agriculture on voluntary water sharing agreements that benefit both municipalities and the agricultural community without permanently drying irrigated acres.

The report shows that these water supply strategies alone would meet the gap in the Front Range’s 2050 projected water demand of 365,000 acre feet, plus an additional 200,000 acre feet of water. In addition, innovative land use planning and incentives for smart growth can also reduce water demand by impacting the timing, location, and density of population growth.<sup>58</sup>

There also are practical and political stumbling blocks that make a new supply project unlikely at best, if not impossible. All the easiest projects that divert water from the Colorado River Basin to the east side of the Rockies have already been completed, so the cost, scale, distance and logistics of a new project are significant.<sup>59</sup> Colorado already hosts 45 transmountain diversions, with 16 of those originating in the headwaters of the Colorado River. These 16 Colorado River diversions drain 511,700 acre feet of water to the Front Range per year, leaving Colorado River tributaries with streamflows that are substantially below natural conditions. For example, the Fraser River near Winter Park now carries only 25 percent of its natural flow, and the Frying Pan River near Basalt carries just 59 percent of its natural flow. The rivers closest to the Front Range are no longer able to support additional transmountain diversions without seriously imperiling the health of these rivers.<sup>60</sup> Under such conditions, it may not be possible to gain the permits and approvals for any projects in these areas. Projects farther downstream will be extremely expensive.

Then there is the issue of cost and who will pay for a major new water supply project. Because future water supply needs will be localized, and will occur at different times, no discernible group of water users currently exists to pay for large water supply projects. Those who favor the large projects propose that the state should pay for the projects in advance, without any close look at when and where the need for water ultimately will arise.<sup>61</sup> Moreover, water simply may not be available for large new supply projects due to a number of complicated factors such as drought, climate change and legal obligations to downstream users of Colorado River water in other states.<sup>62</sup>

**Perception 7:**            *The permit process for new supply projects must be streamlined; it should not be easier to "buy-and-dry" than to permit a new supply project.*

**Response:** Local, state and federal permits for water projects are essential to assuring that impacts are addressed, whether those impacts are caused by a new supply project or "buy-and-dry."



First, it is not necessarily true that it is easier to “buy-and-dry;” projects that convert agricultural rights to municipal and industrial uses often are subject to the same requirements as a typical transmountain water diversion proposal. “Buy-and-dry” projects often require the construction of infrastructure to transport the water from the farm to the city in addition to the water court proceedings necessary to change the rights from agriculture to municipal and industrial uses. Several counties in eastern Colorado impose the same local permit requirements for these projects that headwaters counties impose on transmountain diversion projects. Where reservoirs are constructed to hold the water or if pipelines go through wetlands, federal and state environmental requirements and approvals identical to those for transmountain diversion projects will be triggered.

Second, transmountain water diversion projects *should* be subject to comprehensive regulatory requirements because of the significant socio-economic and environmental impacts that occur when water is taken from West Slope high mountain streams for use on the Front Range. The object of a complex regulatory process is to fully explore these impacts and make a final determination that best represents all interests and a full set of the potential consequences. Without regulatory oversight, Front Range population growth and development would occur at the expense of the headwaters’ environment and economy, an outcome that is obviously undesirable for the headwaters region and the state as a whole because the recreational opportunities and scenic attractions afforded by the headwaters region are key factors in attracting visitors and businesses to Colorado.

**Perception 8:**            *New transmountain diversions are necessary to protect Colorado’s entitlement to water under the Colorado River Compact.*

**Response.** The Colorado River Compact does not require a race to develop new transmountain diversion projects.

The Colorado River Compact and its influence on Colorado’s water future are enormously complex. But generally speaking, it serves to protect a certain amount of Colorado River water in perpetuity for use in Colorado. The Compact is an agreement among seven states that apportions the consumptive use of the waters of the Colorado River Basin between the Upper Basin states - Utah, Wyoming, Colorado and New Mexico - and the Lower Basin states, California, Arizona and Nevada. The Compact is both an intergovernmental agreement approved by each state, and federal law consented to by Congress under the Compact Clause of the United States Constitution. The Compact cannot be modified or terminated without the unanimous consent of each of the member states.<sup>63</sup>

The Compact allocates to the Upper Basin 7.5 million acre feet of water (326,000 gallons equals one acre-foot) and 8.5 million acre feet of water to the Lower Basin, including the Lower Basin tributaries, annually. The allocation available to Colorado is referred to as its “Compact entitlement.”<sup>64</sup> By allocating water among the Colorado River Basin states in perpetuity, the Colorado River Compact eliminates the need for Colorado to rush to develop water projects just to protect its legal water supply.

Additional transmountain diversions will only reduce the amount of water in the Colorado River that can be delivered at Lee Ferry to meet Colorado's compact delivery obligation by removing water that would have flowed west from the river and thus increasing the risk of Compact curtailment on *existing* Colorado water users. A rush to develop Colorado's entitlement by increasing diversions from the West Slope could shut down existing major water supply projects such as the Colorado-Big Thompson, Homestake, the Frying Pan-Arkansas Project or Denver Water's Moffat and Dillon Reservoir Projects or Wolford Mountain when methods are implemented to ensure that Colorado delivers its share of water under the Compact.

## Notes

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<sup>1</sup> State of Colorado Office of the Governor, "Executive Order D 2013-005, Directing the Colorado Water Conservation Board to Commence Work on the Colorado Water Plan," 14 May 2013 <<http://www.colorado.gov/cs/Satellite/GovHickenlooper/CBON/1251616203275>>.

<sup>2</sup> Office of the Governor, Executive Order D 2013-005.

<sup>3</sup> CDM, "SWSI 2010 Mission Statement, Key Findings, and Recommendations," Colorado Water Conservation Board, 26 Jan. 2011 <<http://cwcb.state.co.us/water-management/water-supply-planning/Documents/SWSI2010/SWSI2010FactSheet.pdf>>.

<sup>4</sup> Currier, John, "SWSI 2010 Reality Check," Colorado River District, 8 Jan. 2014 <[http://www.crwcd.org/media/uploads/2014\\_1Q\\_sws\\_i\\_2010\\_reality.pdf](http://www.crwcd.org/media/uploads/2014_1Q_sws_i_2010_reality.pdf)>.

<sup>5</sup> Currier.

<sup>6</sup> CDM, "Appendix H, 2050 Population Projections for the State of Colorado Municipal and Industrial Water Use Projections," Colorado's Water Supply Future, Statewide Water Supply Initiative 2010, Final Report (SWSI 2010), Colorado Water Conservation Board, January 2011: 3-8 <<http://cwcb.state.co.us/water-management/water-supply-planning/pages/swsi2010.aspx>>.

<sup>7</sup> Northwest Colorado Council of Governments Water Quality/Quantity Committee, "Water Conservation Efforts in the Headwaters Communities in the Northwest Colorado Council of Governments Water Quality/Quantity Region," Northwest Colorado Council of Governments, 2 Mar. 2009 Updated 31 Mar 2009 <<http://www.nwccog.org/docs/qq/QQWaterConservationUpdated3-31-09-1.pdf>>.

<sup>8</sup> SWSI 2010, Appendix H 3-8.

<sup>9</sup> SWSI 2010, Appendix H Exhibit 26.

<sup>10</sup> State Demography Office - Dashboard, Department of Local Affairs <[https://dola.colorado.gov/demog\\_webapps/dashboard.jsf](https://dola.colorado.gov/demog_webapps/dashboard.jsf)>.

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<sup>11</sup> SWSI 2010, Appendix H.

<sup>12</sup> Colorado-based Economic Research, "CBER Colorado Economic Forecast 2013," CBER, 7 Jan. 2013 <[http://cber.co/uploads/CBER\\_Forecast\\_2013final.pdf](http://cber.co/uploads/CBER_Forecast_2013final.pdf)>.

<sup>13</sup> SWSI 2010, Appendix H.

<sup>14</sup> For a description of changing development patterns in the Denver Metro Areas see Goetz, Andrew, "Suburban Sprawl or Urban Centers: Tensions and Contradictions of Smart Growth Approaches in Denver, Colorado," Urban Studies 50 (August 2013): 2178-2195 <<http://usj.sagepub.com/content/early/2013/03/14/0042098013478238.abstract>>.

<sup>15</sup> C.R.S. § 29-20-303 (1).

<sup>16</sup> *P-W Investments, Inc. v. City of Westminster*, 655 P.2d 1365 (Colo. 1982).

<sup>17</sup> C.R.S. § 29-20-104 (1)(e).

<sup>18</sup> C.R.S. § 31-23-206 for municipalities; C.R.S. § 30-28-106 for counties.

<sup>19</sup> C.R.S. § 31-23-206(1) for municipalities; C.R.S. § 30-28-106(3)(a) for counties.

<sup>20</sup> "Section 5: Land Preservation Subdivision Exemptions," Subdivision Regulations, Routt County, Colorado, Adopted 7 Mar. 1972 Amended and Reinstated 27 Sept. 2011 <<http://www.co.routt.co.us/DocumentCenter/View/144>>; *see also* Zoning Regulations, Routt County, Colorado, Adopted 7 Mar. 1972 Amended and Reinstated 27 Sept. 2011 <<http://www.co.routt.co.us/DocumentCenter/View/145>>.

<sup>21</sup> C.R.S. § 29-20-104 (1)(f).

<sup>22</sup> *Bethlehem Evangelical Lutheran Church v. City of Lakewood*, 626 P.2d 668, 671 (Colo. 1981).

<sup>23</sup> C.R.S. § 29-20-104 *et seq.*; C.R.S. § 30-28-133 (4)(a)(II); *Bd. of County Com'rs of Douglas County, Colo. v. Bainbridge, Inc.*, 929 P.2d 691, 698-99 (Colo. 1996).

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<sup>24</sup> *Bainbridge*, 929 P.2d at 698.

<sup>25</sup> *Construction Industry Associate of Sonoma v. City of Petaluma*, 522 F.2d 897 (9<sup>th</sup> Cir. 1975), *cert. denied*, 424 U.S. 934 (1976).

<sup>26</sup> "Chapter 6: Growth Management Quota System (GMQS) and Transferable Development Rights (TDR)," Pitkin County Land Use Code, July 2006 <<http://www.aspenpitkin.com/Portals/0/docs/county/countycode/chapter%2006.pdf>>; *Wilkinson v. Bd. of County Com'rs of Pitkin County*, 872 P.2d 1269, 1276 (Colo.App. 1993)

<sup>27</sup> "Title 11 Chapter 3, Growth Management Program," Westminster Municipal Code, 1 Jan. 2011 <<http://www.ci.westminster.co.us/CityGovernment/CityCode/TitleXI/3GrowthManagementProgram.aspx#s8>>; *see also P-W Investments, Inc. v. City of Westminster*, 655 P.2d 1365 (Colo. 1982).

<sup>28</sup> "Chapter 18.70, Residential Growth Management," City of Golden Municipal Code, updated through October 2013 <<http://sitetools.cityofgolden.net/Code.asp?CodeID=728>>.

<sup>29</sup> *Droste v. Bd. of County Com'rs of the County of Pitkin*, 159 P.3d 601 (Colo. 2007).

<sup>30</sup> C.R.S. §29-20-104 (1)(g).

<sup>31</sup> *Nopro Co. v. Town of Cherry Hills Village*, 504 P.2d 344, 349 (Colo. 1972).

<sup>32</sup> *Droste v. Bd. of County Com'rs of Pitkin County*, 85 P.3d 585 (Colo. App. 2003); *Colo. Springs v. Eagle County Bd. of County Com'rs*, 895 P.2d 1105 (Colo. App. 1994).

<sup>33</sup> Kindquist, Cathy Elsa, "The South Park Water Transfer: The Geography of Resource Expropriation in Colorado, 1859-1994." Thesis, University of British Columbia, 1996.

<sup>34</sup> Grand County Assessor's Office, "Grand County Acres," Northwest Colorado Council of Governments, (n.d.) <[http://www.nwccog.org/docs/qq/Grand County Land](http://www.nwccog.org/docs/qq/Grand%20County%20Land)

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[Distribution\\_201309061046420744.pdf](#)>.

<sup>35</sup> Suzanne Kenney, Summit County GIS Analyst, phone interview, 31 December 2013.

<sup>36</sup> Kuhn, Eric, "The Colorado River: The Quest for Certainty on a Diminishing River," Colorado River Water Conservation District, 8 May 2007  
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<sup>40</sup> SWSI 2010, "Section 1, Introduction," Colorado Water Conservation Board  
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<sup>41</sup> AECOMM, "Colorado River Water Availability Study, Phase I Report, Draft Findings," Northwest Colorado Council of Governments, November 2009: 3-45

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<sup>43</sup> Kuhn, Eric, "Risk Management Strategies for the Upper Colorado River Basin," Colorado River Water Conservation District, 2 Jan. 2012

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<sup>44</sup> Kuhn, [Risk Management Strategies for the Upper Colorado River Basin](#).

<sup>45</sup> USBR, [Water Supply and Demand Study 2](#).

<sup>46</sup> United States Department of Interior Bureau of Reclamation, "Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead," USBR, December 2007 <<http://www.usbr.gov/lc/region/programs/strategies.html>>.

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<sup>48</sup> Coley/Forrest Inc., "Water and its Relationship to the Economies of the Headwaters Counties," Northwest Colorado Council of Governments, December 2011

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<sup>51</sup> Hydrosphere Resource Consultants, Upper Colorado River Basin Study.

<sup>52</sup> "Most Endangered Rivers" American Rivers

<<http://www.americanrivers.org/endangered-rivers/>>; likewise, the Fraser River, located near Winter Park, CO, was named the most endangered river in 2005, while the Eagle River, located near Vail, Avon, and Eagle, CO, was designated most endangered in 2010.

<sup>53</sup> "Outdoor Recreation Economy" Outdoor Industry Association,

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<sup>54</sup> "West Slope Principles for the Colorado Water Plan," Northwest Colorado Council of Governments, 6 Nov. 2013

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<sup>55</sup> Colorado Basin Roundtable, White Paper.

<sup>56</sup> Colorado Basin Roundtable, White Paper.

<sup>57</sup> South Platte Roundtable, Metro Roundtable, Arkansas Roundtable, "Draft, Filling the East Slope Municipal Water Supply Gap, A Joint Statement of the South Platte, Metro and Arkansas Roundtables," Colorado Water Conservation Board, 23 July 2013,

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<sup>59</sup> Best, Allen, "Water Demands Grow on Both Sides of the Continental Divide," Aspen Journalism, 11 Dec. 2013 < <http://aspenjournalism.org/2013/12/11/water-demands-grow-on-both-side-of-the-divide/>>.

<sup>60</sup> Coley/Forrest Inc., Water and its Relationship to the Economies of the Headwaters Counties.

<sup>61</sup> South Platte Roundtable, Metro Roundtable, Arkansas Roundtable, Filling the East Slope Municipal Water Supply Gap.

<sup>62</sup> USBR, Water Supply and Demand Study 1.

<sup>63</sup> "Colorado River Compact," USBR, 1922  
<<http://www.usbr.gov/lc/region/pao/pdfiles/crcompct.pdf>>.

<sup>64</sup> *See* C.R.S. § 37-46-101 establishing the Colorado River Water Conservation District to “safeguard for Colorado, all waters to which the state of Colorado is equitably *entitled* under the Colorado river compact.”