Sent via mail and e-mail

June 13, 2008

Ms. Kara Lamb
Bureau of Reclamation
11056 West County Round 18E
Loveland, CO 80537

Re: Southern Delivery System Draft Environmental Impact Statement

Dear Ms. Lamb:

The undersigned organizations (Organizations) are pleased to offer the following comments on the Draft Environmental Impact Statement (DEIS) on the proposed Southern Delivery System (SDS). The SDS proponents are the City of Colorado Springs—acting through Colorado Springs Utilities (CSU)—the City of Fountain, the Security Water District, and potentially the Pueblo West Metropolitan District (collectively "Proponents").

The Organizations below represent thousands of Coloradoans statewide, including many citizens living and recreating in the area that would be impacted by the proposed project. The Organizations share a common vision of water management and advocate for environmentally and economically sustainable decisions that conserve, protect, and restore Colorado's rivers.

Our comments below address many of the issues and potential impacts of the proposed alternatives, specifically:

- Purpose and Need Statement (pp. 2-4);
- Range of Alternatives (pp. 4-5);
- Cumulative and Connected Impacts (pp. 5-6);
- Water Quality and Stormwater (p. 6);
- Wetlands (p. 7);
- Streamflows (p. 7);
- Paleontological Resources (p. 8);
- Water Conservation and Efficiency (pp. 8-18); and
- Energy Use (pp. 18-27)

The National Environmental Policy Act (NEPA) requires federal agencies to prepare a detailed statement on the environmental impacts of a proposed "major federal action" and all of the reasonable alternatives thereto before authorizing any such action.[1] NEPA's many policies and goals include:

- Encouraging a "productive and enjoyable harmony between man and his environment";[2]
- Promoting "efforts which will prevent or eliminate damage to the environment and biosphere";[3]
- Using "all practicable means and measures . . .to create and maintain conditions under which man and nature can exist in productive harmony";[4]
- Fulfilling "the responsibilities of each generation as trustee of the environment for succeeding generations";[5]
- Assuring "all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings";[6]
- Allowing beneficial use of the environment "without degradation . . . or other undesirable and unintended consequences";[7]
- Preserving "important historic, cultural, and natural aspects of our national heritage";[8]
- Achieving a "balance between population and resource use";[9] and
- Enhancing "the quality of renewable resources" and maximizing recycling of depletable resources.[10]

<u>Purpose and Need Statement</u>

The Purpose and Need for the proposed project is too constrictive. Currently the DEIS expressly omits any project alternatives that do not include perfecting existing Arkansas River Basin water rights and, further, defines the purpose of this project expressly as a means to perfect Arkansas Basin River water rights. The reliance on this narrow Purpose and Need Statement and efforts to develop rights for the sake of development is far too narrow and excludes from consideration other ways to meet water demands in an economic and sustainable manner.

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[1] 42 U.S.C. § 4332(2)(C).
[2] 42 U.S.C. § 4321.
[3] *Id.*
[4] *Id.*
[5] *Id.* at § 4331(b)(1).
[6] *Id.* at § 4331(b)(2).
[7] *Id.* at § 4331(b)(3).
[8] *Id.* at § 4331(b)(4).
[9] *Id.* at § 4331(b)(5).
[10] *Id.* at § 4331(b)(6).

As currently defined, the DEIS Purpose and Need statement is too narrow to satisfy the statutory requirements of NEPA noted above as well as well as the requirements of Council on Environmental Quality (CEQ) regulations found at 40 C.F.R. §§ 1500.2, 1502.1 (full and fair discussion of significant environmental impacts and reasonable alternatives that would avoid or minimize adverse impacts), and 1502.14 ("rigorously explore and objectively evaluate all reasonable alternatives").

Scoping comments by the Environmental Protection Agency (EPA) in 2003 noted a Purpose and Need Statement needs to "generate a broad and reasonable range of alternatives".[11] The EPA scoping comments said the Purpose and Need Statement for the proposed SDS should "describe how much [more] water is needed than is currently supplied and why".[12]

The DEIS identifies the basic project purpose to be "providing a safe, reliable and sustainable water supply for the Participants through the foreseeable future." However, according to the DEIS, the SDS project or any alternative must fulfill three needs: (i) "To use developed and undeveloped water supplies to meet most or all projected future demands through 2046," (ii) "To develop additional water storage delivery and treatment capacity to provide system redundancy;" and (iii) "To perfect and deliver the Participants' existing Arkansas River Basin Water Rights." Notably, section (iii), above, appears to have replaced an element of Purpose and Need—found in documents distributed at public scoping meetings—that referenced using water conservation and other programs to reduce demand and consumption.

The revised Purpose and Need Statement is so narrowly constrained that the DEIS omits from consideration any project alternatives that do not include perfection of Arkansas River Basin water rights. The Purpose and Need Statement reduces the scope of the SDS alternatives analysis to those alternatives that are simply desirable from the standpoint of the Participants, thereby omitting consideration of alternatives that would better comport with 40 C.F.R. § 1502.14 including, *inter alia*, water conservation, water reuse, land use planning strategies, and other mechanisms for delivering water that might be achieved in a more economic and sustainable manner, all of which are practical and feasible from the technical and economic standpoint.[13]

As stated in *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1990): "an agency may not define the objectives of its actions in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's

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[11] Environmental Protection Agency, "Scoping Comments on the Proposed Draft Environmental Impact Statement for the Southern Delivery System Project, Fryingpan-Arkansas Project, Colorado" (Nov. 14, 2003), "Detailed Comments" at 1.

[12] *Id.*

[13] *See* Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 46 Fed. Reg. 18026 (1981).

action [such that] the EIS becomes a foreordained formality." But the SDS narrowly scoped Purpose and Need Statement expressly excludes consideration of alternatives that do not use the Participants' existing Arkansas River Basin water rights. As a result, the DEIS inappropriately fails to identify and assess reasonable alternatives to the proposed action that could avoid or minimize adverse effects on the human environment in violation of NEPA and applicable CEQ regulations. The Final EIS—and DEIS revisions in the meantime—must address this shortcoming by broadening the Purpose and Need Statement.

Range of Alternatives

Due to the overly narrow Purpose and Need Statement other elements of the DEIS are called into question because a full range, analysis, and comparison of alternatives cannot be done. The Organizations respectfully request that the Bureau address these concerns prior to the Final EIS, expanding the analysis to include other alternatives to meet water demand, including water reuse, water conservation, land use planning strategies, and other mechanisms for delivering water that might be achieved in an economic and sustainable manner.

Most disappointing is the definition and comparison of the "No Action Alternative". In discussing cumulative effects, the DEIS states (pp.340-341) that the No Action Alternative would have "major adverse cumulative impacts" on wetlands and riparian vegetation, primarily due to increased groundwater pumping. The DEIS goes on to describe the Action Alternatives as all having "similar" cumulative effects as the No Action Alternative, even though use of water from Pueblo Reservoir would largely replace groundwater pumping. This comparison is more apples-to-oranges than apples-to-apples.

The DEIS must compare alternatives to existing conditions, not merely to each other. Table 104 from the Socioeconomics chapter illustrates this issue well, as the cost of wastewater for Colorado Springs under Alternative 1 (No Action) is compared to existing conditions, but alternatives 2-7 are compared to Alternative 1, misdirecting the representation of the cost comparison. Impacts of the preferred Alternative are therefore found to be "negligible" compared with the No Action Alternative even thought they will still cause "major adverse impacts" in comparison to existing conditions.

Further, several viable alternatives were eliminated from consideration in the DEIS, including indirect potable reuse and alternatives which could address flood and stormwater control, because of this artificial comparison.

Exact details of how the Bureau developed the cost threshold are unclear. However, the threshold seems too low and ultimately too restrictive. The document points out that the Participants have a strong interest in developing a more reliable water supply system with greater redundancy. Developing a system with increased reliability is a costly effort for any water supplier, and in a changing economic environment these costs are likely to go up across the board.

The comparison and consequential discarding of alternatives which included indirect potable reuse were screened utilizing a flawed benchmark of the cost of water. Other municipalities and water providers are seeing rising costs on both traditional and non-traditional water supply projects, but are also realizing that they will have to make a larger investment to provide reliable water into the future. For example, the Aurora's Prairie Waters Project—designed to make potable re-use of water Aurora has already developed from other sources—is expected to cost nearly $1 billion for an initial delivery of 10,000 acre-feet/year.

The DEIS appears to have ignored the fact that the operating principles governing water already developed under the federal Fryingpan-Arkansas Project dictate: "The project is to be operated in such a manner as to secure the greatest benefit from the use *and reuse* of imported project water within project boundaries in the State of Colorado"[14] (emphasis added).

By overly restricting the cost screening criteria in the SDS EIS, the Bureau eliminated a variety of creative solutions that could provide water to the participants while at the same time limit environmental impacts.

In sum, the range of the alternatives is far too narrow, there is little difference between the various alternatives, and the cost screening criteria is too restrictive. A true comparison of a variety of alternatives would have made this DEIS more useful, and would be consistent with NEPA.

Impacts of Alternatives and Specific Concerns

Cumulative and Connected Impacts

The overall organization of the DEIS makes the true impacts of the alternatives difficult to ascertain. In particular, the cumulative impacts were not analyzed in a meaningful way, as a true analysis should identify (1) the area in which effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions—past, proposed, and reasonably foreseeable—that have had or are expected to have an impact in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate. *See, e.g., Fitiofson v. Alexander*, 772 F.2d 1225, 1245 (5th Cir. 1985) (this level of detail is necessary even at the EA stage); *see also* 40 C.F.R. § 1508.25. The Bureau's references to a lack of cumulative impacts from the actions to be covered by the DEIS fails to meet even these basic elements.

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[14] *See* H.R. Doc. No. 130, 87th Congress, 1st Session, "Operating Principles [for] Fryingpan-Arkansas Project, Adopted by the State of Colroado" (March 15, 1961).

The Table of Contents has only two sections that reference "cumulative effects", once when it is defined on page 121, and again on page 527 where the cumulative effects for the years 2046-2050 are discussed. Under further examination, the cumulative impacts analysis is not a true discussion of "cumulative" but rather the Bureau has partitioned the analysis under the environmental resource headings in Chapter 3, and never provides a comprehensive study of the cumulative impacts across all resources.

The DEIS fails to analyze the direct, indirect, cumulative, and connected impacts that will result from new growth (e.g., commercial and urban development) facilitated by SDS. NEPA regulations, 40 C.F.R. § 1508.25(c), and court decisions make clear that environmental analyses pursuant to NEPA must consider future actions that are "reasonably foreseeable" even if they are not yet proposals and may never trigger NEPA-review requirements.[15] This includes activities on both public and private land.[16] Similarly, EPA's 2003 scoping comments directed: "[t]he impacts of growth and development beyond established estimates should be analyzed".[17]

A basic summary of the cumulative impacts and reasonably foreseeable future actions facilitated by SDS should have been included in the DEIS to provide a complete picture of the potential impacts resulting from the SDS.

Water Quality and Storm Water

SDS impacts on water quality will be seen primarily on Fountain Creek, a stream the State of Colorado already includes on its § 303(d) list of impaired waters. These impacts would be driven by increases which will be seen in effluent returned to Fountain Creek. Additional impacts may be seen from use by Pueblo West should Reclamation select an alternative which diverts water from a facility associated with Pueblo Reservoir. Because water from SDS would be used to serve future growth, we can also assume that increased storm water runoff will be likely, as new growth will require increases in non-permeable surfaces in the region, adding an additional concern for water quality.

Significant information is available in The Fountain Creek Watershed Plan, developed by the Pikes Peak Area and Pueblo Area Councils of Government. The plan documents erosion, sedimentation, and flooding issues, and makes specific technical and policy recommendations for the Fountain Creek watershed.[18]

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[15] *Fitiofson v. Alexander*, 772 F.2d 1225, 1245 (5th Cir. 1985).
[16] *Natural Resources Defense Council v. U.S. Forest Service*, 421 F.3d 797, 815-16 (9th Cir. 2005).
[17] Environmental Protection Agency, "Scoping Comments on the Proposed Draft Environmental Impact Statement for the Southern Delivery System Project, Fryingpan-Arkansas Project, Colorado" (Nov. 14, 2003), "Detailed Comments" at 2.
[18] *See* the Executive Summary, available at http://www.fountain-crk.org/Plan%20Documents/fc_watershedplan.html.

Future NEPA documents for SDS should include the recommendations of the Watershed Plan specifically as they deal with mitigating water quality impacts on Fountain Creek. Mitigation also should be sufficient to reduce water quality impairment so that Fountain Creek can be removed from the State's § 303(d) list.

Wetlands

The FEIS must require the Participants to prioritize the avoidance of all wetlands impacted by SDS, rather than simply working to mitigate impacts.

It should be a top priority that all alternatives seek to avoid wetland disturbance rather than look for ways to mitigate wetland disturbance. *See* 40 C.F.R. § 1508.20(a) (noting the definition of "mitigation" includes "[a]voiding the impact altogether by not taking a certain action or parts of an action"). Increased return flows associated with multiple alternatives could have impacts on the regional wetlands. Currently there are good quality wetlands on Williams Creek near its confluence with Fountain Creek. Furthermore, the Arkansas Darter—a fish listed by Colorado as threatened and also listed as a federal candidate species—finds habitat at the mouth of Williams Creek. Finding mechanisms to avoid both the wetlands and the Arkansas Darter on Williams Creek such as a diversion channel or short pipeline to avoid disturbance would help to preserve these areas. One final additional issue to consider with regard to wetlands is the future loss of return flows due to the loss of irrigated land as the Participants develop their Arkansas River Water Rights.

Stream Flows

The DEIS fails to include a detailed operating schedule related to stream flows. The FEIS must include a detailed operations schedule and a cumulative impacts analysis of stream reaches affected by the project.

In the DEIS, there appears to be significant flexibility in how the project could be operated. Any of the alternatives, including the preferred alternative, could be operated in a variety of ways including some that would be contradictory to the assumptions of the DEIS. We are concerned that the assumed operations and their resulting impacts may be much different than the actual operations should the project come online.

SDS alternatives will have impacts on several specific stream reaches, including on the West Slope, the Upper Arkansas River, the Lower Arkansas River, and on tributary streams to the project. Timing of stream flows, stream levels and other fluctuations all need to be considered on specific streams as well as in a cumulative impacts analysis, pursuant to 40 C.F.R. § 1508.25(c). The lack of a detailed operation schedule and insufficient cumulative impact analysis is a flaw in the DEIS, making it difficult to know impacts on stream flows in some reaches.

Paleontology

The region where SDS will be constructed and operated lies in a rich paleontological area, sharing ground with the Cretaceous-Tertiary Boundary (K-T Boundary), the Dawson Formation, and other resources. These unique resources should be protected if any aspect of the Project proposal goes forward. The FEIS must include details of how that protection will be carried out.

All alternatives except the Wetland Alternative would require the construction of a reservoir at Jimmy Camp Creek to receive and store Arkansas River Water. While the construction of the actual Jimmy Camp Creek Reservoir seems to have avoided most impacts to these resources, location and construction of a pumping station and other facilities required to operate the reservoir should be sited as to avoid impacts as well. Many steps can be taken to mitigate impacts on the K-T Boundary and Dawson Formation, including following internationally recognized standards and procedures for locating and processing fossils and other artifacts.

The discussion on page 528 of the DEIS focuses on identification and removal of valuable specimens during the construction process, but seem poorly adapted to protect a resource which is valuable because it contains an undisturbed rock interface area, rather than a discrete fossil. In situations where an undisturbed rock interface of this nature could potentially be impacted, avoidance is the best form of mitigation. The map accompanying the discussion (DEIS, p. 500) shows that the K-T boundary has only been approximately defined in the western portion of the impacted area, and not defined in the area of the proposed treatment plant.

However, a mitigation strategy also needs to address the unique value of the K-T layer lies in the chemical characteristics of its rock layers, which show elevated iridium levels worldwide believed to be associated with the event causing extinction of the dinosaurs, and therefore should be protected from contamination as well as disturbance. Further and final analysis by the Bureau should include comprehensive mapping of the K-T Boundary, so best to avoid all potential impacts to this resource.

<u>Other Critical Issues Not Addressed</u>

A. Conservation and Efficiency

Prior to committing large financial resources to the proposed Southern Delivery System, Proponents must greatly increase their demand management. The EPA stated it well in its 2003 scoping comments: "The best practicable conservation measures should be incorporated in any proposal that further reduces supplies in the Arkansas River basin".[19]

Conservation represents a "no regrets" strategy – one that doesn't tie the utilities to expensive infrastructure or rising electricity costs, and doesn't have detrimental impacts on river systems or rural communities. While conservation programs come with a price tag, it's much smaller than the one for the SDS.

The proposed alternative for SDS involves a contract with the Bureau of Reclamation.[20] As a result, the provisions of the federal Reclamation Reform Act (RRA) apply.[21] Under the RRA, the Bureau of Reclamation has a duty to promote "full consideration and incorporation of prudent and responsible water conservation measures" in the water projects of non-Federal water entities that receive water from Federal reclamation projects.[22]

Project beneficiaries—including those using water for municipal and industrial uses—must develop conservation plans containing definite objectives, proposed conservation measures and a proposed time schedule for compliance[23] and must submit their conservation plans to the Bureau.[24] The RRA requires that water recipients certify their compliance with the Act.[25] These requirements must be met prior to approval of the project, to ensure timely and economic inclusion of water conservation measures in the original design of the project. Post-hoc consultation would result in expensive refitting, lengthy delays in service, or less effective conservation measures.

It is unclear—but doubtful—from the face of the Draft EIS whether all project beneficiaries have complied with the RRA. The final EIS must include evidence that the provisions of the RRA have been met by all project beneficiaries.

1. <u>City of Fountain & Security Water District</u>

<u>Conservation Measures</u>–
According to the 2001 City of Fountain's water conservation plan, the 2004 Security Water District water conservation plan and the SDS Draft EIS the City of Fountain and Security Water District both lack water conservation measures or programs (such as rebates) that provide incentive for customers to use water more efficiently. While both entities have adopted the 1992 National Energy Policy Guidelines (required) they have not gone beyond these basic national

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[19] Environmental Protection Agency, "Scoping Comments on the Proposed Draft Environmental Impact Statement for the Southern Delivery System Project, Fryingpan-Arkansas Project, Colorado" (Nov. 14, 2003), "Detailed Comments" at 2.
[20] *See* 73 Fed. Reg. 11,144-11,146 (February 29, 2008).
[21] 42 U.S.C. §§ 390aa *et seq.*
[22] 42 U.S.C. § 390jj(a).
[23] *Id.* at § 390jj(b); 43 C.F.R. § 427.1.
[24] 43 C.F.R. § 427.1.
[25] 42 U.S.C. § 390ff.

requirements to promote indoor efficiency, despite existing technologies—readily available in the marketplace—that save more water.

The utilities also have not implemented widespread education and outreach measures that inform customers about the importance of water efficiency. Conservation measures help to increase efficiency, improve behavioral practices, and educate the public. The combination of multiple measures greatly improves the overall effectiveness of any conservation program.

In the commercial and industrial sectors, both entities require landscape plans and encourage use of plants from their plant list. This requirement, however, should extend beyond the commercial and industrial sector (which typically has limited landscaping) to the residential sector (which typically has more landscaping).

The City of Fountain has not updated its water conservation plan since 2001. Since that time—i.e., after the drought of 2002—many water conservation practices have become the norm. The requirements of the RRA—plan objectives, proposed conservation measures and a proposed time schedule for compliance—would not be met were the City of Fountain to rely on such an outdated plan.

Conservation has been proven to be cost effective and a source of real water savings.[26] Public perception of water conservation has also drastically changed in areas where education and media programs are present. As a prerequisite to moving forward with the SDS, the City of Fountain's plan must be updated with specific conservation savings targets and goals that should then be integrated in the city's long term planning process.

Security Water District has not updated their water conservation plan since 2004 and does not include specific targets and goals that should be integrated in the District's long term planning process. Setting ambitious but achievable conservation savings goals is an essential component of a community's water conservation plan, and a requirement of the RRA in this case.

It is also critical to use up-to-date and accurate information in the planning process. The water conservation plan for Fountain and Security uses a Denver Water cost benefit analysis consisting of data from more than 10 years ago to determine moderate and maximum levels of conservation. Such outdated materials would not suffice in supply side planning and are not adequate for conservation planning either. Both entities use this data in their respective conservation plans, which should be updated.

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[26] *See, e.g.*, Western Resource Advocates, *Smart Savings: Water Conservation Measures that Make ¢ents*, WRA (2008); found at www.westernresourceadvocates.org

It is essential to keep detailed and accurate data (e.g., data on unaccounted for water). Prior to pursuing additional water supplies the Proponents must have a firm understanding of how every gallon is used within their system.

Levels of Use and Demand Forecasting -
According to the 2004 conservation plan Security Water District has a system wide use of 223 GPCD, 21% greater than the median system wide Front Range levels of use. Greater effort must be made to drive down use to a more reasonable level. If use decreased to the median Front Range level of 184 gpcd, 624,000 gallons of water could be saved each day! That is 699 AF each year—50% of the yield Security hopes to get through SDS.[27] Furthermore, if use decreased to the level of Front Range leaders like Aurora and Boulder—160 gpcd—it would save 1 million gallons each day and 1129 AF each year, thereby meeting 81 % of the yield Security hopes to obtain through the SDS project.

The Water District assumes that levels of use will remain relatively unchanged over the next forty years. In 2046 the demand forecast in Appendix A of the draft EIS shows an overall demand of 6,486 AF annually. Given the build-out population of 27,000, expected to be reached in 2026, the average per capita use in 2046 will be 214 gpcd. This is still much greater than median Front Range use (*see* **Figure 1**) and does not factor in the downward trend of per capita use that has been seen throughout the Southwestern United States. The Final EIS must include a more reasonable level of per capita use, based on updated conservation savings targets and a new plan submitted by the Water District.

Figure 1: System Wide Use Figures

Front Range GPCD							
	Total (gal)						
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**AVG**
Westminster			191	191	170	156	177
Longmont	215	195	213	201	196	180	200
Denver	213	203	221	211	192	166	201
Fort Collins	196	185	211	198	183	154	188
Greeley	218	197	220	201	192		206
Loveland	182	165	204	190	160	136	173
Broomfield	191	192	225	203	210	189	202
Lafayette	151	137	148	147	102	126	135
Louisville	183	178	193	182	133	157	171
Superior	149	127	131	125	128	120	130
Aurora	173	171	192	184	168	127	169
Multi-city Avg.	187	175	195	185	167	151	**177**
						Median =	**184**

[27] SDS Draft EIS §1.5.1.2 Purpose and Need. Table 3 – Participants' Existing Supplies, Future Water Demand, and Anticipated Yield from the Participant's Proposed Action.

The City of Fountain also uses a demand forecast that is unreasonably high. According to Appendix A in 2046 the City of Fountain expects to serve 66,700 customers with a total demand of 15,600 AF annually. This means that on average the city expects system wide use to be 226 gpcd—that is 53% greater than current system wide per capita use. This gross overestimation of demand would result in undue burden placed on taxpayers and unnecessary withdrawal of water from already stressed rivers and streams. Given that the City of Fountain is experiencing a decrease in per capita use rather than an increase—future demand forecast must be based on more realistic levels of use; at the very least, on current levels of use.

Additionally, the City of Fountain is experiencing rapid growth and is expected to continue at current rates well into the future. Such growth will result in the addition on many new homes and business. The City should take this opportunity to set guidelines for development that ensure new development will be built to high levels of efficiency. This will ensure that Fountain's water use will remain low for decades to come.

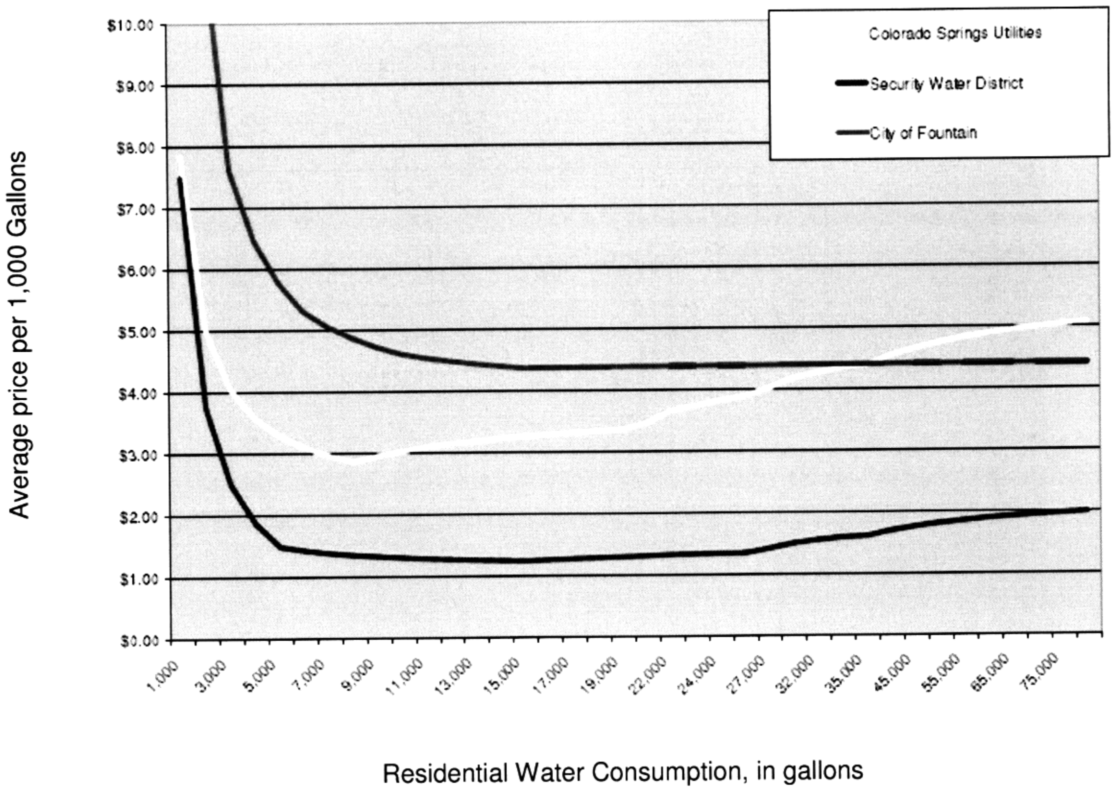
Rates-
The City of Fountain has implemented an inclining block rates structure. However, the structure does not work effectively to convey a conservation price signal to consumers due to the high minimum fixed service charge and the nominal increase in per unit price from one block to the next. Combined together, these elements form an average curve (see below), which fails to send a price signal to customers.

Security Water has an inclining block rate structure and claims that this is long term strategy to send a pricing message to its customers.[28] But the structure does not convey a strong conservation price signal to consumers due to the nominal increase in per unit price from one block to the next, despite recent adjustments. Because of the negligible price differential, customers are unaware that their water use has exceeded one block and moved to the next.

In order for inclining block rates to be an effective conservation tool consumers must understand that the more water they use the more they will pay per unit; this is reflected in a steep positive slope on the average price curve. As illustrated in **Figure 2**, below, this is not the case with the City of Fountain and Security Water District.

[28] Personal correspondence with Western Resource Advocates, June 9th, 2008

FIGURE 2: Average Price Curve



Re-use-
Both The City of Fountain and Security have implemented some water re-use projects throughout their service areas, using non-potable water for irrigation purposes. These programs should be expanded as re-use reduces the amount of water that must be withdrawn from native sources and increases the efficiency of the overall water delivery system.

Agricultural Transfers-
Transfers of water from the agricultural to urban sector on either a permanent or temporary basis helps to diversify the water delivery system without increasing the amount of water withdrawn from already stressed rivers and streams. While the City of Fountain has some transfers already in place more should be pursued to maximize use of existing supplies within the region. With more than 280,000 acres receiving supplemental irrigation within the Arkansas Valley the potential for mutually beneficial water transfers is substantial.

Planning-
Conservation savings goals do not appear to play a role in the planning process for the City of Fountain or Security Water District. Much like planning for new

supplies, demand-side management takes time to plan and implement. Therefore, the two must be concurrently considered and integrated into long term planning. In some communities, effective demand management programs can reduce, delay, or eliminate the need to seek new supplies, as well as reduce costs and energy consumption associated with pumping and treating water before and after use — thereby saving tax payers money.

2. City of Colorado Springs

Conservation Measures–
While Colorado Springs Utilities (CSU) has low single family residential water use, its system-wide use is significantly higher-198 gpcd.[29] Although CSU has extensive conservation programs for its residential sector, implementation of conservation measures still has a long way to go. CSU also has significant room for improvement in the commercial, institutional, and industrial sectors.

The utility offers rebates on numerous water-efficient devices, but even the most successful program – rebates for clothes washers – had only a 9% participation rate as of mid 2007. Improving implementation of conservation measures—and the resulting water savings—would significantly reduce the need for reliance on the proposed SDS.

- **Clothes washers**: If 50% of residences convert to high efficiency washers, CSU could save at least 1,200 AF/year.[30]
- **Efficient faucets**: A 50% implementation rate would save 1,600 AF/year.[31]
- **Landscape Conversions**: If 25% of all turf grass was converted to low-water-use or xeric plants, CSU could save approximately 15,000 AF/year.[32]

CSU's approved conservation plan has set an implementation timeline for commercial and industrial measures that the utility has lacked in the past. Implementation for some of these new measures will begin as early as summer of 2008. Development of these and other commercial and industrial measures should be considered a priority. Furthermore, CSU should ensure that proper funding is available for the conservation department to develop, implement and enforce these measures in the coming years.

[29] Western Resource Advocates, *Front Range Water Meter: Water Conservation Ratings and Recommendations for 13 Communities*, 2007, 45.
[30] Based on calculations by Western Resource Advocates using data from Amy Vickers. *Handbook of Water Use Conservation* (Amherst, MA: 2001) at 118.
[31] Based on calculations by Western Resource Advocates using data from Vickers at 103.
[32] Based on calculations by Western Resource Advocates using data from Western Resource Advocates *et al., Facing our Future: A Balanced Water Solution for Colorado* (2005) at 83.

Currently conservation is not well funded and the limited number of staff restricts CSU's ability to implement measures necessary to reach their full conservation savings potential. With additional staffing in their conservation department, CSU would likely be able to reach higher rates of implementation. The salaries of two full time employees—paid over forty years—would amount to less than 1% of the *capital* cost of the SDS[33] to say nothing about the huge annual energy costs and carbon footprint of pumping large volumes of water up 2,000 vertical feet.

Furthermore, the utility should enact additional city ordinances that can help further reduce water demand throughout the CSU service area, working with city council to adopt, e.g., turf grass limits and soil amendment requirements for new commercial and residential areas, as well as point-of-sale retrofit requirements for indoor appliances. Ordinances of this type have been implemented in communities across the Front Range with great success in reducing demand. Likewise, CSU's conservation plan notes landscape codes and audits are among the highest water saving measures.

The CSU service area has a rate of "unaccounted for water" of 9%. While this meets the American Water Works Association standard, other nearby cities—including Denver, Berthoud, Broomfield, and Aurora—report unaccounted for water of less than five percent.[34] Reducing CSU's water losses to five percent would provide an additional 3,300 acre-feet per year – more than 8.5% of CSU's expected SDS project yield.

Incorporating the above measures would further strengthen CSU's conservation program and, consistent with the RRA, should be adopted prior to committing enormous financial resources to the proposed SDS project.

Levels of Use-
Per person, system-wide water use in Colorado Springs is among the highest of Front Range cities. In 2006 Colorado Springs, residents used 198 gallons per person per day (gpcd). In comparison, Boulder and Aurora's residents use 160 gpcd; and the *median* water use among a large group of Front Range cities from 1998-2003 (pre drought & during drought) is 184 gpcd.

Before investing hundreds of millions in a new supply project, cities must set and meet ambitious new goals for per capita use matching leaders on the Front Range and throughout the southwestern United States. Reducing per capita water use to the Front Range median would save CSU 5,810,000 gallons each day! That is 6,508 AF annually or 17% the expected yield of SDS. Combined with decreased system loss and one quarter of SDS's expected yield could be

[33] Based on calculations by Western Resource Advocates – assumes two employees, paid $75,000 annually, for 40 years.
[34] Western Resource Advocates, *Front Range Water Meter: Water Conservation Ratings and Recommendations for 13 Communities*, 2007, 15.

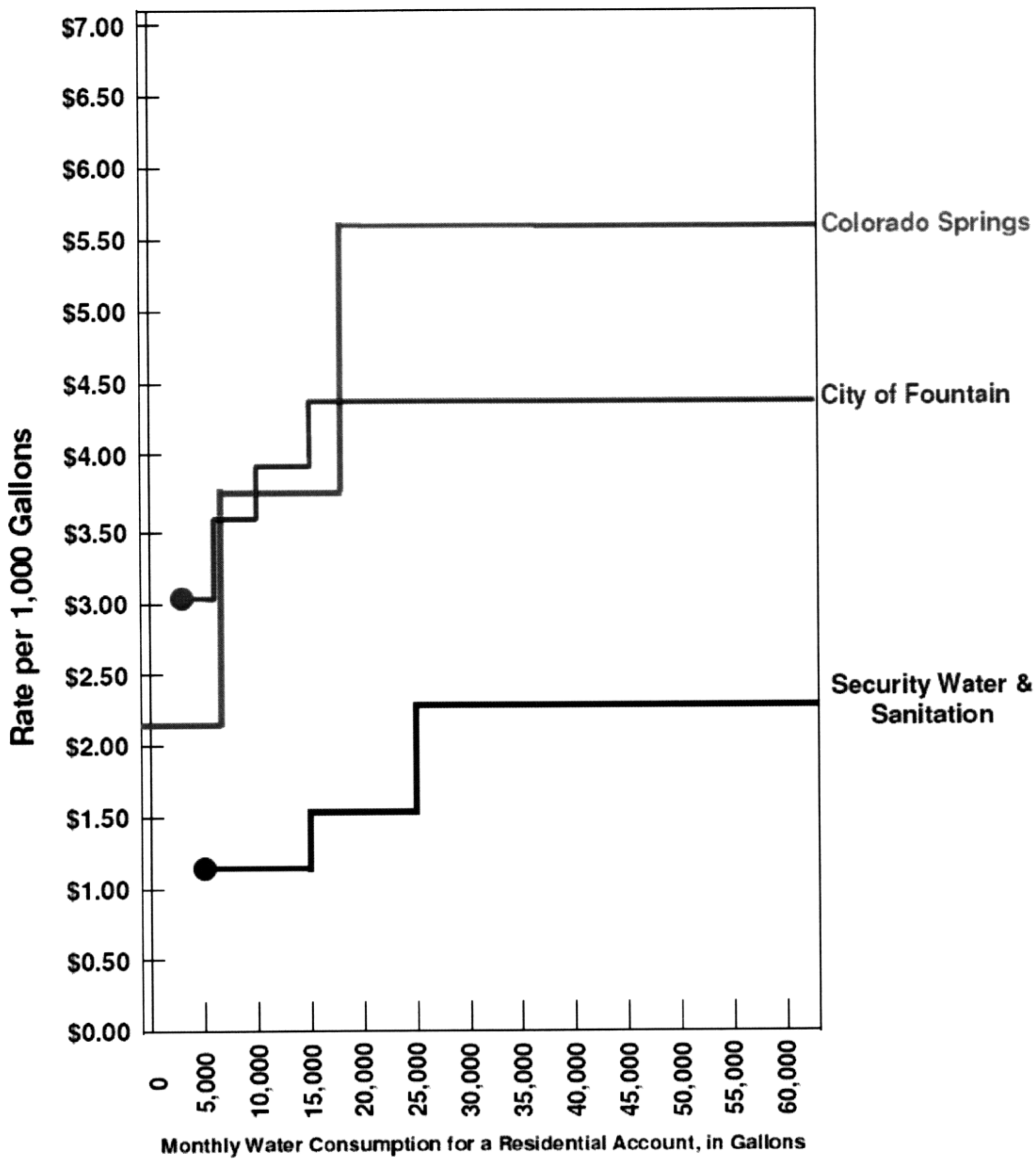
met through increased efficiency – and likely at a lower cost to consumers. If use decreased to the level of Front Range leaders like Aurora and Boulder—160 gpcd—it would save 15.7 million gallons each day and17,665 AF each year, thereby meeting 46 % of the yield CSU hopes to obtain through the SDS.

Rates-

Currently, CSU has an inclining block rate structure with three blocks that target low- end water users (*see* **Figure 3**). The last threshold in the CSU rate structure is set below 20,000 gallons, at 18,700 gallons, and, as such, does not target high-volume users. One could use 20,000 gallons or 40,000 gallons and still be charged the same per unit price. Adding additional tiers for high-volume users would send a more effective conservation price signal to the largest water users.

SEE NEXT PAGE

FIGURE 3: Marginal Rate Curve



Re-use-
CSU delivers 5,217 AF (1.7 billion gallons) annually of reclaimed or recycled water to customers throughout the city. Many non-potable projects outlined in the 2001 non-potable water master plan are operational, while others have been allocated in the 10-year budget. The utility should make these non-potable projects a priority in the years to come and should examine possible new projects to expand the reclaimed water system as they update the non-potable water master plan in 2009.

Planning-
CSU's current conservation plan draft states a goal of 7.5% sustained demand reduction now through 2046, in addition to 9.4% reduction for natural replacement of inefficient fixtures. Total conservation savings from both demand management and natural replacement is 15.6% through 2046. CSU anticipates a 3.8% savings due to natural replacement by 2017, in addition to a sustained conservation program savings goal of 7.5%. The total savings in 2017 from both is 10.7%. However, according to the Draft EIS, only a 7.5% conservation savings is assumed for each of the alternatives.

The Final EIS must include the substantial savings that will be realized through natural replacement and conservation programs either in the savings or in the overall demand forecast. With projected growth, setting realistic, but strong conservation goals now and incorporating them into supply planning will help to prepare the utility for a future of continued economic growth and sustainable development, and help the utility to meet its goal of being a "national leader in water conservation and efficient water use."

B. Energy Use

Introduction
If the Southern Delivery System is constructed and operated as described in the Draft EIS, the water utilities – notably Colorado Springs Utilities (CSU) – will have significant new energy demands. While we commend Colorado Springs Utilities for selecting the least energy-intensive delivery system alignment as the proposed action (*see* **Table 1**, below), if the project proponents lower water demands through greater water conservation (*see* related comments on water conservation and efficiency), energy needs will drop. Indeed, significant conservation could avoid the energy requirements and costs of SDS for many years.

We find the proposed action has unexplainably high energy requirements. The system's high energy needs, along with probable future regulation of greenhouse gas emissions, make SDS water supplies an expensive and potentially risky investment. In addition, according to the Draft EIS, CSU does not intend to mitigate the greenhouse gas emissions resulting from the SDS. No matter which SDS alternative (including the No Action Alternative) is selected, the water utilities should avoid additional greenhouse gas emissions by using renewable energy resources to meet new energy demands.

Some alternatives, notably the re-use alternative, were excluded from the Draft EIS apparently based on cost criteria. The cost criteria should be re-visited. First, the cost of water projects is rising. Some new projects, notably Aurora's Prairie Waters Project, are quite expensive when compared against traditional supply projects. Second, the incremental energy required to recycle water may be significantly lower than projected energy requirements for the SDS. CSU wastewater must be treated to tertiary standards before it is discharged. The energy required to produce recycled water, therefore, is only the amount needed in addition to tertiary treatment. Based on our analysis of potential future electricity costs and the cost of greenhouse gas emissions, a reuse alternative may be more cost-competitive than projected in the Bureau of Reclamation's Evaluation of Alternatives.

Table 1. Comparison of the energy use and GHG emissions of the Draft EIS's seven alternatives. Columns marked with an asterisk (*) reflect WRA's independent calculations; otherwise, figures are estimates found in the Draft EIS.

Alternative	Firm Yield (AFY)	SMAPD (AFY)	Average Energy Use (MWh/ day)	Average Energy Use (MWh/ yr)	Energy Intensity (given SMAPD) (MWh/AF)*	GHG emissions (short tons CO_2/yr)	GHG emissions (short tons CO_2/MWh)*	Capacity Equivalent (MW) (Coal plant, 85% capacity factor)*	GHG Intensity (short tons CO_2/AF)*
No Action (1)	42,400	54,400	697	254,405	4.677	252,600	0.9929	34	4.643
Preferred (2)	42,400	52,900	683	249,295	4.713	247,500	0.9928	33	4.679
Wetland (3)	74,900	69,300	1,001	365,365	5.272	362,800	0.9930	49	5.235
Arkansas River (4)	74,400	68,100	1,096	400,040	5.874	397,200	0.9929	54	5.833
Fountain Creek (5)	46,400	59,500	683	249,295	4.190	247,600	0.9932	33	4.161
Downstream Intake (6)	68,400	65,700	1,419	517,935	7.883	514,300	0.9930	70	7.828
Highway 115 (7)	37,900	47,200	688	251,120	5.320	249,400	0.9932	34	5.284

Energy Intensity of the SDS

The Draft EIS states that in 2046, the proposed action would provide 52,900 AFY (Simulated Mean Annual Project Delivery, SMAPD) to CSU and the Cities of Fountain, Security, and Pueblo. The project will require, on average, 683 MWh of electricity per day; annually, this amounts to 249,295 MWh.[35] Accordingly, the energy intensity of the water, or the energy embedded in each unit of water, is 4.71 MWh/AF.

Compared to other water supplies in the Western U.S., the SDS is an extremely energy intensive water supply. For reference, seawater desalination is currently considered the most energy intensive "new" water supply; a proposed plant in Southern California expects to use between 4.66 and 5.12 MWh/AF.[36]

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[35] Summary Draft EIS, section 2.2.2.3.

[36] *See* "Precise Development Plan and Desalination Plant Project", Environmental Impact Report for the Proposed Carlsbad Desalination Plan (December 2005); *see also* Park, L., B. Bennett, S. Tellinghuisen, C.

Energy used to provide water can be divided into three components:

1. raw water conveyance;
2. treatment; and
3. distribution.

After assessing the energy required for the SDS at each of these components, we find that the total energy required by the proposed system is inaccurate and/or not sufficiently explained in the Draft EIS and must be clarified prior to inclusion in the Final EIS.

The SDS lifts water approximately 2,140 feet from Pueblo to Colorado Springs. If the system's pumping stations operate at 100% efficiency, the energy intensity of an acre foot conveyed to Colorado Springs should be approximately 2.1 MWh/AF. Typically, pumps operate at 75 to 80% efficiency; assuming this, conveying water from Pueblo Reservoir to the proposed Jimmy Camp Creek reservoir should require 2.67 - 2.85 MWh/AF.

The energy intensity of water treatment varies, depending on the salinity and quality of the raw water and treatment requirements. Research from other states in the West found that water treatment typically requires 0.033 MWh per AF of potable water produced[37]; nationwide estimates are slightly higher, at 0.081 MWh/AF.[38]

Distribution represents the third component of energy use in providing water; a utility's energy use for distribution will vary, depending on the topography of the distributional zone. However, water delivered to the Jimmy Camp Creek terminal storage reservoir will primarily serve CSU's Templeton Pressure Zone, at an elevation of 6,935 ft.[39] We expect that water could be distributed to users within this pressure zone primarily by gravity, and do not expect distributional energy requirements to be substantial.

Table 2, below, compares the Bureau of Reclamation's estimate of total SDS energy demand with WRA projections of energy requirements for conveyance, treatment, and distribution.

Smith, and B. Wilkinson. 2008. *The Role of Recycled Water in Energy Efficiency and Greenhouse Gas Reduction*, a report for the California Public Utilities Commission.

[37] Navigant Consulting, Inc. 2006. *Refining Estimates of Water-Related Energy Use in California.* California Energy Commission, PIER Industrial/Agricultural/Water End Use Energy Efficiency Program. CEC-500-2006-118.

[38] Summit Blue Consulting, LLC. 2006. *Energy and Water: Vital Connections*, presentation at the ASES Conference, Denver, CO, http://summitblue.com/presentations/EnergyRoleinDrinkingWaterDelivery_RisksBenefitsofEnergManagementstrategies_7-06.pdf.

[39] Personal communication with Keith Riley, Colorado Springs Utilities.

Table 2. Projected energy use for the SDS, according to the Draft EIS and independent calculations (n/a = not available).

Source	Energy Use, Conveyance (MWh/AF)	Energy Use, Treatment (MWh/AF)	Energy Use, Distribution (MWh/AF)	Total Energy Use (MWh/AF)
Draft EIS	n/a	n/a	n/a	4.71
Independent Calculations	2.67 – 2.85*	0.033 – 0.081	0**	2.70 – 2.93

* Range represents pumping efficiencies of 75 - 80%.
** Distributional energy will probably not be zero, but should be relatively small.

The discrepancy in **Table 2** between WRA estimates and those in the EIS is striking. It indicates the energy use calculations in the Draft EIS are inaccurate and/or not sufficiently explained. The Final EIS must re-examine and clarify the energy needed to convey, treat, and deliver water in all the SDS alternatives.

Meeting SDS Energy Demands

In order to convey untreated water from the Pueblo Reservoir to the Jimmy Camp Creek terminal storage reservoir, the SDS proposes the construction of three pumping plants, which will rely on electricity from Aquila Energy, Tri State Generation and Transmission (via Mountain View Rural Electric Association), and Colorado Springs Utilities.[40] Currently, there is little or no excess capacity on Aquila or Tri State's generating systems. In addition, the SDS will operate constantly during the months of April to October, and may operate constantly from October to December.

The SDS proposals would increase demand for a new, baseload power plant on either the Aquila or Tri State systems. If this new load were met by fossil fuel power plants, there would be additional greenhouse gas emissions and water demands by the fossil plants.

Project beneficiaries should commit to reducing the carbon intensity of the SDS's electricity demands through using renewable sources of energy. Renewables like wind and solar photovoltaic do not consume fossil fuels, do not emit greenhouse gases, and don't need water.[41] And, Colorado Springs and the larger Arkansas River basin have excellent opportunities for additional development of these sources of power, as noted below. NEPA requires that federal agencies use their auspices to "enhance the quality of renewable resources".[42]

The SDS will require the equivalent of a 33 MW coal plant (operating year-round at 85% capacity), or 97 MW of wind power (operating at 35% capacity). The SDS

[40] Draft EIS, Section 2.2.2.1.

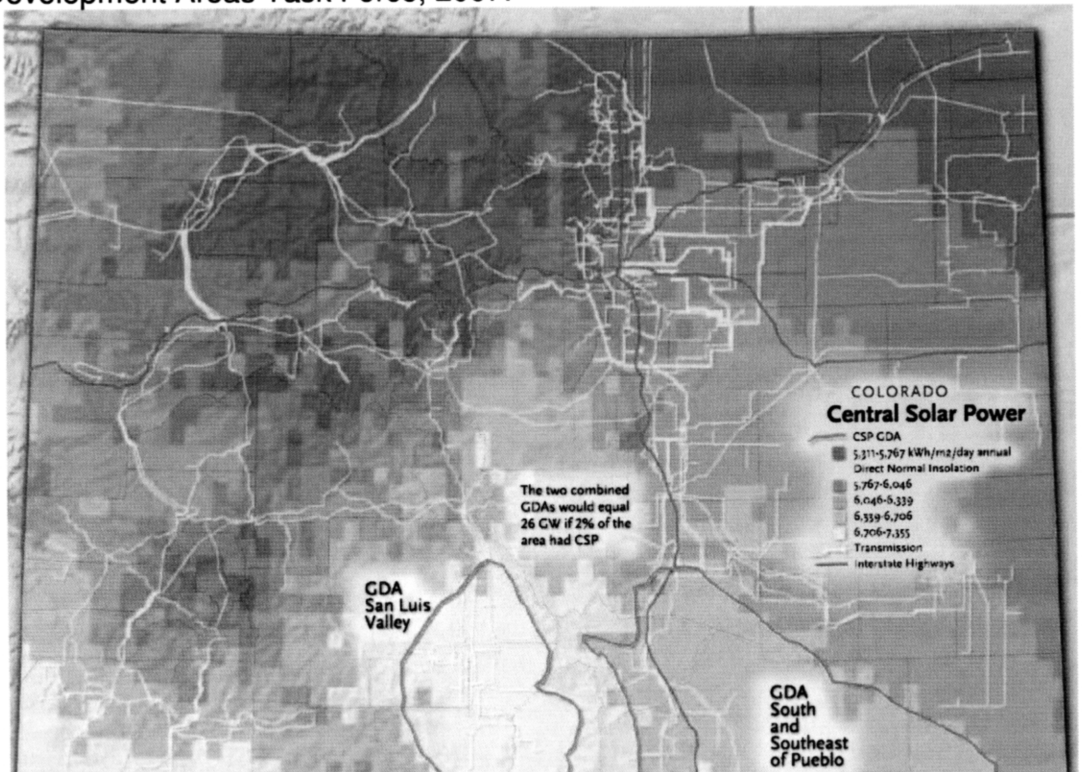
[41] *See* Western Resource Advocates, *The Last Straw: Water Use by Power Plants in the Arid West* (2003); U.S. Department of Energy, *Energy Demands on Water Resources: Report to Congress on the Interdependency of Energy and Water* (2006).

[42] 42 U.S.C. § 4331(b)(6).

will rely on electricity from Tri State, Aquila, and CSU. We feel it is incumbent upon CSU—in light of new electricity demands from SDS—to work with each of these electricity providers to increase renewable capacity on their systems. In each case, renewable capacity should be in addition to any new renewable capacity already planned for the systems.

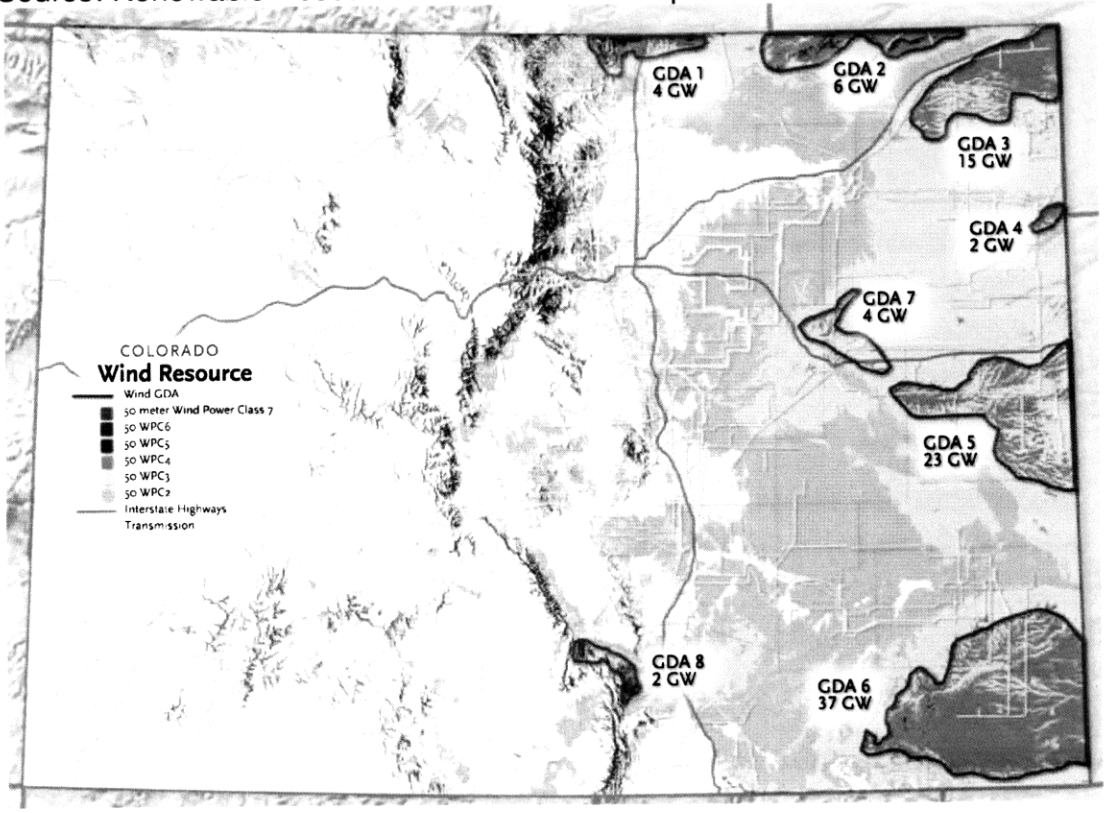
Increasing renewable capacity on these electricity providers' systems is realistic and feasible. Southeastern Colorado has extensive high class wind and solar resources; *Connecting Colorado's Renewable Resources to the Markets*, a report commissioned by Senate Bill 07-091, identifies 39,000 MW of wind power available in Southeastern Colorado, and 96,000 MW in the entire state. Furthermore, the report identified two generation development areas (GDAs) with high potential for Concentrating Solar Power (CSP): the San Luis Valley and the region Southeast of Pueblo. If only 2% of the land area in these two GDAs is developed for solar CSP, 26,000 MW of power would be available (*see* **Figure 1** and **Figure 2**, immediately below).[43]

Figure 1. Potential for electricity generation from concentrating solar power in Colorado. (1 GW = 1,000 MW.) Source: Renewable Resource Generation Development Areas Task Force, 2007.



[43] Renewable Resource Generation Development Areas Task Force. 2007. *Connecting Colorado's Renewable Resources to the Market*, a report of Colorado Senate Bill 07-091.

Figure 2. Potential for electricity generation from wind power in Colorado. Source: Renewable Resource Generation Development Areas Task Force, 2007.



Cost and Risk of the Southern Delivery System

The high energy demands of the Southern Delivery System will make it a very expensive system to operate. In the Draft EIS, the Bureau of Reclamation estimates that electricity will comprise 50% of the system's annual operations and maintenance costs. But this estimate is based on a price of electricity of 5 c/kWh[44] – lower than what actual industrial electricity prices have been since 2003. The cost of electricity is likely to continue to rise given trends in fuel prices and future regulation of greenhouse gas emissions.

In 2005, the average industrial price of electricity in Colorado was 5.74 c/kWh.[45] Given this price, the electricity required to deliver one acre-foot of water costs $271 (2005 dollars). This price is likely to escalate; indeed, since 2000, real industrial electricity prices in Colorado have risen 3.1% annually [nominal prices

[44] Personal communication with Keith Riley, Colorado Springs Utilities.
[45] Energy Information Administration, Department of Energy. 2007. *Retail Sales, Revenue, and Average Retail Price by Sector, 1990 Through 2006 (Table 8).*

were adjusted for an inflation rate of 2.5%]. Using the conservative escalation rate of 1%, real electricity prices in 2030 would be 7.4 c/kWh, or approximately $347 per AF of water. Although we rely on this conservative rate of escalation for further calculations in this section, higher escalation rates on electricity prices are possible. For example, if price continues to grow at 3%—the rate experienced since 2000—electricity costs per acre-foot in 2030 would be twice as much as the Draft EIS estimate (**Table 3**).

Table 3. Potential electricity costs for the SDS under three different rates of escalation.

Escalation Rate (Annual)	Electricity Cost in 2030 (c/kWh)	Electricity Cost in 2030 ($/AF)
0% (DEIS estimate)	5	271
1%	7.4	347
2%	9.4	444
3%	12.0	566

In addition to the base cost of electricity, the utilities are likely to incur additional costs resulting from regulation of greenhouse gas emissions. In its recent Colorado Resource Plan, Public Service Company of Colorado (PSCo) estimated a base cost of $20 per metric ton of CO_2 emitted. This estimate was based on climate change legislation proposed in 2007 and earlier, and did not consider Senate Bill 2192, which was authored by Senators Lieberman and Warner and introduced in the Senate on December 7, 2007. Under this bill, the EPA estimates the cost of emissions in 2030 at $46-$83 per metric ton of CO_2 (2005 dollars). Although the Warner-Lieberman legislation was not passed in 2008, it serves as an indication of the direction of national climate change policy.

The direct and indirect costs of electricity for the SDS are variable, depending on fuel costs and the climate change legislation enacted. If real electricity costs remain level and CO_2 emissions costs follow the low trajectory ($20 per metric ton), delivering one acre-foot of water in 2030 will cost $690; given escalating electricity costs and the EPA's high estimate of CO_2 emissions costs, delivering one acre-foot could cost as much as $1,034 (2005 dollars). For comparison, the Draft EIS estimates the total O&M costs of the SDS at $663,600,000 for the period 2012 – 2046,[46] or approximately $570/AF (2007 dollars).[47] Clearly, with the cost of GHG emissions and higher costs of electricity, the total price will likely be higher – perhaps twice as much as the Draft EIS estimates. The risk and

[46] Summary Draft EIS, p. 20.

[47] Estimate of $570/AF is based on CSU's projected volume delivered (full project deliveries starting in 2035, and partial deliveries between 2012 and 2035). We use this total projected volume and the Draft EIS's total projected O&M costs to derive O&M costs per AF.

costs of greenhouse gas emissions – and the impact on electricity – should be considered in estimating operating costs of the proposed SDS.

The total cost of the SDS will be comprised of both capital and annual O&M costs. Assuming the SDS will be paid over a thirty year term at a 5% discount rate, the annual capital cost of the SDS is approximately $69.7 million, or $1,320 per acre-foot (2007 dollars).[48] Annual operating and maintenance costs could be as much as $1,034, making the total annual costs for the SDS as much as $2,354 per acre-foot (**Table 4**).

Table 4. Summary economic analysis of the Proposed Action. The three independent calculations differ only in electricity costs; they reflect escalation rates of 1%, 2%, and 3%.

Source	Total Capital Costs (2007 $)	Annualized Capital Costs(1) ($/AF)	O&M Costs – Electricity ($/AF)	O&M Costs, Excluding Electricity ($/AF)	GHG Regulation Costs ($/AF)	Total O&M Costs ($/AF)	Total ($/AF)
Draft EIS	1.07 billion	1,317(2)	236(3)	335	0	570	1,887
Independent Calculations	1.07 billion	1,317	347(4)	335	85 – 352(7)	767 – 1,034	2,084 – 2,351
Independent Calculations	1.07 billion	1,317	444(5)	335	85 – 352(7)	864 – 1,131	2,181 – 2,448
Independent Calculations	1.07 billion	1,317	566(6)	335	85 – 352(7)	986 – 1,253	2,303 – 2,570

1. Capital costs were annualized over a 30-year term at a 5% discount rate.
2. The Draft EIS did not estimate annualized capital costs.
3. Based on 5 c/kWh.
4. Based on electricity costs escalating at 1% annually.
5. Based on electricity costs escalating at 2% annually.
6. Based on electricity costs escalating at 3% annually.
7. Based on cost estimates ranging from $20/metric ton to $83/metric ton.

Numerous conservation programs and municipal ordinances can be implemented or expanded for less than the costs in the "Total" column above. As a consequence, greater conservation by the potential project beneficiaries is a risk-averse strategy that makes economic sense for the utilities.

In sum, the analysis of electricity prices in the Draft EIS is inadequate. Prior to issuance of the Final EIS, the Bureau must revise its price and risk estimates to incorporate a more meaningful and likely range of prices for energy, including the likelihood of regulation of greenhouse gas emissions.

[48] This estimate assumes the SDS will deliver its full SMAPD volume of 52,900 in each year; in reality, in the earlier years (prior to the early 2030s, less water will be delivered, making the capital costs per acre foot of water higher than this estimate).

Mitigation of Energy Use and GHG Emissions
In 2046, the SDS pipeline and associated pumping facilities are projected to emit 247,500 tons of CO_2.[49] In the interim years, the SDS will emit up to that volume (or more, if additional water supplies are available and in demand). According to CSU, the SDS will likely provide the full simulated mean annual project delivery (SMAPD) of 52,900 AFY, starting between 2030 and 2035. Prior to this time, the SDS will provide less than the full SMAPD. If the SDS provides the full SMAPD from 2035 to 2046, and half of the SMAPD for the time period from 2012 to 2034, it will account for the cumulative emissions of 5,445,000 tons of CO_2.

The emissions estimate above assumes the SDS relies on electricity from the grid, with an average GHG intensity of 0.993 short tons of CO_2/MWh generated. In reality, the SDS will receive electricity from Tri State, Aquila, and CSU, all of which generate more of their electricity from coal than the statewide average. Accordingly, the carbon intensity of their electricity is higher than the statewide average. Furthermore, if the SDS increases demand for a new, baseload power plant, the GHG emissions attributed to the SDS could be much higher: Average GHG emissions from a coal plant are approximately 1.125 short tons of CO_2/MWh.[50] If power for the SDS is primarily generated at a coal plant, the GHG emissions would be 280,457 short tons of CO_2/year, for a cumulative total of 6,170,000 short tons of CO_2 over a 34 year operating period. Likewise, if power for the SDS is primarily generated at wind or solar facilities, the project's annual and cumulative GHG emissions will be much lower.

The Final EIS must include calculations of the SDS's actual carbon emissions, based on various sources of energy, including renewables.

Compounding Impacts
Increasing demand for a new power plant could have unintended, compounding effects on water supplies in the Arkansas River or adjacent basins. Most fossil fuel plants consume substantial amounts of water for cooling and other processes. A typical coal plant that relies on wet re-circulating cooling, for example, will consume 541 gallons of water per MWh of electricity generated. Combined cycle natural gas plants consume less water – approximately 180 gallons per MWh. Renewables like wind power and solar photovoltaics consume no water, and solar thermal plants, if they use dry cooling, consume approximately 80 gallons per MWh.

The SDS will rely on electricity from the grid; in 2006, 71.5% of Colorado's power was generated at coal plants, and 23.4% was generated from natural gas.[51] System-wide, we estimate that generating one MWh in Colorado consumed 410

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[49] Summary Draft EIS, p. 43.
[50] EPA, as cited in http://www.eia.doe.gov/cneaf/nuclear/page/nuclearenvissues.html
[51] Energy Information Administration, Department of Energy. 2007. *Electric Power Industry Generation by Primary Energy Source, 1990 Through 2006 (Megawatthours) (Table 5).*

gallons of water. When operating at full capacity, the SDS will demand over 249,000 MWh/yr.[52] Delivered from the grid, this power will be responsible for the additional consumption of 314 acre-feet of water annually. By relying on renewable sources of power, CSU and the other utilities can reduce both the carbon and water footprints of their energy demands.

Energy Conclusions

The SDS will require a significant amount of energy. This energy requirement makes the SDS an expensive and carbon-intensive new source of water for Colorado Springs Utilities, Fountain, and Security. In order to reduce the impact of the SDS, the Final EIS must:

1. Minimize the utilities' demand for the SDS by increasing implementation of water conservation measures. The implementation rate of CSU's conservation programs is low. CSU should commit to hiring one or two more full time employees in their conservation department. Given rising electricity costs and the potential cost of greenhouse gas emissions, investment in conservation programs represents a robust, risk averse strategy.

2. Better explain the total energy requirements of the SDS alternatives, including the estimates for conveyance from source water, treatment, and distribution.

3. Include more accurate estimates of the costs of electricity, including the likelihood of regulation over greenhouse gas emissions, to more accurately reflect future O&M costs.

4. Commit the Proponents to minimizing the carbon footprint of the SDS, including use of renewables from local suppliers to offset load by SDS. Currently, Tri State, Aquila, and CSU all rely heavily on coal power, making the SDS a very carbon-intensive source of water. Investing in renewable sources of energy will both reduce the carbon emissions from SDS and avoid the water consumption by fossil fuel plants.

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[52] Draft EIS, Section 2.2.2.3.

Overall Conclusions

Several basic elements of the DEIS are inadequate and need to be revised to make the SDS documents comply with NEPA. In short, the Final EIS—and revisions to the DEIS in the meantime—must:

1. broaden the Purpose and Need Statement;
2. compare alternatives to existing conditions, not merely to each other;
3. broaden the range of alternatives;
4. re-visit the cost screening criteria, especially for re-use; and
5. include a complete analysis of cumulative impacts of the alternatives and foreseeable future actions facilitated by them.

Mitigation

Federal agencies are required, to the fullest extent possible, use all practicable means consistent with the requirements of NEPA to "restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment."[53]
CEQ regulations further define mitigation as:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.[54]

Specific mitigation to offset the potential impacts of this project are included throughout this comment letter. Some are reiterated and summarized below.

[53] *Id.* at 1500.2(f).
[54] 40 C.F.R. § 1508.20.

In order to effectively mitigate for the impacts of the SDS project, the FEIS—and revisions to the DEIS in the meantime—must:

1. require implementation of the suggested protections found in The Fountain Creek Watershed Plan, developed by the Pikes Peak Area and Pueblo Area Councils of Government.
2. mitigate to reduce water quality impairment so that Fountain Creek can be removed from the State's § 303(d) list.
3. prioritize the avoidance of all wetlands impacted by SDS, rather than simply trying to mitigate impacts.
4. include a detailed operations schedule and a cumulative impacts analysis of stream reaches affected by the project.
5. clearly define and avoid all impact to paleontological resources at the K-T Boundary, including detailed mapping of the K-T Boundary, and provide more detailed instructions for recovery and processing of artifacts.
6. require updated conservation and efficiency plans from the Proponents that comply with the Reclamation Reform Act.
7. require the Proponents to reach water use levels of 160 gpcd system-wide or lower through rates, rebates, other programs, and new ordinances, including a focus on high penetration of commercial savings programs.
8. commit CSU to hiring two more full time employees in their conservation department, one of whom could assist the other Proponents.
9. explain the different elements of the energy requirements of the SDS alternatives, including estimates for conveyance from source water, treatment, and distribution.
10. include more accurate estimates of the costs of electricity, including the likelihood of regulation over greenhouse gas emissions, to more accurately reflect future O&M costs.
11. require that the Proponents commit to minimizing the carbon footprint of the SDS, including using renewables from local suppliers to offset load by SDS.

Should you or anyone from the Bureau have questions or wish to discuss these comments further, please do not hesitate to contact the undersigned organizations.

Sincerely,

Becky Long For

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