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*Re: Northern Colorado Water Conservancy District, Windy Gap Firing Project
Grand County Cooperating Agency Comments:*

Windy Gap Firing Project Draft Environmental Impact Statement

Gentlemen:

This letter was prepared on behalf of our client, Grand County, acting in its capacity as a cooperating agency under the National Environmental Policy Act (“NEPA”) for the Windy Gap Firing Project (“WGFP”) Draft Environmental Impact Statement dated August 2008 (“DEIS”). This letter synthesizes comments prepared by Lurline Underbrink Curran and Katherine Morris, Grand County; Jeff Clark, Bishop Brogden; Lane Wyatt, Wyatt and Associates; Jean Townsend, Coley/Forrest, Tom Cope and Robert Tuchman, Holme Roberts & Owen LLP; Dave Taussig, White and Jankowski; and Barbara Green, Sullivan Green Seavy LLC. This letter also incorporates by reference all written comments previously submitted by or on behalf of Grand County during the WGFP EIS process, all of which should be included in the administrative record. Such comments include those in the letters listed in Exhibit A, as well as in our letter to you dated March 31, 2008 (“PDEIS Comments”), concerning the WGFP Preliminary Draft Environmental Impact Statement (“PDEIS”).

Grand County continues to be concerned that the DEIS, like the PDEIS, fails to satisfy NEPA’s fundamental requirement that an environmental impact statement (“EIS”) “foster both informed decision-making and informed public participation.” *See Colorado Environmental Coalition v. Dombeck*, 185 F.3d 1162, 1172 (10th Cir. 1999); *accord*

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Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349 (1989). None of our concerns with the DEIS is new. The most serious concern continues to be that the DEIS fails to use *existing* (actual) hydrologic conditions against which to measure the impacts of the Windy Gap Firing Project. The Windy Gap Reservoir stream depletions used in the DEIS to describe “existing” stream conditions are over three times greater than actual depletions. Consequently, the percentage of change in depletions at the Windy Gap Reservoir as presented in the DEIS for each alternative are much smaller than the percentage of change in depletions that actually will occur. The DEIS’s failure to adequately describe the significance of new stream depletions calls into question all of the analysis of impacts to the aquatic environment likely to occur in the Colorado River. Thus, the DEIS is fatally flawed. This flaw is discussed in more detail, below.

General Comments

1. The Analysis of Impacts Caused by Hydrologic Modifications is Fatally Flawed

Some of the most significant impacts to Grand County result from hydrologic changes associated with flow depletions. The analysis of hydrologic conditions in the DEIS must document changes in magnitude, frequency, duration, timing, and rate of change before the impacts of flow depletions on the aquatic environment can be adequately understood. See B.D. Richter, J.V. Baumgartner, J. Powell and D.P. Braun, *A Method for Assessing Hydrologic Alteration within Ecosystems*, Conservation Biology 10(4) (1996). NEPA requires EISs to contain high quality information and accurate scientific analysis. 40 C.F.R. § 1500.1(b); see also *id.* §1502.24. When relevant information is incomplete or unavailable except at an exorbitant cost, the EIS must disclose that the information is incomplete or unavailable and discuss its significance. *Id.* § 1502.22.

To the extent that information on actual impacts to the Upper Colorado River Basin from the existing Windy Gap Project is available or readily obtainable, it should be used in preference to predicted impacts from modeling. Because Windy Gap diversions have occurred primarily in May and June, and only in specific years, the analysis should focus on actual stream conditions when the Windy Gap Project actually operated. An understanding of the actual impacts of the Windy Gap Project requires at a minimum a comparison of pre-Windy Gap Project conditions with *existing* conditions. Only then could predictions of future conditions be potentially reliable. Moreover, it is important to recognize that all models have limitations that information on actual impacts does not:

I sometimes think we place too much faith in models --
computer programs, or similar patterns -- rather than

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walking the ground, looking, seeing, feeling. Models, rather than improving thought, often impose a barrier to thought. We get so wrapped up in our analogue we forget that *it is reality we seek to describe.*

Utahans for Better Transportation v. U.S. Department of Transportation, 180 F. Supp. 2d 1286, 1290 (D. Utah 2001) (emphasis added).

There are several problems with the way that the analysis of hydrologic impacts has been approached. A discussion of some of the key problems follows. For a more thorough discussion of problems with the model *see Report on Windy Gap Firing Project Hydrology Technical Report* by Bishop-Brogden Associates (“BBA Report”), attached to this letter as Exhibit B, and *Memo on Windy Gap Firing Project DEIS Aquatics Resources Technical Report* by Lane Wyatt (“Wyatt Memorandum”), attached to this letter as Exhibit C.

1.1 The significance of hydrologic modifications is under-reported and therefore, the accuracy of the impact analysis is called into question.

a. The amount of existing diversions are over-reported. The DEIS does not use actual existing diversions to determine baseline conditions, so the “existing” diversions from Windy Gap Reservoir are over-reported. Table 3 on page 22 of the DEIS Water Resources Technical Report states that the existing average diversions at the Windy Gap Reservoir total **11,080** af per year. (See column labeled “Total” and row labeled “Average”.) This number is very close to the diversion records maintained by the Office of the State Engineer, so we believe it is reasonably accurate. On Table 3-2 on page 3-9 of the DEIS, however, the “existing” average annual diversions from Windy Gap Reservoir are reported as **36,532** af per year. (See column labeled “Existing Conditions/Average Annual Flow” and row labeled “Windy Gap Diversions.”) This is a discrepancy of 25,452 af per year.

b. The percent increase in diversions over existing conditions is under-reported. Because of the failure to use *actual* existing average annual diversions, the percent increase in diversions at Windy Gap for all alternatives is *under-reported*. For example, Table 3-2 calculates the percent difference between “existing conditions” for Windy Gap diversions and Windy Gap diversions for each alternative. For the Proposed Action, Table 3-2 reports that the average annual Windy Gap diversions will be 46,084 af. (See column labeled “Alternative 2/Avg. Annual Flow” and row labeled “Windy Gap diversions”.) This number is compared to “existing” average annual flows of 36,532 af to derive an increase of 9,552 af in average annual diversions, which is a percent difference of **26%**. (See column labeled “Alternative 2/Percent Diff” and row labeled “Windy Gap

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diversions”). However, if the 46,084 af of average annual Windy Gap diversions for Alternative 2 is compared to the *actual* existing average annual diversions of **11,080** af, then the increase in diversions is **35,004** af which is a percent difference of over **300%**. Consequently, the significance of the future depletions that will be caused by the Proposed Action is grossly under-reported.

c. The average annual stream flows below Windy Gap for existing conditions is under-reported. Because of the failure to use the lower *actual* existing average annual diversions, the existing average annual stream flows below Windy Gap Reservoir are under-reported. For example, Table 3-2 reports that the Colorado River below Windy Gap Reservoir is **151,358** af under existing conditions. (See column labeled “Existing Conditions/Avg. Annual Flow” and Row labeled “Colorado River below Windy Gap.”) This number is simply the difference between 187,889 af at the Colorado River above Windy Gap Reservoir, and the “existing” diversions of 36,532. If, however, the actual existing average annual diversions of 11,080 are used, then the existing average annual flows below Windy Gap Reservoir would actually be **176,809** af.

d. The percent decrease in annual average stream flows over existing conditions below Windy Gap Reservoir is under-reported. Because of the failure to use the *actual* existing average diversions to calculate existing stream flows below Windy Gap Reservoir, the percent change in stream flows below Windy Gap Reservoir that would result from each alternative are incorrect. For the Proposed Action, for example, Table 3-2 reports that flows in the Colorado River below Windy Gap will be **130,075** af. (See column labeled “Alternative 2/Avg. Annual Flow” and row labeled “Colorado River below Windy Gap.”) This number is compared to “existing” flows below Windy Gap Reservoir of 151,358 af to derive a decrease in average annual flows of **21,283** af which is a percent difference of **14%** (See column labeled “Alternative 2/Percent Diff” and row labeled “Colorado River below Windy Gap.”) However, if Alternative 2 is compared to the *actual* existing average annual diversions of **11,080** af and the corresponding existing flow of **176,809** af below Windy Gap Reservoir, then the reported 130,074 af flow in the Colorado River below Windy Gap Reservoir for Alternative 2 represents a decrease in average annual flows of **46,734** af, or a decrease in over **26%**. Consequently, the significance of stream flow depletions that will be caused by the Proposed Action is grossly under-reported.

e. The analysis of impacts to the aquatic environment cannot be accurate. Because the “existing” diversions are over-reported and the percent decrease in stream flows for each alternative is under-reported, the analysis of the impact of these changes to the aquatic environment, recreation and water and wastewater facilities is called into question

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1.2 The model study period is inadequate to evaluate west slope impacts.

A model study period of 1950 to 1996 was used. DEIS at 3-13. This period overstates projected stream flows for the alternatives and therefore understates resulting impacts to the Upper Colorado River Basin. Extending the model study period through approximately 2005 would result in a more accurate representation of water demands, stream flows, reservoir operations, and water administration under drought-year and dry-year conditions, when impacts are more significant. See Hydrosphere Resource Consultants, Inc., *Upper Colorado River Basin Study, Phase II* (May 29, 2003) (“UPCO Phase II Report”) at 75 (discussing impacts of 2002-2003 drought). The DEIS provides no justification for omitting 2002 from its summary of annual changes in flow for the five driest years. DEIS at 3-17. Additionally, although the Windy Gap water rights might not be in priority during drought years such as 2002, the DEIS provides no justification for ignoring the impact of such conditions when analyzing cumulative effects. *Id.* at 3-14, 3-42.

1.3 Average annual or monthly flows are not adequate to determine impacts to aquatic environment. As Grand County has previously pointed out, what is important is not changes in *average* annual or monthly flows or water quality (or predicted water quality on a single day such as July 25), but actual changes in *daily* flows and *daily* water quality, including temperature. Reporting average annual or monthly flows and ignoring other flow factors can mask significant impacts that may occur on a given day or series of days, thereby creating the false impression that environmental impacts are insignificant, because *on average* they appear to be insignificant. The monthly time-step may be reasonable for estimating gross-level changes in yield or reservoir storage, but it is inadequate to address daily fluctuations in river flow, stage, channel width, and other factors that affect the aquatic environment. See, e.g., *id.* at 3-67, Figure 3-29 (exceedances of weekly average temperature standard in Colorado River during July and August 2007).

1.4 The results of the QUAL2K model are inadequate to describe water quality impacts. The modeling of water quality impacts by the QUAL2K model are even more problematic. *Id.* at 3-90 to 3-92. Although the DEIS uses disaggregated daily flows for analyzing surface water hydrology, it does not use daily flows for analyzing surface water quality. Instead, conditions on only a single day each year, July 25, were modeled, based on the apparently untested assertion that it represents a worst case analysis. *Id.* at 3-92, 3-141. The DEIS does not adequately explain why, in any given year, a day other than July 25 might not have worse water quality conditions than those modeled for July 25. See *Wyatt Memorandum*, Exhibit C.

2. Violations of Legal Requirements

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Whether an environmental impact is significant depends on both its context and its intensity. 40 C.F.R. § 1508.27. “Intensity” means “severity of impact” and is determined by evaluating a number of factors, including “[w]hether the action threatens a violation of Federal, State, or local law or requirements imposed for protection of the environment.” *Id.* § 1508.27(b)(10). Here, the Proposed Action threatens violation of such laws and requirements, thereby increasing the significance of the WGFP’s environmental impacts, but the DEIS fails to acknowledge these potential violations.¹ A related requirement is that the environmental consequences section of an EIS must discuss “[p]ossible conflicts between the proposed action and the objectives of Federal, regional, State, and local . . . land use plans, policies, and controls for the area concerned. *Id.* § 1502.16(c); *see also id.* § 1506.2(d). Furthermore, when such laws or requirements are violated, heightened scrutiny of environmental impacts is required, which the DEIS also fails to do. *See Maryland-National Capital Park & Planning Comm’n v. U.S. Postal Service*, 487 F.2d 1029, 1037 (D.C. Cir. 1973) (“When . . . the Federal Government exercises its sovereignty so as to override local zoning protections, NEPA requires more careful scrutiny.”).

The Proposed Action threatens to violate the following Federal, State, or local laws or requirements (as have operations of the existing Windy Gap Project and the Colorado-Big Thompson Project (“C-BT”) in some instances):²

2.1 **Senate Document 80.** Requirements of Senate Document 80, including its provisions on “Manner of Operation of Project Facilities and Auxiliary Features” will control WGFP. DEIS at 1-42 to 1-43. Connection of WGFP facilities to C-BT facilities and storage of C-BT water in non-project facilities would require Congress to amend Senate Document 80 because Senate Document 80 does not include Chimney Hollow Reservoir as a C-BT project feature.

a. The Bureau of Reclamation’s authority is constrained. Senate Document 80 is the legal foundation of the C-BT Project. Senate Document 80 describes C-BT facilities and conditions to protect the beneficiaries of those facilities, including Grand County. Senate Document 80 contains requirements for use of C-BT water by the Municipal Subdistrict as a supplemental supply on the east slope, use of Green Mountain Reservoir for west slope beneficiaries, and provisions that specifically protect the headwaters of the Colorado River system in Grand County. Senate Document 80 is

¹ It may be that the applicant intends to comply with all laws and requirements, but the DEIS fails to mention all applicable laws and requirements or the steps that will be taken to ensure compliance. As presented, the Proposed Action would violate several laws and requirements.

² Grand County has raised many of these issues in prior letters and meetings, but to no avail. Some of these violations may not necessarily involve environmental protection or land use laws or requirements, but are included because they must be addressed before the Bureau could approve the WGFP.

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unique. But for the agreement between the east and west slopes contained in Senate Document 80, the project would not have been built. The 10th Circuit has described Senate Document 80 as “The Document, embodying the salient features of the project, [Senate Document 80] was Congressional sanction for a conciliation of conflicting interests of affected water users on both sides of the Rockies.” *United States v. Northern Colo. Water Conservancy Dist.*, 608 F.2d 422, 430 (10th Cir. 1979) *citing*, *United States v. Martin*, 267 F.2d 764 (10th Cir. 1959). The Bureau of Reclamation’s (“Reclamation”) role in operating the C-BT Project is that of “a trustee responsible for the protection of West Slope interests and delivering water to northeastern Colorado.” Consolidated Cases Nos. 2782, 5016 and 5017, Supplemental Judgment and Decree, p. 2 dated February 9, 1978; *aff’d* by *United States v. Northern Colorado Water Conservancy Dist.*, 608 F.2d 422, 429-30 (10th Cir. 1979).

b. Any excess capacity contract that Reclamation enters with the Municipal Subdistrict must comply with Senate Document 80.

- (1) Reclamation must include terms and conditions in any excess capacity contract to ensure that WGFP operations are consistent with Senate Document 80. Primary purposes of Senate Document 80 that concern Grand County are:
 - (a) Primary Purpose No. 1 “to preserve the vested and future rights in irrigation”
 - (b) Primary Purpose No. 2 “to preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and Rocky Mountain National Park”
 - (c) Primary Purpose No. 3 “to preserve the present surface elevations of the water in Grand Lake and to prevent a variation in these elevations greater than their normal fluctuations”
 - (d) Primary Purpose No. 5 “to maintain conditions of river flow for the benefit of domestic and sanitary uses of this water”
- (2) Senate Document 80 requires that to facilitate compliance with the stipulations in paragraphs (j), (k), and (l) a representative may be selected to represent the interests of Grand County and “will be

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recognized as the official spokesman of said interests in all matters dealing with project operations affecting Grand County.”

- (3) Because the WGFP implicates Senate Document 80, through its use of C-BT facilities, the WGFP “deal[s] with project operations affecting Grand County”, Grand County must be consulted regarding any determination on whether a C-BT excess capacity or carriage contract can be issued and must consent to any changes in operations to C-BT facilities contemplated by the WGFP.
- (4) As Reclamation is aware, similar concerns were expressed by Grand County when Northern was seeking to transfer Operations and Maintenance, including water scheduling from Reclamation to Northern. In his letters dated May 14, June 1, and June 11, 2007 to Eric Wilkerson, Mr. Fred Ore made it clear that any changes in operations would require a “collaborative agreement” among all project beneficiaries due to the unique status of the C-BT Project and the mandates of Senate Document 80. The same rationale applies to the WGFP – Grand County’s agreement is required for changes in project operations which includes such a major change in operations that would allow repositioning.

2.2 Section 402 of the Federal Water Pollution Control Act (“FWPCA”), 33 U.S.C. § 1342. Transport of Windy Gap water through Grand Lake is an un-permitted point source discharge of pollutants (including nitrogen, phosphorus, and possibly elevated temperatures) into navigable waters, in violation of the FWPCA.

2.3 Section 401 of the Federal Water Pollution Control Act (“FWPCA”) 33 U.S.C. § 1341. Section 401 of the FWPCA requires that in connection with issuance of a section 404 permit the State of Colorado certify that the project will not cause violations of State water quality standards. Given the water quality violations that would result from the Proposed Action, a 404 permit could not be issued.

2.4 Water Conservancy Act, Colo. Rev. Stat. § 37-45-118(1)(b)(II). The Act requires

“Any works or facilities planned and designed for the exportation of water from the natural basin of the Colorado river and its tributaries in Colorado, by any district created under this article, shall be subject to the provision of the Colorado river compact, and the “Boulder Canyon Project

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Act.’ Any such works or facilities shall be designed, constructed and operated in such manner that the present appropriations of water and, in addition thereto, prospective use of water for irrigation and other beneficial consumptive use purposes, including consumptive uses for domestic, mining, and industrial purposes, within the natural basin of the Colorado River in the state of Colorado from which water is exported will not be impaired nor increased in cost at the expense of the water users within the natural basin. The facilities and other means for the accomplishment of said purposes shall be incorporated in and made a part of any project plans for the exportation of water from said natural basin of Colorado.”

Each of the alternatives includes new “works or facilities planned and designed for the exportation of water from the Colorado River and its tributaries.” Accordingly, facilities and other means to protect the Colorado River basin must be part of the project plan and permit conditions for the WGFP.

2.5 **Colo. Rev. Stat. § 37-60-122.2.** These provisions require mitigation of impacts to fish and wildlife.

2.6 **Grand County Areas and Activities of State Interest (“1041”)**
Regulations. A new or amended 1041 permit is required owing to changes in project participants and operations compared to the Windy Gap Project as originally permitted. Reclamation, however, has stated in the past that a new or amended 1041 permit may not be required for the WGFP and the DEIS continues to state that a 1041 permit will be required only if there is construction of facilities in Grand County.

2.7 **Reclamation Project Act of 1939, 43 U.S.C. § 389.** Section 14 of the Reclamation Project Act of 1939 requires a determination that a contract would be in the best interest of the United States and the project. DEIS at 1-43.

2.8 **Reclamation Act of 1902.** Section 8 of Reclamation Act of 1902 requires that the “Secretary of Interior, in carrying out the provision of this Act, shall proceed in conformity with State law” relating to the use water. *California v. US*, 438 US 645 (1978)

2.9 **Colorado Water Law.** Colorado water law requires a change of the Windy Gap water rights decree from a direct flow right to a storage right. Section 8 of the Reclamation Act of 1902 recognizes Colorado laws on the control, appropriation, use, or distribution of water and requires Reclamation to proceed in conformity with them.

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See 43 U.S.C. § 383. Since none of the proposed WGFP east slope reservoirs were covered by the Blue River Decree, a change of C-BT water rights also would be required to store C-BT water in the east slope reservoirs described in the DEIS such as Chimney Hollow.

a. The Expansion of Use Doctrine. To protect water users, Colorado courts read limitations into decrees by implication. One such limitation is that an appropriator may not “**lend, rent, or sell any excess water** after completing the irrigation of the land for which the water was appropriated.” (emphasis added) *Orr v. Arapahoe Water and Sanitation District*, 753 P.2d 1217, 1223 (Colo. 1988). Accordingly, if the original appropriators of the Windy Gap water rights do not have a need for the water, under Colorado law the water must be left in the Colorado River.

Pre-positioning will expand the use of the C-BT water rights. Colorado’s statute on changes of use does not allow such expansion to the injury of other water rights. C.R.S. § 37-92-305(3) – (4). In *Twin Lakes Reservoir & Canal Co. v. City of Aspen*, 568 P.2d 45, 50 (Colo. 1977) the Colorado Supreme Court said the expanded use doctrine applies to water rights in the exporting basin of a transmountain diversion. The Proposed Alternative cannot be implemented without a change in the water rights decree

b. The Anti-Speculation Doctrine. Originally, the Windy Gap Project had only six participants. Presently thirteen entities are participating in the firming project, most of which are not those original six entities. See Exhibit D, *Windy Gap Ownership and Transfer History*. The Municipal Subdistrict proposes to use its Windy Gap water rights, with priority dates of 1968, 1976 and 1980, to serve new demands by cities that were not entitled to Windy Gap units at the time the project was built in 1985, much less when the rights were originally filed upon (and in the case of the City and County of Broomfield, not even in existence). The Municipal Subdistrict’s attempt to serve these new municipalities under its 1968 priority violates Colorado’s anti-speculation doctrine because the service of water to these new municipalities was not contemplated at the time the Windy Gap appropriations were made. *City of Thornton v. Bijou Irrigation Co.*, 926 P.2d 1, 37-40 (Colo. 1996) (applying the anti-speculation doctrine to municipal appropriators). Nor does the DEIS disclose any firm contracts for water service. To add these new municipalities to the Windy Gap system, the Municipal Subdistrict must (1) file for a change of water rights to change the place of use for these water rights for these new entities; or (2) seek a decree with appropriation dates reflecting the time at which it had firm contractual commitments to use the water.

2.10 **Water Supply Act.** The Water Supply Act (“WSA”), 43 U.S.C. §390b(b) provides that storage may be included in any reservoir project surveyed or constructed by the U.S. Army Corps of Engineers (“COE”) or Reclamation for anticipated future

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demand or need for municipal or industrial purposes. However, Section 390b(d) provides:

Modifications of a reservoir project heretofore authorized, ...to include storage as provided in subsection (b) of this section which would seriously affect the purposes for which the project was authorized, surveyed, planned, or constructed, or which would involve **major structural or operational changes shall be made only upon approval of Congress** as now provided by law. (emphasis added).

The D.C. Circuit Court of Appeals concluded that a settlement agreement between COE, Southeastern Power Customers, Inc., a group of Georgia Water Supply providers and the State of Georgia providing for the reallocation of water stored in Lake Lanier to municipal purposes violated the W.S.A. *Southeastern Federal Power Customers v. Geren*, 514 F.3d 1316 (D.C. Cir. 2008). The Court held that the reallocation of Lake Lanier's storage capacity to local consumption constituted a "major operational change" and thus required congressional approval. *Id.* at 1325. *See also* Order and Memorandum of Decision, Dated September 25, 2008, *Lower Arkansas Valley Water Conservancy District v. United States, et.al*, Civil Action No. 07-cv-0224-EWN-MEH, United District Court for the District of Colorado at 38, "*Re Application of City and County of Denver*, 1989 WL 128576, at *5 (D. Colo. Oct 23, 1989) (noting that an application to change a "water right to a different point of diversion, use and place of use" is "[b]y definition . . . a major operational change that may only be made upon congressional approval").

The C-BT project was approved by Congress to bring water from the western slope to lands on the eastern slope greatly in need of "supplemental irrigation" using the facilities in Senate Document 80. Use of C-BT Project facilities for the delivery and storage of (1) Windy Gap municipal supplies and C-BT water rights (2) in a new 90,000 acre foot non-federal Chimney Hollow Reservoir (3) under the guise of repositioning, all constitutes "major structural and operational change" and thus congressional approval for all of the alternatives that would rely on the C-BT.

2.11 **Warren Act, 43 U.S.C. §§ 523-525.** Warren Act of 1911 does not allow Reclamation to enter into a carriage contract for non-irrigation water. All of the proposed alternatives presented in the DEIS contemplate that there will be an Excess Capacity Contract between Reclamation and the Municipal Subdistrict. The Warren Act allows Reclamation to contract for the use of excess capacity in reclamation project facilities, but places strict limits on this authority. *Id.*, § 523. In particular, "[e]xcess capacity will

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be made available **only for the storage and conveyance of non-project water to be used for irrigation....**” *Id.*

During the 1980’s, Reclamation developed principles to govern transfers of project water, including the use of excess capacity in projects owned by the Department of Interior. See Department of the Interior, *Principles Governing Voluntary Water Transactions that Involve or Affect Facilities Owned or Operated by the Department of Interior* (Dec. 16, 1988)(“1988 Principles.”) The policies emphasize that transactions must be agreed to among willing parties and must not adversely affect third parties. *Id.*, Preamble, § 3. The transaction must comply with applicable state and federal laws. *Id.*, § 1

In 2001, Reclamation issued a new policy - WTR-P04 - that specifically addresses contracts for excess capacity in reclamation projects. Reclamation Manual, Policy WTR-P04 (Jan. 10, 2001). The policy begins by reaffirming the 1988 Principles. *Id.*, ¶ 1. It also recites the Warren Act restriction that excess capacity is available only for irrigation. *Id.*, § 5.A (citing 43 U.S.C. § 523). Policy WTR-P04 recites the Warren Act restriction that: “[e]xcess capacity will be made available **only for the storage and conveyance of non-project water to be used for irrigation....**” *Id.*, § 5.A (citing 43 U.S.C. § 523) (emphasis added). According to these laws and policies, none of the proposed alternatives presented in the DEIS would be lawful because they will convey non-project water for purposes other than irrigation.

3. Purpose and Need; Range of Alternatives

As Grand County pointed out in its PDEIS Comments, the statement of purpose and need is too narrow, thereby unduly limiting the range of alternatives analyzed. This shortcoming persists in the DEIS, whose narrow range of alternative results in a document that fails to satisfy NEPA’s requirement “that agencies take a ‘hard look’ at environmental consequences” *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 350 (1989).

The DEIS states that the purpose of the WGFP is “to deliver a firm annual yield of about 30,000 af of water from the existing Windy Gap Project to meet a portion of the water deliveries anticipated from the original Windy Gap Project and to provide up to 3,000 af of storage to firm water deliveries for the [Middle Park Water Conservation District].” DEIS at 1-4. The justification for this purpose is the need “to meet a portion of the existing and future demands of the Project Participants.” *Id.* The DEIS estimates future water needs of WGFP participants, which will eventually exceed water supplies available to them, due in part, but only in part, to limited historic yields from the Windy Gap Project. *Id.* at 1-20 to 1-40. What emerges from this information, however, is the

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conclusion that even with the WGFP, all the participants are predicted to face significant water shortages in 2050. The total projected water demand for the WGFP participants in 2050 is 251,450 af, with an estimated shortage of 110,688 af, of which 26,138 af³ would be met by the WGFP (excluding Middle Park Water Conservation District's 429 af of firm yield, since its water demand and shortage are not included in the 2050 totals). *See id.* Table ES-1. WGFP's contribution to meeting participants' 2050 water demand would only amount to 10% of total demand. *See id.* Figure ES-2. The remainder, 84,550 af (34% of total 2050 demand) would have to be met by new water supplies—as yet unidentified—and conservation—as yet unquantified and of doubtful efficacy because it is voluntary. *Id.* Participants' needs, therefore, are not so much to firm Windy Gap Project yields, but to obtain additional water supplies to meet their anticipated needs. *See id.* at 1-37.

Moreover, it is apparent that none of the alternatives in the DEIS will accomplish the stated purpose of the WGFP. Taking into account cumulative impacts, the Proposed Action would firm only about 24,000 af of water. DEIS Tables 3-20, 3-21. This is only 80% of the approximately 30,000 af included in the statement of purpose. The situation would be even worse for Middle Park, which would receive a firm yield of only 429 af, compared to the 3,000 af included in the statement of purpose.

One reason none of the alternatives analyzed in the DEIS satisfies the purpose and need is that the purpose and need is too narrow. Consideration of alternatives is “the heart of the environmental impact statement.” 40 C.F.R. § 1502.14. Because of this, agencies may not define purpose and need “so narrowly that it foreclose[s] a reasonable consideration of alternatives.” *Davis v. Mineta*, 302 F.3d at 1118. As Reclamation's NEPA Handbook explains,

This brief statement [of purpose and need] is a critical element that sets the overall direction of the process and serves as an important screening criterion for determining which alternatives are reasonable. All reasonable alternatives examined in detail must meet the defined purpose and need.

A brief background discussion may be included for additional information, as appropriate. . . . This background

³ This actually overstates WGFP's potential contribution to meeting participants' water needs in 2050. Taking into account cumulative effects, the WGFP firm yield is predicted to be only 23,616 af (excluding 429 af for Middle Park). *See* DEIS Tables 3-20, 3-21. This represents only 9.4% of participants' total water demands.

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discussion should be general and not tied to any specific alternative.

Care must be taken to ensure an objective presentation rather than a justification. A purpose and need statement will generally allow a range of reasonable alternatives. If a purpose and need statement appears to allow only one reasonable solution, the statement and the reasons for rejecting other alternatives should be re-examined and confirmed or revised, as appropriate.

U.S. Department of the Interior, Bureau of Reclamation, National Environmental Policy Act Handbook 8-5 to 8-6 (Public Review Draft: 2000) (“2000 NEPA Handbook”); *see also* United States Department of the Interior, Bureau of Reclamation, National Environmental Policy Act Handbook (Oct. 1990) 4-3 (“1990 NEPA Handbook”).

As a result of the flawed statement of purpose and need in the DEIS, the range of alternatives it analyzes is unreasonably narrow. All alternatives - even the so-called “no action” alternative - rely on construction of one or more reservoirs to store water diverted from the Colorado River. The consequence of this, as the DEIS acknowledges, is that “[a]ll alternatives would result in an increase in water diversions from the Colorado River below the Windy Gap Reservoir.” DEIS at 3-55. They are merely variations on the same theme. In addition, the DEIS reports that alternatives were excluded from consideration because Congressional approval would be required. Nevertheless, the Proposed Action would also require Congressional approval. Because of this, there is no way to ensure that the least environmentally damaging alternative will be selected as required under the COE’s 404(b)(1) analysis.

Finally, the alternatives that are presented do not even make a significant contribution to the water needs used to justify the purpose. On the other hand, a statement of purpose and need such as the following would lead to a broader range of reasonable alternatives, some of which might even be more cost effective than or environmentally preferable to those analyzed in the DEIS: “Meet Participants’ existing and future water demands to the extent of 30,000 af per year [or whatever quantity would be appropriate] by measures such as mandatory conservation measures or goals, new sources of water, firming the yield of the Windy Gap Project, and requiring that all Windy Gap water be reused to extinction.” The mitigation measures listed below that should have been discussed in the DEIS could serve as alternatives, or parts of alternatives, for analysis.

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4. Baseline, Cumulative Effects.

An understanding of baseline conditions in the Upper Colorado River Basin, including those that result from on-going human disturbances, is essential under NEPA. In discussions about the inadequate baseline used to measure impacts in the DEIS, Reclamation has insisted that the word “baseline” is not even mentioned in NEPA. This misses the point. NEPA requires an analysis of existing conditions, whether or not the word “baseline” is used. “Without establishing the baseline conditions which exist [before the Proposed Action occurs], there is simply no way to determine what effect the proposed [action] . . . will have on the environment, and, consequently, no way to comply with NEPA.” *Half Moon Bay Fishermans’ Mktg Ass’n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988). In this case, existing conditions consist of an aquatic environment that has been significantly altered. Not only does the DEIS fail to explain this, but it does not even accurately describe the existing hydrologic conditions. (*See* General Comments Section, above.)

The Upper Colorado River Basin has been severely degraded by human activities. On average, an estimated 65% of the water in the Upper Colorado River System is diverted to the east slope—a percentage that will increase to 85% if both the WGFP and Denver Water’s Moffat Collection System Project are implemented. Graphs presented in Exhibit B, *BBA Report*, visually demonstrate the reduction in average daily stream flows at Hot Sulphur Springs before and after various water projects came online. As a result of such diversions to the east slope, the following impacts have occurred in Grand County in recent years (many of which constitute violations of Senate Document 80), largely due to C-BT and Windy Gap operations:

- reduced water quality in Grand Lake;
- insufficient flows for agricultural irrigators to pump water from the Colorado River;
- insufficient flows for Hot Sulphur Springs to pump water for its public water system;
- insufficient flows to preserve fishing on the Colorado River, despite the instream flow requirements of the June 23, 1980 Memorandum of Understanding;
- insufficient flows in late summer to maintain commercial fish ponds on some ranches;

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- high temperatures in the Colorado River above Williams Fork, resulting in fish mortality;
- establishment of the didymo (rock snot) a nonnative algae that creates thick mats of moss that attach to rocks creating nuisances;
- reduction in the number of kayaking days;
- death of cottonwood trees along the river;
- increased nutrient loading and other potential impacts from birds (some nonnative, such as pelicans) attracted to the Windy Gap Reservoir; and
- spread of whirling disease.

Documentation of these conditions may be found in a number of technical reports, including the UPCO Phase II Report and Coley/Forrest, *Grand County: Its Economy & Water Resources* (July 2007).

A more detailed description of past water diversion projects and their resulting impacts (e.g., conditions before and after the C-BT, the Windy Gap Project, and Denver Water's Moffat Collection System project) is necessary to understand how these conditions came about as well as how they can be mitigated. *See Lands Council v. U.S. Forest Service*, 395 F.3d 1019, 1028 (9th Cir. 2004) (holding that EIS for a timber sale "should have provided adequate data of the time, type, place, and scale of past timber harvests and should have explained in sufficient detail how different project plans and harvest methods affected the environment.") As EPA explains:

The identification of the effects of past actions is critical to understanding the environmental condition of the area. Knowing whether the resource is healthy, declining, near collapse, or completely devastated is necessary for determining the significance of any added impacts due to the proposed project. The NEPA document should consider how past activities have historically affected and will continue to detrimentally affect the resources of concern.

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EPA, *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, EPA 315-R-99-002/May 1999, § 4.3.

A significant shortcoming of the DEIS is that it lacks a detailed description of ongoing impacts from past water projects. A description of ongoing impacts to natural hydrologic conditions could enable Reclamation to develop a more defensible prediction of the likely effects of the WGFP, as well as improve the analysis of the incremental impacts of the WGFP when added to other past, present, and reasonably foreseeable future actions. Moreover, a more detailed description is especially important here because of the complex interactions among the various diversions from the Colorado River and its tributaries and the real possibility that implementation of the WGFP could be a “tipping point,” resulting in disproportionately greater impacts in the river basin than otherwise would result if WGFP depletions did not occur in an already severely degraded stream system. Finally, a more detailed description would reveal that mitigation of many of the impacts associated with the existing Windy Gap Project could be mitigated by the project proponent through modifications to reservoir diversions and pumping schedules and coordination with the Denver Water Board and Reclamation.

In Grand County, existing impacts are of two kinds. The first result from permanent features constructed for past projects, such as the Windy Gap Reservoir. The second are more dynamic and result from actions that can be modified, such as the timing and quantity of diversions and of releases from reservoirs. Because existing and future hydrologic conditions—particularly the frequency, duration, and magnitude of stream depletions—are controlled, and can therefore be modified by the Municipal Subdistrict, Reclamation, and the Denver Water Board, hydrologic conditions can form the basis for an adaptive management plan that could significantly mitigate both existing and future impacts for the mutual benefit of all. Adaptive management is discussed below under mitigation.

5. No Action Alternative

Like the PDEIS, the DEIS improperly identifies the No Action Alternative (Alternative 1) as the possible future enlargement of the Ralph Price Reservoir by 13,000 af. DEIS 2-14 to 2-18. The DEIS admits that Alternative 1 “was analyzed along with the action alternatives *to provide a basis for comparison.*” *Id.* at 2-14 (emphasis added). As Table 2-6 of the DEIS illustrates, Reclamation uses Alternative 1 to advantage, by making changes in various parameters from the Proposed Action appear insignificant when compared to the changes predicted for Alternative 1. Such an approach is contrary to the purpose behind analyzing a no action alternative:

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In requiring consideration of a no-action alternative, the Council on Environmental Quality intended that agencies compare the potential impacts of the proposed major federal action to the *known impacts of maintaining the status quo*. . . . In other words, the *current level of activity is used as a benchmark*.

Custer County Action Assn' v. Garvey, 256 F.3d 1024, 1040 (10th Cir. 2001) (emphasis added).

It is true that CEQ guidance states that when “choice of ‘no action’ by the agency would result in *predictable* actions by others, this consequence of the ‘no action’ alternative should be included in the analysis.” Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations, Question 3, 46 Fed. Reg. 18,026, 18,027 (Mar. 23, 1981) (emphasis added). Alternative 1 is not, however, predictable. It is speculative, because there is no assurance that the regulatory authorizations for enlargement of the Ralph Price Reservoir will be received, that Longmont will obtain funding for and actually construct the enlarged reservoir or that water rights will be properly decreed. The environmental impacts of Alternative 1 would need to be analyzed in an EA or EIS. DEIS at 2-17. In addition, a 404 permit from COE and a 1041 permit from Boulder County, as well as county location and extent review and special use review would be required. *Id.* at 2-17, 1-46. Detailed design studies for the enlargement of the Ralph Price Reservoir have not been conducted. *Id.* at 2-17. As a result, specific information on the construction, material requirements, scheduling, and cost is not available. *Id.* “To be a reasonable alternative, it must be non-speculative, and bounded by some notion of feasibility.” *Utahans for Better Transportation v. U.S. Department of Transportation*, 305 F.3d 1152, 1172 (10th Cir. 2002) (citations omitted). Alternative 1 fails that test. The No Action Alternative should be maintaining the status quo. If anything, possible enlargement of the Ralph Price Reservoir should be included in the cumulative impact analysis for the no action alternative.

6. Reliance on Illegal Prepositioning

As Grand County has pointed out repeatedly, prepositioning is illegal, among other reasons, because it requires the C-BT project to be operated in violation of Senate Document 80, and requires changes in C-BT and Windy Gap water rights to allow storage in a non-federal facility on the east slope. *See e.g.*, letter dated March 22, 2004 from the Colorado River Conservation District, Grand County and Northwest Colorado Council of Governments to Richard Aldrich and John Chaffin, a copy of which is attached as Exhibit E. These concerns have never been satisfactorily addressed. The January 2007 personal communication with the Colorado State Engineer, who “indicated

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that the Proposed Action to deliver and store water in Chimney Hollow Reservoir using prepositioning could be administered in compliance with current water right decrees and within the priority system,” does not do so. DEIS at 3-7. The question is not whether prepositioning would pose an impediment to administering water rights under Colorado law, but whether prepositioning violates Senate Document 80 and other federal and state law. Grand County continues to believe that it is illegal.

The request by Reclamation to the State Engineer was misdirected – a declaratory judgment should be obtained. It has long been the law in Colorado that the courts – not the State Engineer - determine use rights in water. (“**Administrative action**, forbearance of enforcement or **State Engineer acquiescence** in water use practice **does not substitute for judicial determination of use rights.**” (emphasis added) *Empire Lodge Homeowners’ Ass’n. v. Moyer*, 39 P.3d 1139, 1156-7, (Colo. 2001). Moreover, the statement by the State Engineer is wrong. It is not within Northern’s, or the Municipal Subdistrict’s, or Reclamation’s, or the State Engineer’s discretion on whether a change of water rights application must be filed – rather it is a mandatory requirement. Colorado’s Supreme Court has told the State Engineer and all water users that “[t]he change of water right and augmentation plan statutes provide that **applications for approval of the water use practices** they encompass **are mandatory, not discretionary.**” (emphasis added) *Empire Lodge*, 39 P.3d at 1158.

NEPA requires that the lead agency evaluate “all reasonable alternatives.” 40 C.F.R. § 1502.14(a). An illegal alternative is not a reasonable alternative. It is only a “phantom alternative.” *National Resources Defense Council v. Evans*, 364 F. Supp. 2d 1083, 1116 (N.D. Cal. 2003). Because of the illegality of Alternative 2 and the DEIS’s emphasis on it as the Proposed Action, the document fails to inform the public, let alone Reclamation, of a range of reasonable alternatives, thereby failing to promote informed decision making, and ultimately fails to fulfill NEPA’s purposes. At a minimum, the DEIS should have analyzed an additional alternative, construction of Chimney Hollow Reservoir without use of prepositioning. This would enable Reclamation to take into account the uncertainty arising from the illegality of prepositioning and also inform the COE’s section 404(b)(1) Guidelines analysis.

7. Inadequate Analysis of Socioeconomic Impacts Identified during Scoping

The west slope socioeconomic issues identified during scoping include, among others, “potential impacts to tourism and recreation industries in Grand County” (not just active recreation participants using publicly accessed facilities), “additional cost associated with the potential need to upgrade wastewater treatment plants in the Fraser River and Colorado River basins,” and “economic impacts to the communities of Grand Lake, Kremmling and Hot Sulphur Springs and how each alternative would affect future

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growth and real estate values.” ERO Resources Corp., *Public Scoping Report* 14 (Dec. 19, 2003). While the DEIS addresses some of these potential impacts, its analysis is too narrow and excludes impacts of vital importance to Grand County and its citizens. Therefore, the DEIS fails to take the hard look that NEPA requires.

There are three types of impacts that are excluded from consideration, understated, or ignored in the DEIS’s socio-economic analysis: (1) impacts referenced in ERO’s Public Scoping Report and not pursued; (2) impacts referenced in the Recreation, Land Use or Visual Impacts sections of the DEIS and not pursued; and (3) impacts mentioned in earlier documents submitted by Grand County but are missing from the DEIS. Many of these impacts are discussed in sections 1.1, 1.2, and 1.3 of the memorandum dated December 15, 2008, from Coley/Forrest, *Windy Gap Firing Project - Draft Environmental Impact Report (DES 08-30)* (“*Coley/Forrest Memorandum*”), attached as Exhibit F.

7.1 Pervasive Disregard for the Private Sector in Grand County. Water resources and the local Grand County economy are inextricably linked, as set forth in Coley/Forrest, Inc., *Grand County: Its Economy and Water Resources* (2007) (prepared for Grand County). Although the WGFP directly impacts the environmental quality of the Colorado River, Lake Granby, Shadow Mountain Reservoir, and Grand Lake, there is a pervasive and nearly total disregard in the DEIS for private sector impacts arising from the WGFP’s impacts on these surface waters. Some private sector impacts that are ignored include:

- ranchers whose irrigation systems fail due to reduced stream flow in the Colorado River;
- ranchers who rely on fishing leases along the Colorado River;
- real estate and resort developments where a healthy Colorado River is their primary or sole asset;
- lakefront and riverfront properties whose value is directly related to reservoir water clarity and water quality;
- numerous summer recreation-oriented and visitor-oriented businesses including private marinas, local motels, restaurants, recreation gear and apparel retailers, grocers and the like;
- construction-related impacts on adjacent properties and developments.

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7.2 **Socioeconomic Impacts Excluded – Recreation.** The most significant exclusion arises from the DEIS’s definition of recreation which is limited to active recreation where there is public access. There is a general bias in the DEIS that, if recreation is not active recreation that is accessible by the general public, then it merits no analysis. The only recreation activities quantified in the DEIS are commercial kayaking and commercial rafting on selected portions of the Colorado River and related camping. This is narrow and inadequate. While commercial kayaking and commercial rafting in selected reaches of the Colorado River are a few core summertime visitor activities, there are other more significant recreation activities that bolster the Grand County economy in the summer that are likely impacted by the WGFP. These include:

- commercial and private fishing in locations other than Reach 5 of the Colorado River;
- other commercial and private boating in reservoirs;
- camping in locations other than Reach 5 of the Colorado River, and
- passive recreation enjoyment of the Colorado River and the reservoirs.

Each of these affected recreation activities has related impacts on lodging, restaurant sales, recreation equipment, rental providers, guides or outfitters, and other related purchases.

In the summer, many out-of-state visitors come to Grand County because of Rocky Mountain National Park, a national destination, but they linger because of the fishing, boating, and scenic beauty that Grand County currently offers. The local economy relies on this recreation relationship. The water resources that are compromised by the WGFP are necessary components of Grand County’s scenic beauty and tranquility and its more passive recreation venues. (See comments R-1, R-2, R-6 to R-8, R-11 in the attached *Coley/Forrest Memorandum*.)

Further, the DEIS drops certain recreation impacts from further consideration because they are “too difficult to quantify” or “unlikely to affect visitors.” These are discussed in section 1.7 of the *Coley/Forrest Memorandum*. This is inconsistent with EPA *Guidelines for Economic Analyses* which provide extensive detail on how to treat qualitative or uncertain impacts. (See comments SE-3 - SE-7, SE-10, and SE-12 in the attached *Coley/Forrest Memorandum*.)

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7.3 **Socioeconomic Impacts Excluded – Land Use / Agricultural Impacts.**

The Land Use section (3.18) of the DEIS does not acknowledge a relationship between Colorado River hydrology and agricultural land use. Therefore, the DEIS's discussion of socioeconomic impacts does not address this important negative impact. Based on research conducted by Coley/Forrest, there are substantial potential negative relationships between further reductions in Colorado River streamflow and agricultural land uses through irrigation ditch failures, impacts to development directly dependent on river and reservoir views and usage. These are documented in communications with the Grand County ranching community. Coley/Forrest, Inc., *Grand County: Its Economy and Water Resources* (2007) (prepared for Grand County, Colorado). See *also* comments SE-1 and SE-9 in the attached *Coley/Forrest Memorandum*.

7.4 **Countywide Analysis.** The few socioeconomic impacts that are reported in the DEIS are presented on a countywide basis. This approach misses the significance of impacts that may seem small on a countywide basis, but comprise the economic lifeblood of smaller communities and some economic sectors. For example fishing and boating along some reaches of the Colorado River are significant areas of summer economic activity in the relatively small communities of Hot Sulphur Springs and Kremmling. The *Public Scoping Report* expressly mentions concerns about impacts on these communities; the DEIS ignores them.

7.5 **Cumulative Effects Analysis.** The DEIS states that the "cumulative socioeconomic effects were evaluated" but provides only the results of this analysis. DEIS at 3-286. The analytical steps are excluded from the DEIS and the Socioeconomic Technical Resource Report, so it is not possible to analyze the results.

If Reclamation had concluded that the socioeconomic issues identified during scoping were not significant or had been covered by prior environmental review, it was required to include "a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere." 40 C.F.R. § 1501.7(a)(3). Therefore, the DEIS must include an analysis of *all* issues identified during scoping or an explanation of why they are insignificant or have already been analyzed. Furthermore, when the DEIS does analyze environmental impacts, it often fails to do so adequately by minimizing or overlooking impacts to Grand County. Such deficiencies are identified in this letter, the comment letters on technical reports, and the other letters that Grand County has submitted.

8. **Criteria on Significance**

The DEIS reports many impacts in numerical form, often without criteria for determining whether those impacts are significant and without explaining what those

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numerical changes mean. For example, we are told that there would be increases in temperature, specific conductivity, ammonia concentrations, inorganic phosphorus concentrations, selenium concentrations, and aquatic plant growth and decreases in dissolved oxygen concentrations in the Colorado River on July 25; and that these changes vary by alternative. DEIS at 3-96 to 3-101. But we are not told what effect these changes would have on aquatic life in the Colorado River or whether any of the changes would be significant. Without knowing whether the changes would be significant or insignificant and the reasons therefore, it is impossible to make an informed comparison of the environmental impacts of different alternatives. Although the DEIS does refer to various water quality standards, they are not necessarily relevant to the issue of significance for purposes of NEPA. To correct this deficiency, the DEIS should include specific criteria for each impact category to determine whether a given impact would be less than significant, potentially significant, or significant, and explain the reasoning behind these conclusions. It should also include a discussion of mitigation measures for impacts that are potentially significant or significant.

9. Inadequate Discussion of Mitigation

An EIS must include a discussion of “[m]eans to mitigate adverse environmental impacts” 40 C.F.R. § 1502.16(h); *see also* 73 Fed. Reg. at 61,316-17 (to be codified at 43 C.F.R. § 46.130). As the Supreme Court recognized, such a discussion is essential to ensure that agencies take a hard look at the environmental consequences of proposed actions. *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 352. Furthermore,

omission of a reasonably complete discussion of possible mitigation measures would undermine the “action-forcing” function of NEPA. *Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects.*

Id. (emphasis added); *see also Colorado Environmental Coalition v. Dombeck*, 185 F.3d at 1173 (“It is not enough to merely list possible mitigation measures.”).

Judged by these requirements, the discussion of mitigation in the DEIS is still inadequate.⁴ Many of the proposed west slope mitigation measures for the Proposed Action are too vague and uncertain to enable Reclamation, Grand County, or other

⁴ The status of one mitigation measure is unclear, because it is found in the Executive Summary, but does not appear to be included in the body of the DEIS. DEIS at ES-21 (“Opportunities for improvements to aquatic life habitat in the Colorado River and mitigation of impacts to fish will be coordinated with CDOW, Grand County and other responsible agencies.”), 3-145, 3-293.

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interested groups and individuals to evaluate “the severity of the adverse effects.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 352. Some of the most significant west slope impacts from the WGFP would result, directly or indirectly, from reduced surface water flows. Yet the only proposed mitigation measures for surface water hydrology relate solely to Granby Reservoir. DEIS at 3-55. Even those are too uncertain to qualify as mitigation. Reclamation notes only that “*it may be possible to modify prepositioning operations*” and undertakes to conduct additional evaluations “*to determine if changes in the timing of water deliveries to the East Slope can reduce impacts to Granby Reservoir while still meeting the purpose and need for the project.*” *Id* (emphasis added). As a cooperating agency, Grand County is entitled to review and comment on all such proposals and evaluations. *Memorandum of Agreement Between the Bureau of Reclamation and Grand County Board of County Commissioners for the Windy Gap Firing Project Proposed by the Municipal Subdistrict, Northern Colorado Water Conservancy District*, dated effective January 22, 2005 (“MOA”), § V.I.

With regard to surface water quality, Grand County appreciates the Municipal Subdistrict’s commitment to continued participation and funding of ongoing nutrient studies in the Three Lakes System. DEIS at 3-129. Although the County also welcomes the proposal to determine whether increasing bypass flows from 90 to 135 cfs when Windy Gap is being pumped would result in reduced downstream temperatures, it is dismayed the Municipal Subdistrict would only “consider increasing required bypass flows under certain water supply conditions” if the studies are favorable. *Id*. As mitigation for recreation and socioeconomic impacts, the Municipal Subdistrict would curtail diversions from the Colorado River if flows at the Kremmling gage are less than 2,200 cfs during the annual Big Gore Race. *Id*. at 3-253, 3-290. While Grand County appreciates that gesture, the measure would not mitigate impacts to kayaking, rafting, fishing, and other recreational activities on days other than those on which the Big Gore Race are held, nor would it address the other significant socioeconomic impacts to Grand County discussed in these comments. *See also* comment letters dated February 11, 2008 on Draft Recreation Resources Technical Report and Draft Socioeconomic Resources Technical Report; and letter dated February 11, 2008 transmitting Coley/Forrest report on Draft Recreation Resources Technical Report and Draft Socioeconomic Resources Technical Report.

Another deficiency of the DEIS regarding mitigation is that it merely catalogs the mitigation measures included in the 1981 Windy Gap EIS, and does not include an adequate discussion of those measures. *See* DEIS at 1-7 to 1-8. What is needed is a comparison of the impacts predicted in the Windy Gap Project EIS with the actual impacts that have resulted from that project, together with an analysis of whether, and to what extent, the mitigation measures have been effective. For example, the Municipal Subdistrict paid \$100,000 for a habitat manipulation project and \$450,000 for biological

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investigations. The DEIS should have reported on the effectiveness of the habitat mitigation project and what was learned from the biological investigations. *Id.* at 1-7. Another example is the proposal to determine whether increasing bypass flows from 90 cfs to 135 cfs when Windy Gap is being pumped would result in reduced downstream temperatures. *Id.* at 3-129. That study should have been completed before the DEIS was prepared. An analysis of the original Windy Gap mitigation could also provide a basis for Reclamation to determine whether existing mitigation measures satisfied the Municipal Subdistrict's obligation under Colo. Rev. Stat. § 37-45-118(1)(b)(II) for the original Windy Gap Project and to decide what additional mitigation measures would be necessary for the Windy Gap Project or the WGFP.

There are a number of obvious mitigation measures the DEIS should have considered, but does not. More detailed mitigation proposals are contained in Grand County's December 29, 2008 letter to COE regarding the Windy Gap Firing Project 404 Permit Application ("*404 Permit Comment Letter*"). Examples of mitigation that should have been discussed in the DEIS include, without limitation:

- Because Windy Gap water can be reused to extinction, unlike C-BT water, the DEIS should have discussed requiring WGFP participants to reuse to extinction all or a significant portion of their Windy Gap water. *See* DEIS at 1-12, 1-19.
- Although the DEIS rejects water conservation as an alternative, it does not explain why water conservation should not be proposed as an additional mitigation measure. The DEIS does, after all, recognize that "[t]o meet future water requirements will require continued improvements in water conservation in addition to the proposed WGFP." *Id.* at 1-18.
- The DEIS does not consider what would probably be the most effective mitigation measure, adaptive management of the Upper Colorado River. 73 Fed. Reg. at 61,315 (to be codified at 43 C.F.R. § 46.30) ("Adaptive management recognizes that knowledge about natural resource systems is sometimes uncertain."); 61,317 (to be codified at 43 C.F.R. § 46.145) ("Bureaus should use adaptive management, as appropriate, particularly in circumstances where long-term impacts may be uncertain . . ."). *See generally* The NEPA Task Force Report to the Council on Environmental Quality: Modernizing NEPA Implementation 44-56 (Sept. 2003). In short, this would entail developing a stream management plan with all the major diverters. The plan would include qualitative goals, monitoring to identify whether the goals are being met, and specified triggers to require

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changes in operation. A decision-making process would be established to adapt operations to achieve the management plan's goals for the benefit of all parties, when specified. The Grand County Stream Management Plan is the perfect basis for an Adaptive Management Plan.

- The DEIS does not consider integrated operations of the Denver Water Board and the Municipal Subdistrict systems to serve the City of Broomfield, a WGFP participant that wants to firm 13,739 af of water. Since the Denver Water Board and the Municipal Subdistrict both serve Broomfield, it would seem that allowing water to bypass the Denver Water Board diversion points in the headwaters of the Fraser River, be captured in Windy Gap, and then moved through the C-BT system to Broomfield could provide benefits to the Fraser River. Unlike water moved through the Moffat system which cannot be used to extinction, water provided from Windy Gap can be. This measure could provide additional water for the front range.
- The DEIS does not consider upgrading the Windy Gap Substation. Currently, Western Area Power Administration is in the process of preparing an EIS for upgrading a 69kV line to 138 kV from the Windy Gap Substation to the Granby Pump Plant. Prepositioning would require more pumping by a system that may not be able to meet future demands. This potential impact could be mitigated, at least in part, by upgrading the substation.
- Reclamation is a beneficiary of the WGFP through "shrink" water. This water could produce approximately \$1.4 million in additional revenue to Reclamation, which could be used to fund the clean up of Grand Lake. If one of the short-term solutions is to draw down Shadow Mountain Reservoir, these funds should also be used to pay for the pumping and power interruption charges, so that no other agency or entity is required to bear any such costs.

10. Cumulative Actions

Cumulative actions are actions "which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement." 40 C.F.R. § 1508.25(a)(2). Although section 1508.25(a)(2) uses the word "should," courts have made preparation of a single EIS mandatory in the case of cumulative actions: "Under § 1508.25, two or more agency actions *must* be discussed in

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the same impact statement where they are . . . ‘cumulative’ actions.” *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F.3d 989, 998-99 (9th Cir. 2004) (emphasis added). As explained in *Klamath-Siskiyou*, the environmental analysis must be done in a single document “when the record raises ‘substantial questions’ about whether there will be ‘significant environmental impacts’ from the collection of anticipated projects.” *Id.* at 999. See *Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1215 (9th Cir. 1998) (single EIS required for five timber sales in same watershed).

The WGFP and the Denver Water Board’s Moffat Collection System Expansion project are cumulative actions. The Denver Water Board proposes to develop 18,000 af of new firm yield to the Moffat Treatment Plant, primarily through diversions from the Upper Fraser River and Williams Fork River basins. DEIS at 2-42. Specifically, flows in the Fraser River and the Colorado River below the confluence with the Fraser will be reduced by average annual diversions of about 9,300 af. *Id.* at 3-42. Other impacts to the Colorado River will result from changes in the timing of flows below the Williams Fork Reservoir due to changes in the operation of the reservoir. *Id.* at 3-46. These impacts to the Colorado River are themselves significant, as are those of the WGFP. Together they are cumulatively significant and therefore must be analyzed in the same EIS.⁵ 40 C.F.R. § 1508.25(a)(2). Cumulative impacts to the Platte River basin may also be cumulatively significant.

A single EIS analyzing the impacts of both projects is not a mere formality. Without such EIS, there can be no assurance that Reclamation and COE have, collectively, taken a hard look at alternatives to the simultaneous operation of the WGFP and Moffat Collection System Expansion project, the cumulative environmental impacts of those two projects (with emphasis on the hydrology, water quality, and aquatic resources of the Colorado River), and measures to mitigate those impacts. Here, a single EIS is particularly appropriate, given the complex interrelationships among present and future diversions from the Upper Colorado River Basin. See *Kleppe v. Sierra Club*, 427 U.S. 390, 413 (1976) (“Cumulative environmental impacts are, indeed, what requires a comprehensive impact statement.”). Indeed such complexity argues for use of adaptive management, with development of a stream management plan and monitoring to ensure that the operation of both projects contributes to achieving the management plan’s goals.

⁵ The Environmental Protection Agency also suggested this in its comments on WGFP EIS scoping. Letter dated November 4, 2003, from EPA to the Bureau.

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11. Wild and Scenic Designation

The DEIS notes that the Kremmling and Glenwood Springs Field Offices of the BLM analyzed river and stream segments that might be eligible for inclusion in the National Wild and Scenic Rivers System (“NWSRS”) and identified several segments in Grand County that are eligible for inclusion. DEIS at 3-233 to 3-234. The DEIS also recognizes BLM’s policy that when a river segment is determined to be eligible “its identified outstandingly remarkable values shall be afforded adequate protection, subject to valid existing rights, and until the eligibility determination is superseded, management activities and authorized uses shall not be allowed to adversely affect either eligibility or the tentative classification” BLM Manual § 8351.32.C (May 19, 1992); see also *id.* § 8351.52.C. But the DEIS fails to take the next step and analyze what effect the alternatives would have on BLM’s interim management policy and whether Reclamation should use its own authorities to protect these segments until the eligibility determination is superseded.

In addition, “[o]nce a river is found eligible, the respective agency is committed to evaluate all actions within its control through the filter of the river’s potential for designation. Some specific authorities for protecting river-related values include the Clean Water Act for free flow and water quality, the Endangered Species Act for plant and animal species within a river corridor, and the Archaeologic[al] Resources Protection Act for cultural resources.” Interagency Wild and Scenic Rivers Coordinating Council, *The Wild & Scenic River Study Process* 30 (Dec. 1999). The DEIS also fails to evaluate the WGFP “through the filter of the river’s potential for designation.” Instead, it specifically declines to determine whether any of the alternatives would affect the suitability of the eligible segments for inclusion in the NWSRS. DEIS at 3-235.

The Nationwide Rivers Inventory compiled by the National Park Service (“NPS”), available at <http://www.nps.gov/ncrc/programs/rtca/nri/states/co.html>, includes a 23-mile reach of the Colorado River, from State Bridge to the Blue River. (As of December 4, 2008, the NPS webpage had not been updated to include the 5 segments BLM determined were eligible in March 2007.) “Each federal agency shall, as part of its normal planning and environmental review process, take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Inventory” Presidential Memorandum for the Heads of Departments and Agencies (Aug. 2, 1979). The DEIS fails to do that. Further, “[a]gencies shall, as part of their normal environmental review process, consult with the Heritage Conservation and Recreation Service [now the NPS] prior to taking actions which could effectively foreclose wild, scenic, or recreational river status on rivers in the Inventory. *Id.*; see also CEQ Memorandum for Heads of Agencies, Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory, 45 Fed. Reg. 59,190 (Sept. 8, 1980) (“CEQ Memorandum”).

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Such consultation did not occur. See DEIS at 4-4. The CEQ Memorandum also requires that “[w]hen environmental impact statements are prepared on proposals that affect Inventory rivers, the lead agency should request HCRS and the affected land managing agency to be cooperating agencies as soon as the Notice of Intent to prepare an EIS has been published.” 45 Fed. Reg. at 59,192. It does not appear, however, that Reclamation requested either the NPS or BLM to be cooperating agencies.

12. Grand County’s Status as a Cooperating Agency

In its congressional declaration of policy, NEPA provides that “it is the continuing policy of the Federal Government, *in cooperation with State and local governments . . .* to use all practicable means and measures . . . in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.” 42 U.S.C. § 4331(a) (emphasis added).

A cooperating agency is any federal, state, or local agency (other than a lead agency) that “has jurisdiction by law or special expertise⁶ with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment.” 40 C.F.R. § 1508.5. A cooperating agency is entitled to active and meaningful participation in preparation of an EIS. The CEQ regulations require a lead agency to “[u]se the environmental analysis and proposals of cooperating agencies with jurisdiction by law or special expertise, *to the maximum extent possible* consistent with its responsibility as lead agency.” *Id.* § 1501.6(a)(2) (emphasis added).

Recently promulgated Department of the Interior regulations (based on 516 DM 1-6) also highlight the important role cooperating agencies should play in the NEPA process.⁷ For example, “In accordance with 40 CFR 1501.6, throughout the development of an environmental document, the lead bureau will collaborate, *to the fullest extent possible*, with all cooperating agencies concerning those issues relating to their jurisdiction and special expertise.” 73 Fed. Reg. at 61,320 (to be codified at 43 C.F.R. § 46.230) (emphasis added). Furthermore, the official of a bureau who is responsible for

⁶ “*Special expertise* means statutory responsibility, agency mission, or related program experience.” 40 C.F.R. § 1508.26. Grand County’s special expertise includes its 1041 permitting authority and special use permitting authority over the Windy Gap Project and any modifications thereto, as well as substantial knowledge about the west slope environmental impacts associated with the Windy Gap Project and the proposed WGFP, most of which would occur in Grand County.

⁷ These regulations apply to the Bureau. See 73 Fed. Reg. 61,291, 61,314 (Oct. 15, 2008) (to be codified at 43 C.F.R. § 46.10(a)).

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making and implementing a decision and ensuring NEPA compliance “must whenever possible consult, coordinate, and cooperate with relevant State, local, and tribal governments . . . concerning the environmental effects of any Federal action within the jurisdictions or related to the interests of these entities.” 73 Fed. Reg. at 61,317 (to be codified at 43 C.F.R. § 46.155).

Grand County is a cooperating agency for preparation of the WGFP EIS pursuant to Memorandum of Agreement Between the Bureau of Reclamation and Grand County Board of County Commissioners for the Windy Gap Firing Project Proposed by the Municipal Subdistrict, Northern Colorado Water Conservancy District, dated effective January 22, 2005 (“MOA”). The MOA recognizes that Grand County qualifies as a cooperating agency because the WGFP may have impacts on the County’s environment and may require the County to issue a new special use permit, a new 1041 permit, or amendments to the existing permits. MOA, § I.A, C. Among other things, Reclamation agreed to:

- Identify the County in the EIS as a cooperating agency and summarize its roles and responsibilities as a cooperating agency.
- Be available to discuss with the County any questions or issues related to County jurisdiction and special expertise.
- Use the environmental analyses and proposals of the County, where it has special expertise and jurisdiction, to the maximum extent possible, consistent with Reclamation’s responsibilities as the lead agency.
- Prior to inclusion in the EIS, provide to the County for review and comment project information and study results concerning the County’s jurisdiction and special expertise,⁸ including:
 - (1) Draft hydrology and water quality reports, data, and analyses for reservoirs, lakes and stream reaches in Grand County that may be impacted by the project and the analyzed alternatives.
 - (2) Draft reports, data and analyses for environmental and social impacts within Grand County due to the project.

⁸ Grand County retained the right, however, to comment on all issues relating to the EIS. MOA, § IX.C.

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- (3) Reports, data and analyses of alternatives to be evaluated in detail in the Draft and Final Environmental Impact Statements (“EISs”).
 - (4) Preliminary draft Chapters of EISs describing existing conditions and impacts within Grand County likely to be caused by the project.
 - (5) Comment letters on the draft and final EISs that are specific to County data and impacts, for preparation of suggested responses.
 - (6) Mitigation proposals that address impacts that may occur in Grand County caused by the Project.
- Consult with Grand County on technical studies when the County has jurisdiction by law or special expertise associated with the resource being studied.
 - Promptly inform the County of all schedule changes relative to comment deadlines and meetings.

MOA, § V.

As a cooperating agency, Grand County submitted detailed comments through its counsel, Sullivan Green Seavy LLC, on the technical reports prepared for the WGFP Preliminary Draft Environmental Impact Statement (“PDEIS”). Although Grand County submitted these comments in a timely manner, it did not learn until too late that Reclamation intended to release the PDEIS for comment before it had reviewed or, in the case of some reports before it had even received, all the County’s comments. As a result, Reclamation could not have considered or taken into account in its DEIS any of Grand County’s comments submitted in 2008, contrary to its responsibilities to Grand County as a cooperating agency generally, and specifically under § I of the MOA. *See* 40 C.F.R. § 1501.6(a)(2); 73 Fed. Reg. at 61,320 (to be codified at 43 C.F.R. § 46.230); *see also Davis v. Mineta*, 302 F.3d 1104, 1123 (10th Cir. 2002) (“a reviewing court may properly be skeptical as to whether an EIS’s conclusions have a substantial basis in fact if the responsible agency has apparently ignored the conflicting views of other agencies having pertinent expertise.”) (internal quotation marks and citation omitted); *Fund for Animals v. Norton*, 281 F. Supp. 2d 209, 227 (D.D.C. 2003) (inadequate review of public comments suggests a failure to take a “hard look” under NEPA). A list of the County’s comment letters on the technical reports is provided in Exhibit A. Neither the County nor its

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counsel ever received any response to these comments. From our review of the DEIS, it is apparent that Reclamation largely ignored Grand County's comments when it prepared the DEIS.

As a cooperating agency, Grand County also submitted comments on March 31, 2008 through its counsel, Sullivan Green Seavy LLC, on the PDEIS and requested a meeting to go through the comments in greater detail. Neither the County nor its counsel ever received any response to the PDEIS Comments. Nor did the requested meeting ever take place. Again, it is apparent that Reclamation largely ignored Grand County's comments when it prepared the DEIS.

More generally, Reclamation's failure to take Grand County's comments into account is contrary to Executive Order 13,352 on "Facilitation of Cooperative Conservation," which directs the Secretary of the Interior to "carry out the programs, projects, and activities of the agency . . . that implement laws relating to the environment and natural resources in a manner that: (i) facilitates cooperative conservation; . . . [and] (iii) properly accommodates local participation in Federal decision-making" Exec. Order No. 13,352, § 3(a), 69 Fed. Reg. 52,989 (Aug. 30, 2004). "Cooperative conservation" is defined as "actions that relate to use, enhancement, and enjoyment of natural resources, protection of the environment, or both, and that involve collaborative activity among Federal, State, local, and tribal governments *Id.* § 2. In the preamble to its NEPA rulemaking, Department of the Interior recognized that "an emphasis on the use of cooperating agencies may result in additional steps in the NEPA process, but is likely to lead to improved cooperative conservation and enhanced decision making." 73 Fed. Reg. at 61,301. Reclamation's actions are not consistent with these objectives.

In addition, Reclamation's lack of regard for Grand County's comments are contrary to the principle of consensus-based management, which "involves outreach to persons, organizations or communities directly who may be interested in or affected by a proposed action with the assurance that their input will be given consideration by the Responsible Official in selecting a course of action." 73 Fed. Reg. 61,316 (to be codified at 43 C.F.R. § 46.110(a)); see also Department of the Interior, Environmental Statement Memorandum ESM03-7, Procedures for Implementing Consensus-Based Management in Agency Planning and Operations (July 2, 2003). Understandably, Grand County has no assurance that its input was in fact given consideration.

Specific Comments by Section

Section 1.3.1

Municipal Subdistrict

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Comment. The purpose and need is drawn so narrowly as to foreclose other less environmentally damaging alternatives. The purpose is “to deliver 30,000 af of water from the existing Windy Gap Project to meet a portion of the water deliveries anticipated from the original Windy Gap Project and to provide up to 3,000 af of storage to firm water deliveries for the [Middle Park Water Conservation District].” The real purpose and need for the participants is for more water generally. The purpose and need statement might have more credibility if the original Windy Gap Project participants were the same as the WGFP participants. Instead, the DEIS ignores the fact that of the original eight cities in the original Windy Gap Project, only three are participating in the WGFP, and only one to the full extent of its ownership (Longmont 80 original and firming units).). See attached Exhibit D, *Windy Gap Ownership and Transfer History*. This Exhibit shows that only 28% of the requested storage volume is by original owners, who collectively need only 26,000 af. The City of Broomfield, the participant requesting the most storage at 25,000 af was not even located within the boundaries of Northern or the Municipal Subdistrict when the water rights were appropriated or the ROD issued for the original project.

Section 1.4.1 Colorado-Big Thompson Project

Page 1-4

Comment. Please note that the C-BT Project was approved by Congress in Senate Document 80 and decreed in the Blue River Decree for supplemental irrigation and industrial use, not municipal purposes. In addition note that the C-BT project does not allow for storage of C-BT water in Chimney Hollow Reservoir because Chimney Hollow reservoir is not a C-BT project feature approved by Congress.

Section 1.4.2.1 Windy Gap Project Environmental Impact Statement

Page 1-5

Comment. The June 8, 1981 ROD issued by the Corp of Engineers permitted a project (Application No. 6520) with a maximum diversion of 300 cfs according to Exhibit A to that ROD, which described “a pumping plant with a maximum discharge capacity of 300 cfs.” The DEIS notes that diversions are limited to 600 cfs. Impacts greater than 300 cfs need to be included in this NEPA analysis and corresponding mitigation to substantially reduce impacts associated with diversions at 600 cfs.

Section 1.5.2 Windy Gap Project Delivery Shortage

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Page 1-9

Comment. The actual diversions from Windy Gap averaged 11,080 af.

Page 1-10

Comment. Additional reasons that need to be added to the bullet points for lack of diversions are: (1) lack of demand by original participants; (2) sale of units to new entities which increased water demand over time; (3) power costs charged for pumping based on starting up a pump and costs to purchase “Overrun Power” at market rates which is considerably higher than the preferred rate for “Allotted Power”.

Section 1.6.1 Sources of Water Supply

Page 1-11

Comment. What is the basis of the statement that extreme droughts are excluded from firm yield planning? How does the author define an “extreme drought?”

Page 1-12

Comment. The discussion of “reuse” of trans-mountain water is incomplete. First, the 404 (b)(1) Guidelines require applicants for 404 Permits to take steps to “minimize potential adverse effects” to the aquatic ecosystem. Second, Colorado law requires that: “In order to minimize the amount of water removed from Western Colorado eastern slope importers should, **to the maximum extent feasible**, reuse and make successive use of the foreign water.” *Denver v. Fulton Irrigating Ditch Company*, 506 P.2d 145, 148 (Colo. 1972) (emphasis added). In *Fulton* 506 P.2 at 146-147, the Colorado Supreme Court defined the terms “reuse” “successive use” and “right of disposition” as follows: (1) “‘Re-use’ means a subsequent use of importer water for the same purpose as the original use.” [for example treatment of sewage to potable water standards and re-cycled into the regular water system, which the Court noted that Denver’s research was continuing such that in the future potable water will be extracted from sewage for delivery to the water mains] (2) “‘Successive use’ means a subsequent use by the water importer for a different purpose.” [for example after municipal use the treated sewage is used for irrigation] and (3) “‘Right of disposition’ means the right to sell, lease, exchange or otherwise dispose of effluent containing foreign water after distribution through Denver’s water system and collection in its sewer system.” The DEIS discloses that these participants practice “successive use” and “disposition” through exchanges of some of trans-mountain water. None “reuse” Windy Gap water. To satisfy requirements of federal and state law, the discussion of reuse must be expanded.

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Section 1.6.2.3 Water Conservation

Page 1-15

Comment. The DEIS notes that water conservation includes both supply-side and demand-side management. If the WGFP is to be permitted as the least damaging environmental alternative, then conservation measures need to be included as conditions to the Carriage Contract or the 404 Permit. We have proposed such a permit condition in the *404 Permit Comment Letter*.

Section 1.10 The Decision Process

Page 1-42

Comment. As noted above, the decision process will require resolution of many threshold legal questions that have not been resolved. Either execution of the Carriage Contract should be delayed until such questions can be resolved or any approvals must be contingent on resolving those questions.

Section 1.10.2 Senate Document 80 and Section 14 Analyses

Page 1-42

Comment. The DEIS notes that Reclamation's decision on whether an excess capacity contract is consistent with Senate Document 80 and other federal law will be made "later" and is not part of this EIS. Grand County reiterates that it must be included in the negotiation process for any excess capacity contract pursuant to Senate Document 80.

Pages 1-42 and 1-43

Comment. In a Reclamation study of nutrients in the C-BT system (Leiberman, 2008), there is a box and whisker plot showing the statistical similarity in secchi depths between Granby Reservoir, Grand Lake, Carter Lake, and Horsetooth Reservoir, and that also illustrates secchi depths are statistically different (shallower) on Shadow Mountain Reservoir. When Reclamation undertakes to "consider the effects of the proposed project on Reclamation's ability to continue meeting the five primary purposes of the C-BT Project and whether or not the C-BT Project can continue to be operated in accordance with lettered stipulations (a) through (l) in the Manner of Operation," please include in this consideration the fact that Grand Lake is the only natural lake of the five water bodies mentioned above, and that its trophic status prior to construction and operation of

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the C-BT system was oligotrophic. This status has not been maintained, and in fact has been steadily degraded to the current conditions in which Grand Lake, contrary to the DEIS assertion that it is mesotrophic, can often be considered eutrophic.

Section 1.10.3.

Comment. Please add that Grand County will have 1041 permitting authority over all of the alternatives, not just those where there will be construction in Grand County. Grand County issued permits for the original Windy Gap Project. Each of the proposed alternatives will result in a change in the operation of and participants in the permitted Windy Gap Project thereby triggering either amendments to the existing permits or new permits.

Section 2.1.2.1 Level 1 Alternative Screening

Page 2-5

Comment. Prepositioning is carried forward as part of the preferred alternative even though it may be illegal. The DEIS does not disclose the factual or legal basis for the statements that: 1) Total allowable C-BT storage would not change; or 2) the existing C-BT water rights and diversion would not be expanded. As described above, prepositioning involves both a change of C-BT and Windy Gap water rights. Only the water court has jurisdiction to decide whether: 1) total allowable storage would not change; 2) whether C-BT and Windy Gap water rights would be expanded; and 3) what terms and conditions need to be included to protect from injury.

Page 2-6

Comment. The DEIS should explain why storage of CB-T water in Chimney Hollow Reservoir and prepositioning were not eliminated. Storage of Windy Gap water in Horsetooth Reservoir was eliminated because it would require Congressional action; Congressional action is required for storage of C-BT water in Chimney Hollow Reservoir.

Section 2.2.1 Current Windy Gap Project Operations

Page 2-14

Comment. The DEIS states that Windy Gap is not stored on the East Slope. Since the impact analysis is based on this assertion, any amendment to the Carriage Contract must

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make this limitation a condition. For purposes of this condition, storage would mean that water shall not be held in any facility for more than 72 hours.

Section 2.2.2 Participant Operations under the No Action Alternative

Page 2-15

Comment. It is speculative to include the enlargement of Ralph Price Reservoir as the No Action Alternative.

Section 2.4.2 Operations

Page 2-24

Comment. The DEIS notes that Windy Gap is delivered instantaneously through the Adams Tunnel. However, in order to distinguish between Windy Gap water or C-BT water and to prevent unlawful enlargement of C-BT water rights, the Carriage Contract must require that each water right that is carried through the Adams Tunnel be accounted for separately based on actual - not instantaneous - diversion/deliveries.

Comment. The DEIS states that when C-BT water is stored in Chimney Hollow, that creates more space in Granby Reservoir. More space in Granby Reservoir creates the ability of the C-BT water rights, which are senior to Windy Gap, to store in that space. This creates the potential for expansion of use of the C-BT water rights. The DEIS says the C-BT diversions and water rights would not be expanded. We have proposed a permit condition in the *404 Permit Comment Letter* so that C-BT water rights will not be expanded.

Comment. Middle Park's 3,000 af should continue to be stored in Granby Reservoir. There is no need to deliver Middle Park's water to Chimney Hollow and then "exchange" it back Granby Reservoir for release.

Section 2.8.2 Reasonably Foreseeable Actions

Page 2-42

Comment. Add to reasonably foreseeable future projects the Colorado Springs Substitution and Green Mountain Reservoir Substitution and Power Interference Agreements as described in Grand County's letter dated October 30, 2008.

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Comment. (also page 3-42 and elsewhere) The reasonably foreseeable actions and cumulative effects sections should include a discussion of climate change. The United States Supreme Court has stated that the “harms associated with climate change are serious and well recognized.” *Massachusetts v. EPA*, 127 S.Ct. 1438, 1455 (2007) (ruling that EPA can regulate greenhouse gases under the Clean Air Act). Therefore, global climate change must be analyzed under NEPA. See e.g. *Border Power Plant Working Group v. Department of Energy*, 260 F. Supp. 2d 997, 1028-1029 (S.D. Cal. 2007). At a minimum, the EIS could include a discussion of the influence of a 4 degree Fahrenheit temperature increase by 2050 and the possible influence on planning for increased winter precipitation matched by decreased summer precipitation as predicted in the Colorado Water Conservation Board’s “Climate Change in Colorado” report. In considering climate change, Reclamation should follow the methods outline in its own document, appendix U of the “Final EIS- Colorado River Interim Guidelines For Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead, October 2007.”

Section 2.10.2 Comparison of Alternative Impacts

Page 2-56

Comment. Table 2-6 lists average Windy Gap Diversions of 36,352 af as existing conditions. This is wrong. Actual diversions from Windy Gap have averaged 11,000 af from 1985 to 2004 (page 1-9). This is the existing condition against which to compare impacts.

Page 2-67

Comment. Table 2-7 Comparison of cumulative effects. The same error occurs in this table as in Table 2-6 with the incorrect reporting of Windy Gap diversions of 36,352 af

Chapter 3 Affected Environment and Environmental Consequences

Comment. The DEIS fails to describe that most of the alternatives are not consistent with the requirements of existing local and regional plans including the Grand County Master Plan and the NWCCOG Water Quality Management Plan.

Comment. **Displaying Windy Gap Diversions of 36,352 af as “Existing Conditions” is a fatal flaw.** Throughout the DEIS, Windy Gap Diversions for Existing Conditions are listed as 36,352 af as an average annual amount. This is a modeled number that is over

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three times actual diversions. This flaw permeates every table, graph, text and makes it difficult to comment. See discussion in General Comments Section, above.

Section 3.3 Determination of Environmental Effects

Page 3-2

Comment. The DEIS states that “[f]or Reclamation purposes action alternatives are compared to the No Action alternative for determining effects.” Reclamation should use existing conditions to compare effects.

Section 3.4 Area of Potential Effect

Page 3-3

Comment. Change “may” to “will” in the 8th line and put a period after “diminish” in the 13th line. As written, there are no bases for these statements without the changes.

Section 3.5.1.1 Affected Environment; Areas of Potential Effect

Pages 3-3, 3-4 and 3-6

Comment. For alternatives including Rockwell Mueller, affected area should include the Fraser River, which should also be considered due to impacts from the Moffat Firing Project. The statement “The Fraser River is not included in the study area because none of the alternatives affect Fraser River flows” cannot be true even during the filling of the Rockwell/Mueller Creek reservoir site.

Page 3-6

Comment. The sentence “Colorado River average monthly flow changes, as a percentage of total streamflow, would be less than 10 percent downstream of the confluence with the Blue River...” is misleading simply due to the location of the site downstream of two major confluences. Moreover, it probably is wrong owing to the inaccurate description of existing conditions discussed in General Comments Section, above. The percent change for each stream segment from the Granby Dam down to the study area boundary should be presented here in a table, or alternatively, the stream segments with the highest *and* lowest percent changes should be offered.

Section 3.5.1.3 Water Rights, Agreements and Contracts

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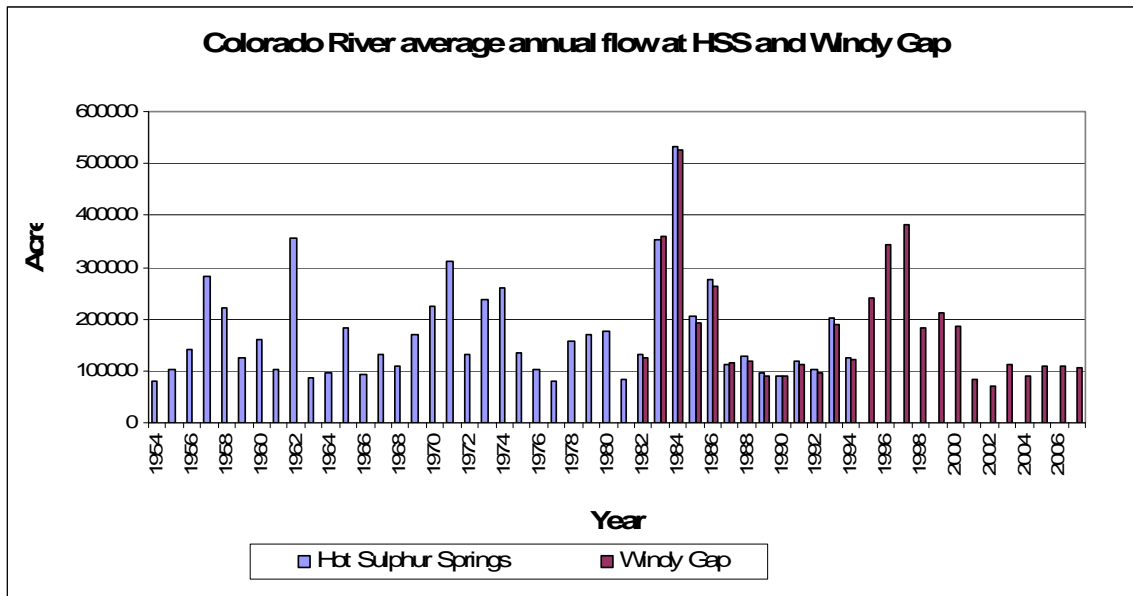
Page 3-6

Comment. As described above, there are a number of legal actions that are necessary to implement the WGFP.

Section 3.5.1.4 West Slope Surface Water Hydrology

Page 3-8

Comment. Figure 3-3. This figure should not stop at 1994, but should continue on through the latest date available. While the USGS gage at Hot Sulphur Springs was abandoned by GS, USGS continues to maintain the gage at Windy Gap, which has been proven⁹ to be statistically consistent with the Hot Sulphur Springs data (see figure below). The additional period of record from 1995 to 2007 is important to show the cumulative year drought conditions during that time, in particular the driest year on record from 1905 to 2007, which was 2002. In addition, a figure ought to be included to display predicted future flows over the next 30 years with WGF.



The additional water years should be included when evaluating trends, and low flow conditions. Similarly, special consideration should be made for the years in which Windy Gap water was and was not diverted. In addition, consideration should also be made for

⁹ Personal communication with Alan D. Druliner, Colorado Water Science Center, USGS, September 2008.

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the fact that the last century was one of the wettest on record, and that “climate models predict a reduction of Colorado River flows ranging from 5 to 50% by mid-century”.¹⁰

Comment. Figure 3-4 This diagram should be edited to include 2002 as the lowest water year. The difference in flow between the two years is 10,352 af (80,360.3 af versus 70,007.6). As the figure scale does not allow for adequate discernment of the changes to low flow, an additional figure should be added showing average flows from 1950-2008, the lowest flow year (2002) as represented by USGS Windy Gap gage data, and the flow due to proposed changes from the preferred alternative.

Page 3-9

Comment. Please note that the flows from the Windy Gap diversion point to the mouth of the Williams Fork River of 90 cfs is 10 cfs below the flow identified as being critical *in winter* in the Grand County Stream Management Plan, Phase II. It is 150 cfs below critical summer flow recommendations. Similarly, from the mouth of the Williams Fork River to the mouth of the Troublesome Creek, the flow of 135 cfs is 15 cfs below winter critical flows, and 115 below summer critical flows. The flushing flow recommended by the Azure Settlement is equivalent to the optimal flows recommended by the Stream Management Plan, and 300-750 cfs below that recommended for flushing flows.

In 2003, 64,200 af were diverted via Windy Gap. This is 91.7% of the annual flow in the 2002 water year.

Page 3-10

Comment. If no historic gage flow data is available, how can Reclamation plan to “bypass native flows” in the Rockwell Mueller or Jasper East areas?

Section 3.5.1.5 East Slope Surface Water Hydrology

Page 3-11

Comment. figure 3-6 Please attach year labels on the X axis.

Section 3.5.2.2 Method for Effect of Analysis

Page 3-14

¹⁰ Colorado School of Mines Magazine, Summer 2008

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Comment. Use of a daily time step model would not require “disaggregation” to get to daily diversions.

Section 3.5.2.3 Facilities and Stream Segments Affected by Windy Gap Operations

Page 3-14

Comment. The DEIS notes that Windy Gap water that is pumped into Granby Reservoir is assessed a 10% shrink charge upon introduction. It appears that this shrink is then attributed to the CB-T decree. This operation appears to create an expanded use of the C-BT decree, because the C-BT is not decreed for diversion at Windy Gap, but water diverted from Windy Gap is attributed to C-BT. This needs to be explained further and the decree that authorizes this operation referenced.

Comment. We are not aware of any decree for either Windy Gap or C-BT that allows an exchange of C-BT water with Windy Gap water that is called an “instantaneous delivery.” This needs to be explained and the legal authority for doing so under Colorado law referenced. It appears that the fiction of “instantaneous delivery” will not be operated under the WGFP, but rather water would be routed to Chimney Hollow Reservoir.

Page 3-15

Comment. Willow Creek should not be affected by WGFP, but it apparently is. This appears to be the result of an undecreed exchange of Windy Gap water to Willow Creek Reservoir, which causes Willow Creek Reservoir rather than Granby Reservoir to spill. This operation makes no sense and needs to be explained. The DEIS needs to disclose the decree that authorizes this exchange of Windy Gap water to Willow Creek Reservoir.

Page 3-16

Comment. The DEIS states that “C-BT water delivered would not exceed current amounts.” The impact analysis in the DEIS is based on this assumption. Therefore, the Carriage Contract must include a condition that limits deliveries of C-BT water through the Adams Tunnel to current amounts. We have proposed such a permit condition in our *404 Permit Comment Letter*.

Section 3.5.2.5 C-BT and Windy Gap Project Operations and Diversions

Pages 3-19 through 3-21

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Comment. Tables 3-2, 3-3 and 3-4 erroneously lists Windy Gap Diversions at 36,532 af (average) at 7,804 af (dry) and 38,512 af (wet). Actual diversion records are much less in all types of years. See General Comments Section, above.

Comment. Table 3-2 purports to compare average annual flow and diversion amounts. This is an example of how it is deceiving to present Windy Gap Diversions of 36,532 af as “existing conditions” rather than actual diversion when deriving differences and percentage of change. In fact *actual* diversions at Windy Gap Reservoir are show in Table 3, p. 22 of the Water Resources Technical Report. Those diversions averaged 11,080 af. That amount is the “existing conditions;” that is the amount of effect on the river since Windy Gap came on line. It is not some hypothetical modeled amount that created the existing conditions. Accordingly when one puts in the actual diversions of Windy Gap, the comparison looks much different and the impacts are staggering. See General Comments Section, above.

Table 3-2 should be revised:

Location	Existing Conditions		Proposed Action	
	Avg Ann Flow	Avg Ann Flow	Diff	Percent diff
Windy Gap Diversions (modeled)	36,532 af	46,084 af	9,552 af	26% increase
Windy Gap Diversions (actual)	11,080 af	46,084 af	35,004	316% increase

Page 3-21

Comment. (also 3-25 and elsewhere). The assertion is regularly made that Windy Gap would not divert during dry years, yet there are tables that show diversions in dry years. Correct this conflict or limit diversions to dry years as a condition of the Carriage Contract.

Page 3-24

Comment. Please discuss nocturnal pumping scheme for Windy Gap which minimizes power cost during pumping and maximizes power generation and revenues during daylight hours when power demands are high. How will the WGFP influence this

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schedule? A discussion of this schedule here would be appropriate to make way for the related impacts to water quality in section 3.8.

Section 3.5.2.6 West Slope Streams and Existing Reservoirs

Page 3-26

Comment. The DEIS states that average annual flows below Windy Gap would decrease 14% from existing conditions. As stated numerous times, the so called “existing” conditions do not reflect actual diversions by Windy Gap, which are much less. In fact, the average annual flows will decrease by 26% . See General Comments Section, above.

Comment. Figure 3-12. Please break hydrograph into two time periods so that changes in flow below 200 cfs can be distinguished.

Page 3-27

Comment. Figure 3-13. Please break hydrograph into two time periods so that changes in flow below 200 cfs can be distinguished.

Comment. The table on this page shows that the Proposed Action would increase the number of days that flows dropped below 100 cfs over the 47 year study period from about 1.8 days per year in August to 2.9 days. This 47 year period does not include the extended drought conditions and lowest flow year on record, so it underestimates the true number of low flow days. According to the Grand County Stream Management Plan the critical/minimum cfs for that stretch is 250 during the summer, optimal is 450 cfs. Critical flows are defined as “that flow below which habitat is lost at the greatest rate.” (GC SMP, March 2008, pA-4).

Comment. Tables 3-7 and 3-8. The DEIS should state where these figures are derived. They might be helpful once corrected to determine the low flows in the critical reach below Windy Gap. Changes in stream flows should been shown in cfs as reported for increases in east slope streams. (Tables 3-9, 3-10, 3-11.) Similar tables in cfs should be prepared for West Slope streams where the decreases (impacts) will occur.

Page 3-28

Comment. Willow Creek is already seeing below standard levels of dissolved oxygen for its stream classification. The DEIS must describe how the reduction in flows will exacerbate this situation.

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Page 3-30

Comment. Please explain what “reintroduction shrink” means; what percentage is charged in each East Slope firming reservoirs; which decree it is charged to; and the basis for a reintroduction shrink.

Section 3.5.2.9 Windy Gap Firming Project Yield

Page 3-41

Comment. Table 3-13. The WGFP does not satisfy the purpose and need statement. The firm yield reported is 26,600 af rather than 30,000 af. The WGFP also does not meet the Purpose and Need for Middle Park’s firm yield of 3,000 af. Instead, it is reported that only 429 af of firm yield is generated for Middle Park.

Section 3.5.3 Cumulative Effects

Page 3-42

Comment. The additional foreseeable actions described for Section 2.8 above need to be added to the cumulative impacts section.

Section 3.5.3.1 Summary Comparison of Hydrologic Changes

Page 3-42

Comment. The cumulative impacts section demonstrates the need to use the same model to identify the impacts of the WGFP and the Moffat Collection System Expansion project. There are a number of assumptions on how the Denver Water Board may operate. Use of the Denver Water Board’s daily point flow model would ensure those assumptions are accurate and applied to both projects. For example, when the Big Lake Ditch lease expires, that would take the call off of the Denver Water Board’s Jones Pass Tunnel, and more water is likely to be diverted out of the Williams Fork River by the Denver Water Board, PLUS there is the lack of return flow down Reeder Creek. The timing of when those impacts occur is also critical. It is not adequate to look at the impacts on an average annual basis.

Section 3.5.3.2 Facilities, Streams and Lakes Affected by Reasonably Foreseeable Actions

Pages 3-43 through 3-45

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Comment. The comparisons in Tables 3-14, 3-15, 3-16, are wrong because they start from the wrong baseline for Windy Gap diversions of existing conditions of 36,532 af rather than the actual diversions of 11,080 af. See General Comments Section, above.

Page 3-47

Comment. The Shoshone call reduction needs to be examined more closely. In fact, when that agreement went into effect in 2003, that was also the greatest year of diversion by Windy Gap of 64,200 af. The report is replete with statements that Windy Gap will not divert during a dry year, but there is no analysis of the effects from the Shoshone call reduction.

Section 3.5.3.4 West Slope Streams and Existing Reservoirs

Page 3-50

Comment. Figure 3-25 excludes the months of December through March. In addition, the resolution is inadequate in the months shown where flow is below 200 cfs to be able to distinguish one condition from another, rendering the figure relatively useless for understanding much of the water year.

Page 3-51

Comment. Figure 3-26 excludes the months of December through March. In addition, the resolution is inadequate in the months shown where flow is below 200 cfs to be able to distinguish one condition from another, rendering the figure relatively useless for understanding much of the water year.

Page 3-52

Comment. The potential consecutive dry year reduction in the surface elevation of Granby Reservoir of 33 feet means that when compared to the average depth at full pool of 74 feet, the reduction will be 44%. When compared to the maximum depth at full pool of 221 feet, the reduction will be 15%. With such a significant potential reduction, the inclusion of a bathymetric map, with an evaluation of regions of the reservoir where water levels might be reduced significantly enough to prohibit access is necessary. In addition, a calculation of the potential reduction in water surface also would be instructive.

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Comment. Please develop area-elevation curves for Granby Reservoir under different scenarios, similar to what was done for the Shadow Mountain Reservoir drawdown, showing reservoir surface area versus reservoir stage or area of reservoir bed exposed versus reservoir stage.

Comment. Please develop a figure to project future Granby Reservoir elevations under consecutive dry year, moderate, and wet year scenarios that can be compared side-by-side with, or that also includes historical elevations like those shown in figure 3-6, and that makes clear how the historical elevation fluctuations might be exacerbated.

Comment. Reductions in water surface elevation, water surface area, increases in exposed reservoir sediment surface areas call for accompanying discussions and mitigation in sections concerning water quality (3.8), recreation area, access to boat ramps (3.19), and air quality (due to potential dust issues) (3.16), and probably other sections as well.

Comment. All of these same issues may also be true for Willow Creek Reservoir and should be discussed both here and in other appropriate sections in the document.

Section 3.5.4 Proposed Mitigation.

Page 3-55

Comment. See the discussion of mitigation in the General Comments Section, above. Numerous additional mitigation conditions are required as detailed in the *404 Permit Comment Letter*.

Section 3.6.1.3 West Slope Ground Water Hydrology and Quality

Page 3-56

Comment. Water quality results are reported from: 1) Apodaca and Bails 2000, a survey study that looked at water quality in 12 Colorado counties in addition to Grand County. Sampling sites in Grand County were 5, maybe 6 in number: 2 on the upper Fraser, 2 in the extended Grand Lake area, 1 at the confluence of the Colorado River with the Blue River, and one, potentially in Grand County, on the Blue River. 2) Topper 2003, a survey of ground water in the entire state of Colorado, and *which relies upon data from the Apodaca and Bails article* for the upper Colorado River 3) Bauch and Bails 2004, which studied the Fraser River watershed with sites located only as far downstream as Tabernash. Based upon these resources it is difficult to understand from where water quality values specific to the Colorado River in the study area in question may have come

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from. The Topper publication states that ground water quality in the Colorado River *can vary widely*.

Comment. The discussion of impacts to ground water is inadequate. For example, there is no analysis of potential degradation and influence from coal formations which extend just west of the Granby area, nor analysis of the influence from the hot springs in Hot Sulphur Springs. Also omitted is a discussion of potential degradation from leaking underground storage tanks which have been identified in Grand Lake, Heeney, Hot Sulphur Springs, Kremmling, Parshall, and Winter Park (Colorado Ground Water Atlas 2000). Any discussion of impacts to ground water quality from reduced flows in the Colorado River are missing.

In order to discuss ground water quality in the study area with any degree of certainty a study would have had to have been conducted, because without such a study, the data is entirely too sparse to draw any reliable conclusions.

Section 3.6.2.3 Ground Water Hydrology

Page 3-57

Comment. Please quantify the “temporary changes in ground water levels near the reservoirs” that might be expected due to “the occasional large decreases in reservoir elevations during a series of dry years” and account for the number of homeowners who would lose access to their water supplies, if any.

Comment. It is difficult to understand how the potential consecutive dry year reduction in the surface elevation of Granby Reservoir of 33 feet mentioned on p3-52 coincides with the statement “The historical variation in the lake surface elevation of Granby Reservoir (nearly 90 feet) is larger than the expected change due to any alternative.” How can this variation be accounted for with a mean reservoir elevation of 74 feet? Again, a thorough examination of the issues identified in the comment for p3-52 are required to understand the increases in variations.

Section 3.6.2.4 Ground Water Quality

Page 3-58

Comment. In section 3-10 the statement is made that the Colorado River is a gaining river throughout most of the study area. The ground water section would be a good place to discuss this as well, in particular where the Colorado River is *not* a gaining river, and under what conditions. To say that changes in river stage and hence ground water levels,

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due to the project, especially with attenuation over distance, would be insignificant compared to what currently exists ignores the fact that ground water quality in certain regions of the study area may already be unacceptably degraded. Without having accurate measurements of the current condition (measured water quality parameters), it is impossible to understand what “some changes in water quality that could increase as much as 38 to 45 percent” means.

Comment. “There may be some changes in water quality that could increase as much as 38 to 45 percent in some parts of the Colorado River. Similar changes in alluvial ground water quality along the Colorado River would be expected.” The preceding statements suggest that ground water quality has been evaluated only as an extrapolation of surface water quality. This is inadequate because the effects to ground water quality are likely to be more strongly felt due to increasing influence from bedrock aquifers and decreasing contributions from recharge or any potential periods when the stream might switch to a “losing stream” due to excess flow. The requisite “hard look” requires an evaluation of carefully selected ground water samples on a regular basis.

Section 3.7 Stream Morphology and Floodplains.

Comment. The DEIS recognizes the need for channel maintenance flows ranging from 80 percent of 1.5-year discharge to the 25-year peak flow (p3-60). These flows maintain the physical characteristics of the river channel, banks and floodplain and to maintain unimpaired flow in the channel. In addition the channel will need periodic flushing flows to remove sediment and accumulated interstitial debris. These are two different functions.

Comment. Page 3-62 of the DEIS establishes the channel maintenance flows as the 2-year peak discharge (i.e. the lower end of the range previously identified), which the DEIS equates to about 1,240 cfs at Hot Sulphur Springs. The DEIS then indicates that under existing conditions this necessary channel maintenance flow is exceeded about 4% of the time, and with WGFP this would be reduced to about 3% frequency of exceedance, and a similar analysis for cumulative effects. The PDEIS concludes this change is about 1% less than existing conditions and so is a minor change and not an impact. This conclusion is completely unsupported.

- (1) A change from 4% exceedance interval to a 3% exceedance interval is a 25% change, so describing it as occurring 1% less frequently is grossly inaccurate.

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- (2) The 2-yr peak discharge (1240 cfs) is based the current flow levels, not those that initially formed the channel, and so the flow criteria used is irrelevant and the conclusion is flawed.
- (3) This issue is dismissed (p3-60) because aerial photos from the 1970's, 1990's and 2005 indicate only minor channel changes in river morphology, and the fact that the channel is currently fairly stable in spite of significant C-BT that started in 1947. The DEIS also dismisses the need for evaluation channel maintenance and flushing flows between Granby Reservoir and Windy Gap and the potential WGFP impacts from changes to these flows because flows in this reach are "controlled by instream flows; therefore, it is difficult to define a range of channel maintenance flows based on peak flow events" (p3-63).
- (4) No mitigation is proposed (p3-65); we assume this is because the proposed action will maintain the existing requirement for 450 cfs sediment flushing flow for 50 hours once every three years (p 3-62). Flushing flows are different than channel maintenance flows.

Section 3.7.1.4 West Slope Stream Morphology and Sedimentation

Page 3-60

Comment. The statements that the Colorado River has continued to convey sediment without aggradation or degradation of the stream channel and that the river is a morphological stable stream are not supported by any data.

Comment. Please explain in quantitative terms what the following sentence means for this system: "The lower limit of channel maintenance flows has been defined as 80 percent of the 1.5-year discharge and the upper limit as the 25-year instantaneous peak flow."

Section 3.7.2.3 West Slope Streams

Page 3-62

Comment. The DEIS says that flushing flows were based on a 1981 study. This should be updated. Grand County's Stream Management Plan recommends a flushing flow of 750 to 1200 cfs for a 3 day duration with a frequency of 1 in 2 years during the May to late June period. Flushing flows are critical to transport the sediment. Tubifex worms thrive in sediment.

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Section 3.7.3 Cumulative Effects

Page 3-65

Comment. A reduction of 1.5 in the current 4 percent exceedences rate of the 2-year peak discharge is a difference of 37.5%. Please correct and quantify reductions at the Kremmling gage similarly.

Section 3.7.4 Proposed Mitigation

Page 3-65

Comment. The argument in the mitigation section on this page ignores the fact that stream flows are already too low for healthy channel maintenance. The preceding discussion said nothing about pool depth, interconnectivity between pools, the influence of flow volumes and channel depth on water temperatures, or refuge. The assumption that everything's fine and that the status quo will prevail is inadequate. The channels either need increased flows, or they need rehabilitation.

Section 3.8 Surface Water Quality: General comments regarding issues with the DEIS modeling approach for Colorado River. (See also BBA Report, Exhibit B)

Comment. The DEIS concludes (p 3-129) that the only adverse impacts to streams in Grand County associated with WGFP diversions are an increase in stream temperatures and concentrations of ammonia, inorganic phosphorus, and total dissolved solids for the Colorado River. Proposed mitigation is to "consider increasing required bypass flows under certain water supply conditions" if it can be show that increases would result in measurable benefits to the trout fishery. Both statements are wrong.

The reason the DEIS only identifies minor stream impacts in the Colorado River is because of the inappropriate choice of the steady state QUAL2K model for the purpose of evaluating changes from WGFP alternatives and issues with the input parameters used for the modeling. The use of QUAL2K to model temperature impacts demonstrates this issue. QUAL2K evaluates increases in Colorado River temperature resulting from diversion of water at Windy Gap for a single day, July 25th, and considers both the average diversion for that day, and a diversion to the point where only the 90 cfs mandatory bypass flow remains in the Colorado River below Windy Gap. According to the DEIS this approach would represent worst case conditions (DEIS page 3-92 and

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page 51, Stream Water Quality Technical Report). The conclusions from this modeling approach are flawed for many reasons including:

- (1) The actual result from QUAL2K is that Colorado River temperature would increase as much as 4.0 degrees to a maximum of 18.9 just upstream of the Williams Fork confluence when average stream flows (approximately 425 cfs) are reduced to 90 cfs by WGFP diversions on the single day, July 25 given median meteorological conditions. QUAL2K does not consider a more realistic extended timeframe. For example, if the temperature is predicted to increase 4.0 degrees when flows are reduced from 425 cfs to 90 cfs on July 25, then the temperature of the Colorado River will continue to increase above 18.9 several days later if river flows are maintained at minimum levels due to WGFP diversions and the meteorological conditions (air temperature and sunlight) remain relatively unchanged. Depending on daily weather conditions, there would be a gradual warming of the river downstream from Windy Gap over time, not a single spike in temperature. QUAL2K cannot handle this, a dynamic model would be more appropriate.
- (2) The DEIS concludes that WGFP will only increase temperature to exceed the temperature standard under worst case conditions, but this would not occur on average (p3-96). This statement cannot be supported. This statement is based on the median July temperature of 14.3 degrees as ambient conditions for input to QUAL2K. The source of this data is USGS grab samples which are collected 1 or 2 times per month (p3-67). Median data for 1 to 2 samples per month has no relevance to Colorado Water Quality Control Commission temperature standards which are determined as the Maximum Weekly Average Temperature (MWAT). Inputs to the QUAL2K model for many water quality parameters were based on the median value of measured water quality data for the period of record for July. The median value means that half of the data is greater than that value, which is why the State of Colorado defines existing quality as the 85th percentile for most parameters (5 CCR 1002-31, Section 31.5(20)).
- (3) Despite the QUAL2K model conclusions that WGFP diversions will rarely be of a magnitude to result in exceedance of temperature standards (page 3-96), there are already instances where increased stream temperatures in the Colorado River below Windy Gap in summer exceed standards. Existing MWAT data for Colorado River near Windy Gap indicates water temperature is already at or exceeding the water quality

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standard (MWAT standard = 18.2 degrees) in July and August (p3-67 and 68, Figure 3-29). Moreover, all of the conclusions assume less reductions in flows from current conditions than actually will occur. *See* General Comments Section, above.

- (4) Conclusions about changes in temperature based on QUAL2K are shown in tenths of a degree Celsius (and concentrations of other water quality constituents are shown in tenths of a microgram per liter). This level of resolution is beyond the capabilities of QUAL2K Model. This shortcoming is demonstrated in the sensitivity analysis in the May 2008 Stream Water Quality Modeling and Methods Report (see for example Figure 14, p 21 MM Report).

Comment. QUAL2K is a steady-state model, meaning it simulates water quality based on a multitude of inputs and assumptions for a single instant in time and thus is not dynamic over time. The condition of a steady-state instant (day) that the DEIS assessment considers is July 25 for “average” streamflow years. The concept was that this date is when the Colorado River experiences low-flows and hot and sunny summertime conditions, and it is also when Windy Gap could be diverting. (Note that although the DEIS chose July 25 of an average year to represent a worst case for temperature exceedances and impacts on aquatic life, there is no history of the temperature influence of Windy Gap pumping on aquatic life in July, because between 1984 and 2006 Windy Gap has only diverted one time (in 1985) in the month of July).

Comment. The approach to evaluating Willow Creek water quality is different and found at page 3-92. SSTEMP was chosen to evaluate stream temperature changes in Willow Creek and a mass balance approach was used to evaluate changes in concentrations of ammonia, copper and iron on a single day, July 15. First of all, ammonia is not a conservative parameter and dissociates based on temperature and pH, so mass balance analysis is inappropriate. Further it was assumed that the WWTP plant discharge would not change pH or temperature as effluent becomes a greater percentage of the streamflow because Willow Creek Reservoir releases are reduced under WGFP alternatives (Stream Water Quality Technical Report, page 54). These assumptions are completely unjustified for the following reasons:

- (1) The Preferred Alternative would reduce Willow Creek streamflow by 36% in July of average years (see Table D-15, Water Resources Technical Report Appendices).
- (2) The DEIS assumes average Three Lakes WWTP flows (0.53 cfs) for Three Lakes WWTP (see page 36, Water Quality Monitoring and Methods

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Technical Report) is continuous steady discharge when evaluating both alternatives and cumulative impacts (Stream Water Quality Technical Report, page 116). However, the Three Lakes Service Area population is projected to increase from 8,230 in 2005 to 12,821 by 2020. In addition, peak flows for Three Lakes Sanitation District occur typically in July, so average WWTP discharge flows are not appropriate. For example, the Stream Water Quality Technical Report (page 25) states the monthly average discharge from Three Lakes WWTP between 2003 and 2006 ranged from 0.46 cfs to 1.34 cfs.

- (3) Existing noncompliance with current water-quality standards in Willow Creek (Stream Water Quality Technical Report, p. 26) are noteworthy and must be considered in the assessment of impacts.

Section 3.8 Surface Water Quality: General comments regarding issues with the DEIS modeling approach for Lakes and Reservoirs.

Comment. The DEIS (p 3-129) describes only minor adverse impacts to lakes and reservoirs in Grand County from WGFP. The identified impacts are lower dissolved oxygen resulting in manganese concentrations that would continue to exceed water quality standards, nutrient concentrations would increase in the Three Lakes system, and clarity in Grand Lake would decrease (0.1 meters). As with the DEIS stream impact analysis, this conclusion is a result of a flawed approach to evaluating impacts. The minor impacts to the Three Lakes system summarized by the DEIS in Tables 3-48 to 3-55 are based on modeling by the Three Lakes Water Quality Model and are problematic for many reasons, including:

- (1) The DEIS describes increases in annual average nutrient concentrations (Table 3-47, p 3-103). However, impacts from nutrients are primarily related to algae growth and eutrophication in these waterbodies (page 3-93) which is a seasonal problem. Nutrient concentrations during the algae growing season are more relevant than annual averages. The growing season primarily coincides with the pumping of Colorado River water into Three Lakes which will increase with the WGFP, so actual impacts will be greater than depicted by annual averages.
- (2) Future nutrient concentrations used as input to the Three Lakes Water Quality Model for waters pumped by Windy Gap are based on completely unrealistic projections of nutrient concentration, particularly phosphorus, discharged from WWTPs in the Fraser River watershed. Fraser River water is then pumped by Windy Gap into the Three Lakes system (page 30

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Stream Water Quality Modeling and Methods Report). Therefore, both the in-lake concentrations and the algal response are underestimated. Since the conclusion that WGFP alternatives create no nutrient related impacts to streams or the Three Lakes System is based on the assumption of advanced treatment, then the WGFP project beneficiaries should be responsible for building the WWTP improvements necessary to make this assumption real.

- (3) Conclusions regarding changes in trophic Status Index are based on average chlorophyll *a* concentrations (p 3-93). Evaluating impacts of WGFP on Three Lakes should be weighted by pumping schedules instead of averaging.

Comment. The overall approach to evaluating impacts to the Three Lakes system is flawed. The assessment of impacts from WGFP is focused on eutrophication and does not consider the exacerbation of the existing problems associated with the discharge of pollutants into the 3-Lakes from C-BT pumping. Eutrophication is the increase in productivity of a waterbody, meaning the acceleration of algae and aquatic weed growth as a result of the addition of nutrients or other elements otherwise limiting this growth. Eutrophication is associated with decreased clarity and dissolved oxygen and potential increased concentrations of certain metals. It is usually associated with the gradual worsening of water quality.

The pumping of pollutants problem manifests itself in Grand Lake. It is seasonal in nature and can be best demonstrated by the following example from 2007.

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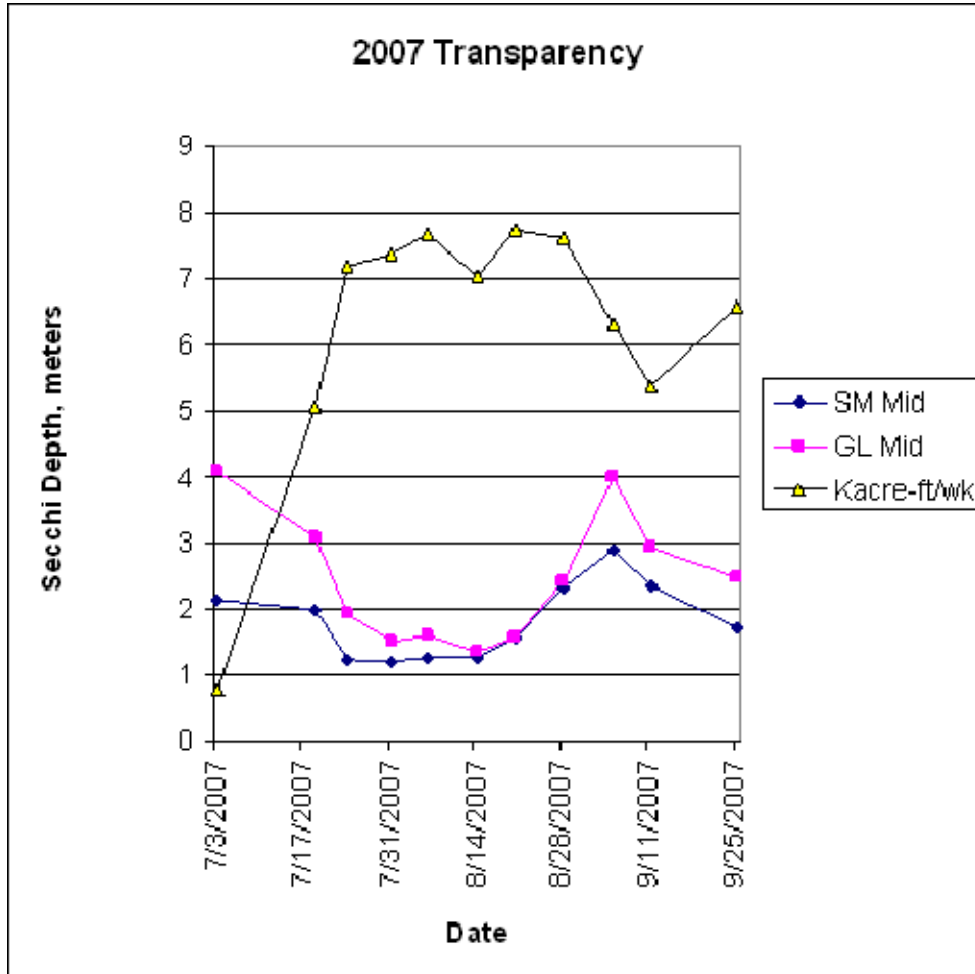
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The graph shows a period of about three months in late summer of 2007. Transparency in Shadow Mountain Reservoir (“SMR”), as measured by Secchi Disk depth, begins to decline in July. This is probably because of eutrophication of the SMR, the well documented seasonal blooms of algae and rooted aquatic vegetation in SMR. It is also documented that pollution levels in Grand Lake are affected by water quality in SMR (see Page 37, US Bureau of Reclamation Report *Nutrients, Chlorophyll a and Secchi Disk Transparency of Five Reservoirs on the Colorado Big Thompson Project, 2005 to 2006*, Davine Lieberman, April 2007; “This late season peak [of total phosphorus] does not occur in Lake Granby, indicating that SMR and Grand Lake are linked by the overflow of SMR water flowing into the epilimnion of Grand Lake during pumping operations.”).

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From the graph it is obvious that as C-BT pumping begins in earnest in late July, Grand Lake clarity is diminished and essentially matches that of SMR. In early September the SMR bloom begins to die off, pumping is reduced and Grand Lake regains its 4 meter clarity briefly. Transparency of SMR again is diminished and the pumping increases toward the end of September and the transparency of Grand Lake responds accordingly.

The average of the Secchi disk depth in Grand Lake during this period is 2.45 meters. This is almost the same value as what is shown as the average annual value of the 15-Year modeling period for both existing conditions and projected alternatives in the WGFP water quality assessment (see Table 45, page 103 of the Lake and Reservoir Technical Report). Although there is a seasonal reduction in Grand Lake's 4 meter clarity by over 65% during this same period as a result of pumping, on *average* there is little change. The approach to analysis of projected impacts focuses on annual averages and fails to incorporate the real problem of seasonal impacts to the 3-Lakes from pumping, and so the DEIS fails to project how WGFP will really affect this existing water quality problem.

Comment. Note that predicted changes for both SMR and Grand Lake for water quality parameters associated with algae growth and affecting clarity are slightly worsened for all WGFP alternatives *on average* (DEIS Table 43 page 91 and Table 46 page 103 of Lake and Reservoir Water Quality Report, July 2008). Given that slight worsening *on average*, it is reasonable to expect that this seasonal polluting of Grand Lake associated with pumping will get significantly worse. The Three-Lakes Water Quality Model does not account for this situation.

Comment. The model assumes instantaneous dispersal of constituents introduced into 3-Lakes (page 65 of WGFP Lake and Reservoir Water Quality Report, July 2008). However, it has been shown that because of temperature differences SMR waters "tend to slide over the surface waters of Grand Lake when water is being pumped down the Adams Tunnel" (see page 8, US Bureau of Reclamation Report *Physical Attributes of Five Reservoirs on the Colorado Big Thompson Project, 2005 to 2006*, Davine Lieberman, undated). This confirms that physical circumstances related to pumping in Grand Lake, at least, partially limit the possibility of eutrophication because pollutants are stripped out of the Lake instead of mixing. It also confirms that the DEIS may be looking at the wrong problem, using incorrect assumptions about mixing, and drawing faulty or misleading conclusions about impacts. Given this, the proposed mitigation to continue participation in ongoing Nutrient Studies in the Three Lakes system is meaningless.

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Comment. In the surface water quality section, the statement “Windy Gap Reservoir is a small in channel reservoir and would have water quality similar to that of the Colorado River; therefore it was not evaluated separately” is unsupportable; monitoring on the reservoir was only begun in earnest in 2008. Windy Gap Reservoir slows and heats discharges from both the Fraser and Colorado Rivers, promoting the growth of algae and vast amounts of aquatic plants. In addition the contributions of migratory and summer populations of water fowl are at this time unknown. The effects to water quality from these influences can only be negative, and warrant further study and separate consideration. (An example of this is the low dissolved oxygen values mentioned below Windy Gap on p 3-66).

Section 3.8.1.3 West Slope Affected Environment

Page 3-66

Comment. The didymo (rock snot algae) also has effects on irrigators and water diverters because it plugs their pumps and intakes. The (Spaulding 2007) cite is not included in the references.

Comment. The statement “Colorado River water is generally of good quality throughout the study area” was grafted from p21 of the Stream Water Quality Technical Report and *refers to water quality data presented for the Colorado River below Baker Gulch, a site on the Colorado located in Rocky Mountain National Park that is of exceptional water quality and is not representative of conditions in the study area.* Data for the Baker Gulch site is presented on p16 of the Stream Water Quality Technical Report and in the cases of specific conductivity, dissolved oxygen, pH, ammonia, nitrate and nitrite, sodium, manganese, and selenium, nearly all of the upper range values are considerably lower than any reported in table 3-23 of the DEIS, and some of the ranges are entirely below those reported in 3-23.

This statement and presentation of the water quality data from that site as being representative of the whole region or even as being inside the study area is deliberately misleading. The statement should read that Colorado River water quality is quite variable throughout the study area.

Comment. While it is the convention of sanitation plants and associated permits to use the units of gallons per day or per minute, these units are inconsistent with the cubic feet per second and acre feet per year units used elsewhere in this document, making this section unintelligible.

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Comment. The Three Lakes Water and Sanitation District should be included in the listing of dischargers to the Colorado River here, and their effluent should be considered a part of the water quality modeling if it was not, as it will be included in the total Windy Gap nutrient load that is returned to the Three Lakes.

Page 3-67

Comment. Figure 3-29. As discussed above, water temperature standards are currently being exceeded. The Proposed Action will make things worse.

Comment. Table 3-26. Water Quality standards are not being met for Granby Reservoir for: dissolved oxygen; chronic summer temperature; and manganese.

Page 3-68

Comment. Table 3-24 for Willow Creek water quality demonstrates that water quality in the study area is variable and quite different from that of Baker Gulch, which has better water quality in nearly all parameters than that of Willow Creek.

Comment. A hard look requires an analysis of the impacts of pumping on the Three Lakes paying particular attention 1) to how the WGFP will reduce flexibility in the system to turn off pumping to stop the export and feeding of algae blooms in Shadow Mountain Reservoir to Grand Lake, 2) to how pumping to optimize nighttime energy consumption when power costs are low and daytime releases through the Adams Tunnel to maximize revenues from energy generation influences water quality.

Comment. For the section including surface water quality and the Three Lakes region, please discuss the fact that 1) the west slope water bodies are more productive than the east slope water bodies (higher chlorophyll α), and 2) the west slope water bodies produce bluegreen algae where the east slope do not. Please include in this discussion 1) why this might be, 2) and what these circumstances mean operationally for the system, and 3) what special challenges they pose to operating in a fair and equitable manner on both sides of the Continental Divide.

Page 3-74

Comment. Grand Lake is not only the largest natural lake in Colorado, it was specifically protected by Senate Document 80 as a primary purpose of the CB-T project: 2. To preserve the fishing and recreational facilities and the scenic attractions of Grand Lake . . ." (emphasis added). "Preserve" is defined as

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1. To keep safe, as from injury or peril: PROTECT. 2. To maintain unchanged. 3. To keep or maintain intact. Webster's II New College Dictionary (1999).

The DEIS demonstrates that water quality has not been preserved in Grand Lake. Instead it has been degraded. The DEIS needs to analyze the alternatives beginning with this key existing problem. The DEIS should explain whether and to what extent the WGFP will "preserve" the water quality in Grand Lake, or whether pumping more polluted water from the Colorado River into Lake Granby, through Shadow Mountain, and into Grand Lake will exacerbate the existing water quality concerns.

Comment. Please update the discussion of dissolved oxygen in Shadow Mountain Reservoir to include what we know to be true, that dissolved oxygen standards are regularly exceeded in the southern end of the reservoir, also updating your table, and especially including a thorough discussion and consideration of the impacts to water quality beyond the mere statement that "Low DO concentrations can be a concern because of the potential release of orthophosphate, ammonia, iron, and manganese from the sediments under anoxic conditions."

Comment. Algae and Trophic State. The statement "All microcystin results received through July 24, 2007 for Shadow Mountain Reservoir have been below the detection limit" tells a partial truth because it stops short of the date for which we do have a value above the detection limit. Results for 8/6/2007 indicate a microcystin toxin value of 1.15 micrograms per liter by ELISA in Shadow. While HPLC results do not corroborate this value, it is not certain that they would, and in any case would likely have required sample concentration techniques, the need for which were unknown at the time. As such, the ELISA value, while acknowledged to be subject to false positives, is the best value we have from the time and should be mentioned with explanation of its limitations.

Comment. Algae and Trophic State. If Ms. Leiberman's data is used, 7.3 micrograms per liter of chlorophyll is an inaccurate average, and peak concentrations have risen to 28 micrograms per liter, or nearly double the value cited here. Nonetheless, a value of 7.3 micrograms per liter does not define the lake as mesotrophic, but rather places it on the meso/eutrophic boundary. Using Ms. Leiberman's averages instead for 1, 5, or 1-5 meter sample collections puts the lake squarely in the eutrophic category, which is unacceptably degraded over pre-Windy Gap and especially pre-C-BT values. Please see comment regarding Jahnke, 1981 document in Lake and Reservoir Water Quality Technical Report section.

Comment. Nutrients. "No recent bioassays have been conducted to determine if this situation has changed." is untrue. Davine Leiberman has completed her three year study

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on the Three Lakes and from my understanding the final report has been submitted to Northern. Data from this report is new, more thorough than what was provided previously to the EIS process, and should be brought to bear on the document.

Comment. **Grand Lake.** “The residence time...is short due to the operation of the C-BT Project and varies according to operations.” This cannot be true for the entire volume of the lake, particularly with the strong stratification that is acknowledged to occur during the summer. Please see comments on p3-93. Again we have a case where it is very inappropriate to use an averaged value, in this case residence time, to represent such a complex system with any degree of accuracy.

Discussion of microcystin toxin in Grand Lake is improved over the PDEIS but still leaves out ELISA value of 1.48 ug/L for 8/6/2008. This value is potentially more reliable than the HPLC values which most likely require concentration of the sample, concentration that did not occur, before they can accurately be relied upon for quantitative values, if at all. Though the ELISA is susceptible to false positives, far better to state this than to omit a potentially significant value. In addition a concentration of 0.19 ug/L was detected in the lake on 8/20/08, and a Grand Lake homeowner’s tap checked in at 0.19 ug/L on 8/14/07.

Comment. The section on clarity notes that Grand Lake clarity has varied between 1.8 meters and 5.6 meters. The 5.6 meter Secchi depth measurement is the second best measurement ever documented on Grand Lake (second only to Pennak's 9.2 meter measurement in 1941). That data was taken in November of 2006, at a time when water temperatures had cooled, summer algal blooms had died off, and C-BT pumping had ceased three weeks earlier to facilitate the draw-down of Shadow Mountain reservoir for weed mitigation. Only East and North Inlet stream flows were providing water to Grand Lake during that time period. These circumstances serve to highlight the fact that pumping schedules and seasonal algae blooms have a very substantial effect on water quality especially in terms of clarity.

Section 3.8.2.2 Regulatory Requirements

Page 3-86

Comment. The need for a 401 Certification from the State of Colorado as part of the 404 permit and an anti-degradation review by CDPHE are noted. However, in spite of conclusions throughout the DEIS regarding exceedances of water quality standards, the DEIS analysis is not consistent with the approach used by CDPHE for evaluating compliance with standards or the anti-degradation review. The DEIS typically considers median water quality values and average flow conditions, which is not the approach

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CDPHE uses for determining compliance with standards (5 CCR 1002-82) or in an anti-degradation review (5 CCR 1002-31.8(3)). The DEIS is inadequate to form the basis of the 404 permit.

Pages 3-87 and 3-88

Comment. The requirement to obtain a 404 permit applies to alternatives that construct reservoirs in waters subject to the jurisdiction of COE.

Section 3.8.2.3 Method for Effects Analysis

Page 3-93

Comment. The representation of flow down the Adams Tunnel as coming entirely from the epilimnion is incorrect. For this concept we are working from a diagram found in a Reclamation document entitled “Hydraulic Lab Report Number 151: Model Studies of the Alva B. Adams Tunnel Inlet Control Structure...” dated September 21, 1944. Some of what follows is contingent on this diagram accurately representing or at least approximating the actual structure of the current Adams Tunnel Inlet.

According to this diagram, the inlet mouth is about four feet high, spanning a distance from roughly 7.4 feet to 12 feet below water surface, calculated from the top possible elevation of the water surface. The location of the Adams Tunnel inlet between the North Inlet and the East Inlet is ideal for maximizing capture of the clean water that flows into Grand Lake from these two very pure rivers. In addition, we believe that the elevation of the Adams Tunnel inlet structure is well placed to “high grade” (to borrow a term from mining) the good quality water that flows into Grand Lake for much of the summer.

In the spring after ice-off the lake turns over and is well mixed. Stratification begins immediately, and an epilimnion, metalimnion and hypolimnion begin to develop. During May, June and possibly all of July (depending on the time of ice off), these layers are thin enough that the water flowing into the inlet is either derived entirely from the mixed waters, the diluted hypolimnion which at this time of year has desirable water quality roughly the same as the mixed waters, or from the very high quality metalimnion, into which we believe the rivers flow once stratification has become established. It is not until roughly late July or early August that the epilimnion has become wide enough (about 4 meters or 16 feet at that time of year) that it is finally able to span the entirety of the Adams Tunnel mouth. At this time all of the water flowing down the Adams Tunnel does appear to be coming from the epilimnion, which is believed to be composed almost entirely of the poorer quality water pumped in from Shadow Mountain Reservoir. From late July or early August, until fall turnover in either October or November, sediment and

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algae laden water from Shadow Mountain Reservoir is thought to spread out over the entire epilimnion, some of which is siphoned off by the Adams Tunnel.

At the time of fall turnover, Grand Lake is capped with a layer of low transparency, high algae and sediment content water. When turnover occurs, this load is incorporated into the whole of Grand Lake, and again the diluted mixed waters are made available to the Adams Tunnel. The flow down the Adams Tunnel is composed of water from Shadow Mountain Reservoir only about three months out of the year, rather than six.

The continual loading of the epilimnion in summer, as well as of the entire mixed water body in winter, year after year, can only mean that Grand Lake has had to arrive at, or continues to approach, a new equilibrium which reflects those undesirable contributions from Shadow Mountain Reservoir. This is evident, among other indicators, in reduced clarity, increased algae growth, and the formation of a significant delta at the channel entrance.

Pages 3-104 and 3-107

Comment. The argument is made that increased pumping will decrease residence times in the three lakes, thereby reducing impacts from increased nitrogen concentrations. This argument appears to be erroneous at least for Grand Lake, but probably also for Granby Reservoir, when according to Davine Leiberman's 2008 study, algae blooms persist in Grand Lake even when pumping is high and flushing rates increase to within the range of days.

Section 3.8.3 Cumulative Effects

Page 3-115

Comment. Pine-bark beetle infestation and climate change must be considered as part of the cumulative impacts for lake and reservoir water quality report and for stream water quality.

Comment. The use of one day of July 25th as a worst case scenario makes no sense.

Section 3-8.3.1 West Slope Cumulative Effects

Page 3-121

Comment. Granby Reservoir. "Phosphorus concentrations would be lower than in the direct effects analysis due to anticipated advanced wastewater treatment in the Fraser

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River basin in the future.” If the analysis of phosphorous concentrations in the DEIS is based on the assumption that treatment plants will be upgraded, then the Carriage Contract must be conditioned on such upgrades being constructed by the applicant for the predictions about phosphorous to be accurate.

Comment. There is no discussion of how the possible consecutive dry year reduction in water levels of up to 44% from the mean depth of 74 meters, 15% difference from the maximum depth (p3-53 WGFP DEIS), will influence water quality. Repeated freezing and thawing of exposed sediments is likely to increase nutrient and potentially metals loading in the reservoir which is not accounted for in any way.

Section 3.9 Aquatic Resources

Comment. The conclusions in the Aquatic Resources section are based on the information contained in the Aquatic Resources Technical Report dated July, 2008. The conclusions brought forward into the DEIS are inaccurate because of the many problems with that technical report. Please refer to the *Wyatt Memorandum*, Exhibit C for a detailed discussion of the inadequacies of the aquatic resources impact assessment. In addition, all of the conclusions about impacts to aquatic resources are called into question by the failure to use existing conditions to measure the significance of stream depletions. See General Comments Section, above.

Comment. This section should refer to Grand County’s Stream Management Plan. See comment under Chapter 5, below.

Page 3-137

Comment. The reduction of 24% habitat for fishery is significant and is likely to be far more significant if the impacts were measured against actual *existing* stream flow conditions. See General Comments Section above.

Section 3.9.3 Cumulative Effects

Comment. Senate Document 80, the document that controls operation of the C-BT, states that one of the primary purposes of C-BT is “[T]o preserve the fishing and recreational facilities and the scenic attraction of Grand Lake, the Colorado River...” As part of discussion of the cumulative effects, there should be a discussion of whether fishing and recreation actually have been preserved under current conditions. The DEIS also should make reference to the 1951 report prepared by the US Fish and Wildlife for Reclamation which detailed the devastating effects of Granby Dam on the Colorado River. We are aware of two scientific assessments of the stream reach below Granby

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Reservoir the 1951 United States FWS report and the Grand County Stream Management Plan. Exhibit G attached shows comparisons of the flows below Granby Reservoir. There is no assessment whether existing bypass flow requirements below Lake Granby and Windy Gap are appropriate for protection of the environment or whether prolonged durations at those flow levels as a result of WGFP alternatives will have an adverse impact.

Section 3.9.4 Proposed Mitigation

Page 3-145

Comment. The discussion of mitigation of impacts to aquatic resources is inadequate.

Section 3.13.2.2 Methods for Effects Analysis

Page 3-195

Comment. If the original Windy Gap was purported to divert an average of 56,000 af why is only 18,779 af of average depletions being paid for under the Fish and Wildlife Service Programmatic Biological Opinion for recovery of endangered fish?

Section 3.18 Land Use

Page 3-216

Please see attached *Coley/Forrest Memorandum*, Exhibit F pg 7 section 1.6, and page specific comments at pg 28 section 2.1 for a complete discussion of the problems with the land use impact assessment.

Section 3.19 Recreation

Page 3-230

The discussion of impacts to recreation is inadequate to satisfy the “hard look” test. Please see attached *Coley/Forrest Memorandum*, Exhibit F pg 9 section 1.7, and page specific comments at pg 29 section 2.2 for a complete discussion of the problems with the recreation impact assessment.

Section 3.21 Visual Quality

Page 3-265

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The discussion of impacts to visual quality is inadequate to satisfy the “hard look” test. Please see attached *Coley/Forrest Memorandum*, Exhibit F pg 24 section 1.8, and page specific comments at pg 33 section 2.3 for a complete discussion of the problems with the visual quality impact assessment.

Section 3.22 Socioeconomics.

Page 3-272

The discussion of socioeconomic impacts is inadequate to satisfy the “hard look” test. Please see attached *Coley/Forrest Memorandum*, Exhibit F pg 25 section 1.9, and page specific comments at pg 35 section 2.4 for a complete discussion of the problems with the socioeconomics impact assessment.

Chapter 5 References

Comment. The DEIS fails to consider or discuss *Grand County’s Stream Management Plan, Phase 2, Environmental and Water Users Flow Recommendations*, April 2008 and mitigation.

Grand County has been involved in an ongoing effort to provide a scientific study for the analysis and recommendation for preferred flow regimen for streams and rivers in Grand County. Phase 2 of that study focused among other things on an environmental flow regimen “determined to best maintain the ecological needs of the stream in relation to fisheries.” *Grand County’s Stream Management Plan, Phase 2, Environmental and Water Users Flow Recommendations*, April 2008, ES-1. (“GCSMP”). The GCSMP has been and is still on the Grand County website. Although the DEIS was completed months after Phase 2 of the GCSMP, the DEIS does not cite this study as a reference or discuss the findings and recommendations for environmental flows. The DEIS needs to be supplemented to include the information from the GCSMP and to include a discussion of potential mitigation measures developed in the GCSMP.

The stream reaches that are affected by the proposed alternatives included in the GCSMP are:

- CR3, Colorado River – Granby Reservoir to Windy Gap.
- CR4, Colorado River – Windy Gap to Williams Fork.
- CR5, Colorado River - Williams Fork to KB Ditch.

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- CR6, Colorado River - KB Ditch to Blue River Confluence.
- CR7, Colorado River - Gore Canyon to Grand-Eagle County Line.
- WC, Willow Creek – Willow Creek Reservoir to Colorado River.
- BR, Blue River - Green Mountain Reservoir to Colorado River.

We would look forward to a meeting to discuss these concerns at any time.

Sincerely,

Barbara J.B. Green

cc: Board of County Commissioners of Grand County
Lurline Underbrink Curran
J. Scott Franklin (via email: j.scott.franklin@usace.army.mil)
Deborah Lebow-Aal, EPA

EXHIBIT LIST

Exhibit A

List of Grand County comment letters on WGFP Technical Reports

Exhibit B

Report on Windy Gap Firing Project Hydrology Technical Report, by Bishop-Brogden Associates (*BBA Report*)

Exhibit C

Memo, *Windy Gap Firing Project DEIS Aquatics Resources Technical Report*, by Lane Wyatt (*Wyatt Memorandum*)

Exhibit D

Table, *Windy Gap Ownership and Transfer History*.

Exhibit E

Letter dated March 22, 2004 from the Colorado River Conservation District, Grand County and Northwest Colorado Council of Governments to Richard Aldrich and John Chaffin (p 21)

Exhibit F

Memo, *Windy Gap Firing Project - Draft Environmental Impact Report (DES 08-30)*, by Coley/Forrest (*Coley/Forrest Memorandum*)

Exhibit G

Table Comparing Flows Below Granby Reservoir

EXHIBIT A

Grand County submitted comments on the technical reports prepared for the EIS, as follows:

- comment letter dated January 31, 2007, on Draft Water Resources Technical Report dated November 2006;
- comment letter dated February 28, 2007, on Draft Geology and Soils Report, Draft Wildlife Resources Report, Draft Cultural Resources Report, Draft WGFP Technical Report Appendices, Draft Modeling Report Addendum, and Draft Vegetation Report;
- comment letter dated February 11, 2008, on Draft Aquatic Resources Technical Report dated November 2007;
- comment letter dated February 11, 2008, on Draft Lake and Reservoir Water Quality Technical Report dated December 2007;
- comment letter dated February 11, 2008, on Draft Recreation Resources Technical Report dated November 2007;
- comment letter dated February 11, 2008, on Draft Socioeconomic Resources Technical Report dated November 2007;
- letter dated February 11, 2008, transmitting comment report prepared by Coley/Forrest on Draft Recreation Resources Technical Report and Draft Socioeconomic Resources Technical Report;
- comment letter dated February 11, 2008, on Draft Stream Water Quality Technical Report and Stream Water Quality Modeling and Methods Report, both dated December 2007; and
- comment letter dated February 11, 2008, on Draft Three Lakes Water Quality Model Documentation dated December 2007.



BISHOP-BROGDEN ASSOCIATES, INC.

Michael A. Saylor
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Jeffrey A. Clark
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December 23, 2008

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Peter Fleming
Colorado River Water Conserv. Dist.
P.O. Box 1120
Glenwood Springs, CO 81602

RE: Concerns and Comments on the Windy Gap Firming Project DEIS

Dear Barb, Dave and Peter:

This letter report provides a summary of our primary concerns and comments regarding the water resource aspects of the Draft Environmental Impact Statement (DEIS) for the Windy Gap Firming Project (WGFP), dated August 2008, and the potential impacts to the upper Colorado River basin. We have reviewed this report on behalf of our clients Grand County, Colorado and the Colorado River Water Conservation District. For purposes of this letter report, we have reviewed the DEIS in general (dated August 2008), but have focused our review on the Water Resources Technical Report (WRTR) and Technical Report Appendices, dated December 2007. We have also reviewed prior drafts reports, supporting engineering or technical reports, records of the Colorado State Engineers Office, published information, information in our files and information available on-line.

This letter report presents an overall summary of our concerns with the information presented in the DEIS and its overall conclusions, followed by detailed comments regarding the Water Resources Technical Report. This letter report also presents a summary of recommended mitigation measures that should be included in any permit approval associated with an Action Alternative for the WGFP.

Overall Principal Concerns

We believe that both the analysis and the overall conclusions of the DEIS are flawed. The DEIS derives its conclusions based on inaccurate modeling and inappropriate methodology. This conclusion regarding the DEIS flaws is based on the following primary concerns:

1. The DEIS does not accurately portray the effects of prior water diversion projects in the Upper Colorado River basin. An EIS analysis is intended to compare the proposed actions to the past, current and future environmental conditions. The upper reaches of the Colorado River in Grand County have been heavily depleted by existing water development projects. The information contained in the DEIS is insufficient to present an accurate representation of the changes in hydrology that have occurred over time.

The table below presents a summary of the historic water development projects as they have affected the native and remaining streamflows. As the table shows, the current average annual streamflow volume at the Hot Sulphur Springs streamgage (USGS Gage No. 09034500) is approximately 26% of the historical native supplies. With the projected depletions from the WGFP, coupled with the foreseeable action of the Moffat Expansion Project, the remaining streamflow will be approximately 17% of the historical native supplies. Figure 1 below shows similar information presented as the average annual hydrographs before and after the development of key water diversion projects. This figure also compares the actual existing hydrology from the USGS gaging stations following completion of the Windy Gap Project to the average streamflow for the five “Dry Years” used in the DEIS. As can be seen on Figure 1, the actual existing average streamflow hydrology is very close to the Dry Year average flow compared to historic flow conditions. The DEIS does not present any substantive information beyond Figure 5 (page 19, WRTR) to represent the true past and present conditions for comparison to the projected depletions. The projected depletions from the WGFP, as well as the proposed Moffat Expansion project, will further deplete the remaining streamflows such that this section of the Colorado will be approach a ‘dry year’ in a majority of the years in the future.

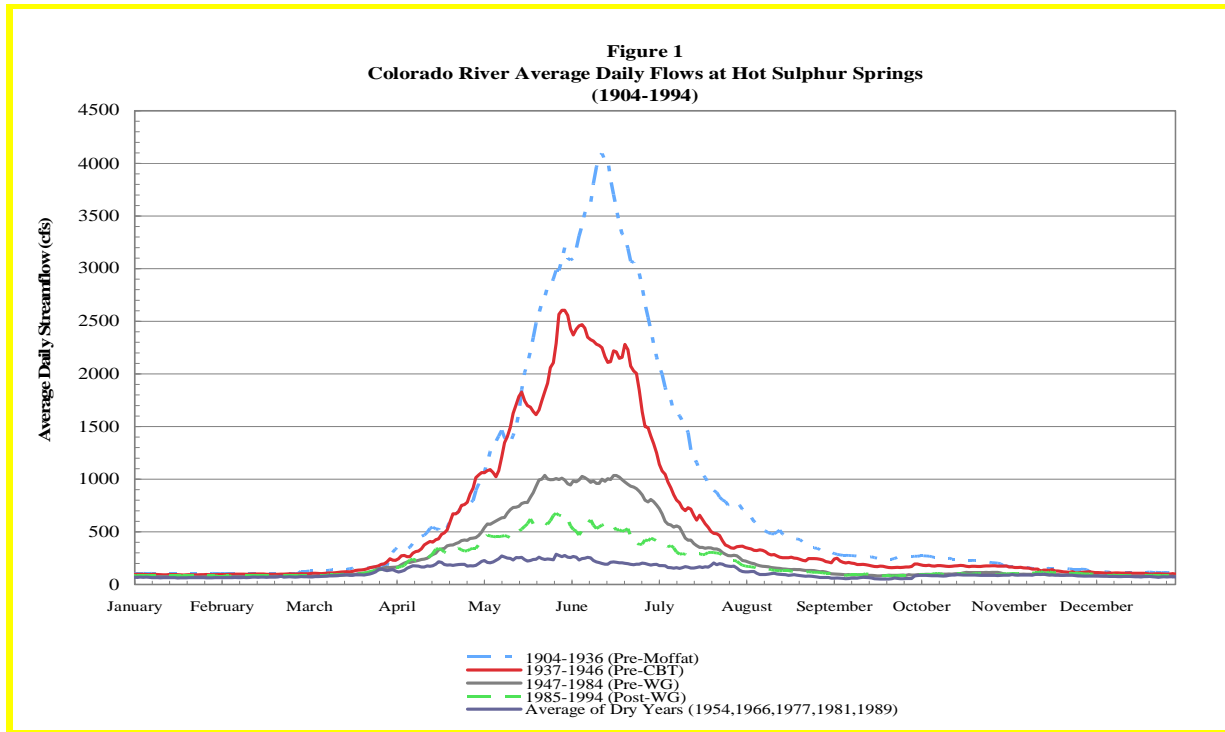
Summary of Colorado River Streamflow and Diversions

Colorado River at Hot Sulphur Springs, CO

	Approx Avg Annual Flow Volume (ac-ft)	Remaining Avg Annual Flow (ac-ft)	% of Native Flow Volume Remaining	Notes
Native Flow	540,000		100%	Colorado River flow at Hot Sulphur Springs from 1904-1936 (pre-Moffat, adjusted for approximate Grand River Ditch diversions).
Grand River Ditch	18,500	521,500	97%	Based upon CDSS recorded annual diversions from 1975-2007.
Moffat Diversions	57,000	464,500	86%	Based upon Denver Water diversion records at the East Portal from 1975-2006.
CBT Diversions	228,800	235,700	44%	Based upon 1985-2005 diversions as shown in the WGFP EIS (Table 5).
CBT Evaporation	15,500	220,200	41%	Based upon 1975-2007 avg Granby content from BOR and SAC tables from NCWCD, plus full SMR, WC & WG acres
Windy Gap Grand County	11,100	209,100	39%	Based upon 1975-2004 diversions as shown in the Windy Gap Firming Project (WGFP) EIS.
Uses	1,200	207,900	39%	Based on current Grand County demands (3,100 af, UPCO 2003) with assumed 60% return flows
Current Flow	138,700		26%	Based upon SEO streamflow records at Hot Sulphur Springs (1985-1994). Note measured flows less than calculated remaining flows.
Windy Gap Firming Project	35,000	103,700	19%	Based upon projected additional future diversions projected in the WGFP EIS.
Moffat Expansion	9,300	94,400	17%	Based upon projected additional future diversions projected in the WGFP EIS.
Future Flow	94,400		17%	Equal to the current flow less additional projected diversions.

Notes: CBT evaporation is replaced at confluence with Blue River

This table may be revised with information presented in pending EIS information for the Moffat Expansion Project



2. The DEIS inaccurately represents Existing Conditions for the Alternatives Analysis. The spectrum of hydrologic effects contained in the DEIS for the WGFP (i.e. water diversions, operations, storage, releases, changes in storage and changes in streamflow) for all project alternatives are modeled by comparing the alternatives to the Existing Condition. Further, the evaluation of all water-based effects associated with an alternative, such as water quality, aquatics, stream morphology, ground water, wetlands, etc., are based on the predicted changes in hydrology. However, the DEIS presents an Existing Condition that is not accurate.

Specifically, the DEIS states that “The purpose of the Existing Conditions scenario is to model current conditions as if they occurred under the same hydrologic conditions or baseflows that existed throughout the study period (1950 through 1996).” All future alternatives are compared to the Existing Condition as shown on Table 3-2 of the EIS (Table 18 WRTR), which shows an average annual Windy Gap (for both WGFP participants and non-participants) diversion of 36,532 acre-feet (af). This presentation of the Existing Condition is contrary to Table 3 (WRTR) which states that the Windy Gap project historic diversions since construction have averaged 11,080 af per year (1985-2005). This level of historic diversions of the Windy Gap project correspond with the CDSS diversions records, which show average annual diversions of 11,987 af.

Based on the text of the WRTR, it appears that the model used indicates diversions of Windy Gap water into Granby Reservoir even though it may spill in upcoming months. However, it is impossible to tell from the results presented in the DEIS for a comparison of how much water is later spilled versus how much is diverted to the Windy Gap users directly or into storage for later delivery. Based on the total average flow quantification upstream and downstream of Windy Gap, it appears that, on average, the flow in the Colorado River will be depleted by 36,532 af/year – indicating that this number is inclusive of Granby spills. Based on this information, the Existing Conditions number used in the DEIS overstates the actual existing conditions by over 300%, and therefore understates future depletions by 25,452 af/year.

Further, the model indicates that there are three nodes, or points of quantification, upstream of the Windy Gap diversion dam (Colorado River above Windy Gap); Colorado River below Lake Granby,

Willow Creek at the confluence with the Colorado River and Fraser River at the confluence with the Colorado River. However, the sum of these three nodes under the Existing Conditions is approximately 19,200 af/year less than the indicated flow at this location. The sum of these three nodes should be nearly identical to the flow available at Windy Gap (allowing for some minor local inflows or diversions).

The Technical Appendices to the WRTR presents the modeled average streamflow at various locations. Table D-16 shows the average monthly streamflow for Average, Dry and Wet conditions at Hot Sulphur Springs. We compared the 'Existing Conditions' average monthly streamflows (1950-1996) to the USGS streamgage data for this same location (1950-1994), and note several significant differences:

**Comparison of Modeled and Actual Average Monthly Flow
Colorado River at Hot Sulphur Springs**
(all values in cfs)

Data Source	April	May	June	July	Aug	Sept	Oct	Nov	Annual
USGS Gage	276	664	793	403	152	90	96	93	256
DEIS Model	146	278	953	482	170	87	87	83	216

DEIS flows from WRTR Table D-16 for Existing Conditions
USGS data for Colorado River at Hot Sulphur Springs (No. 09034500)

This table indicates that the streamflow used in the DEIS for Existing Conditions is significantly lower in most months than the actual hydrology at this location. This also indicates that, on average, the modeled streamflow is 40 cfs less than the actual streamflow. Thus, the DEIS understates the actual effects of the action alternatives.

For these and other reasons described herein, we believe that the alternatives comparison methodology is flawed and inaccurately represents the effects from the proposed project.

3. The DEIS modeling does not accurately represent the impacts associated with the WGFP

3.1. Model Time-Step We have significant concerns regarding the model time step used to evaluate West Slope impacts as described in DEIS. We believe that it is inappropriate to use a detailed daily model to evaluate the projected new water yield from additional facilities and additional diversions under the WGFP, and then use an independent, monthly model to evaluate the hydrologic effects to the source area of the water supplies. In Colorado, water rights are typically administered on a daily basis. As a result, the upper Colorado River basin can experience dramatic flow changes due to daily changes in both natural conditions and water administration, as well as the operations of several large-scale water facilities within the modeling area. For example, a Shoshone Powerplant 'call' coming on or off within a month may result in significant changes in streamflow that would not be accurately represented by a monthly time-step.

Currently, there are four other EIS documents being prepared or under review associated with Federal permit applications for major water projects in Colorado;

- NCWCD's NISP Project
- Denver Water's Moffat Expansion Project
- Fort Collins/Greeley's Haligan-Seaman Enlargement Project, and

- Colorado Springs Utilities' Southern Delivery System (SDS)

Three out of these four projects, the Moffat, Haligan-Seaman and SDS projects, are being evaluated using a daily operations model. Only the NISP project, also being initiated by NCWCD, uses a monthly model to evaluate effects.

The Moffat Project and the WGFP both propose additional diversions from essentially the same source; the Fraser River (since Colorado River flows above Windy Gap are largely captured by the Colorado-Big Thompson (CBT) project). Further, the depletions from both projects affect essentially the same general area and stream segments, aquatic environment, recreation, water quality, etc. In our opinion, it is both inaccurate and inappropriate to use a monthly model, when a daily model already exists for the exact same study area (DW's PACSM model, which was also originally constructed by Boyle Engineering). For this and other reasons described herein, we believe that the effects from both projects should be considered together using the same daily model.

- 3.2. Model Study Period We also have significant concerns regarding the modeling period used to evaluate WGFP effects (1950 – 1996). We recommend that any model used to evaluate the effects of the WGFP should include hydrologic and water operations data up through at least 2005. The drought during the early part of this decade, which we may still be suffering from, is well-documented as being the most severe on record at many locations. We understand that during single drought years, such as 2002, the WGFP may not have been able to divert (although this may not be true in the future due to the Shoshone call relaxation agreement discussed below), however the record-low streamflows in 2002 can have carry-over effects on water operations, water storage, water administration, water quality, recreation and other aspects of the WGFP. The dramatic changes in water operations and water supplies in the years following 2002 are an example of why this period needs to be included in the assessment of impacts. For example, the four highest total annual diversions for the Windy Gap project occurred in the years immediately following 2002; 2003, 2005, 2006 and 2007. This is likely due to significantly increased demand for water to refill Windy Gap users' reservoirs, coupled with significant storage space available in general and, in particular, in Lake Granby. This may also be partially due to the fact that in 2002 the CBT project was unable to deliver its annual "Quota" to its shareholders for the first and only time in the 60-year history of the project. As the operations of the Windy Gap project are intertwined with CBT operations, these significant modeling events need to be included in any analysis of effects. For example, the end of month storage records for Horsetooth Reservoir, a CBT project reservoir, show that it reached the lowest monthly levels of all-time in 8 of the 12 months in 2002 in 2003. This is likely a component of the record diversions of the Windy Gap project in 2003. Further, many streamgages in the upper Colorado River basin, including the WGFP modeling area, recorded the lowest streamflows ever during this time period. In particular, 2002 and/or 2004 are in the "Top 5" driest years at several locations throughout the basin of impact, and should be modeled as part of their dry-year averages (see table below). Any evaluation of effects to streamflow, water operations, water quality, stream morphology, recreation, etc. may be significantly inaccurate without considering this data.

We also note that the model relied upon for West Slope impacts, CRDSS, has been extended to include 2005 data and is presently available.

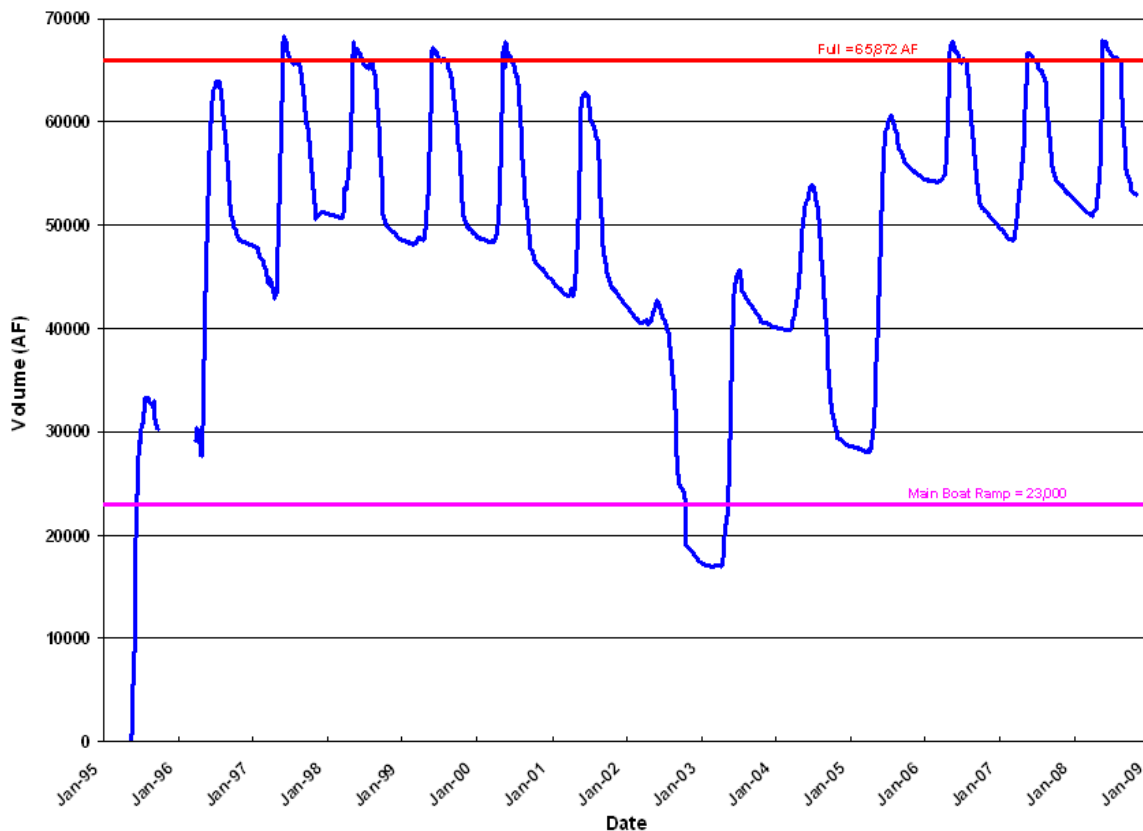
Colorado River High/Low Annual Streamflow Comparison 1950 - 2005

1950-2005		1954-2005		1962-2005		1950-2005	
Fraser at Winter Park		Colorado blw Baker Gulch		Colorado nr Kremmling		Colorado nr Dotsero	
Top 5 Wettest							
Year	Total AF	Year	Total AF	Year	Total AF	Year	Total AF
1984	34,081	1984	79,294	1984	1,772,380	1984	3,064,944
1957	33,045	1983	77,719	1983	1,321,769	1983	2,394,818
1995	32,595	1997	77,054	1997	1,260,346	1997	2,370,025
1983	31,712	1995	72,782	1962	1,239,785	1957	2,338,400
1996	23,256	1986	66,978	1996	1,141,010	1962	2,332,556
Top 5 Driest							
Year	Total AF	Year	Total AF	Year	Total AF	Year	Total AF
1966	5,017	1977	25,856	1964	418,582	1981	850,017
1964	4,706	1989	25,712	1981	406,927	2004	829,383
2002	4,617	1981	22,787	1963	401,375	1954	803,510
1963	4,557	1954	20,353	2004	373,800	1977	766,998
1954	4,011	2002	18,063	2002	362,861	2002	626,028

The years highlighted in yellow are NOT included in the WGFP modeling for these locations.

Another example of the effects of the 2002 drought sequence is shown by the storage levels of Woford Mountain Reservoir (WMR). This reservoir came on-line in approximately 1995, but was “turned on” for the entire period of record in the DEIS model in the Future Conditions model. The chart below shows the total storage volume for WMR since construction, and clearly shows a dramatic drop in storage levels in 2003 - 2005. It is not clear if and how such operations were modeled in the DEIS. By extending the model period, it would capture all of the known operational data during this extreme event.

Wolford Mountain Reservoir Historic Volume



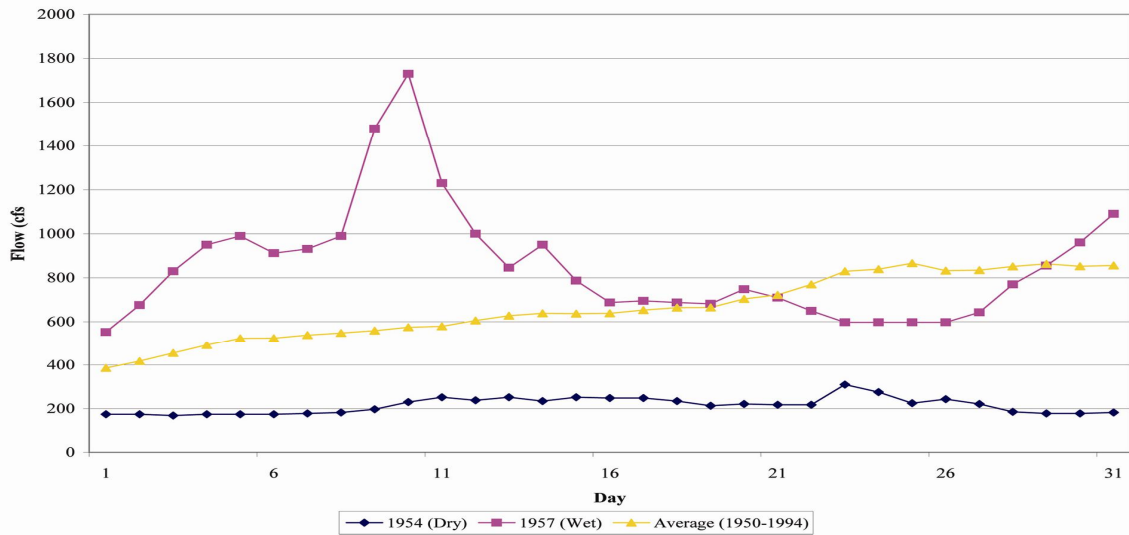
Source: Colorado River Water Conservation District

3.3. Disaggregation of Daily Flows The methodology used to estimate daily changes in streamflow is flawed and inaccurate. This is due to the fundamental assumption regarding the use of the daily disaggregation factors to evaluate effects. The WRTR states that “absent any flow changes due to the WGFP, the historical relationship between daily and total monthly flows should apply to total monthly flow estimated by the model.” However, the report later concludes that annual streamflows may be reduced by as much as 157,000 af/year (WRTR Table 32); presumably this reduction would occur during the months of May through July. The report also states that the monthly streamflow at certain locations may be increased by up to 25% and reduced by as much as 37% (Section 8.6). These changes projected by the model represent a dramatic alteration of the existing hydrologic record, and should not be relied upon as an accurate means of predicting daily changes in streamflow.

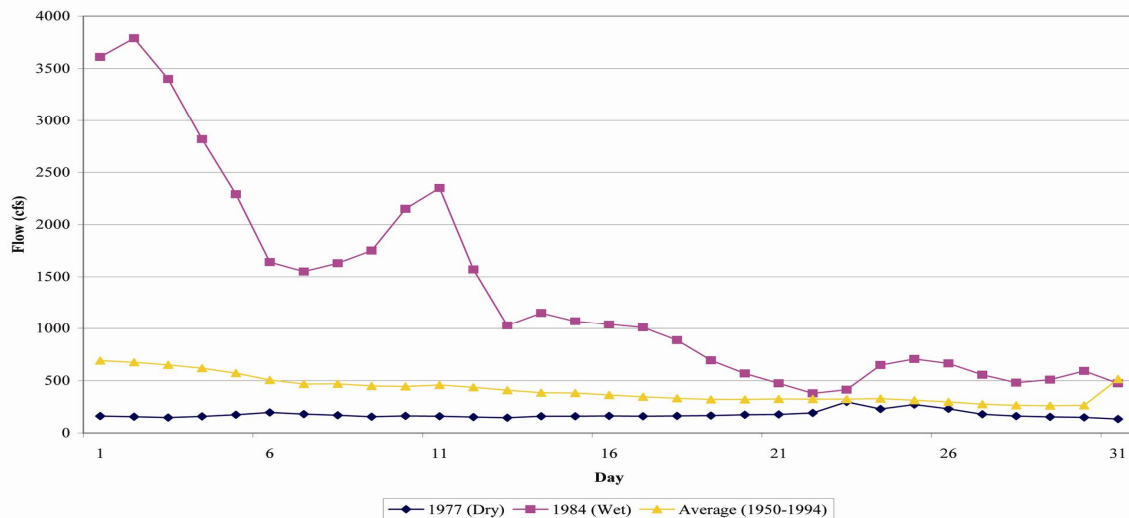
It is our understanding that the creation of daily flows was based on disaggregation of the long-term average daily streamflow as a function of the monthly total. The flow regimes in the upper Colorado River basin are highly variable; from month to month, year to year and, in particular, subject to extreme changes from wet years to dry years. As an example, we compared the long-term average daily streamflow for the months of May and July (replicating the disaggregation factors used in the analysis) to the actual streamflow for one of the “wet” and “dry” years indicated in the modeling. As is evident on the graphs below, there are dramatic differences between the average, wet and dry conditions that are not captured by the DEIS model. Even using the modeled average monthly flows presented in Table D-14, it shows that average year flows are reduced from 472 cfs to 365 cfs in July (reduction of 108 cfs, or 23%) and wet year flows are reduced from 1716 cfs to 1265 cfs in the same month (reduction of 450 cfs, or 26%).

The dry-year flows for the same month are 127 cfs. The use of the long-term average daily flows to generate the factors to represent daily flows in all years, wet (1716 cfs), average (472 cfs) or dry (127 cfs), is inappropriate and can be highly inaccurate. In other words, the daily pattern of streamflows within a given month is not the same from year to year, even within two “average” years. This difference is even more pronounced between wet and dry years, and will result in inaccurate predictions of daily flows. For these reasons, we believe that the application of the disaggregation factors can be highly inaccurate resulting in daily flow estimates that are flawed. As noted above, using a daily point-flow model such as PACSM would alleviate the errors from the disaggregation methodology used in the DEIS.

**Colorado River at Hot Sulphur Springs
 May Comparison of Average, Wet & Dry Daily Streamflow**



**Colorado River at Hot Sulphur Springs, CO
 July Comparison of Average, Wet, & Dry Daily Streamflow**



3.4. Granby Spills in the Model

The operation of the model is discussed in Section 7.4.1.1, page 84. The DEIS model overestimates probable actual WGFP pumping that would later spill due to a lack of a forecasting tool in the model. Windy Gap water rights, with or without the WGFP, should have little or no impact on the flows in the Colorado River immediately below the Lake Granby dam but before Windy Gap. Yet the DEIS reports that the Preferred Alternative will result in over 5,000

af/yr less flow below Lake Granby than under the No Action Alternative (the comparison should be to existing conditions). Windy Gap water is pumped in the model even when Granby is certain to spill. Since CBT spills more frequently in the No Action Alternative, there are more Windy Gap spills in the No Action Alternative. Under the Preferred Alternative, when the Windy Gap spills decrease, the flow below Lake Granby decreases. In reality, with adequate forecasting, these Windy Gap spills would be less likely to occur, and therefore the flows immediately below Lake Granby would see little change. We recommend that the model be modified to include some form of forecasting to reduce this effect. As is, the DEIS dramatically overstates the WGFP pumping and the reduction in streamflow in the Colorado River between Lake Granby and Windy Gap.

3.5 Foreseeable Actions

We believe that the DEIS fairly accurately considers future actions that can reasonably be considered foreseeable, and reports that most were incorporated into the Future Conditions model. However, the DEIS does not incorporate one of the key future conditions that we believe will have a dramatic effect on future water operations in this area and therefore needs to be included; the Shoshone Call Reduction (by virtue of DW's contract with Xcel). The DEIS does not indicate why this future condition was not included. The Shoshone Call Reduction is a long-term agreement that has been enacted since the modeling for this DEIS, and very likely will be implemented in the future. Although the implementation of this agreement may occur in principally drier years, when Windy Gap diversions may otherwise be reduced, it is still critical to include it in the model. The diversion records for the Windy Gap project for the year immediately following the 2002 drought provide a dramatic example. Prior to 2002, the highest volume pumped by the Windy Gap model was 21,896 af (1992, Table 3 WRTR). However, in the following dry year of 2003, during which the Shoshone agreement was being implemented, the Windy Gap project pumped a total of 64,200 af – nearly three times the prior maximum. Although the WRTR reports that only 7,850 af of this can be attributed to the Shoshone call reduction agreement, this amount should be included in the modeling to accurately assess the changes in both water operations and environment effects.

4. The WGFP does not provide Middle Park Water Conservancy District (MPWCD) a firm annual supply of 3,000 af. Based on the 1980 Azure Settlement Agreement(s), Northern (MSD) committed to provide 3,000 af of water **per year** to MPWCD as part of the approvals of the Windy Gap project. It is well-known that, despite the presentation of information at the time, the Windy Gap project has not been able to deliver this water to MPWCD every year. The DEIS explains that the WGFP will 'firm up' approximately 26,000 af per year to the WGFP participants based on new diversions and storage facilities, but DOES NOT proposed to firm up the original contractual commitment to the West Slope of this 3,000 af per year. Rather, the Purpose and Need statement for the WGFP states that it will "...provide up to 3,000 af **of storage** to firm water deliveries for the Middle Park Water Conservancy District" (emphasis added). The commitment of storage space is NOT the same as the firm annual delivery of water. In fact, the DEIS proposed actions result in a firm yield to MPWCD of approximately 429 af per year – only 14% of the original obligation. This is completely unacceptable. Any new project that results in the "firming-up" of water under the Windy Gap project needs to first provide 3,000 af per year to MPWCD before any Windy Gap users receive delivery of any water under the project.

5. A copy of the model needs to be made available to all interested parties. We believe that a copy of the DEIS hydrology model needs to be made available to interested parties so that a thorough review and understanding of the model and its results can be made. Such a review may eliminate some of the questions and uncertainties, or reveal areas where the model may be improved resulting in more accurate results and conclusions. We believe that any representations regarding impacts from a project of this magnitude needs to be made using a model that has been peer-reviewed and critiqued by all the major stakeholders. As discussed below, a thorough comparison of the model results from

Denver Water's PACSM related to the Moffat Expansion Project needs to be made prior to proceeding with either project.

6. The EIS analysis needs to be combined with the Moffat Expansion Project. As described in the Cumulative Effects section of the DEIS, Denver Water's Moffat Expansion Project will result in additional depletions to essentially the same source of water as the WGFP. Because the CBT project already captures nearly all of the available streamflow from the Colorado River system above Windy Gap (except for the minimum bypass flows), the vast majority of the yield to Windy Gap is derived from inflows from the Fraser River. Therefore, both projects divert from essentially the same source. Further, both projects will have cumulative effects to the nearly identical segments of the Colorado River system. Both projects will need to evaluate nearly identical hydrologic, environmental, recreational, socio-economic, etc., effects from the projects. In our opinion, it is highly illogical to evaluate both projects using completely independent methodologies. At a minimum, we believe that this EIS needs to be tabled until completion of the EIS for the Moffat Collection System such that an "apples-to-apples" comparison of the results can be made.

7. The DEIS does not address the need to modify the Lake Granby outlet structure with pre-positioning. As stated in the DEIS, the WGFP should not result in changes to the operation of the CBT project. Under the Preferred Alternative, if prepositioning is allowed, large volumes of CBT water will be stored by prepositioning in Chimney Hollow Reservoir. Any CBT water stored in Chimney Hollow will need to be accounted for as CBT water in Lake Granby to prevent an enlargement of the CBT water rights and additional new depletions to the Colorado River. As a result, if for example, there is 50,000 ac-ft of CBT water stored in Chimney Hollow, Lake Granby should reach a "paper fill" when the Lake Granby CBT contents reach approximately 490,000 ac-ft (Lake Granby's total capacity less 50,000 af). When this happens, all inflows to Lake Granby in excess of the CBT direct-flow rights should start to "spill" – as if the reservoir was physically full like it would be without pre-positioning. Therefore, prepositioning could create occurrences in the future when Lake Granby water levels will not be at the spillway, but the inflows will be in excess of the 440 cfs outlet capacity. According to the DEIS, inflows could be greater than 3,000 cfs and, in fact, have historically been over 4,000 cfs. The outlet from Granby Reservoir will need to be modified to allow for releases of this magnitude in order to prevent this excess inflow from being stored, which would constitute an enlargement of the CBT water rights, or at the very least, a retiming of inflows that would have otherwise spilled from the dam. This is the way NCWCD has modeled the Preferred Alternative; however, the modeled results cannot actually occur in the future without the modification to the outlet works a capacity of 3,000 cfs or greater.

Water Resources Technical Report – Detailed Comments

The following provides a summary of our concerns and comments regarding specific sections of the WRTR. The concerns are described sequentially with the report and reference specific pages or sections.

Page 2:

- The modeling needs to limit the operational storage capacity at both Granby and Chimney Hollow Reservoirs to the current active capacity of 465,568 af for Lake Granby.
- The DEIS needs to show how, with 90,000 af available for storage at Chimney Hollow, the operational storage targets will change for both CBT and Windy Gap water.
- Regarding the No Action alternative, the report states that "Most participants indicate that in the long term, they would seek other storage options... to firm Windy Gap water..." We

agree with this statement, that most participants will seek to find ways to firm up the Windy Gap water on their own. In fact, the original "Environment Statement" for the Windy Gap project (1981) stated "*It is anticipated that this storage requirement could be accommodated either by utilizing available storage in Granby Reservoir for longer periods and/or by utilizing East Slope storage currently owned or leased by Windy Gap participants. -- Since there is currently over 400,000 acre-feet of privately owned storage within the boundaries of the Conservancy District with only a present demand for approximately 30,000 acre-feet, it is logical to assume that the storage requirements for Windy Gap water are present without dependence upon new reservoir construction along the Front Range.*" (Page IV-68). This indicates that the overall Purpose and Need for the project, as well as the alternatives analysis are flawed, as there may be less-environmentally damaging alternatives than the ones discussed in the DEIS. The DEIS needs to thoroughly develop the No Action alternative to confirm that there is a need for this project and the alternatives presented for review.

Page 3 We recommend that the active modeling area be extended downstream to the Dotsero streamgage. This would incorporate the anticipated depletions upstream of Shoshone from projected growth in the Eagle River basin, and would allow for an evaluation of the effects from the construction of Wolcott Reservoir as a potential source for the 10,825 water.

Page 4 The first full sentence starting with "Flow changes, as a percentage of total streamflow,..." should be deleted. This presents conclusions without context and may prejudice readers of this document.

Page 9

4.2.1 We believe that the model time step produces highly inaccurate results. See our overall concerns above regarding the model time step used to evaluate West Slope impacts.

4.2.2 We believe that the modeling period does not accurately reflect changes in hydrology and any associated water-based effects, and must be extended through at least 2005. See our overall concerns above regarding the modeling period used to evaluate WGFP effects.

4.2.4 The use of disaggregation factors to predict daily flow is highly inaccurate, and the associated evaluation of flow effects is flawed. See our overall concerns above regarding the daily disaggregation factors to evaluate the effects.

Page 15, last paragraph The letter from the former State Engineer indicating that he *could* administer the CBT and WGFP system in compliance with the current decrees is misleading and does not indicate approval of this practice. Only the water court or modifications to the Blue River decree in District Court can approve the storage of CBT or Windy Gap water in new facilities. Currently, the water rights for the CBT project and the Windy Gap project are not decreed to allow for storage at Chimney Hollow and some of the other action alternatives. These rights will need to be changed in water court before water can be diverted pursuant to any of the action alternatives.

Page 16, 6.1.1.2

- The report should specify that the USGS ceased operations at the Hot Sulphur Springs gage (09034500) in 1994, but that NCWCD has maintained a gage near this site since 1989 during the summer months only. However, we note that a comparison of the records for these two nearly-identical locations have several extremely large discrepancies. If the DEIS model used data from NCWCD, it may be inaccurate.
- This section should present a significant discussion and show much more detailed information regarding the full history of streamflows and stream depletions to this region, not just the flows averages before and after CBT. See our overall concerns above regarding the presentation of historical hydrology above.

Table 2, page 21 This table shows the historical spills from Lake Granby from 1957 - 2001, which shows that there have been 15 years of spill during this time; or 1 out of 3 years on average. However, we note that Granby spilled 6 years in a row from 1995-2000, with the previous duration of 4 consecutive years. The model used to evaluate WGFP yields, which are highly vulnerable to Granby spills, only captures 2 years of the longest period of historic spills. This is another example of why the hydrology used for the modeling should be extended to include the time period up through at least 2005.

Table 3, page 22 There are differences in monthly and total annual volumes of water pumped between this table and the official diversion records maintained by the SEO as shown on CDSS. Although the differences are minor in most years, we note that there is a large discrepancy in June of 2005 (19,520 af). The DEIS needs to explain these differences.

Table 4, page 23 The table should also show the average annual number of days pumped, which is significantly less than the sum of the monthly average days. Based on the records available on CDSS, the Windy Gap project pumped approximately the same average annual volume (just over 11,000 af/year) before and after 1996 (the end of the model study period). However, the duration of pumping is significantly different for these two time periods. The Windy Gap project pumped water for an average of approximately 30 days per year during the model study period, but averaged approximately 57 days per year since 1996. This means that the project diversion season has recently been nearly twice as long as the data used in the model analysis. The model may therefore inaccurately predict the effects of pumping to the source area. This is another reason to extend the model through at least 2005 to more accurately capture both the project operations and hydrologic effects.

Figure 6, page 24 The records and calculations used to support this figure need to be provided in the DEIS.

Table 6, page 25 This table of existing Colorado River water rights is missing several large capacity ditches that divert from the upper Colorado River. The report should also include a list of water rights shown on the tabulation, and not included in the model, including the reasons they were not considered. The text on page 23 states that these water rights were incorporated into the hydrologic model, but doesn't discuss the details of how they were modeled. Previous EIS information indicated that these water rights were included in the model based on their priorities as tabulated by the Division Engineers Office. We believe that the DEO tabulation of these priorities is incorrect, as they should be administered as senior to the CBT project. Previous EIS information has also indicated that these rights would not be entitled to divert during times of Shoshone call. However, the modeling is inaccurate as these rights are currently entitled to divert due to protection from the HUP account in Green Mountain Reservoir allowing them to divert during times of a Shoshone call.

6.4.1 West Slope GW Hydrology and Quality This section makes several conclusions that are not supported by technical evidence described in the DEIS.

Table 10 (page 41) We note that 5 of the 13 WGFP Participants are also participants in the proposed NISP project. While we understand from NCWCD staff that the future water demands of these entities is more than the combined potential yield from both projects, this DEIS should provide more detailed information about the joint participation in both projects and the consequences if one or both projects are not developed.

7.1, page 59 This section states that the WGFP Participants existing demand for Windy Gap water is approximately 21,045 af/year, whereas the No Action demand is approximately 40,765 af/yr. Given that several of the participants have an immediate need for additional water and significant levels of projected future demands, the DEIS needs to state in detail why the demands will rise for all the alternatives compared to existing conditions. The demands presented in DEIS appear to be designed to meet and exceed available supplies, and not represent demands that were determined by analysis.

- The last paragraph states that “There would be some days under all of the alternatives at all three locations when flows would increase, which is due to changes in the timing of spills from Lake Granby.” Table 14 also shows percentages of flow increases below Windy Gap. This information is inaccurate and misleading, as the report also discusses in Section 7.4.1.1 (page84) that the model overestimates probable actual WGFP pumping that would later spill due to a lack of a forecasting tool in the model. This section should be modified to specifically reflect the overestimation of flow increases due to the model.
- This section also presents information about how often the streamflow doesn't change. While this is useful information, it is much more significant and appropriate to also have a thorough discussion of the flow changes during the days of pumping.
- The DEIS must include a detailed presentation of information regarding any increases in duration of minimum flow conditions at various location on the Colorado River. The Windy Gap project is subject to meeting minimum flow conditions at certain locations. The DEIS needs to report the frequency and duration of flow conditions at or below these minimums under the Existing Conditions and each of the alternatives.
- Table 14, on page 63 The title states “Colorado River at Hot Sulphur Springs and Kremmling,” but does not explain if the percent of flow changes are identical at both locations.

Page 65, 3rd paragraph from bottom This paragraph states “Therefore, under Existing Conditions and the No Action alternative, Windy Gap diversions would be limited or curtailed in most wet years.” This statement is not consistent with Tables 18 and 20. These tables show Windy Gap Adams Tunnel diversions under Existing Conditions being fairly similar in average (11,500 af) and wet (12,081 af) years. However, under the No Action alternative, Windy Gap deliveries jump from 10,910 af in average years to 29,879 af in wet years. This represents a 274% increase, which is not considered “limited.”

Page 69 This page discusses the assessment of evaporation among Windy Gap and CBT water in the reservoirs. It states that pre-positioning CBT in Chimney Hollow would be subject to a different evaporation rate than if it was stored in Granby, which is true. Table 16 shows that evaporation at Lake Granby would be reduced (418 af/yr average) between the Existing Condition and the Proposed Action, which makes sense since Granby elevation and content are both projected to be lower. However, the table also shows evaporation in Chimney Hollow increasing by only 356 af/yr. This cannot be accurate, as the gross evaporation rate at Chimney Hollow is much greater than at Granby. This section should summarize the projected evaporation of CBT and Windy Gap water separately at each facility under each alternative. Also note that the word “Hollow” is missing in the middle paragraph (which states “Long term storage of C-BT water in Chimney [sic] Reservoir...”)

Table 17, page 70 This table is incorrect, as it shows that CBT spills increase with the Proposed Action, compared to the Existing Conditions. With pre-positioning, CBT spills should decrease, so this table inaccurately represents the actual conditions if the preferred alternative is adopted. This is likely due to the lack of adequate forecasting in the model used to evaluate effects.

Table 18: This table is flawed, with the following examples:

- Based on the information provided, the total flow available above the Windy Gap diversion should be equal to the sum of the three flow nodes above it; at Colo R below Granby + Willow Creek at confluence + Fraser River at the confluence. However, under the Existing Conditions column, the sum of these flows (168,700 af) is approximately 19,200 af less than the modeled flow above Windy Gap. There may be minor inflows and some irrigation diversions between these gages, but not as much as 19,200 af/year. Similar inaccuracies are shown for the other alternatives. We also note that a similar table in the DEIS Report (Table 3-2) fails to show any data for the Fraser River, which further adds to confusion.

- Under the Existing Conditions column, the Windy Gap diversions are shown to be 36,532 af/yr, yet the Windy Gap Adams Tunnel deliveries are only 11,500 af/year. This leaves a difference of 25,032 af/yr, which is not explained in the DEIS.
- These tables (18, 19 and 20) should also show lines for Windy Gap water into and out of storage in Granby and Chimney Hollow, water exchanged between them, as well as actual deliveries through the Adams Tunnel.

Table 20

- This table is flawed for the same reasons as Table 18 and 19
- The report states that under most wet years, Windy Gap will not be able to divert under Existing Conditions due to capacity in the CBT system. This table shows average Windy Gap Adams Tunnel deliveries of 12,081 af/yr and average Windy Gap diversions of 38,512 af/yr (under Existing Conditions). However, we note that 4 of the 5 wet years modeled were actually years that Granby spilled (Table 2), and Windy Gap yield should be nearly zero. If the model used historic hydrology (and historic spills), the average diversions and tunnel deliveries under Wet years should be nearly zero. This is important because the data presented in the DEIS under-estimates the impacts of all action alternatives.

7.2

- This section of the DEIS presents conclusions regarding groundwater conditions that are not supported by any reported evidence or analysis. For the alluvial wells in the vicinity of Lake Granby, the DEIS does not present any water level mapping or inventory of wells logs for this area indicating depth and water levels compared to the reservoir. In localized areas, along the shoreline particularly near the dam, the groundwater gradient may be from the reservoir to the alluvium, in which case changes in reservoir storage may have a significant effect on the water levels in local residential wells. This may also induce a flow of lower quality water from the reservoir into relatively sterile residential wells.
- Changes in riparian alluvium of up to 6 inches may have an adverse effect on alluvial wells depending upon the duration of the changes in the groundwater elevations. The discussion in this section is also unsupported by any data or technical analysis.
- Changes in river stage can result in a change in alluvial bank-storage, which will cause lagged changes in streamflow. While the effects of this may be minimal over most stream reaches due to the limited alluvium, the DEIS needs to address this.

7.4.1.2:

- This section needs to show much more detailed information about the reductions in streamflow during projected days of pumping, not just percent of time when flows won't change. It should present the information as both numerical changes in modeled flows compared to existing flows and as a percentage change of flow during times of pumping; under wet, average and dry conditions. It should clearly show the range of maximum daily flow changes by month at various locations (from X cfs to Y cfs). It should also discuss the frequency and duration of flows at or near the Windy Gap minimum flows as a result of the project alternatives.
- Similarly with the changes in stream depth (top of page 87) due to the reductions in flow, the report should state that the depth is reduced from a depth of X inches to a depth of Y at various locations, and not just the percentage change.
- The report should address these changes in comparison to both existing flows and to historic (pre-project) flow regimes to the extent this information can be estimated.

- This section, and all other action alternatives, need to have a table similar to Table 21 showing the monthly average and maximum streamflow before and after at various locations on the East Slope. The evaluation for West Slope streams should equal or exceed the evaluation of the source area streams.

Figures 27 and 29 (page 88) The report needs to show both the Existing Conditions and the current option on the same graph to be able to compare the changes in storage.

Table 21 This is a very helpful table, however, it is only presented for East Slope streams. This is the exact type of information that would be helpful to evaluation potential impacts to West Slope streams.

7.4.2.1:

- This section is misleading regarding changes in Granby elevations. The DEIS minimizes the changes in elevations by stating that the 18' projected are much less than the existing 90' fluctuations. However, such a change represents a 20% increase over current conditions.
- Regarding the numerous domestic wells that supply water to the homes surrounding Lake Granby, this section states "is probable that much of the ground water adjacent to the lake is from topographically higher areas surrounding the lake rather than from Lake Granby." As described above, the DEIS does not present any data or analysis to support this assertion.

7.4.3.1

- This is one of the sections that appears to present conclusions regarding changes in daily streamflow, that are likely a result of the disaggregation methodology. The results in this section are erroneous, as the methodology to generate the daily flows is flawed. A daily model would produce the best results for estimating daily flow data. At a minimum, the DEIS should use varying disaggregation factors for wet, average and dry years at the various locations (instead of the long-term average factors). See our overall concerns above regarding the use of daily disaggregation factors to evaluate effects under the DEIS.
- As with other sections of this report, this section needs to present the hard-number changes in flow, averages and maximums, for both the existing and alternative conditions. For example, the text indicates that the 2-year peak flow is 923 cfs at HSS under Existing Conditions, but does not report what the projected flow will be under No Action. Rather it deflects the information by stating that the changes will only reduce the exceedance of this flow rate "less than 1 percent." Further, a change from 3.3% exceedance to 3% exceedance is a 10% change overall – not a less than 1% reduction.
- This section should also present information about the changes to the 2-year peak flow from historic conditions, as well as Existing conditions.
- Similarly with the range of channel maintenance flows (bottom page 96), the DEIS needs to present the total number of years that such events occurred during the 47-year period. This section should also compare this information to historic hydrology.

7.5.1.2 (page 104)

- As before, this section may be misleading due to the lack of "forecasting" in the model, and the resulting increase in WGF pumping and subsequent spills from Lake Granby, that would probably not occur in reality. This section should also present information regarding the change in frequency of Granby spills, as well as the average and maximum change in spill duration. For example, if you were to summarize the information on Table D-4, it appears that Lake Granby

spills would drop from 21 years (out of 47) and roughly 1,200 total days of spill down (57 days/year during spill years) to 14 years and 880 days of spill (a reduction of 2 weeks/year during spill years) under the preferred action. Further, under Table D-11, it concludes that there will a 100% reduction of spills in the months of July and August. However, the DEIS needs a comprehensive explanation of the changes to Granby spills, rather than the bits and pieces of tangential information.

- This section needs to present much more actual projected daily flow changes on an average and maximum basis, in addition to the monthly and annual averages. Similarly, what are the projected maximum daily changes in river stage (depth), in addition to the monthly averages.
- Figures 31 through 34 should also present historic hydrology.

7.5.1.3

- The current Windy Gap water rights do not allow for storage in Chimney Hollow. The participants will need to change their water rights in Water Court to allow for such storage. The fact that “There are no decreed storage limits in Chimney Hollow Reservoir” and the discussion on Granby/Chimney Hollow operations (page 110) indicate that such a change of operations is contemplated. Therefore, terms and conditions in the water rights decree may be necessary to prevent injury to other water rights.
- The discussion regarding changes in Lake Granby should also show, similar to Figures 35 and 36, the projected elevation changes during wet and dry years. Figure 37 should also show the same information for the Existing Condition to compare the proposed changes.

Sections 7.5, 7.6 and 7.7 Many of the comments from Section 7.4 (No Action) also apply to these sections. These sections needs to present much more detailed information regarding specific changes in flow and stage, duration of changes, etc., to accurately identify the impacts. Tables such as Table 24 for the East Slope streams should also be presented here.

Section 7.9 As described above, the original Windy Gap Project anticipated a firm delivery of 3,000 AF to Middle Park WCD. Any changes to the project as a result of the WGFP should fulfill the original obligation of the project, and ‘firm up’ Middle Park’s 3,000 af/year prior to any additional deliveries to the East Slope.

Section 8.2.1, page 144 This section is highly misleading regarding Urban Growth in Grand and Summit Counties. The information presented here is total projected water demands, where only a small percentage of these demands will be consumptively used. The return flows from these uses will return to the river system immediately and over the next several months. This results in an inaccurate comparison to Windy Gap or Moffat diversions – which are 100% depletive to the Colorado River system.

Section 8.3 See discussion above regarding the Shoshone call reduction in the Future Conditions model. This is a long-term agreement that very likely will be implemented in the future, and needs to be included in the modeling and comparison of alternatives.

Section 8.4.2:

- The section indicates that “downstream demands would increase in the future” (page 148). The DEIS provides no information or basis to support this assertion. We believe that it would be accurate and appropriate to state that the projected additional depletions of water upstream of these demands (from WGFP, Moffat, etc.) will reduce the water supplies to these demands, resulting in an increase in administrative calls in the future.

- Based on the information in the DEIS, it is highly unlikely that the flows at HSS will increase 25% of the time in the future. The cumulative effects section discusses the projected additional depletions upstream of this gage from the WGFP, Moffat and some minor increases in Grand County consumptive uses. This conclusion may be significantly inaccurate, and inappropriately presents the results of the project. Alternatively, this is solely a result of the lack of forecasting in the model which shows an increase in flows due to Windy Gap water that is pumped and then later spilled at Lake Granby – which is not realistic.

Section 8.4.2.2 The last full paragraph (page 151) states that the cessation of irrigation under the Big Lake ditch by Denver Water “would result in approximately 8,800 AF/year less depletion and a corresponding increase in flows on average in the Williams Fork River...” It would be helpful to present an estimate of the NET increase to the Colorado River from the reduction in consumptive uses associated with the cessation of irrigation under this ditch. This section implies that there is an increase in flows of 8,800 af/year to the river system. While this may be accurate for flows in the Williams Fork, it is not an accurate representation of flow changes to the Colorado River system. The cessation of irrigation under this ditch will result in an increase in yield to the Denver Water system from both a reduction of bypasses at the upstream Jones Pass collection system, as well as increased water supplies for storage at Williams Fork Reservoir. The additional water stored in Williams Fork Reservoir will be used to offset additional depletions at either the Moffat Collection System or Dillon Reservoir. Thus, there is no net gain to the Colorado River downstream of the Blue River and an actual loss in streamflow to the Fraser and Blue Rivers. This section of the DEIS needs to present a detailed summary of the changes to the Denver Water system and the resultant additional depletions to the Colorado River. This is another example of why the EIS evaluation for both projects needs to be combined and evaluated using a daily model.

Section 8.4.2.6

- The gains represented in Table 29 by the Shoshone call relaxation agreement are an excellent example of why the model used to evaluate impacts to the West Slope needs to a) be extended through at least 2005, and b) include the implementation of this agreement. Further, as the Shoshone relaxation benefits both the WGFP and the Moffat Expansion Project, both should be evaluated using the same model.
- This section does not explain why the model did not include this agreement in the Future Conditions. Both of the above factors may understate the projected impacts to the West Slope.
- Table 29 indicates that Windy Gap realized additional yields of 7,850 af from the Shoshone agreement in 2003. This would mean that Windy Gap diverted approximately 56,350 af under its own water rights. This total volume is approximately 2.5 times the previous maximum diversions of 21,900 af/year (1992), which would appear to be highly unlikely given the drought conditions that were occurring in 2003. This section should provide additional information regarding how the values shown in Table 29 were determined. Further, the DEIS should state what the increases were to CBT diversions, which either occurred as a result of diversions under the CBT direct-flow right or from additional storage at Granby that was not replaced by the CBT pool in Green Mountain Reservoir.
- The Summary on page 158 indicates that, based on historic information and the forecasting criteria, the Shoshone call reduction agreement may have been enacted in “1 out of every 6 to 7 years” during the modeling period. Given this frequency of occurrences, this foreseeable action should be included in the modeling for the WGFP.

Tables 30 – 32:

- Many of the same comments for Table 18-20 also apply to these tables

- These tables no longer show “Adams Tunnel Windy Gap Deliveries.” The only information presented about Windy Gap operations is “Windy Gap Diversions,” which also includes significant quantities of water that will subsequently spilled at Granby. This may significantly overstate the actual future Windy Gap operations.
- It would be very helpful to have two comparison columns, Existing Conditions and the modeled Future Conditions, to better understand what the action consequences are.
- These tables show an Existing Condition Windy Gap diversion of 36,532 af, and then compare all alternatives to this volume. In fact, the Existing Conditions should show a Windy Gap diversion of approximately 11,500 af/year. Because the EIS and Executive Summary also represent the “Difference” as a result of the WGFP, this is a highly inaccurate portrayal of the total project pumping and the effects of the alternatives.
- These tables should also show lines for Windy Gap water into, and out of, storage in Granby to really understand the operations.
- Table 32 shows that, during wet years, **the Cumulative Effects will deplete the flow of the Colorado River at Kremmling by an average of 157,000 AF.** This is critical piece of information regarding impacts to the West Slope, and needs to be highlighted in the DEIS and Executive Summary documents.

Section 8.7.1.3 This section should present much more detailed information regarding the effects to Rockwell/Mueller Reservoir in addition to Lake Granby. If the changes are similar to Section 7, then this should be stated in the section.

Recommended Terms for Mitigation and Approval

As you know, we assisted in the preparation of a set of criteria or conditions that should be incorporated into any approval of permits associated with the Windy Gap Firing Project. These conditions are summarized in Grand County’s comment letter to the U.S. Army Corps of Engineers regarding the 404 Permit Application for the WGFP.

Please let me know of any questions regarding this information.

Very truly yours,

BISHOP-BROGDEN ASSOCIATES, INC.



Jeffrey A. Clark
Principal - Hydrologist

cc: Lurline Curran
Eric Kuhn
Stan Cazier

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EXHIBIT C

To: Barbara Green, Mary Keyes
From: Lane Wyatt
Date: November 20, 2008
RE: WGFP DEIS Aquatic Resources Technical Report (July 2008)

I reviewed the revised Aquatic Resources Technical Report for changes since the November 2007 PDEIS version. I took the February 11, 2008 Grand County comment letter on this report and changed it so that references to page numbers and tables are correct for the July 2008 version of the Technical Report. I also eliminated previous comments that did not seem useful. The new version of the comments on the July 2008 Aquatics Technical Report is below.

1.0 GENERAL COMMENTS.

In spite of Grand County's written comments to the Bureau of Reclamation, the analysis continues to rely on "average monthly" values for diversions and stream flows. This is a fatal flaw that calls into question all of the conclusions that might be drawn regarding environmental impacts that are caused by changes in hydrology. So that decision makers can understand the nature and extent of impacts to the aquatic environment, flows need to be depicted in terms that display the magnitude and duration of flow conditions.

A similar concern with the use of monthly flow data to determine environmental effects was discussed in a report by the National Academy of Sciences, Committee on Hydrology, Ecology, and Fishes of the Klamath River Basin, National Research Council, Hydrology, Ecology, and Fishes of the Klamath River Basin, (2007) ("National Academy of Science Report") www.nap.edu/catalog/12072.html. The committee concluded that "[a]lthough monthly flow values can be useful for general river-basin planning, they are not useful for ecological modeling for river habitats, because the monthly average masks important discharge values that may exist only for a few days or even less. In short, planners operate on a monthly basis, but fish live on a daily basis." (National Academy

Science Report at 5)¹

The following comments elaborate on the problem caused by using monthly average flows as a predictive tool, and summarize the major deficiencies in the Aquatics Report.

1.1 Frequency of Conditions.

The Report focuses on the probability that a given amount of habitat will be available during any given wet or average water year. It does not look at how altering flows may impact the frequency with which conditions in the reach below Windy Gap (or for that matter below Lake Granby) will resemble those of a dry year as a result of diverting water to the East Slope.

1.2 Changes to the Hydrograph.

In those years when Windy Gap is pumping, we expect two changes to occur. First, the magnitude of peak flows below Windy Gap will be reduced. Second, because the WGFP will allow pumping to occur later into the year, the day at which the outflow from the reservoir equals the CWCB minimum flow requirement will be moved early in the year (*See Figure 1.2 A*, below). As a result, in many years, there will be an increase in the number of days that stream flows below Windy Gap will be reduced to the CWCB minimum.

¹ The Bureau of Reclamation estimated monthly stream flows in its Natural Flow Study, which monthly flows were used as inputs into the instream flow studies for the Klamath River. (National Academy Science Report. at 3) The Committee concluded the Natural Flow Study was “seriously compromised” because among other things, the flows were calculated as monthly values, where the ecological applications of these calculated flows required daily values, and as a result, the output of the study would not have satisfied ultimate use requirements. (Id. at 3-4). It added that the use of monthly data was a “major shortcoming” which was “so severe that [it] should be addressed before decision makers can use the outputs of the study to establish precise flow regimes with confidence.” (Id. at 5).

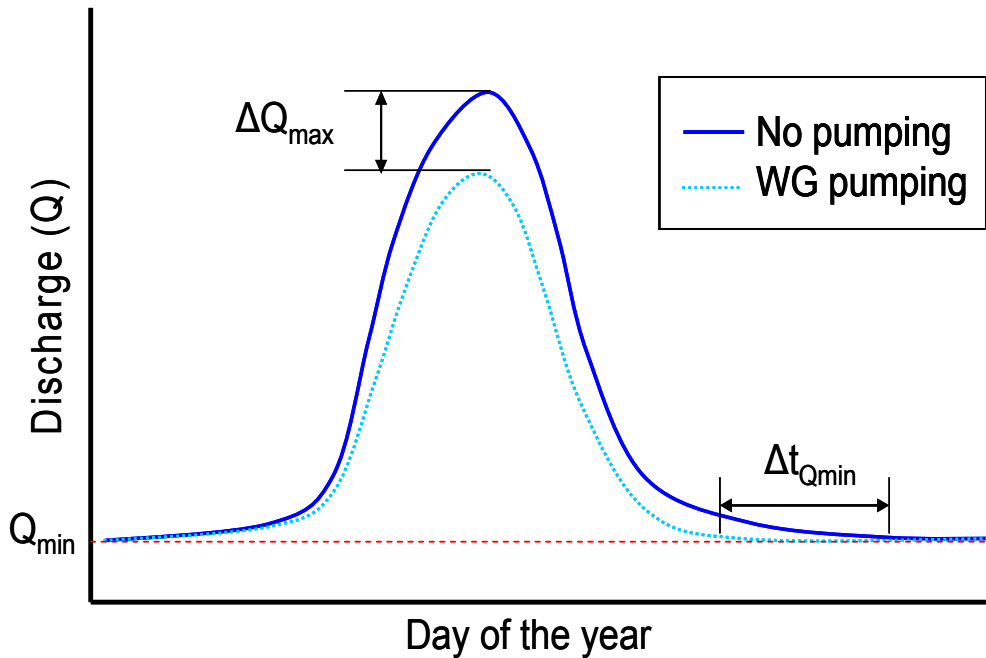


Figure 1.2 A. Theoretical hydrographs showing discharge out of Windy Gap Reservoir when water is not being diverted (No pumping) and when water is being diverted (WG pumping) over the course of a calendar year. Pumping is expected to reduce peak discharge by ΔQ_{\max} , which is less than or equal to the maximum pumping rate of the Windy Gap pumping station. In addition, pumping is expected to increase length of time discharge below Windy Gap is equal to the CWCB's minimum flow by $\Delta t_{Q_{\min}}$.

The Report ignores potential changes in the extent and frequency of low flow periods and the impacts of such changes on aquatic resources. The impacts of the WGFP cannot be assessed without this information. One way to begin to address this question would be to model how daily flows below Windy Gap Reservoir would have been decreased were any of the project alternatives in operation. This sort of analysis would have the additional benefit that it could then serve as the base for analyzing cumulative impacts by examining how, for example, the frequency and duration of low flows (not to mention peak flows) increase if the Denver Water Department's Moffat Firming Project comes online.

Discharges in the Colorado River are highly variable, ranging from 23 cfs to approximately 4,300 cfs (Aquatics Report, p. 14). As with other rivers, the peak flows are critical for maintaining a healthy ecosystem. However, floods of different sizes with different return intervals often provide different services, in terms of maintaining ecosystem function. For example, very large floods may be responsible for building the floodplain through major bar deposits, whereas slightly smaller, bankfull floods may be responsible for the formation and maintenance of the active channel. More frequent moderately sized floods may, in turn, provide other sets of important services, including the scouring of sediments from spawning sites and flushing of these sediments downstream. Unfortunately, how reductions in the average magnitude of peak flows will affect their ability to maintain a healthy stream ecosystem is not addressed.

Peak flows between Lake Granby and Windy Gap will be reduced in some years. The Aquatics Report states: “Maximum average monthly flow reductions of up to 20 to 30 percent [will occur] in July and August of wet years. This may cause some shift in habitat as a response to reduction in peak flows, but is unlikely to impact fish populations.” (p.39). In spite of the magnitude of these reductions, no evidence is presented to support the assertion that the impacts to fish populations are unlikely. It would be surprising if changes of this magnitude did not result in aquatic resource changes of some significance.

Because stream temperatures increase more rapidly when flows are low, extending the period of low flow increases the probability that both daily maximum temperature and weekly average temperatures will increase. As further discussed in “Temperature Effects” below, the Report does not evaluate these potential impacts.

1.3 Changes to the Hydrologic Regime.

The Aquatics Report focuses on the *probability* that the WGFP will impact the Colorado River in any given year. For example, it attempts to assess the probability that the WUA for a particular life stage of a given trout species will increase or decrease as a result of pumping in wet, average, and dry water years. However, the Report does not recognize how changing the *probability* of low flows in any given year impacts the *frequency* with which these changes occur across a period of years. This is surprising because the report does talk about the frequency with which, for example, the WUA available to Juvenile Rainbow Trout below Windy Gap will change (e.g., Table 22 p.45). However, it does not extend this analysis to the relevant time scale. Instead the Report simply talks about the number of average years out of ten that experience the maximum change from existing conditions. By reducing peak flows and by increasing the duration of low flows in average years, the WGFP is essentially creating more years that have a hydrograph that is typical of low flow, or dry years.

The Report recognizes that the proportion of years with protracted low flows late in the season will increase, yet no analysis of the consequences of these extended dry year conditions is offered. The proportion is important because population dynamics of many species are very dynamic. Trout, in particular, have highly variable recruitment. The vulnerability of trout varies with both species and life stage. For example, because late-season flows are often correlated with higher temperatures, low flow years may enhance growth of fish fry but place additional stress on juveniles and adults. By reducing growth of juveniles and adults, egg production in spawning season will be low and recruitment the following year poor. If years with poor recruitment are rare, the long-term viability of the population may not suffer as a result of low flow years. Conversely, by increasing the frequency of these low flow years, the WGFP could substantially limit recruitment and thus impair the long-term viability of the population. How the increase in the frequency of years with protracted periods of low flow will impact the trout population has not been assessed.

Below Windy Gap, both the magnitude and duration of floods with different recurrence intervals (e.g., 2-yr, 5-yr, 10-yr) will tend to be decreased. Similarly, the size and duration of the typical flood in an average year will be reduced. These reductions are likely to be exacerbated by the additional changes that are occurring within the basin (e.g., Moffat Tunnel expansion, urban growth in Summit and Grand Counties) which will also further reduce peak flows. These changes in the flow regime raise a number of important questions which have not been addressed, such as the effect on ecosystem services relating to reduction in volume and duration of flood flows. Will there be a decrease in the efficiency with which fine sediments are flushed through the system and thus a reduction in availability of suitable spawning habitat? What will be the impact of these changes in the flow regime be on other species? Will algal growth be promoted? Will recruitment of riparian species be reduced? Will macroinvertebrate habitat more frequently be buried by fine silts?

1.4 Instream Flow Incremental Methodology.

The bulk of the analysis presented in the Aquatics Report focuses on how changes in flow resulting from the WGFP will affect habitat availability. Although this sort of analysis is useful, as presented, the analysis is incomplete.

First, the analysis focuses on the proportion of time a given WUA is available to adult or juvenile brown or rainbow trout. As presented, it is impossible to answer questions about whether or not certain types of habitat are available when they are needed. For example, it does not matter if adequate amounts of spawning habitat are available 95% of the time, if the habitat is never available during the spawning season. An analysis of how the WUA available to each life stage of each species varies over the course of the year is needed. Information should be presented regarding flow and habitat requirements at different life stages for relevant species.

Second, effects of changes in flow on suitable habitat availability of adult and juvenile life stages are modeled, but effects of flow changes on fry and spawning habitat were not. Typically, all four life stages are evaluated in analyses using the Instream Flow Incremental Methodology (IFIM). Because they are such poor swimmers, comparatively speaking, availability of suitable fry habitat is more sensitive to changes in flow than is availability of habitat for adults. By failing to evaluate how changes in flows impact the availability of fry and spawning habitat, the Aquatics Report systematically ignores potentially critical impacts of the WGFP.

Third, as mentioned above, the analyses appear to have been conducted using monthly average flows. Flows vary on a variety of time scales ranging from hours (e.g., during flash floods) to years (e.g., changes in precipitation driven by climatic events like La Niña and El Niño). By using monthly averages, variations occurring on smaller temporal scales can be masked. For example, flows throughout July may be very low but if there was a very large flood during the month, average monthly flows may appear closer to the long-term average. More importantly, by using monthly averages, extreme events tend to be dampened. Given that fish and other aquatic organisms respond to

changes in flow that occur on much shorter time scales, it is inappropriate to evaluate changes in habitat availability using a monthly time step. Furthermore, the exceedence graphs (Figures 27-410) should indicate how time was measured. Does the X-axis represent the percentage of days, months, or years for which a given WUA or percent change in exceedence is exceeded?

Fourth, not only do flows vary on shorter time scales than is picked up in monthly averages, but by presenting the results of the analysis as the proportion of time that a given WUA is available, the effects of annual variability are masked. Based on the analysis presented in the Aquatics Report, we cannot answer the question: how much more likely is it that brown trout fry will be limited by low habitat availability in successive years if the WGFP is online, versus the current condition? Similarly, we cannot answer whether or not it is more likely that trout populations will experience a catastrophic event. If, as suggested above, daily flows for the period of record were modeled under the different project alternatives, we could ask questions about how WUA would, in turn, vary. Such an analysis would allow us to ask when and how frequently did the WUA available to the various life stages drop to low levels? These issues could potentially be addressed by changes in the level of aggregation in which the analyses have been done.

Fifth, changes in WUA or temperature are not the only mechanisms by which fish can be impacted. For example, trout could be impacted if changes in flow lead to a collapse of important food resources like the stonefly, *Pteronarcys californica*. Alternatively, if reduced peak flows cause additional sediments suitable for the tubificid worm, *Tubifex tubifex*, to accumulate along the Colorado River below Windy Gap then problems with whirling disease may be exacerbated. As these examples make clear, the report needs to justify why its focus on WUA is appropriate and why some of the other obvious effects of changes in flows have been ignored.

Finally, at the very least the Report should provide justification for why it does not fully evaluate the environmental impacts of the WGFP on any species other than brown and rainbow trout. The focus on trout species to the exclusion of most other species is inappropriate. Virtually all of the Colorado's aquatic species and many if not most of its riparian species are adapted to the historic flow regime. The report makes no effort to assess how changes in flow may impact other fishes, including the native mottled sculpin, algae, or riparian communities. The EIS should be adequate to satisfy the analysis of impacts to the aquatic environment that must be performed by the Corps of Engineers under the 404(b)(1) guidelines. Limiting the analysis to salmonid and macroinvertebrates is not adequate for 404(b)(1) purposes.

1.5 Unsupported Conclusions.

The Report does give a brief nod to the impacts on aquatic macroinvertebrates, asserting that “[H]abitat needs of the macroinvertebrates present in the Colorado River are similar to those of trout species. Water quality conditions are not expected to change. The species and distributions of macroinvertebrates are not expected to change. The

abundance should remain the same as observed with the future conditions for all alternatives.” (p. 46) However, no evidence is presented for these assertions. Since invertebrates live on the surfaces of and in the interstices between the rocks and cobbles of the stream bottom rather than in the water column where trout are found, it is not really accurate to say that the habitat needs of the two groups are similar. Further, because low flows will not only reduce the proportion of the stream channel that is inundated and thus the WUA, but may also increase the likelihood that the interstitial spaces become clogged with sediments, it is not at all clear that the effects of low flows on habitat availability will be similar for trout and macroinvertebrates.

1.6 Temperature Effects.

The Report fails to adequately address how stream temperatures will be impacted by the WGFP. The Report analysis models how reducing flows will affect temperatures based on average July 25 flows. It concludes that reducing flows will cause an increase in water temperature on the Colorado of between 0.8°C and 4°C on July 25, with the greatest increases seen when flows are reduced to 90 cfs (p.38). Although this analysis is useful, it is unclear how assessing the anticipated increase in stream temperature on July 25 will be extended from a daily maximum to a weekly average. Does this analysis account for the probability that stream temperatures on July 25 are not only affected by the conditions on that day, but by the conditions on previous days? Does reducing the flow through the Colorado River have the same impact on average weekly stream temperatures as it does on maximum daily temperatures?

Because stream temperatures fluctuate more rapidly when flows are low, extending the period of low flow increases the probability that both daily maximum temperatures and weekly average temperatures will increase during those years pumping extends the low flow period. When flows are low the stream is poorly buffered against hot, sunny days. Further, when the low flow period is extended the probability that hot sunny days will occur when flows are low is increased. Thus when the low flow period is extended, there is a greater probability that hot, sunny days will result in higher stream temperatures.

By increasing the number of years with protracted low-flow seasons, the WGFP increases the frequency with which critical temperatures (either daily maximum temperatures or maximum weekly average temperatures) will be exceeded. Assuming that the probability of having a temperature exceedence is correlated with the length of the low flow season, increasing the frequency with which years with protracted low flows occur will increase the frequency years with high temperatures are observed. This begs the question: how will increasing the frequency of years with elevated stream temperatures affect the stream biota, generally, and trout specifically?

On p. 38 the report states: “Lower flows could increase the potential for exceedence of the weekly maximum average temperature standards for aquatic life, but is unlikely to measurably impact fish populations. This conclusion is based on the observed water temperatures, which occasionally exceed 19°C under current conditions, and the

healthy fish population that is in the river.” That healthy trout coincide with occasional observations of high temperatures is not evidence that the trout are unaffected by high temperatures. Part of the rationale behind temperature standards is the need to protect against sublethal effects that may not be manifest without protracted, repeated exposure to elevated temperatures. That trout have withstood the occasional high temperature observed to date is not evidence that their populations will remain healthy and vigorous if the frequency (either within a year or across years) with which they are exposed to high temperatures increases. Indeed this observation is not evidence that there have been no effects of the high temperatures observed under current conditions. A more thorough evaluation of the impacts of increased temperatures is warranted.

1.7. Cumulative Effects.

The cumulative effects section (p. 50-55) is both brief and incomplete. As with other sections it focuses on the proportion of time juvenile and adult trout habitat will be reduced. As written, it is impossible to tell which impacts will occur when, as only the proportion of years with reductions in habitat availability and maximum percent change during those years is reported. Thus, the analysis presented does not address the question how will the cumulative impacts of the various foreseeable actions on habitat availability impact the long-term health and viability of the brown and rainbow trout fisheries?

There are a number of other problems with the cumulative effects section. First, the Report only analyzes the cumulative impacts of the reasonably foreseeable actions on trout WUA. It does not analyze other potential impacts on the stream ecosystem. Perhaps the most significant oversight is the lack of an analysis of the cumulative impacts of the various reasonably foreseeable actions on temperature – both daily maximums and weekly averages. Again, such an analysis should focus not only on the degree to which temperatures on a given day may increase, but on the likelihood that trout will experience potentially harmful daily or weekly temperatures as a result of more frequent (i.e. more years) and more prolonged (i.e., more days each year) low flow seasons. As before, modeling changes on a daily time step would be useful because it would allow estimates of both daily maximum temperatures and weekly average temperatures to be produced.

Second, as mentioned previously, trout are not the only species likely to be affected by changes in the hydrologic regime. The cumulative impacts of these actions on other species must be considered.

Third, the list of “reasonably foreseeable actions expected to affect hydrologic conditions and potentially aquatic resources” (p. 50) is incomplete. There has been no mention of the potential of global climate change to contribute to the cumulative impacts of this project. Although the impacts of climate change are uncertain, reduced precipitation, earlier runoff, and increased late season temperatures are all possible and would all have negative impacts on the river. At the very least, the potential for global climate change to exacerbate the impacts of the WGFP should be discussed.

Fourth, the cumulative impacts section does not appear to recognize the importance of the impacts that have already occurred within the Colorado River basin. If, as we suggest, the frequency with which the stream experiences low flow years determines the long-term impact of low flow events, then it is important to recognize that the frequency of low flow years has already been increased by the numerous water projects already operating in the basin. Part of the goal of a cumulative impacts analysis is to ensure that ecosystems do not die the death of a thousand cuts. However, this is hard to ensure if the first 500 are ignored. The cumulative impacts sections must factor in how the existing water projects have increased the frequency and duration of low flow periods.

1.8 Study Area

The study focused on riverine habitat in the Colorado River from Lake Granby downstream to the confluence with the Blue River (p. 3), which is expected to input enough water to buffer any further effects downstream. However, this assumes that the Blue River will continue to be managed as it is presently, with high releases (commonly 350 – 1000+ cfs) from Green Mountain Reservoir through most of the year. Moreover, there appears to be some indication that Blue River flows may be reduced by a reduced call for Blue River water to the Shoshone power plant (see “reasonably foreseeable actions” on p. 50). It is reasonable to expect that the less water contributed from the Blue River, the less its buffering capacity. Lastly, capacity of the Blue River to “buffer” hydraulic and temperature changes does not necessarily imply a capacity to buffer ecological changes (e.g., increased downstream export of energy and organisms due to changes in ecosystem function and metabolism).

Although the effects of changes in streamflow will be diminished below the Blue River, this does not mean they necessarily will be insignificant. A quantitative assessment is needed that demonstrates the impacts of changes in flow resulting from either Windy Gap or the cumulative impacts of the various projects being considered in the Upper Colorado. This could be done, for example, if a flow analysis demonstrated that the maximum amount of water that could be diverted through Windy Gap was trivial compared to the flow on Colorado below the Blue River – even during periods of low flow.

The Colorado River was divided into two reaches for the IFIM analysis (p. 66). The first reach extended from Windy Gap to the Williams Fork River and the second from the Williams Fork Reservoir to the Blue. Although it was stated that this division was made on the basis of “hydrology and habitat characteristics” (p. 70), evidence supporting this assertion is lacking. Similarly, evidence demonstrating that the two study sites established to represent these reaches were, in fact, “representative” (p. 36) also is lacking. Because of this it is difficult to evaluate how the hydrology data were combined with the habitat data from Lone Buck or Breeze to scale up to the entire “Habitat Reach” (p.37).

These may not be appropriate representative reaches, and it is perhaps unrealistic to presume that each segment could be represented by one representative reach for two reasons:

- (1) **Geomorphology.** The “Lone Buck” reach represents the floodplain run-riffle habitat that characterizes much of the upstream segment. However this reach does not represent the constrained higher-gradient habitat which runs through Byers Canyon. Likewise the “Breeze” reach represents the floodplain run-riffle habitat that characterizes much of the downstream segment, but does not represent the slow moving, low gradient habitat in the lower reaches nearer to Kremmling.
- (2) **Land Management.** Both representative reaches are located on State Wildlife Areas, which are managed to provide habitat for fish and wildlife. These areas have reduced livestock grazing regimes, and reduced livestock access to the stream and riparian zone. It is unlikely that other ranches in the Colorado River valley manage livestock, grazing, and other land uses in an equally sustainable way.

A related concern involves the propagation of error. How sensitive is the IFIM analysis to errors made in the field either in the measurement of hydrologic parameters or in the proportion of different habitat types? Similarly, before the conclusion can be reached that there will be few impacts of any of the alternatives, it would be good to know how sensitive the IFIM is to changes in discharge within the Colorado River.

1.9 Additional Incompletely Addressed Impacts.

Although changes in flow associated with WGFP may have the greatest impact on aquatic biota, other changes resulting from WGFP and associated cumulative changes should also be explicitly considered in the Report. Discussion of the impact of the presence and operation of the WGFP facilities on aquatic biota (e.g., the obstacle to fish movement caused by the Windy Gap dam, or possible fish entrainment from pumping activities) is almost entirely lacking. Whether this should be done as part of the evaluation of the cumulative impacts, or as the discussion of the WGFP specific impacts is unclear, but it should be addressed in the report.

As with temperature, discussion of WGFP impacts on other water quality parameters was brief. Although the report states that dissolved oxygen levels below Windy Gap could decrease by 0.6 mg/L, it does not discuss what they will likely be or how frequently they will be reduced. As a result, it is difficult to assess what the impacts of this reduction may be other than knowing that trout will not be acutely impacted. As with temperature, knowing that dissolved oxygen remains above the lethal minimum oxygen requirement of 5.0 mg/L is no assurance that chronic effects will not result from the change in operations.

Although the Report states that there will be no change in the trophic state of west slope streams and reservoirs, it does not provide data in support of this conclusion. How will nutrient availability in both the Colorado River and the affected reservoirs change as a result of the WGFP? Will these changes have any impacts aside from their potential to alter the trophic state of these ecosystems?

2.0 SPECIFIC COMMENTS BY PAGE

Comment No. 1 Page 2:

a. The Report contains legal conclusions about prepositioning that are contrary to Colorado law. Grand County and the Colorado River Water Conservation District have sent many letters to the Bureau of Reclamation raising concerns about prepositioning. Because of reliance on legal conclusions that do not conform to Colorado law, subsequent conclusions in the Aquatics Report are based on the false premise that there will be no expansions of C-BT diversions. Before the actual levels of diversions can be quantified, the proponents of the WGFP will need to file an application to change the place of storage of C-BT water rights (assuming Reclamation will consent) and of the Windy Gap water rights to allow them to be stored in the proposed new reservoirs. Whether or not there will in fact not be any expansion of the C-BT and Windy Gap water rights from existing conditions will depend on the decrees issued by the water court.

Comment No. 2 Page 3:

a. The study area should extend to 15- mile reach for endangered species to comply with the Endangered Species Act.

Comment No. 3 Page 10:

a. Macroinvertebrate sampling was done on September 17, 2004 for assessment of existing conditions. No effort is made to explain how the flows during this period compare to average, wet or dry year hydrology presented in the Technical Reports. Conclusions about water quality are based on a worst case analysis for July 25th. Are macroinvertebrate population metrics expected to be different during the falling limb of the hydrograph (July) than at base flow (September)?

Comment No. 4 Page 13:

a. Table 1. Are the temperature values shown based on daily, maximum or weekly average? Or some other value?

b. What is the basis of statement that management actions of stocking and regulations limiting harvesting affect fish population more than environmental conditions? Describe what is meant by catastrophic event.

Comment No. 5 **Page 14:**

a. Table 2. What were the native species in the Colorado River in the past, before C-BT and Moffat? Cutthroat trout?

b. Table 3. Where range of temperatures and dissolved oxygen are given, at what locations were samples taken? When?

Comment No. 6 **Page 15:**

a. Senate Document 80, the document that controls operation of the C-BT, states that one of the primary purposes of C-BT is “[T]o preserve the fishing and recreational facilities and the scenic attraction of Grand Lake, the Colorado River...” As part of discussion of past actions, there should be a discussion of whether preservation of fishing and recreation has occurred. The Report should rely on and make reference to the 1951 report prepared by the US Fish and Wildlife for the Bureau of Reclamation which detailed the devastating effects of Granby Dam on the river.

b. How was the reduction in the flows established by 1961 Operating Principles for the C-BT project modeled? The Report should disclose the impacts that occurred in September 2006 when the flows below Granby dam were reduced to 20 cfs.

c. Portions of the River below Windy Gap are also a Gold Medal Fishery.

d. Existing bypass flow requirements below Lake Granby and Windy Gap are described, but there is no assessment whether these flows are appropriate for protection of the environment or whether prolonged durations at those flow levels as a result of WGFP alternatives will have adverse impacts.

Comment No. 7 **Page 24:**

a. Why are the metrics of fish population for Willow Creek in Table 10 different than those for the Colorado River found in Tables 4 and 5, page 19?

Comment No. 8 **Page 25:**

a. The macroinvertebrate metrics in Table 11 are fairly consistent at the three sites on Willow Creek. Only two sites are used for to represent the much longer reach of the Colorado River, with many more environmental influences along that reach. There is not the same consistency of these metrics for the Colorado River (see Tables 8 & 9, page 21) as for Willow Creek. Willow Creek data were collected in May 1997 whereas Colorado River data were collected in September 2004. There is no discussion as to whether this inconsistency between results for Willow Creek and the Colorado River demonstrates the effects of seasons (May versus September) on macroinvertebrate

metrics, or hydraulics (early runoff versus base flow), or hydrology (were 1997 & 2004 wet, dry or average years?).

Comment No. 9 Page 27-29:

a. The text reports that all these lakes and reservoirs provide recreational fishing. What is not stated, but is demonstrated by the tables, is that the reservoirs are dominated by non-native suckers, which are not considered a game fish: Table 14 Shadow Mountain Reservoir – 81% suckers; Table 15 Granby Reservoir – 86% suckers; and Table 16 Windy Gap Reservoir – 89% suckers.

Comment No. 10 Page 29:

a. There is a discussion of Whirling Disease, but not on the effects of the WGFP on that disease. As part of the past actions, Windy Gap Reservoir became a breeding ground for tubifex worm which caused and contributed to Whirling Disease in the Colorado River. What data forms the basis of statement that Windy Gap is no longer considered a “major source” of TAM?

Comment No. 11 Page 32:

- a. Need to extend study to 15 mile reach for endangered species.
- b. What data forms the basis of the statement that the Colorado River cutthroat does not occur in the study area? What was the cutthroat in Shadow Mountain Reservoir? What was the dominant species in the Upper Colorado River before damming of the river and diversions by C-BT, Denver and Windy Gap? Wasn't it the Colorado River cutthroat? How has the disappearance of the Colorado River cutthroat from the head waters of the Colorado River been factored into past actions?

Comment No. 12 Page 34:

a. Figure 8. Typical hydrograph is presented based on average daily flows. How was this daily hydrograph used in the Aquatics Report, if at all? Graphs of low daily flows and high daily flows would be helpful for comparison purposes.

Comment No. 13 Page 36:

a. Only two sites were selected for studying fish habitat, and the sites are stated to be representative of the reach of the river affected. Those two sites are not representative of the reach from Granby Dam to Windy Gap Reservoir, nor the reach from Windy Gap to the head of Byers Canyon, nor of the reach in Byers Canyon, nor the reach below Con Ritchards through the Kremmling area to the head of Gore Canyon, nor of the reach in Gore Canyon.

b. The report states the hydrologic conditions at six sites were combined with the habitat data from the two sites to determine changes to fish habitat. The report does not say how the hydrologic data was used in the River 2D model, but the report states that “average dry, and wet years were modeled under the various WGFP alternatives” not daily stream flows.

Comment No. 14 Page 37:

a. Figure 9. This schematic should also be represented by a field map showing these locations on the ground. Are these locations the same as where a stream gage is located? If so, this should be stated. If so, how were actual daily gauged stream flows used to calibrate the modeled flows in River 2D?

Comment No. 15 Page 38

a. What is the basis for statement that a “qualitative” approach for assessing changes in fish community/population is sufficient for this analysis? The Report concludes that factors such as fishing pressure, management and stocking can change fish population more than physical habitat. What is the basis of this statement? What fishing pressures have been experienced in the study area? What management and stocking practices are in place in study area? What about Whirling Disease’s impact on Rainbow Trout?

b. There are no clear criteria to define an “impact” to the aquatic environment. For example, temperature changes are reported at an accuracy of a tenth of a degree Celsius in the Stream Water Quality Report for the July 25th worst case. The Aquatics Report then concludes that although temperatures are projected to increase 4 degrees to about 19 degrees as a result of WGFP in this worst case, and thus will exceed State of Colorado water quality standards for temperature below Windy Gap, it is “unlikely to measurably impact fish populations.” A water quality standard has been established to protect the fish; a violation of this standard is, in and of itself, an impact and the standard is the criterion to measure whether impacts will occur.

Comment No. 16 Page 37:

a. The basis for not studying daily values in May, June, July, August is not revealed. The assumption is that flows are high in May and June, which may or may not be true, depending upon the year, and the flows that year. It appears that more refined water quality studies were conducted when the July 25th flows below Windy Gap dropped below 90 cfs. This method, if properly done, is what needs to occur on a daily basis to determine impacts. The 19° C predicted temperature is just above the Williams Fork confluence, miles downstream. What was the predicted temperature just below Windy Gap? The Report does not reference the temperature data gathered by Grand County Network. How does that temperature data compare to Miller’s data? Isn’t it a fact that the lower flows “will” (not could potentially) increase the weekly maximum average temperature below Windy Gap? There is no discussion of the interim

temperature standard on this reach. Why? Are the Rainbow Trout healthy in this reach of the river, as stated in the Report?

Comment No. 17 Pages 38-47:

a. Out of a 292 page report, only 7 pages with three tables are devoted to describing the impacts on the streams on the West Slope.

Comment No. 18 Page 39:

a. Contrary to the statement that fish habitat data is not available for the reach between Granby Dam and Windy Gap, the 1951 Fish and Wildlife Report studied this reach extensively. As part of past, present and future actions, this 1951 report should be independently factored into the WGFP analysis – from a scientific perspective. The statement is made (without any supporting basis) that there may be shift in habitat, but unlikely to impact fish populations. Where would the impacted habitat be located and where would the fish shift to find suitable habitat? When would this occur? Under what circumstances? What are the daily flows when a shift would occur?

b. It is not surprising that the habitat model shows a consistent pattern for the WGFP alternatives. That is what happens when “monthly averages” are used – everything is “smoothed” out - spikes in flows are gone, back to back days of low flows disappear, series of low flow days or high flow days are masked, daily opportunities to divert based on river conditions get averaged, etc. It is not a real picture of the impacts. It is perhaps for this reason that the “impacts” in figures 27-231 are presented in such a meaningless manner as: (1) percentage change in exceedence and (2) percent change in percent exceedence – without a correlation of flows.

c. The Report concludes no “substantial” change in fish habitat at 4 specified sites as a result of any WGFP alternative in all flow conditions. However, Tables 21 and 22 (p44 and 45) show some of these 4 sites with 24% loss in habitat (e.g. Hot Sulphur) in wet years (frequency of 1 in 10 years - it is not clear if that is 1 in 10 wet years or the wet year frequency is 1 out of 10 years, as in the Water Resources Report). The Report also states that below Windy Gap “substantial” (20-30%) losses of habitat occur for all WGFP alternatives for both Brown and Rainbow trout. Then it states these losses only occur 10-20% of the time. Who determines what is a “substantial” change?

Comment No. 19 Pages 43-45:

a. Tables 20, 21 and 22. This is the “heart” of the impact analysis. There are a number of problems. First, the percent change could be an increase of decrease in habitat, which is not shown. Second, the frequency of occurrence is measured in “years,” not days or even months. The model should show the days in the months of the years that the impacts occur. Third, although life stages are said to be shown, the spawning stage is not presented. Fourth, no basis is stated for asserting that dry year flow conditions would not change. Fifth, the statement that four of the sites exhibited no

substantial change is not borne out by the table. Sixth, what is considered substantial decrease in habitat? 20-30% decrease according to the Report, but on an average monthly basis. How does this translate into days of decrease in habitat and what are the flows on those days?

Comment No. 20 Page 46:

a. It is not surprising that fish habitat changes for all alternatives are very similar because averages will tend to smooth out the bumps. An impact, even in 1 out of 10 years is an impact, especially if the flow and habitat are reduced on a day or a series of days, which is not shown. The measure of the frequency of impact in years is too broad. It needs to be brought down to a daily basis to have any meaning.

b. What is the basis of the statements on this page about the trout being able to withstand impacts based on frequency of years of impact?

c. The Report concludes that because trout in the study area have a maximum age of about 6 to 7 years, the loss of habitat associated with the WGFP alternatives that are projected to occur less frequently than their life span (e.g. 2 out of 10 years) are not consequential. This conclusion makes no sense: there is a significant habitat loss (e.g. 24% reduction), and there is no consideration of losses for other subsequent hydrologic years. The entire population present at that time would be affected even if it is only twice in 10 years

Comment No. 21 Pages 51:

a. One very short paragraph in the Aquatics Report asserts fish habitat impacts under cumulative impact analysis is very similar to those described in the section on direct effects of WGFP alternatives. However a comparison of Tables 25 and 26 with Table 21 and 22 shows additional losses from cumulative affects typically at least 5% more than direct effects and as much as 18% additional habitat loss for adult Rainbows above the Blue River in average years. Interpretation of the data in these tables in the text is misleading at best.

Comment No. 22 Page 51 and Tables 26 and 27:

a. The problems concerning the analysis of direct impacts are multiplied when attempting to look at cumulative impacts, especially when it comes to daily flows and the need to take a “hard look” at impacts. The conclusion presented in Tables 26 and 27 cannot be verified, because monthly averages are shown. The statement that this is a “slight increase in loss of habitat but a slight decrease in frequency” is not explained because each of the reasonably foreseeable actions is not described. Accordingly it is impossible to know which of the actions caused the incremental increase in loss of habitat and which of the actions caused a slight decrease in frequency and why this phenomenon occurred.

Comment No. 23 Page 66:

a. As described on page 66, the output from a stream flow model should show “changes in habitat for a duration of time”. Because fish live on a daily basis, that habitat change should be modeled on a daily time step.

Comment No. 24 Page 73:

a. Figure 14. This photograph shows low flows with rocks exposed as “existing conditions.” The existing conditions include substantial transmountain diversions by past actions. Where is the analysis and comparison of pre-development flows (past) to existing flows (current) to reasonably foreseeable cumulative actions (future) and the impacts on the aquatic system?

Comment No. 25 Page 74:

a. The Report recognizes that the “actual habitat experienced by species is a function of the discharge at the site over time.” Because rivers flow on a daily basis and changes in flows occur daily, it is important to know the flow regimen of the river on any particular day.

b. The Report recognizes the importance of the habitat flow step over time, but fails to make an analysis of the daily flows. Instead, “for this study, the flows from the Windy Gap analysis and monthly gage data (ERO and Boyle 2007) was used to generate a baseline and proposed action hydrology data sets.” The “hydrology data set of interest is copied into spreadsheet columns.” That is, this is the “input” based on “monthly average flows”.

Comment No. 26 Page 78:

a. Whirling Disease is a “limiting factor” for Rainbow Trout, but no further discussion is provided as to whether the WGFP alternatives will increase the disease.

Comment No. 27 Page 82:

a. The Report notes that the habitat for both species peaks at both sites between 400 cfs and 500 cfs. It is not clear if those peaks are transposed up or down the stream to different sites with different habitat conditions. A range of flows preferred by trout should be provided.

Comment No. 28 Pages 84-86:

a. Figures 20 to Figure 23 are the most helpful in showing the Habitat Area with a flow rate in cfs as it is typically done for these types of study. All of the impacts should be done showing impacts at a given rate of flow. Without translating this

information to flows, the impacts cannot be readily determined by those familiar with stream flows measured in cfs or whether there is an impact to fish on a given day.

EXHIBIT D
WINDY GAP OWNERSHIP AND TRANSFER HISTORY

Owners	Units Transferred	Current Windy Gap Units Owned	Windy Gap Firming Project Units	Requested Storage Volume (af)
ORIGINAL OWNERS				
Longmont (80 Units)	0	80	80	13,000
Boulder (80 Units)	43 Units to Broomfield in 1991	37	0	-
Estes Park (80 Units)	77 Units 40 Units to PRPA in 1976 1 Unit to Central Weld County WD in 1985 35 Units to Superior in 1988 1 Unit to Left Hand WD in 1988	3	0	-
Fort Collins (80 Units)	80 Units to PRPA in 1976	0	0	-
Greeley (80 Units)	20 Units [??] 13 Units to Broomfield in 1989 3 Units to Fort Lupton in ____ 5 Units to Evans in ____ 12 Units to Little Thompson Water District in ____	64	44	7,000
Loveland (80 Units)	40 Units to PRPA in 1976	40	40	6,000
Totals (480 Units)		224 Units	184 Units	26,000
SUBSEQUENT OWNERS				
PRPA	Acquired 160 Units in 1976	160	51.5	13,000
Central Weld County Water District	Acquired 1 Unit in 1985	1	1	330
Superior Metropolitan District #1	Acquired 35 Units in 1988 6 Units to Louisville in 2002	15	15	4,500

WINDY GAP OWNERSHIP AND TRANSFER HISTORY

Owners	Units Transferred	Current Windy Gap Units Owned	Windy Gap Firming Project Units	Requested Storage Volume (af)
	7 Units to Erie in 2002 & 2003			
Left Hand Water District	Acquired 1 Unit in 1988 1 Unit to Lafayette in _____	0	0	-
Broomfield	Acquired 13 Units in 1989 Acquired 43 Units in 1991	56	56	25,200
Louisville	Acquired 6 Units in 2002 Acquiring 3 Units from Greeley	6	9	2,700
Erie	Acquired 3 Units in 2002 Acquired 4 Units in 2003 Acquired 7 Units from _____	14	20	6,000
Evans	Acquiring 5 Units from Greeley	0	5	1,750
Little Thompson Water District	Acquiring 12 Units from Greeley	0	12	4,850
Lafayette	Acquired 1 Unit from Left Hand Water District Acquiring 7 Units from _____	1	8	1,800
Fort Lupton	Acquired 3 Units in _____	3	3	1,050
Middle Park		0	0	3,000
Totals		480	344.5	90,180

SOURCE:

- Attachment #7 to Package of City of Longmont 2005 City Council Retreat Water Supply and Storage Issues
- Exhibit A to Longmont City Council Communication May 6, 2008, Windy Gap Firming Project Update
- DEIS for Windy Gap Firming Project (August 2008), Section 1.7 and Table 1-6

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March 22, 2004

Richard K. Aldrich, Field Solicitor
John C. Chaffin, Field Solicitor
United States Department of the Interior
Office of the Solicitor
316 North 26th Street, Room 3005
Billings, MT 59101

Via Facsimile and FedEx

Re: Windy Gap Firming Project and C-BT Project "Pre-positioning"

Dear Mr. Aldrich and Mr. Chaffin:

The Colorado River Water Conservation District ("River District"), the Commissioners of Grand County, Colorado ("Grand County"), and the Northwest Colorado Council of Governments Water Quality and Quantity Committee ("NWCCOG") greatly appreciate the opportunity to submit legal comments on the proposal of the Municipal Subdistrict of the Northern Colorado Water Conservancy District to firm-up its Windy Gap Project yield by "pre-positioning" federal C-BT Project water in a new non-federal reservoir.

As you know, "pre-positioning" refers to the Municipal Subdistrict's proposal to store federal C-BT Project water in a new non-federal reservoir on Colorado's Front Range in order to create additional storage space in the C-BT Project's Granby Reservoir for purposes of storing and then conveying non-federal Windy Gap Project water. Our understanding of the proposal is that the pre-positioned C-BT Project water in the new Front Range reservoir would "convert" into Windy Gap Project water when Windy Gap pumps under its junior priority into Granby Reservoir. Simultaneously, the Windy Gap Project water pumped into Granby Reservoir would "convert" into C-BT Project water. In this manner, the pre-positioning reservoir would act as a new storage facility for both the C-BT Project and the Windy Gap Project.

We are somewhat hesitant in submitting our legal objections to the pre-positioning proposal at this time. Even though pre-positioning would detrimentally impact recreation, fishing, water quality, and wastewater treatment costs in Grand County and further downstream, it is conceivable that, under certain circumstances (presently unknown), the West Slope might support pre-positioning. Unfortunately, we are not aware of any effort by the Municipal Subdistrict to include West Slope benefits or propose any form of mitigation or compensation for the adverse impacts that would result from pre-positioning. Regrettably, we therefore have no alternative at this time but to oppose pre-positioning.

The River District, Grand County and NWCCOG are West-Slope beneficiaries of (and represent other beneficiaries of) the C-BT Project. Each entity is also a signatory to the 1980 Windy Gap-Azure Settlement Agreement and have maintained a keen interest in the equitable operation of the project since its inception. Individually, and together, all three entities are particularly well-suited to comment on the substantial legal obstacles to the controversial pre-positioning concept.

I. The Interests of the River District, Grand County, and NWCCOG.

The River District is a political subdivision of the state of Colorado, created pursuant to C.R.S. § 37-46-101, *et seq.* The River District is comprised of all or parts of 15 western Colorado counties within the drainage basin of the Colorado River and its principal tributaries, including the Yampa, White and Gunnison Rivers. The River District was formed for the purpose of the conservation, use and development of the water resources of the Colorado River Basin for the benefit of all of the inhabitants of the district. The River District also is charged with safeguarding Colorado's entitlement to water under the Colorado River Compact. The River District is an expressly recognized beneficiary of the C-BT Project.¹

The Colorado River arises in Grand County, which is the location of numerous transmountain diversion projects, including the C-BT Project, the Windy Gap Project, Denver's Moffat Collection System, and Denver's Williams Fork Collection System. The impacts of transmountain diversions on the Colorado River headwaters are profound, particularly in Grand County. Currently, an average of 65% of the total available water supply in Grand County is diverted across the Continental Divide to the Front Range. That figure will arise to an astounding 85% if the Windy Gap Firming Project and Denver's proposed Moffat Collection Improvement Project are implemented as proposed. Those two pending projects will have substantial impacts on recreation, fishing, water quality, wastewater treatment costs, and the operation of irrigation diversion structures within Grand County. More generalized impacts will be felt throughout the West Slope. In addition, Grand County is the local permit authority for the Windy Gap Project and recently was designated as a cooperating agency for purposes of the Windy Gap Firming Project NEPA process.

NWCCOG is an association of some 30 municipalities and counties in the headwaters of the Colorado River basin formed by Executive Order by the governor. NWCCOG also is the designated regional water quality planning agency under Section 208 of the federal Clean Water Act for the region where the Windy Gap Project is located, and in that capacity plays an integral role in all water quantity and water quality related matters in the Colorado River headwaters region.

¹See Supplemental Judgment and Decree, dated February 9, 1978, in Consolidated Case Nos. 2782, 5016 and 5017, Federal District Court, District of Colorado. (The original October 12, 1955 Judgment and Decree in Consolidated Case Nos. 2782, 5016, 5017, and all subsequent rulings are referred to herein as the Consolidated Cases or the Blue River Decree).

II. The Windy Gap Firing Project and Pre-Positioning.

The Windy Gap Project is a non-federal project sponsored by the Municipal Subdistrict of the Northern Colorado Water Conservancy District that relies on the federal C-BT Project for storage, conveyance and delivery of West Slope water to Colorado's northern Front Range. The project is comprised of a small reservoir with a large pumping plant and pipeline, located on the Colorado River (downstream of the C-BT Project collection facilities) in Grand County. Windy Gap pumps water only when: 1) its relatively junior water right is in priority; and 2) excess storage space is available in the C-BT Project's Granby Reservoir, also located in Grand County. The Municipal Subdistrict's desire to firm the yield of Windy Gap is based in large part on the fact that Windy Gap normally diverts only in average water years. In dry years, the Project's junior water right is not in priority to divert. In wet years, there is little or no excess capacity available in the C-BT Project facilities to store and convey Windy Gap water.

The Municipal Subdistrict has proposed a variety of means to improve the yield of the Windy Gap Project, including the pre-positioning concept of moving federal C-BT Project water that has been stored in Granby Reservoir to a new, non-federal reservoir located on the Front Range. Pre-positioning would significantly increase the volume and frequency of Windy Gap's transmountain diversions from the headwaters of the Colorado River in Grand County and would change the operation of the C-BT and Windy Gap Projects in ways not contemplated by the original agreements, authorizing documents and water right decrees for either project.

III. Pre-positioning Would Violate Federal Law.

A. The C-BT Project must be operated in conformance with Senate Document 80.

The C-BT Project was authorized by Congress in 1937.² The authorizing legislation for the C-BT Project requires that the Project be constructed and operated in conformance with the Project's feasibility report submitted to Congress – commonly referred to as Senate Document 80.³ Senate Document 80 also operates as a contract between the United States, acting through the Bureau of Reclamation ("USBR" or "Reclamation"), and the West Slope and Front Range parties affected by the C-BT Project. Senate Document 80 requires that the C-BT Project be operated "in a fair and

²Act of August 9, 1937, 50 Stat. 564, 595 (1937).

³*Id.* (Senate Document 80 is formally entitled *Synopsis of Report on Colorado-Big Thompson Project, Plan of Development and Cost Estimate prepared by the Bureau of Reclamation, Department of the Interior, 75th Congress, First Session, June 15, 1937*).

efficient manner equitable to all parties having interests therein.”⁴ The USBR is required to operate the C-BT Project in accordance with the terms of Senate Document 80, and in accordance with the USBR’s role as “a trustee responsible for protection of the West Slope interests” in the C-BT Project.⁵ Senate Document 80 has the force and effect of a federal statute.⁶

As demonstrated below, pre-positioning would violate federal law – Senate Document 80 itself – simply because pre-positioning would require that the C-BT Project be operated in a manner that is contradictory to the express and specific directives of Senate Document 80.

B. Pre-positioning is inconsistent with the specific directives of Senate Document 80 and the Blue River Decree.

Senate Document 80 requires that the C-BT Project be operated:

1. To preserve the vested and future rights in irrigation.
2. To preserve the fishing and recreational facilities and the scenic attractions of Grand Lake, the Colorado River, and the Rocky Mountain National Park.
3. To preserve the present surface elevations of the water in Grand Lake and to prevent a variation in these elevations greater than their normal fluctuations.
4. To so conserve and make use of these waters for irrigation, power, industrial development, and other purposes, as to create the greatest benefits.
5. To maintain conditions of river flow for the benefit of domestic and sanitary uses of this water.⁷

Pumping from the Windy Gap Project into Granby Reservoir and subsequent conveyance of that water through the C-BT Project facilities has increased sediment and nutrient loading in Grand Lake. Pre-positioning would violate express purposes of the C-BT Project because it would exacerbate the existing adverse impacts of the Windy Gap Project on fishing and recreation in Grand Lake and the surrounding area by increasing the sediment and nutrient loading.

⁴Senate Document 80 at Page 3.

⁵See Supplemental Judgment and Decree, dated February 9, 1978, at pg. 2, Consolidated Cases.

⁶See Colorado River Storage Projects Act, 43 U.S.C. §620j; *Public Service Company v. Federal Energy Regulatory Commission*, 754 F.2d 1555 (10th Cir. 1985).

⁷Senate Document 80 at pg. 2.

C. Storage of C-BT Project Water on the Front Range is limited to Horsetooth and Carter Lake Reservoirs.

Senate Document 80 and the Blue River Decree specify Horsetooth and Carter Lake Reservoirs as the C-BT Project's Front Range water supply storage facilities.⁸ Storage of Project water in an entirely new Front Range reservoir simply was not considered in Senate Document 80 or the Blue River Decree. Pre-positioning C-BT Project water in a new reservoir, even under the cloak of the temporary "pre-positioning" of that water, would violate Senate Document 80 and the Blue River Decree because it would require fundamental changes in the manner in which C-BT Project water is stored in Granby Reservoir, carried under the Continental Divide, and then stored on the Front Range.

Furthermore, Reclamation has a trustee obligation, created by Senate Document 80, to deliver C-BT Project water for *irrigation* purposes in northeastern Colorado.⁹ Reclamation does not have a similar trustee obligation for the delivery of *municipal* Windy Gap Project water. Pre-positioning would put Reclamation's trustee obligation at substantial risk because Reclamation's control over the delivery of the irrigation water would be relinquished to a non-federal project and reservoir. Likewise, Reclamation's trustee obligation to the West Slope beneficiaries of Senate Document 80 would be breached because Reclamation could not guarantee that C-BT Project water would be delivered and used in compliance with Senate Document 80.

D. Pre-positioning would result in the illegal benefit to the Windy Gap Project of releases from the Green Mountain Reservoir "replacement pool."

Senate Document 80 specifies that the 52,000 acre-foot "replacement pool" in Green Mountain Reservoir shall be available to replace water in western Colorado "which would be usable there if not withheld or diverted by said project."¹⁰ The C-BT Project is the only transmountain diversion project that the replacement pool is intended to benefit. The Project benefits by storing or diverting water that the Project would otherwise not be entitled to divert, in exchange for water released for the Green Mountain Reservoir replacement pool. The C-BT Project's exchange of water from Green Mountain Reservoir was confirmed in the Consolidated Cases in 1992 (and contemporaneously by Colorado's Division 5 Water Court).¹¹ The amount of C-BT Project water

⁸Senate Document 80 at pgs. 18-21; Blue River Decree at para. 14, pgs 27-28. Senate Document 80 also refers to Arkins Reservoir, which was not constructed. The storage capacity of Arkins Reservoir was essentially transferred to the enlarged Horsetooth Reservoir. Smaller Front Range reservoirs also were integrated into the Project as power generation facilities.

⁹See Order of November 2, 1977, Consolidated Cases.

¹⁰Senate Document 80, pg. 3, para. 5(a).

¹¹See Findings of Fact, Conclusions of Law and Judgment and Decree, Consolidated Cases, dated November 10, 1992; and Case No. 88CW382, Water Division 5, State of Colorado.

stored in Granby Reservoir by virtue of the exchange with releases from the replacement pool varies from year to year but, in almost all years, the C-BT Project diverts a substantial percentage of the Project yield pursuant to the Green Mountain Reservoir replacement functions.

Under pre-positioning, federal C-BT Project water stored in Granby Reservoir would be moved to a new non-federal reservoir on Colorado's Front Range for the sole purpose of enhancing the yield of the non-federal Windy Gap Project. The Windy Gap Project would therefore benefit from the release of water from Green Mountain Reservoir's replacement pool. The sequence by which the Windy Gap Project would benefit from the replacement pool may appear indirect; however, the result is clear: Pre-positioning would improve the Windy Gap Project yield by a trade of C-BT Project water that was previously stored in Granby Reservoir by virtue of releases from the Green Mountain Reservoir replacement pool. Senate Document 80, and, as described below, the Azure Agreement, both prohibit this result.

E. Pre-positioning would violate the federal Reservoir Projects Act.

The Reservoir Projects Act requires express Congressional approval for any modification of a Reclamation reservoir project that seriously affects the purposes for which the project was authorized, planned or constructed, or which involves a major operational change in the project.¹² It would be difficult to conjure a more clear-cut example of a "major operational change" than the Municipal Subdistrict's proposal to move C-BT Project water from storage in the federally-owned Granby Reservoir, located in Grand County on the west-side of the Continental Divide, into a new non-federal reservoir located on Colorado's Front Range, particularly a reservoir that did not exist and was not even contemplated at the time the C-BT Project was authorized.

In addition, pre-positioning would violate the Reservoir Projects Act because it would seriously affect one of the primary purposes for which the C-BT Project was planned by jeopardizing the recreational and fishing opportunities at Grand Lake and the surrounding area.

F. Pre-positioning would require new, specific Congressional authority.

When a proposed method of operating a Reclamation project is not clearly authorized by the project's authorizing legislation, the proper course is for Reclamation to allow Congress to address the issue. Under no circumstances does Reclamation have the discretion to make operating changes that are inconsistent with federal law. In 1978, Department of Interior Solicitor Krulitz issued an important Opinion on the Fryngpan-Arkansas Project that applies with equal force to pre-positioning today. The Solicitor's Opinion states:

¹²43 U.S.C. § 390b(d).

The Bureau's current operating plans are controversial. They have important implications for the environment for both the east and west slopes, and the economic viability of the project as a whole. When, as here, such fundamental values collide and various interests clash openly, it is far better for Congress, most directly expressing the will of the people, to resolve such disputes than for the constructing and operating agency to do it

In cases where important and controversial economic and environmental interests are involved, caution is demanded. It is, in close cases, the better rule to seek additional and clarifying Congressional authority than to take questionable actions that may seriously affect important resources through means and in a manner which, it can be seriously argued, Congress has not considered.¹³

Pre-positioning is controversial. It would require Reclamation to breach its trustee obligations to water users on both sides of the Continental Divide. Senate Document 80, the operational "bible" for the C-BT Project, cannot realistically be interpreted as authorizing pre-positioning. In these circumstances, Reclamation must reject pre-positioning absent the express authorization of Congress.

IV. Pre-positioning Would Violate the Azure Settlement Agreement, the Windy Gap Record of Decision, the Windy Gap Carriage Contract and the Grand County Permit for an Activity of State Interest for the Windy Gap Project.

A. The Windy Gap Project must be operated in a manner consistent with Senate Document 80.

In 1979, the Colorado Supreme Court ruled that the Municipal Subdistrict had failed to comply with the compensatory mitigation provisions of Colorado's Water Conservancy District Act in its plan to develop the Windy Gap Project because the project failed to adequately protect current and prospective water users in the Colorado River Basin.¹⁴ Following the court's decision, the Municipal Subdistrict went back to the drawing board and, on April 30, 1980, entered into the so-called Azure Agreement with the River District, Grand County, NWCCOG, and other parties. The 1980 *Agreement Concerning the Windy Gap Project and the Azure Reservoir and Power Project*

¹³Opinion by Solicitor Krulitz, re: Authority to Divert Flows From Hunter Creek Tributaries, Fryingpan-Arkansas Project, Colorado, 85 I.D. 326, 334-335 (June 28, 1978).

¹⁴*Colorado River Water Conservation District v. Municipal Subdistrict, Northern Colorado Water Conservancy District*, 198 Colo. 352, 610 P.2d 81 (1979).

allowed the Windy Gap Project to move forward.¹⁵ Only after the Azure Agreement was executed did Reclamation approve the Final Environmental Statement (“FES”) and issue a Record of Decision (“ROD”) for the Windy Gap Project. In fact, the terms and conditions of, and the mitigation called for by, the Azure Agreement were expressly recognized and effectively incorporated into both the FES and the ROD.¹⁶ By its own terms, the carriage contract for Windy Gap was conditioned on completion of the FES and execution of the ROD.¹⁷ The carriage contract, as amended, must therefore be construed in a manner consistent with the Azure Agreement and the Supplemental Azure Agreement.

The signatories to the Azure Agreement did not want to allow the Windy Gap Project to change the operation of the C-BT Project in any way, so paragraph 14 of the Azure Agreement requires that the Municipal Subdistrict “comply with all terms and provisions of Senate Document 80 in the design, construction, and operation of the Windy Gap Project.” In other words, the Windy Gap Project was approved only on the assurance that Windy Gap operations would be “invisible” to the C-BT Project, and that Windy Gap would always take a back-seat to the operation of the C-BT Project.

Now, the Municipal Subdistrict proposes just the opposite. Its pre-positioning proposal would require that C-BT Project operations be manipulated for the sole purpose of benefitting the Windy Gap Project. As discussed above, pre-positioning would violate the specific operational criteria set forth in Senate Document 80. It naturally follows that pre-positioning would violate a fundamental tenet of the Azure Agreement—the operation of Windy Gap in a manner consistent with Senate 80. For this reason, pre-positioning likewise runs afoul of the FES and ROD for the Windy Gap Project, and is inconsistent with the Windy Gap carriage contract.

B. The Azure Agreement prohibits the release of water from Green Mountain Reservoir to benefit the Windy Gap Project.

The Azure Agreement expressly provides that the “Subdistrict will not claim the use of Green Mountain Reservoir for replacement purposes for the Windy Gap Project operation.”¹⁸ As discussed above, pre-positioning would allow the Windy Gap Project to benefit from the release of water from Green Mountain Reservoir’s “replacement” pool in direct contradiction of the Azure Agreement.

¹⁵The Azure Agreement was supplemented by the March 29, 1985 *Supplement to Agreement of April 30, 1980*. The original agreement is referred to as the Azure Agreement; the supplemental agreement is referred to as the Supplemental Azure Agreement.

¹⁶See Windy Gap Project, USBR Final Environmental Statement (FES 81-20), and Record of Decision, June 18, 1981.

¹⁷See article 12, Carriage Contract No. 14-06-700-7497, October 3, 1973. The original carriage contract has been amended by an Amendatory Contract, Contract No. 4-07-70-W10707, dated March 1, 1990.

¹⁸Azure Agreement at para. 18.

C. The Azure Agreement covers the entire Windy Gap Project, not just its desired yield.

The Municipal Subdistrict may argue that pre-positioning is not inconsistent with the Azure Agreement because the proponents do not plan to divert more than the negotiated volumetric limits for the Windy Gap Project that are set forth in the Azure Agreement. However, the Azure Agreement and the Supplemental Azure Agreement were intended to cover the identified project as a whole - not just the desired yield of the Project. The Azure Agreement provides that the Municipal Subdistrict may build and operate facilities necessary to accomplish the purposes of the agreement, within the conditions and limitations of the agreement.¹⁹ This provision of the Azure Agreement was intended to clear the path toward construction of the identified project; it was not intended to give the Municipal Subdistrict free reign to implement a project as controversial a pre-positioning.

The Windy Gap Project always has been always been considered to consist only of specific identified components. For example, each of the three water court decrees for the Windy Gap Project state that “Windy Gap is an integrated project consisting of Jasper Pump and Pipeline, Jasper Reservoir, Windy Gap Pump, Pipeline and Canal, and Windy Gap Reservoir.”²⁰ In addition, the amended carriage contract states that “it is the purpose of this amendatory contract to: (1) recognize that the Windy Gap Project has been completed and that the Project Works have been utilized to introduce, store, carry, and deliver Subdistrict Water, as contemplated by the [original carriage contract].”²¹ Construction of a new Front Range reservoir as a means to increase the project yield cannot reasonably be considered to be within the limitations and conditions of the Azure Agreement, the original or amended carriage contract, or the FES and ROD, particularly when the operation of the new reservoir would require a change in the operation of the C-BT Project. The West Slope would not have agreed to the settlement embodied in the Azure Agreement if the operation of the Windy Gap Project had been designed to change the C-BT Project.

D. The Grand County Permit for an Activity of State Interest for the Windy Gap Project Does Not Contemplate Pre-positioning.

In 1980, Grand County issued a permit to the Municipal Subdistrict for the Windy Gap Project, pursuant to its statutory authority to regulate and permit activities of state interest under C.R.S. § 24-65.1-101 *et seq.* The permit followed public hearings and includes specific findings made by the Board of County Commissioners concerning the impacts of the Windy Gap Project. In particular, the permit states that the proposed project “will not significantly deteriorate aquatic habitats, marshlands and wetlands...” This finding was based on an evaluation of the present

¹⁹Azure Agreement at para. 37.

²⁰Decrees, Civil Action No. 1768, District Court, Grand County, Colorado; Case Nos. W-4001, and 80CW108, Water Division 5, State of Colorado.

²¹Amendatory Contract No. 4-04-70-W0107, March 1, 1990, at Recital (c).

configuration of facilities and operations of the Windy Gap Project and did not include any evaluation of the pre-positioning concept. Moreover, the permit is conditioned upon compliance with the Azure Agreement. Because pre-positioning is not within the scope of the Grand County permit and because pre-positioning violates the Azure Agreement, pre-positioning would result in the violation of Grand County regulations and the Grand County permit.

V. Pre-positioning Would Require Changes of Water Rights for the C-BT and Windy Gap Projects, and Would Trigger New Mitigation Requirements Under State Law.

Colorado law requires a change of water right for a new place of storage.²² A change in place of storage must be approved by a water court decree to be legally binding and effective.²³ As noted previously, the Blue River Decree specifies the Front Range storage locations of C-BT Project water as Horsetooth and Carter Lake Reservoirs. A change in the storage location of C-BT Project water to a new non-federal reservoir on the Front Range prior to the delivery of that water to its end users therefore would require a change of water right to be effective under Colorado law.

Similarly, the decrees for the Windy Gap Project identify its primary storage facility as the Jasper Reservoir (which has never been constructed). Storage clearly was contemplated (and decreed) as an integral component of the Windy Gap Project. The use of any reservoir to enhance the yield of the Windy Gap Project, other than the decreed 11,000 acre-foot Jasper Reservoir, would involve a change in the place of storage of Windy Gap Project water. It is our understanding that pre-positioning would require Windy Gap Project water to be stored in a new Front Range reservoir. In such circumstances, Colorado law requires a change of water right, and a decree confirming that the change does not injure other water users.²⁴

The construction and operation of the C-BT Project and the Windy Gap Project were both conditioned on the fundamental tenet that the Projects' adverse impacts on the West Slope would be mitigated, and compensation provided to the West Slope. Green Mountain Reservoir serves this function for the C-BT Project. The terms and conditions of the Azure Agreement and the Supplemental Azure Agreement serve this purpose for the Windy Gap Project. The compensation requirement that applies to water conservancy districts (and their subdistricts) is required for all "works and facilities" planned to divert or facilitate the export of water from the Colorado River basin.²⁵ In other words, the requirement applies to all components of such a project — not just to

²²C.R.S. §37-92-103(5).

²³See, e.g., *Santa Fe Trail Ranches Property Owners Ass'n v. Simpson*, 990 P.2d 46, 52 and 54 (Colo. 1999); *Fort Lyon Canal Co. v. Catlin Canal Co.* 642 P.2d 501 (Colo. 1982).

²⁴C.R.S. §37-92-103(5) and 37-92-305(3).

²⁵C.R.S. §37-45-118(1)(b)(II); *Central Colorado Water Conservancy Dist. v. Colorado River Water Conservation Dist.*, 186 Colo. 193, 526 P.2d 302 (1974) (the specificity mandated by the [Water Conservancy Act] then is nothing short of a physical demonstration that any project works or facilities will be designed, constructed, and operated in such a manner


Richard K. Aldrich, Field Solicitor
John C. Chaffin, Field Solicitor
March 22, 2004
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the desired yield of the project. A new facility, such as a new Front Range reservoir, used to enhance the yield of the Windy Gap Project therefore triggers the compensatory mitigation requirement of the Water Conservancy Act. Absent such mitigation, the pre-positioning proposal violates Colorado law.

I have been authorized to represent that the Grand County Commissioners and NWCCOG join fully in these comments.

Thank you again for your time and consideration of our position on this matter. Please let us know when a decision or opinion on this matter has been made by the Solicitor's Office.

Yours very truly,


Peter C. Fleming
General Counsel

cc: Commissioner John W. Keys, III
Colorado River Water Conservation District, Board of Directors
Grand County Commissioners
Barbara Green, Esq.
Taylor Hawes, Esq.
Middle Park Water Conservancy District
Grand Valley Water Users Association
Grand Valley Irrigation Company
Orchard Mesa Irrigation Company
Palisade Irrigation District

that the present appropriations of water, and in addition thereto prospective uses of water within the natural basin of the Colorado River will not be impaired nor increased in cost at the expense of water users within the natural basin).



Date: December 15, 2008

To: Lurline Underbrink-Curran, County Manager
Grand County, Colorado

From: Jean Townsend, President
Coley/Forrest, Inc.

RE: WINDY GAP FIRING PROJECT - DRAFT ENVIRONMENTAL IMPACT REPORT (DES 08-30)

This memorandum includes a review of the *Draft Windy Gap Firing Project – Draft Environmental Impact Statement* (DES 08-30) (DEIS) with emphasis on land use, recreation, visual quality and socioeconomic components in Grand County.

Section 1.0 introduces issues, concerns and potential inadequacies of the DEIS. Section 2.0 provides page-specific comments that correspond with the issues referenced in Section 1.0.

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1.0 GENERAL COMMENTS

This section introduces issues and concerns about specific topics presented in the DEIS that affect Grand County. Where appropriate, page-specific comments are listed at the conclusion of the discussion of each issue or concern. These comments are presented in Section 2.0.

- The first three sections address impacts that have been excluded from consideration. Some were mentioned in the *Public Scoping Report* but excluded (1.1); some were mentioned in the DEIS in a qualitative manner and then dismissed (1.2); some are simply excluded from consideration (1.3)
- The next two sections discuss concerns about the baseline conditions and methodology (1.4) and the definition of the No Action Alternative (1.5).
- The next four sections summarize concerns about specific sections of the DEIS including land use (1.6), recreation (1.7), visual impacts (1.8) and socioeconomic (1.9).
- The final section discusses mitigation. (1.10).

1.1 IMPACTS LISTED IN PUBLIC SCOPING REPORT

The *Public Scoping Report* (ERO Resources, December 2003) lists a number of issues and concerns related to potential Windy Gap Firing Project (WGFP) land use, recreation, visual, and socioeconomic impacts in Grand County. However, a number of these concerns either were not addressed or were not addressed comprehensively in the DEIS. Some illustrative examples follow. All page references in this section are from the *Public Scoping Report*.

Land Use Remarks:

- Two remarks regarding agriculture were: “Disclose effects to irrigation lands and rights downstream of the project and any associated economic effects.” (*page D-10*) and “Evaluate effects to agricultural/irrigation users in the Colorado River Basin.” (*page D-11*)
- Land use concerns related to lakeshore properties “from an alluvial buildup on the Grand Lake side of the outlet canal” were recorded. (*page 15*)
- “Landowner development plans for portions of the Jasper Reservoir should be taken into consideration.” (*page D-12*)

Recreation Remarks:

- A specific request to “evaluate recreation impacts on Grand Lake” was recorded. (*page D-11*)

- Several concerns about aquatic resources related directly to fishing in the Colorado River included “concern about fish kills due to stream flow changes”, “impacts to aquatic resources from water temperature changes and stream flow changes” and “potential impacts to all Colorado River fish species.” (*page D-8*)

Socioeconomic Remarks:

- Socioeconomic issues in Grand County included “potential impacts to tourism and recreation industries” (not just active recreation participants using publicly accessed facilities), “additional costs associated with the potential need to upgrade wastewater treatment plants”, and “economic impacts to the communities of Grand Lake, Kremmling and Hot Sulphur Springs.” (*pages 14 and D-10*)
- Two broad socioeconomic impact remarks were provided: “Evaluate baseline conditions and future impacts to Grand County’s water-based recreation economy and tourism industry.” (*page D-10*) and “Evaluate impacts to the Grand County economy and its ability to grow if water diversions from the basin increase.” (*page D-11*)

Visual Impact Remark:

- Visual impact scoping remarks included “impacts to scenic resources caused by streamflow depletions.” (*page D-10*)

Water Resource and Wastewater Treatment Remarks:

- “Calculate impacts of worst case scenarios on flows and storage.” (*page D-5*)
- “Evaluate future water supplies for Kremmling and Hot Sulphur Springs (*page D-5*)
- “Evaluate impacts to water and wastewater facilities in the Fraser and Colorado River Basins. (*page D-5*)
- Several remarks addressed “...the amount of water that would remain available for West Slope needs in the Fraser River Basin and the communities of Hot Sulphur Springs and Kremmling on the Colorado River.” (*page 11*)

1.2 IMPACTS ACKNOWLEDGED IN DEIS

There are many instances in which the DEIS acknowledges a negative impact but it does not follow through by quantifying the effects or considering the socioeconomic consequences. These qualitative remarks are also removed from the summary and missing from any mitigation consideration.

Construction Impacts. Construction impacts are acknowledged. Some impacts last for up to 38 months. However, there is no recognition of potential negative consequences on private property, such as loss of serenity, or on the County due to increased road maintenance costs. (See comment LU-3.)

Assessed Valuation Losses. Land acquisition is required and acknowledged in Alternatives 3, 4 and 5, but there is no mention of the County's loss in assessed valuation as property is removed from private use and purchased by a tax-exempt entity. These are straightforward calculations that were excluded.

Existing Reservoir Degradation. Decreases in reservoir water surface area, reservoir water clarity and reservoir water quality are all mentioned as having potential negative impacts on recreation and visitation, but there is no attempt to quantify or follow through in the analysis discussion of socioeconomic effects. There is easily accessible secondary literature that addresses and quantifies these relationships. In addition, there is recent case history of lower water surface area effects on Lake Granby from 2002 and 2003. The analysts did not report any attempts to learn about these localized and relevant impacts.

The DEIS concludes that it is unknown whether reduced water clarity, algal growth or chronic toxin concerns in Grand Lake and Shadow Mountain Reservoir will have an impact and so it ignores further consideration. (See comments R-9, R-12, R-15 and R-24.)

Real Estate Values. The DEIS acknowledges "concern" about real estate values but provides no quantitative or qualitative description and no mitigation solutions. There are scholarly articles regarding the relationship between water clarity and property values that could have been applied. ^{1 2 3 4}

1.3 IMPACTS EXCLUDED FROM CONSIDERATION

There is a third category of impacts that were not mentioned in the Public Scoping Document and were not referenced in the DEIS, but were mentioned in earlier documents submitted to the Applicant by Grand County. These types of impacts have also been excluded from consideration. They include:

- loss of sport fishing lease revenues, due to lower streamflows;
- loss of private boating and fishing activities conducted by visitors;
- water supply and demand needs in Grand County;
- reduced real estate values of resorts, dude ranches and developments that rely on views and streamflow.

There is an implicit assumption that Grand County should endure any environmental impacts with socioeconomic consequences so that future Subdistrict customers can have water. It is unclear why one West Slope county should be burdened so that other Front Range counties can

grow. There is no apparent commitment to water conservation by existing Subdistrict customers to even minimize their need for additional water

1.4 BASELINE CONDITIONS AND PARAMETERS

Baseline - Affected Environment. *Guidelines for Preparing Economic Analyses*, prepared by the US Environmental Protection Agency, provides principles for describing baseline conditions. “Specification of baseline conditions can have profound influence on the measurement and interpretation of analytical results...The honesty and integrity of the analysis depend on the ability of the analyst to provide well-defined and defensible choices in selection and estimation of baseline conditions. The first step is to select a baseline that is appropriate to the question the analysis is intended to address. The second step is to estimate the values of relevant factors in the selected baseline scenario.”⁵

The table below summarizes the types of baseline conditions presented in the DEIS for land use, recreation, visual quality and socioeconomic. In my judgment, the depth of quantitative information provided for land use, visual, recreation and socioeconomic baseline conditions is inadequate because it does not match up with many questions outlined in the *Public Scoping Report* or provided by Grand County in prior written communication.

PARAMETERS USED IN THE DEIS TO DESCRIBE THE (BASELINE) AFFECTED ENVIRONMENT IN GRAND COUNTY	
TOPIC & SECTION	PARAMETER USED
Land Use (3.18.1)	<ul style="list-style-type: none"> - amount of state and federal land - % of land in agriculture - comment about low-density residential development
Recreation (3-19.1)	<ul style="list-style-type: none"> - surface water acres, number of boat ramps, number of marinas - preferred boating streamflows on selected reaches of the Colorado River - commercial boating and fishing visitor days on one reach of the Colorado River - number of fishing guide companies - number of annual user days for fisherman in 2004 (no location reference)
Visual Quality (3.21.1)	<ul style="list-style-type: none"> - analysis focuses only on new reservoirs - images that are visible from the proposed reservoirs
Socioeconomic (3.22.1)	<ul style="list-style-type: none"> - permanent population - countywide and towns - seasonal population - countywide and Three Lakes Area - skier visitors and Rocky Mountain National Park visitors - race & ethnicity - employment, labor force, top industries (collapsed), agricultural employment - Per capita income, poverty level, wage rates, household income - income of agricultural production - new reservoirs - broad remarks about tourism, countywide - commercial fishing user days on one reach of the Colorado River - community services (schools, emergency medical, fire protection, State Patrol)

If more rigor had been applied in collecting baseline information that aligned with scoping remarks, then the analyst may have been less likely to ignore potential impacts or dismiss potential impacts as “too difficult to quantify”, “unlikely to noticeably affect”, “contribute to a

diminished recreation experience”, “minimal” and the like. (See comments R-9, R-12, R-13, R-23 and R-24.) Some examples follow.

- The land use baseline excludes the relationship between the Colorado River and adjacent agricultural properties that depend on the River for irrigation.
- The recreation analysis excludes baseline information for any visitor but commercial boating and commercial fishing on one reach of the Colorado River, it excludes all other recreation activities.
- The visual quality analysis excludes consideration of Lake Granby, Shadow Mountain Reservoir, Grand Lake and Willow Creek Reservoir, and the Colorado River as scenic assets that attract and extend the stay of visitors.
- The new information introduced by the socioeconomic analysis excludes consideration of the local economies of the municipalities impacted and property values. The socioeconomic analysis is also hampered by inadequate information in the land use, recreation and visual quality sections.

Hydrological Study Period. Remarks about water-based recreation are based on changes in streamflow from a 47-year hydrologic period (1950 – 1996). It is curious that the last 11 years of data (1997 – 2007) where the streamflow may have been further reduced by man-made factors, including the (original) Windy Gap Project, is excluded from the baseline data set. If more recent information were included and this expanded information set baseline streamflow conditions lower, then the incidence of sub-par streamflow might increase. This condition suggests that any impact findings that rely on the 1947 to 1996 streamflow information might be understated. (See comments R-17 and R-21.)

Water Measurement Parameter. The information on water hydrology that is used in the land use, visual impact and socio-economic components of the DEIS is expressed in average monthly figures, but for the discussion regarding commercial rafting and kayaking. In the one place where daily flows were applied in the analysis, the DEIS found environmental effects and quantified their socioeconomic consequences.

Most environmental impacts and socioeconomic consequences simply do not occur in average monthly increments. The frequency, duration and magnitude of hydrologic changes and related temperature effects impact flushing flows, recreation usage, agricultural usage for irrigation, fishing, boating, scenic viewing and many more types of impacts that have related socioeconomic consequences.

The intricate relationships between water flow, water quality, changes in the magnitude of flow, temperature and temperature changes and timing are vitally important to Grand County. Because in most cases, ERO reports only average monthly statistics, many environmental

impacts with potential related socioeconomic effects in Grand County might be unreported or understated.

1.5 DEFINITION OF “NO ACTION” ALTERNATIVE

In some instances, the DEIS evaluates impacts against the No Action Alternative which already includes substantial impacts relative to Existing Conditions; in other instances, the analysis compares alternatives against Existing Conditions. With the WGFP, the action alternatives are proposed by the same or a related organization that created the No Action Alternative.

While the No Action Alternative may (or may not) meet the required regulatory definition, it is not clear how it can be a “no action” alternative in the common sense definition of “no action.”

The land use, visual, recreation and socioeconomic components of the DEIS provide no clear delineation of the original Windy Gap project as part of Existing Conditions, the No Action Alternative, the Proposed Action Alternative, other action alternatives, or cumulative effects. The “existing” hydrologic conditions correspond to a historic study period from 1950 to 1996 that includes some original Windy Gap effects and excludes others.

As described in the DEIS, the WGFP places incremental environmental burdens on Grand County, relative to the original Windy Gap project. In my judgment, it is of heightened importance that the (original) Windy Gap project impacts be clearly and quantitatively singled out throughout the DEIS, whether or not compensatory mitigation was accomplished.

1.6 LAND USE IMPACTS (DEIS SECTION 3.18)

In the DEIS, land use includes land ownership, land use and transportation.

Narrow List of Impacts. The land use analysis only addresses impacts that are related to construction of new infrastructure. “None of the alternatives would directly affect land use at locations outside of those needed to support project facilities.” (See comment LU-1.)

Method. The DEIS states that “effects to existing land uses were evaluated based on anticipated physical changes at new reservoir sites.” (page 3-223) Also, it states that no new facilities would be constructed along the Colorado River that would affect existing land ownership and land uses. Accordingly, the DEIS identifies no land use impacts in Grand County for No Action Alternative or Proposed Alternative because there are no new reservoir sites and no new facilities along the Colorado River. That is, no hard construction.

There is no acknowledgement of the relationship between water and land use. In my opinion, there are substantial and potentially negative relationships between WGFP water impacts and land use including impacts to agriculture through irrigation ditch failures and impacts to

development directly dependent on river and reservoir and US 40 views and usage. Also, the *Public Scoping Report* specifically identifies potential impacts to the Grand Lake shoreline and property rights from an alluvial buildup on the Grand Lake side of the outlet canal. Both scholarly secondary research and anecdotal illustrative information is available to describe these relationships. (See comments LU-1 and LU-2.)

Transportation. Alternatives 3 and 4 have a construction impact in Grand County lasting 38 months; congestion and traffic delays are acknowledged. Yet, the DEIS contains no related effects on Grand County or on adjacent land uses. (See comment LU-3.)

Land Ownership Changes. The DEIS estimates land acquisition needs for Alternatives 3, 4 and 5 of 300 to 500 acres and notes a loss in agricultural production. Land ownership changes from cumulative effects would be substantially greater; 1,590 acres for Alternative 3 and 4,770 acres for alternatives 4 and 5. The derivation of these figures was not provided.

There is no discussion of potential effects other than “potential loss in additional agricultural land and undeveloped land.” Only 28% of Grand County land is in private ownership (page 3-216). The loss of privately held land has lasting negative impacts on the School District, the County and other jurisdictions that rely on property tax revenues.

Agriculture. An analysis of effects on agriculture is missing from the DEIS, but for mention of some loss of irrigated pasture where reservoirs would be constructed.

With the WGFP, average monthly streamflow decreases of up to 6% in the No Action Alternative and up to 11% in the Proposed Action Alternative are anticipated. With cumulative effects, average monthly streamflow reductions of 15% in the No Action Alternative and between 18% and 21% in the action alternatives are anticipated. There is no mention of related impacts to irrigation ditch operations.

Our interviews with a rancher and former water commissioner ⁶ and supplemented by the *Grand County Stream Management Plan – Draft Report* ⁷ suggest that additional streamflow reductions would further compromise the agricultural irrigation pump intake system perhaps to failure in some situations. Significant drops in streamflow and related increases in temperature hamper or prohibit irrigation activity either because there is inadequate pressure or because dead fish and algae clog the irrigation gate network. All alternatives exacerbate this marginal condition.

Lower streamflow and additional irrigation ditch structure failures is a relationship that the Subdistrict understands. The Municipal Subdistrict paid \$500,000 in mitigation to upgrade diversion structures for ranches below the Colorado River as part of the original construction of Windy Gap Reservoir.

In addition, streamflow reductions may comprise the quality of the Colorado River for fishing, which is a supplemental source of income to ranchers who lease their property to individuals and fishing guides. (See comments LU-2 and LU-4.)

Construction Impacts. The DEIS acknowledges construction impacts of up to 38 months and related construction traffic, periodic vehicle delays and congestion at intersections. There is no mention of related negative impacts on adjacent land uses for Alternatives 3, 4 and 5. (See comment LU-3.)

Real Estate Development Impacts. The DEIS excludes any consideration of the relationship of surface water reductions to Lake Granby and adjacent real estate development or water clarity and quality reductions in Grand Lake and Shadow Mountain Reservoir and adjacent real estate.

Cumulative Impacts. The DEIS states that cumulative impacts “would not have any direct incremental effect on land ownership or use...” (page 3-229) In our judgment, cumulative effects exacerbate streamflow decreases and impact adjacent ranchers through the added potential for irrigation ditch structure failure and reduced opportunity for fishing lease revenues.

1.7 RECREATION (DEIS SECTION 3.19)

Narrow Definition of Recreation. There is a general bias in the DEIS that if recreation is not active recreation that is accessible by the general public, then it merits no consideration or analysis. The only recreation activities quantified are commercial kayaking and commercial rafting on selected reaches of the Colorado River and related camping on one reach of the Colorado River.

This is narrow and inadequate. While commercial kayaking and commercial rafting in selected reaches of the Colorado River are a few core summertime visitor activities, there are other more significant recreation activities that bolster the Grand County economy in the summer that are likely impacted by the WGFP. These include:

- commercial and private fishing in locations other than Reach 5 of the Colorado River;
- other commercial and private boating by visitors in reservoirs;
- camping in locations other than Reach 5 of the Colorado River, and
- passive visitor enjoyment of the US 40 corridor, a national scenic byway, the Colorado River, Grand Lake, Shadow Mountain Reservoir, and Lake Granby.

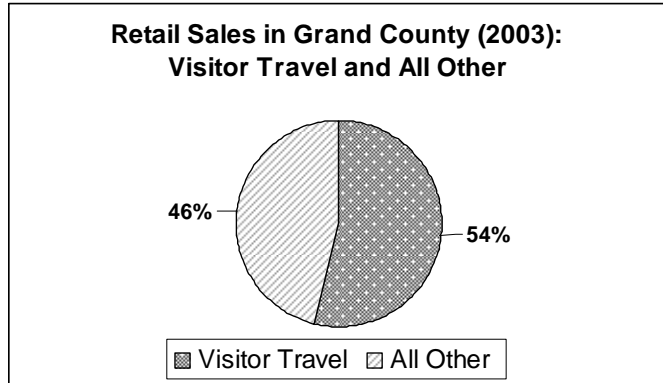
Each of these affected recreation activities have related impacts on lodging, restaurant sales, recreation equipment rental providers and guides or outfitters, and other incidental purchases.

In the summer, many out-of-state visitors come to Grand County because of Rocky Mountain National Park, a national destination, but they linger because of the fishing, boating, and scenic beauty that Grand County currently offers. The local economy relies on this recreation

relationship. The water resources that are compromised by the WGFP are necessary components of the County's scenic beauty and tranquility and its more passive recreation venues. (See comments R-1, R-2, R-6 to R-8, R-11.)

The Tourism Sector in Grand County.

Tourism has played a pivotal role throughout Grand County's history. In the 1870s, rustic "resorts" were built in Hot Sulphur Springs and Grand Lake. These resorts attracted fisherman and hunters. In the early 1900s, tourism activity broadened as Grand Lake emerged as a recreation respite for affluent families escaping the summer heat. Fishing and boating were the cornerstone recreation activities.



Gradually, tourism has grown to become the primary economic driver in Grand County. Unlike other more urban environments, every tourist activity in Grand County relies directly on the natural flow of water.

The *Economic Impact of Travel on Colorado* report ⁸ estimates that in Grand County, the direct impact of spending by visitors equaled \$169.7 million in 2003. These expenditures included only spending on travel, lodging, food and beverages, recreation and other visitor-related commodities. It understates the actual impact on the County's economy because it included no secondary (indirect and induced) impacts such as visitor-related construction activity and business services. This volume of spending comprised 54% of total retail expenditures in the County.⁹ In addition, visitors paid \$7.1 million in local government taxes, which included lodging, auto rental, and sales tax.

As illustrated in the graph to the right, retail sales in July, August and September (the 3rd quarter), for Grand County excluding Winter Park, are 16% to 40% higher than any other quarter. This is the height of the tourism season for the portion of Grand County most impacted by the WGFP.¹⁰ Local businesses as well as municipal governments are highly dependent on retail sales.



As described above August ranks second and July ranks third in retail sales activity. This summer activity is attributable to visitors, many of whom come to see the Rocky Mountain

National Park (2.9 visitors in 2005) but linger in Grand County to participate in fishing, rafting, kayaking, boating, mountain biking, hiking or site-seeing.

US 40 – Grand County’s Tourism Corridor. In 2005, the 80-mile stretch of US 40 from Grand Lake through Granby, Hot Sulpher Springs and Kremmling to State Bridge, known as the Colorado River Headwaters, was designated by the US Secretary of Transportation as a National Scenic Byway. It is one of only ten “America’s Byways” in Colorado. It is also one of 19 Colorado Scenic and Historic Byways. The Colorado River and US 40 are inextricably linked from the visitor’s perspective. Travelers from throughout the country choose to visit Colorado in the summer months because of this prestigious designation.

Preferred Streamflows and Recreation. The table below compares Colorado River streamflow recommendations for recreation contained in the WGFP DEIS with recommendations contained in the *Draft Grand County Stream Management Plan – Phase 2*.¹¹

COMPARISON OF COLORADO RIVER STREAMFLOW RECOMMENDATIONS FOR RECREATION	
WGFP DEIS	DRAFT GRAND COUNTY STREAM MANAGEMENT PLAN
COLORADO RIVER – WINDY GAP TO WILLIAMS FORK RIVER (BYERS CANYON) – GOLD MEDAL FISHERY	
REACH #2 <u>Angling:</u> No data <u>Kayaking:</u> > 400 cfs	CR-4 <u>Angling:</u> Minimum, 60 cfs; Optimum, 200-300 cfs <u>Kayaking:</u> Minimum, 300 cfs; Optimum, 1,000 - 1600 cfs
COLORADO RIVER – WILLIAMS FORK RIVER TO KREMMLING – GOLD MEDAL FISHERY	
REACH #3: <u>Angling:</u> No data	CR-5: <u>Angling:</u> Optimum, 200 - 300 cfs
COLORADO RIVER – KREMMLING TO PUMPHOUSE (GORE CANYON)	
REACH #4 <u>Angling:</u> No Data <u>Rafting:</u> 850 to 1,250 cfs <u>Kayaking:</u> Min. Preferred, 400 - 2,200 cfs Preferred, 1,100 – 2,200 cfs	CR-6: (ALSO GORE CANYON IN CR-7) <u>Angling:</u> Optimum – 200 to 300 cfs <u>Kayaking:</u> Minimum, 900 cfs; Optimum, 1,200 -1,400 cfs <u>Rafting:</u> Minimum, 1,000 cfs; Optimum, 1,200- 1,800 cfs
COLORADO RIVER – PUMPHOUSE TO STATE BRIDGE (PUMPHOUSE)	
REACH #5: <u>Angling:</u> No data <u>Rafting & Kayaking:</u> Min. Preferred, 400 - 3,000 cfs <u>Rafting:</u> Preferred, 2,000 – 3,000 cfs	CR-7 (Pumphouse) <u>Angling:</u> Minimum, 450 cfs; Optimum, 1,000 cfs <u>Kayaking:</u> Minimum, 500 cfs; Optimum, 600 -1,000 cfs <u>Rafting:</u> Minimum, 700 cfs; Optimum, 900 - 1,300 cfs
Sources: WGFP DEIS, Chapter 3, Affected Environment; Draft Grand County Management Plan information is from the “Reach Summary” section.	

The DEIS provides no streamflow figures for angling for any portion of the Colorado River, even though several sections have a Gold Medal Fishery designation. The DEIS flow recommendations for kayaking and rafting are lower or broader than the *Draft Grand County Stream Management Plan-Phase 2* recommendations in most cases. If the *Draft Stream*

Management Plan recommendations are more valid, then the magnitude of impacts is greater and the figures should be adjusted.

The *Draft Stream Management Plan* also contains recommendations for environmental flows, and flushing flows and reports CWCG minimum flow requirement. These are excluded from this analysis of recreation impacts.

Senate Document 80. Senate Document 80, enacted in 1937, allowed the construction of the Colorado-Big Thompson Project. This Document states, “The project must be operated in such a manner as to most nearly affect the following primary purposes ... “to preserve the fishing and recreation facilities and scenic attractions of Grand Lake, the Colorado River and the Rocky Mountain National Park.¹² This suggests that an added level of analysis and scrutiny is appropriate when considering the recreation effects of the WGFP, which is enabled by Senate Document 80. In my judgment, the analysis is too narrowly focused and dismissive of many recreation impacts that are itemized throughout this memorandum.

Fishing in Grand County. A significant portion of Grand County’s summer and fall tourism is based on fishing. While fishing is one of several visitor attractions in East Grand County, it is an economic lifeline to West Grand County. Tom Clark, Mayor of Kremmling, explains that fishing is fundamental part of the local cultural heritage and is a key factor in retaining the local rural atmosphere. While exact figures are not available, Mayor Clark believes that fishing is a substantial part of the local West Grand County economy.¹³ Henry Kirwin, co-owner of Mo Henry’s Trout Shop, reports that his 500 to 1,000 fishing guide clients may come to Grand County to fish its Gold Medal streams, but often extend their stay to enjoy other active and passive recreation opportunities. Fishing is a destination purpose for many summer visitors.

The Colorado Division of Wildlife recently released a report¹⁴ that stated the direct expenditures of anglers averaged \$67 per activity day for Colorado residents and \$118 per activity day for non-Colorado residents. With the secondary impact of dollars re-spent in the economy, the total economic impacts are \$118 per activity day for Colorado residents and \$208 per activity day for non-Colorado residents. The DEIS estimates expenditures for fishing per user day at \$53 (page 3-275). This low expenditure figure, plus the exclusion of all private fishing activity significantly underestimates the contribution of fishing to the local economy.

The DEIS concludes that there are no measurable impacts on fishing in Grand County because the impact on fish habitats will not adversely impact sports fishing. This analysis challenges the DEIS conclusion that fishing is a singular function of fish habitat. The DEIS provides no evidence that fishing is a singular function of fish habitat. (See comment R-23.)

The decision to fish in a stream or river in Grand County relates directly to the anticipated quality and success of the fishing experience, which is a function of many factors, including streamflows, water temperature, water clarity including the absence of slippery moss and algae, the scenic environment of the river corridor, and the expectation of success. Currently, due the existing compromised condition of some streams in Grand County, fishing guides, local fishing

experts, and retailers report¹⁵ that they are guarded in recommending some stream locations to fish and, in the summer months, also encourage anglers to use a temperature gauge and avoid fishing in the afternoon when water temperatures are higher.

The WGFP will further erode the quality of the Colorado River and its tributaries. The *Grand County Draft Stream Management Plan - Phase 2*¹⁶ describes a number of specific existing conditions where the quality of fishing is threatened by whirling disease and/or elevated temperatures. It seems unreasonable to conclude without any evidence that this condition will not reducing.

Method to Assess Water Resources and Recreation Effects. The *Recreation Resources Technical Report* (ERO Resources, 7/08, p 26) cited one analysis on the Arkansas River Basin (Smith and Hill 2000) to conclude that “water levels in reservoirs do not generally influence people’s behavior patterns and it would be speculative to attempt to draw such conclusions about visitor use patterns based on reservoir elevations. However, Smith and Hill showed a strong correlation between water surface area available for recreation and user satisfaction.”

The DEIS estimates reductions in water surface area at Lake Granby but makes no attempt to quantify the recreation visitor impact. There is no follow through in the socioeconomic section. In addition, the authors appear to have made no attempt to develop a local analysis in Grand County through survey research or any other technique. There is secondary research available plus directly relevant and recent experience with low water levels in the Lake Granby that should be pursued.^{17 18}

Fishing in the Colorado River – Gold Medal Fishery And Wild Trout Water Designations. A 20-mile segment of the Colorado River from Windy Gap Reservoir to Troublesome Creek and up Troublesome Creek (Reaches 2 and 3) has a “Gold Medal Fishery” designation from the Colorado Wildlife Commission. This designation for outstanding trout fishing is bestowed sparingly; only 168 miles (1.9%) of the 9,000 miles of trout streams in Colorado have earned this designation. The reputation of the Gold Medal Fishery designation draws fisherman nationally and internationally throughout the summer, according to Dan Murphy¹⁹, owner of the Fishing Hole in Kremmling. The DEIS acknowledges this designation but does not discuss whether the WGFP or the cumulative effects would threaten this designation. This neglect lessens the significance of potential impacts.

The Colorado Division of Wildlife also designates certain mountain streams and some high lakes as “wild trout waters.” These designations are reserved only for waters where the habitat is capable of sustaining a wild trout population and the primary fishery management objective is to maintain a wild trout population and fishery.²⁰ Further degradation to the Colorado River from the WGFP or the cumulative effects would threaten this designation. (See comments R-3 and R-4.)

Wild and Scenic River Designation. All reaches of the Colorado River in Grand County are under consideration by the Bureau of Land Management (BLM) for “Wild and Scenic River

Designation.” The DEIS specifically states that it excludes consideration of whether the WGFP would impact BLM’s determination of Wild and Scenic Designation. This is a potentially significant designation that could generate substantial visitor revenues for Grand County. While not usurping BLM’s analysis, the DEIS should compare eligibility requirements against anticipated impacts of the WGFP and the cumulative effects. (See comment R-10.)

Land-Based Recreation. The DEIS states that effects from water-based recreation would have a limited direct impact on land-based recreation, such as camping, picnicking, mountain biking, and hiking. This statement is unsubstantiated. There is no effort to determine what portion of visitors come to Grand County for a water-based recreation experience, such as boating or fishing, and also participate in complimentary land-based activities. If the water-based recreation opportunity is constrained, it seems reasonable that land-based recreation is also impacted.

Qualitative Remarks and Remarks about Uncertainty. In many instances, the recreation section identifies a potential impact but marginalizes the impact using qualitative words such as “difficult to quantify”, “too speculative”, “may contribute to a diminished recreation experience”, “unlikely to noticeably affect”, etc.

These statements are unsubstantiated. No criteria appear to have been applied to determine whether an impact is potentially significant. In each instance, there is no attempt to quantify the impact in this section, no explanation as to why quantification is not possible, no follow-up attempt to analyze the socioeconomic implications, no consideration of a multiplier effect, and no reference in the summary chapter.

Stated simply, once stated, all qualitative remarks disappear from further consideration in the DEIS. Ignoring these impacts substantially understates the recreation effects and related socioeconomic implications.

The US Environmental Protection Agency *Guidelines for Preparing Economic Analyses*²¹, published in 2000, and the draft *Guidelines*²², prepared in 2008, provide expert guidance on how to treat uncertainty and qualitative findings. Some illustrative statements that highlight the importance of presenting qualitative information and information that may be uncertain are cited below.

- “The issue for the analyst is not how to avoid uncertainty, but how to account for it and present useful conclusions to those making policy decisions.”²³ The *Guidelines* provide several alternative analytical tools with which to present uncertainty, including sensitivity analyses, “switch points” and ways to reduce the range of uncertainty.
- “Highlighting Non-monetized and Unquantified Effects. Economic analyses should present and highlight non-monetized effects when these are important for policy decisions. Reasons why these consequences cannot be valued in monetary terms are important to communicate as well.”²⁴

These quotes are from the 2000 document. The draft 2008 document is even more explicit on these points but EPA does not allow cites or quotes from this later document since it is still in external review draft format. The dismissive style of the DEIS is inconsistent with EPA *Guidelines* and renders the impact analysis questionable. (See comments R-9, R-12 to R-15, and R-17.)

Recreation at Reservoirs. The Lake Granby, Shadow Mountain Reservoir and Grand Lake are centerpieces of the local Grand County economy in the Three Lakes Area. This is evidenced by the number of recreation-oriented and visitor-oriented businesses and related employment, the flow of retail sales, lodging occupancy and other statistics in central Grand County and the Three Lakes area.

The DEIS reports anticipated decreases in water surface area, increases in exposed shoreline, and impacts on boat ramp access. It reports potential adverse boating, camping, hiking and shoreline activities during low water levels but concludes that any impacts are difficult to quantify and so no effort is made to quantify and potential socioeconomic implications are ignored.

It reports a “concern” about reduced water clarity and algal growth in Grand Lake and Shadow Mountain Reservoir that “may contribute to a diminished recreation experience”(page 3-236), but it does not attempt to quantify this effect, describe potential socioeconomic implications, mention the possibility in the summary chapter, or provide mitigation solutions.

The table below consolidates illustrative remarks from the DEIS about recreation impacts in the Three Lakes area.

SUMMARY OF RECREATION EFFECTS ON EXISTING GRAND COUNTY RESERVOIRS FROM WGFP OR CUMULATIVE EFFECTS - DEIS				
	Lake Granby	Willow Creek Reservoir	Shadow Mountain Reservoir	Grand Lake
Boating	“unlikely to noticeably affect”	None	No mention	No mention
Fishing	“not substantially affect shoreline fishing”	None	No effect	No effect
Camping	“could decrease in during low water levels”	None	No mention	No mention
Visitor Experience	“may reduce quality of visitor experience”	None	“reduced water clarity may contribute to a diminished recreation experience”	“reduced water clarity may contribute to a diminished recreation experience”
Source: DEIS: p 3-237, 3-236, 3-246				

There is scholarly research regarding the relationship between lakes and reservoirs and recreation.^{25 26} In addition, some straightforward research in Grand County to first quantify baseline summer recreation in the Three Lakes area and second to measure the impacts of summer recreation in the recent low water years (2002 and 2003) would provide pertinent data.

Ignoring the relationship between the size, access, health and beauty of Lake Granby, Shadow Mountain Reservoir and Grand Lake and recreation activity is a serious flaw, in my judgment, that minimizes the impacts of the WGFP.

The DEIS excludes consideration of Senate Document 80²⁷ requirements which protect Grand Lake and the Colorado River, including specific considerations about recreation, aesthetics and fish.

Lake Granby – Boat Ramp Access – Average Year. The DEIS reports in an average year under the No Action and all action alternatives, one of the three boat ramps on Lake Granby may be inaccessible for one month (May) due to the WGFP. With cumulative effects, one or two boat ramps may be inaccessible for one month (May). See the summary table below.

LAKE GRANBY – BOAT RAMP ACCESS – AVERAGE YEAR (MEASURED IN # OF RAMPS)				
Alternative	Windy Gap Firing Project		Cumulative Effects	
	Boat Ramps Accessible	% Change from Existing Conditions	Boat Ramps Accessible	% Change from Existing Conditions
Existing Conditions	3		3	
No Action	2	-33%	2	-33%
Proposed Action	2	-33%	1	-67%
Alternatives 3-5	2	-33%	1	-67%
Note: Accessibility differs by month in some scenarios. Sources: DEIS pages 3-236 and 3-246				

The analysis of this condition concludes that under either the WGFP analysis or the cumulative effects analysis “it is unlikely to noticeably affect recreation use or the quality of the recreation experience under any alternative. “ (page 3-237; also see 3-247) It is not clear how a 33% to 67% reduction in access to boat ramps would not affect recreation use.

At the end of May each year, the Granby Chamber of Commerce hosts “The Granby Fishing Contest”, a festival that celebrates the beginning of the fishing season in Lake Granby. If this event presents a poor aesthetic for fishing, then the local economy will be compromised throughout the summer as anglers select other places to fish.

In addition to three public boat ramps, there are two private marinas that function in Lake Granby. (The DEIS notes this, page 3-230.) These private marinas would also experience a reduction in users from WGFP impacts. This private sector impact is ignored in the analysis. Ignoring private sector impacts is a consistent error throughout the DEIS, in my judgment. (See comments R-16 and R-24.)

Lake Granby – Boat Ramp Access – Dry Year. The DEIS reports that in a dry year, under the No Action and all action Alternatives, all boat ramps on Lake Granby may be inaccessible for one or two months due to the WGFP. In a dry year, under cumulative effects, no data was provided in the DEIS. (See summary table below.)

LAKE GRANBY – BOAT RAMP ACCESS – DRY (MEASURED IN # OF RAMPS)				
Alternative	Windy Gap Firing Project		Cumulative Effects	
	Boat Ramps Accessible	% Change from Existing Conditions	Boat Ramps Accessible	% Change from Existing Conditions
Existing Conditions	3		3	
No Action	0	-100%	?	?
Proposed Action	0	-100%	?	?
Alternatives 3-5	0	-100%	?	?
Note: Accessibility differs by month in some scenarios. Sources: DEIS pages 3-236, 3-237, 3-246, 3-247				

The DEIS acknowledges that “lower water levels in dry years “may reduce the quality of the recreation experience or “could reduce the quality of the recreation experience...” This appears to be a significant understatement since all boat ramps would be inaccessible in one or more summer months. (See Comments R-16 and R-24.)

Lake Granby – Water Surface Area Effects – Average Year. The DEIS reports that in an average water year, the WGFP would trigger a reduction in surface water area of up to 6% under the Proposed Action and up to 7% under the Proposed Action – Cumulative Effects.

LAKE GRANBY – SURFACE AREA CHANGES – AVERAGE YEAR (MEASURED IN ACRES)				
Alternative	Windy Gap Firing Project		Cumulative Effects	
	Surface Area (May)	% Change from Existing Conditions	Surface Area (May)	% Change from Existing Conditions
Existing Conditions	5,970		5,970	
No Action	-140 or 5,830	-2%	-190 or 5,780	-3%
Proposed Action	-351 or 5,619	-6%	-431 or 5,539	-7%
Alternatives 3-5	-167 or 5,803	-	-239 or 5,731	-4%
Sources: DEIS, Table 3-116, p 3-236 and p 3-246				

- The analysis states that these “relatively small” reductions in boatable area are unlikely to noticeably affect recreation use or quality. (p 3-237) This remark might be based on one personal interview with Orr, in 2008. There is ample secondary research that provides quantitative relationships between reductions in surface areas and recreation.
- This data is presented in average monthly statistics. There is no information on the volume of daily fluctuations within the month. Visitors and recreation users view and use the reservoir on a daily basis. Average monthly statistics might mask the more realistic impacts.
- The derivation of the Existing Conditions figure is uncertain. It might be based on an historic time period (1950 to 1996) that excludes two of the driest years in recent history. If so, then the Existing Conditions figure may be too low and the related impacts understated.

There is historic data available to discern the relationship between of a reduction of water surface area, visitation and recreation, since Lake Granby experienced this effect in 2002 and

2003. It appears that no attempt was made to assemble this information. Our recent interviews with the local business community who experienced these low water years points out that there was a direct relationship. ²⁸ “As the Granby Chamber of Commerce, a community dependent on fishing and boating as one of our major draws to the area, we had to spend a lot of additional time and marketing dollars to convince people that the low water would not detract from their visit. The low water levels did stop people from coming up for the views – dirt where water should be was not always attractive to tourists.” ²⁹

Lake Granby – Water Surface Area Effects – Dry Year. In a dry year, the DEIS states that the WGFP impacts could cause decreases of up to 18 feet under No Action and up to 23 feet under the Proposed Action but provides no information that enables the reviewer to compare these conditions with Existing Conditions. It provides no similar information about cumulative effects. This is an inadequate presentation of potentially significant information that provides the reviewer no context. The table below illustrates the lack of information.

LAKE GRANBY – SURFACE AREA CHANGES – DRY YEAR (MEASURED IN FEET)				
Alternative	Windy Gap Firming Project		Cumulative Effects	
	Surface Area	% Change from Existing Conditions	Surface Area	% Change from Existing Conditions
Existing Conditions	?		?	?
No Action	Up to 18’ decline	?	?	?
Proposed Action	Up to 23’ decline	?	?	?
Alternatives 3-5	?	?	?	?

Sources: DEIS page 3-236

River Hydrology and Adjacent Recreation Dependent Developments. In Grand County, private developments and recreation oriented destinations are a primary foundation of the local economy. Deterring recreation activity in the Colorado River through changes in the timing and magnitude of water flow, water temperature, and water quality directly impacts the socioeconomic fabric of the Grand County economy. There are several major real estate resorts, dude ranches and developments along the Colorado River that rely on fishing as an important guest service or resident benefit; these include Shorefox, Elk Trout Lodge and Bar Lazy J. The DEIS acknowledges the presence of two of these developments but attributes no potentially negative impacts from further hydrologic compromises to the River. (See comment R-2.)

Average Monthly Streamflow and Fishing. The DEIS reports average monthly streamflow information by reach but states that there is no adverse impact on fish habitat based on estimated effects to fish habitat and communities. (page 3-236) There is an intricate relationship between *daily* stream hydrology (flow magnitude, water temperature) and fishing. Fish don’t function on a monthly average basis. If flow levels are too high, anglers cannot wade safely; if flow levels are too low or temperatures are too high, anglers will avoid fishing to preclude further stress the fish. In our judgment, an inadequate amount of information has been presented to reach the DEIS conclusion.

Even with the data as presented, the impact of the Proposed Action and Alternatives 3, 4 and 5 are to reduce the number of days of preferred flows by 20% to 43% in some instances. This magnitude of decrease may effectively eliminate these activities from Grand County.

Commercial Kayaking and Rafting – WGFP Effects Quantified. The DEIS provides extensive information regarding the impact of a change in daily streamflow regime on commercial kayaking and commercial rafting in Reaches 2, 4 and 5 of the Colorado River relative to preferred flows. These figures are important because they are one of few impacts to be quantified and reported in the socioeconomic section (3.22).

The data is analyzed against a baseline study period that extends from 1950 to 1996; it excludes the more recent information where streamflows may have been lower. If more recent data includes lower streamflows, then the number of days of inadequate flow increases. This may be a serious methodological issue that should be considered.

It is unclear how the designations of “preferred flow” and “minimum preferred flows” were determined. The American Whitewater Association has conducted a series of studies aimed at quantifying flow needs that support the “outstandingly remarkable” rafting, float-fishing and kayaking activities on the Colorado River.³⁰

The DEIS concludes that the reduced streamflows will have a negligible impact but for in Reach 2, where there is a 22.7% reduction between the Proposed Action and Existing Conditions. The percent change is presented in the last column in the table below. In a prior section, the DEIS discounts this significant reduction by stating that in Reach 2, “Byers Canyon does not support commercial boating and is infrequently used for kayaking.” (page 3-239) The socioeconomic section miscalculates the impact in Reach 2, as described later in this memorandum.

DEIS ANALYSIS: WINDY GAP FIRING PROJECT EFFECTS						
COLORADO RIVER DAILY STREAMFLOW CHANGES AND IMPACT ON COMMERCIAL KAYAKING AND RAFTING						
Reach Name and Number	Boat Type	CFS	Number of Days over 47 Years within “Preferred” Range			
			Existing Conditions	No Action	Proposed Action	% Change: Existing to Proposed
Byers, #2	Kayaking	> 400	1012	870	792	-22.7%
Big Gore #4	Rafting	850 – 1,250	848	824	825	-2.7%
	Kayaking	400 – 2,200 (1)	1,421	1,425	1,425	-0.3%
	Kayaking	1,100 – 2,200 (2)	1,034	1,035	1,030	-0.4%
Pumphouse, #5	Rafting & Kayaking	400 – 3,000 (1)	3,498	3,520	3,536	+1.1%
	Rafting	2,000 – 3,000 (2)	441	447	421	-4.5%

(1) “Minimum Preferred Streamflows” (2) “Preferred Streamflows”
Sources: DEIS Tables: 3-117, 3-119, 3-120, 3-121, 3-122, 3-123

- For “minimum preferred conditions”, the DEIS sets a wider band of streamflows. This term seems internally inconsistent.

- The derivation of these figures is not explained in the recreation section and so it is not possible to validate the figures independently.

(See comments R-5 and R-21.)

Commercial Kayaking and Rafting – Cumulative Effects Quantified. The DEIS also provides extensive information regarding the cumulative impact of a change in daily streamflow regime on commercial kayaking and commercial rafting in Reaches 2, 4 and 5.

For preferred flows (not preferred minimum flows), cumulative effects are a negative 28% in Reach 2, a negative 20% in Reach 4 and a negative 43% in Reach 5. In Reach 5, preferred rafting streamflows (2,000 to 3,000 cfs) under Existing Conditions are achieved an average of 10% of the time (441 / 4324 days = 10%); with the Proposed Action, rafting in preferred streamflow conditions will be achieved 6% of the time, a 40% reduction. When preferred conditions occur so rarely, this significant drop may signal the end of commercial rafting in Reach 5.

DEIS ANALYSIS: CUMULATIVE EFFECTS						
COLORADO RIVER DAILY STREAMFLOW CHANGES AND IMPACT ON COMMERCIAL KAYAKING AND RAFTING						
Reach Name and Number	Boat Type	CFS	Number of Days over 47 Years within “Preferred” Range			
			Existing Conditions	No Action	Proposed Action	% Change: Existing to Proposed
Byers, #2	Kayaking	> 400	1,012	768	725	-28.4%
Big Gore #4	Rafting	850 – 1,250	848	808	792	-6.6%
	Kayaking	400 – 2,200 (1)	1,421	1,416	1,416	-0.4%
	Kayaking	1,100 – 2,200(2)	1,034	844	827	-20.0%
Pumphouse, #5	Rafting & Kayaking	400 – 3,000 (1)	3,498	3,563	3,579	+2.3%
	Rafting	2,000 – 3,000 (2)	441	235	251	-43.1%
(1) “Minimum Preferred Streamflows” (2) “Preferred Streamflows” Sources: DEIS Tables: 3-124, 3-126, 3-127, 3-128, 3-129, 3-130						

- The difference between “minimum preferred streamflows” and “preferred streamflows” is significant when considering cumulative effects. The term “minimum preferred streamflows” appears to be internally inconsistent.
- The derivation of these cumulative figures is not explained in the recreation section and so it is not possible to validate the figures independently.

(See comments R-5 and R-21.)

Colorado River – Average Monthly Streamflow Changes. The *Recreation Resources Technical Report* (ERO Resources, 7/08) provides average monthly streamflow information for various reaches of the Colorado River. These figures are excluded from the DEIS. The tables below summarize this data for the month of July for each reach of the Colorado River.

- *Colorado River Reach #1.* For the Proposed Action in an average year, average monthly streamflow changes, using July as an example, are 11% below Existing Conditions; for the Proposed Action plus cumulative effects, the average monthly streamflow is 18% below Existing Conditions, a 63% reduction. Yet, the DEIS finds no impact to fishing or boating in this Reach. (See comment R-18.)

COLORADO RIVER – REACH #1 (LAKE GRANBY TO WINDY GAP)				
AVERAGE YEAR - AVERAGE MONTHLY FLOW – JULY				
Alternative	Windy Gap Firming Project		Cumulative Effects	
	Average Monthly Flow (CFS)	% Change from Existing Conditions	Average Monthly Flow (CFS)	% Change from Existing Conditions
Existing Conditions	519		519	
No Action	487	-6%	441	-15%
Proposed Action	462	-11%	425	-18%
Alternatives 3-5	467	-10%	429	-17%

Sources: *Recreation Resources Technical Report*, p 38, p 64

- *Colorado River Reach #2.* For the Proposed Action, the reduction in average monthly streamflow in an average year, using July as an example, is 22% below Existing Conditions and 24% below Existing Conditions under cumulative effects. This reach has a “Gold Medal” fishing designation. Yet, the DEIS concludes no negative impacts to fishing. Boating is discussed elsewhere. (See comment R-19.)

COLORADO RIVER – REACH #2 – WINDY GAP RESERVOIR TO WILLIAMS FORK RIVER (BYERS CANYON)				
AVERAGE YEAR – AVERAGE MONTHLY FLOW – JULY				
Alternative	Windy Gap Firming Project		Cumulative Effects	
	Average Monthly Flow (CFS)	% Change from Existing Conditions	Average Monthly Flow (CFS)	% Change from Existing Conditions
Existing Conditions	482		482	
No Action	386	-20%	355	-26%
Proposed Action	374	-22%	265	-24%
Alternatives 3-5	351	-27%	336	-30%

Sources: *Recreation Resources Technical Report*, p 40, p 65

- *Colorado River Reach #3.* For the Proposed Action, the reduction in average streamflow in an average year, using July as an example, is 14% below Existing Conditions and 17% below Existing Conditions under cumulative effects. This reach has a “Gold Medal” fishing designation. The DEIS concludes that there is limited boating in this Reach so negative impacts associated with lower streamflows are not quantified and fishing is not impacted. (See comment R-20.)

COLORADO RIVER – REACH #3 (WILLIAMS FORK TO KREMMLING)				
AVERAGE YEAR – AVERAGE MONTHLY FLOW - JULY				
Alternative	Windy Gap Firming Project		Cumulative Effects	
	Average Monthly Flow (CFS)	% Change from Existing Conditions	Average Monthly Flow (CFS)	% Change from Existing Conditions
Existing Conditions	735		735	
No Action	641	-13%	597	-19%

COLORADO RIVER – REACH #3 (WILLIAMS FORK TO KREMMLING)				
AVERAGE YEAR – AVERAGE MONTHLY FLOW-JULY				
Alternative	Windy Gap Firming Project		Cumulative Effects	
	Average Monthly Flow (CFS)	% Change from Existing Conditions	Average Monthly Flow (CFS)	% Change from Existing Conditions
Proposed Action	629	-14%	607	-17%
Alternatives 3-5	606	-18%	578	-21%

Sources: *Recreation Resources Technical Report*, p 42, p 68

- *Colorado River Reach #4.* For the Proposed Action in an average year, reduction in average monthly streamflow, using July as an example, is 6% below Existing Conditions and 25% below Existing Conditions under cumulative effects. This is among the most significant differences between the WGFP effects and cumulative effects. There is no discussion of this difference in the DEIS.

The Gore Race, an internationally acclaimed race that brings visitors and economic benefit to western Grand County, occurs annually in August in Reach 4. Streamflow for the time period leading up to and the day of the event is important since this is the time period where competitors are making a go/no go decision. Preferred streamflows are marginally achieved (Figure 3-74, p 3-240) during August with WGFP effects and are not achieved under cumulative effects (Figure 3-77, p 3-249). If the hydrological study period had been extended from 1996, we question whether preferred streamflows could be achieved in August.

Mitigation on the weekend of the event is inadequate because competitors already know that preferred flows are marginal or not being achieved. The conclusion appears to be inconsistent with the analysis. The DEIS states that with mitigation, the Gore Race boating event, held in August, should not be affected. The conclusion appears to be inconsistent with the analysis.

COLORADO RIVER – REACH #4 (KREMMLING TO PUMPHOUSE – BIG GORE CANYON)				
AVERAGE YEAR – AVERAGE MONTHLY FLOW-JULY				
Alternative	Windy Gap Firming Project		Cumulative Effects	
	Average Monthly Flow (CFS)	% Change from Existing Conditions	Average Monthly Flow (CFS)	% Change from Existing Conditions
Existing Conditions	1,745		1,745	
No Action	1,660	-5%	1,303	-25%
Proposed Action	1,647	-6%	1,313	-25%
Alternatives 3-5	1,624	-7%	1,286	-26%

Sources: *Recreation Resources Technical Report*, p 44, p 69.

- *Colorado River Reach #5.* In an average year, the DEIS provides a graph for WGFP effects in Reach 5 (Figure 3-75, p 3-241) but not for cumulative effects. The *Recreation Resources Technical Report* provides both graphs (p 49 and 76). Neither document provides corollary data in tabular format. The WGFP graph indicates that preferred average monthly streamflows for rafting are only achieved in June; the cumulative effects graph indicates that preferred average monthly streamflows for rafting are possibly achieved in June only.

Using daily streamflow information (see above), the DEIS concludes that there would be a neutral to positive impact of days when streamflow would be within the preferred flow range. (Tables 3-122, 3-123) with WGFP effects. This conclusion seems significantly understated given the monthly streamflow information.

COLORADO RIVER – REACH #5 (PUMPHOUSE TO STATE BRIDGE) AVERAGE YEAR – AVERAGE MONTHLY FLOW-JULY				
Alternative	Windy Gap Firming Project		Cumulative Effects	
	Average Monthly Flow (CFS)	% Change from Existing Conditions	Average Monthly Flow (CFS)	% Change from Existing Conditions
Existing Conditions	Graph but no data		Graph but no data	
No Action	Graph but no data		Graph but no data	
Proposed Action	Graph but no data		Graph but no data	
Alternatives 3-5	Graph but no data		Graph but no data	
Source of Graphs: DEIS, Figure 3-75, page 3-241; Recreation Technical Report, 7/08, pages 49 and 76.				

1.8 VISUAL QUALITY (DEIS SECTION 3.21)

Narrow Definition of Visual Quality. The DEIS “study area” for the visual quality assessment focuses only on the visual quality surrounding the proposed new reservoirs. The DEIS acknowledges a concern expressed during “scoping” about the impact to scenic resources from hydrological changes and does make some qualitative remarks.

Visual Impacts of Water Resources. Grand County economy thrives on the visual beauty of the Colorado River and its reservoirs.

- *Colorado River.* The DEIS dismisses the likely degradation of visual quality to the Colorado River from lower streamflows and the related additional moss and algae growth on the riverbed. The DEIS reports that “lower streamflows could potentially reduce the visual quality of the Colorado River, but for most viewers these changes would not be discernable.” The data provided in this section is expressed in average monthly “feet” reduced with no information about the magnitude of the statistic relative to Existing Conditions. The reviewer cannot analyze the results with incomplete information. (See Comment V-5.)
- *Willow Creek below Willow Creek Reservoir.* The DEIS reports lower average annual streamflows of 7% under the No Action, 14% under the Proposed Action and 12% for others. Average annual streamflows are a poor indicator of visual quality which is experienced by viewers on a daily, not average annual basis. The DEIS acknowledges that lower flows would reduce the visual quality for some viewers, but dismisses the impact because “public access...is limited.”

- *Grand Lake.* The DEIS mentions “predicted changes in water clarity or increased algal growth in Grand Lake may contribute to diminished visual quality” but makes no attempt to quantify the impact or measure its socioeconomic consequences. This statement holds for the WGFP and the cumulative impacts. (See comment V-2)
- *Shadow Mountain Reservoir.* The DEIS states that there will be no change in water clarity and minor water quality changes. These impacts “are unlikely to noticeably affect the visual quality.” The conclusion is not quantified or substantiated. (See comment V-3.)
- *Lake Granby.* The DEIS reports increases in visible shoreline in an average year that are up to 93% greater than Existing Conditions due to the WGFP and 120% greater than Existing Conditions from Cumulative Effects. During dry years, the analysis does not provide comparable data. With these sizeable impacts, the DEIS states only that the visual quality of the reservoir for some viewers would be reduced. There is no quantification of potential negative effects on visitation and no follow through in the socioeconomic impact analysis. The magnitude of quantitative information appears to be inconsistent with the qualitative and unsubstantiated judgment. (See comments V-4 and V-7.)

LAKE GRANBY – EXPOSED SHORELINE IN AVERAGE YEAR (MEASURED IN ACRES)				
Alternative	Windy Gap Firing Project		Cumulative Effects	
	Exposed Shoreline	% Change from Existing Conditions	Exposed Shoreline	% Change from Existing Conditions
Existing Conditions	290		290	
No Action	398	37%	450	55%
Proposed Action	560	93%	638	120%
Alternatives 3-5	445	53%	456	57%
Sources: DEIS pages 3-268 and 3-270				

In addition, one year of a substantially negative effect may have a multiple year impact on visitors who may not return and who might tell their friends about their negative experience. This has been the experience of local business community representatives.

1.9 SOCIOECONOMIC IMPACTS (DEIS SECTION 3.22)

Socioeconomic Impacts Considered. The socioeconomic impacts that are quantified are:

- construction costs, jobs and economic output associated with new reservoir construction;
- loss of agricultural land and related output due to reservoir construction;
- loss of commercial kayaking and rafting participants on three reaches of the Colorado River;
- camping associated with loss of kayaking and rafting participants on one reach of the Colorado River.

Excluded Impacts. The most significant flaw with the socioeconomic impact section is that it is too narrow. There are three types of impacts that are excluded from consideration, understated, or ignored in the socio-economic impact analysis: (a) Impacts referenced in the *Public Scoping*

Report and not pursued; (b) Impacts referenced in the Recreation, Land Use or Visual Impacts sections and not pursued; (c) Impacts missing from the analysis. These have been detailed earlier in Sections 1.1, 1.2 and 1.3. (See comment SE-2.)

Pervasive Disregard for the Private Sector in Grand County. Water resources and the local Grand County economy are inextricably linked.³¹ The WGFP directly impacts the environmental quality of the Colorado River, Lake Granby, Shadow Mountain Reservoir, and Grand Lake. There is a pervasive and nearly total disregard for private sector impacts from the WGFP. Some private sector impacts that are ignored include:

- ranchers whose irrigation systems fail due to reduced streamflow in the Colorado River;
- ranchers who rely on fishing leases along the Colorado River;
- real estate and resort developments where a healthy Colorado River is their primary or sole asset;
- lakefront and riverfront properties whose value is directly related to reservoir water clarity and water quality;
- numerous summer recreation-oriented and visitor-oriented businesses including private marinas, local motels, restaurants, recreation gear and apparel retailers, grocers and the like;
- construction-related impacts on adjacent properties and developments.

Socioeconomic Impacts Excluded – Recreation. The most significant exclusion develops from the DEIS' definition of recreation which is active recreation where there is public access. In Grand County, the "recreation sector" has a widespread impact on the entire economy, since recreation is a primary economic driver. When recreation impacts are described in qualitative or conditional terms and marginalized because they are "too difficult to quantify" or "unlikely to affect visitors", then they are dropped from further consideration and excluded from the summary section. These are discussed in Section 1.7. This is inconsistent with EPA *Guidelines for Economic Analyses*, which provide extensive detail on how to treat qualitative or uncertain impacts. (See comments SE-3 - SE-7, SE-10, and SE-12.)

Socioeconomic Impacts Excluded – Land Use / Agricultural Impacts. The Land Use Section (3.18) of the DEIS does not acknowledge a relationship between Colorado River hydrology and agricultural land use. Therefore, the socioeconomic section does not address this important negative impact. Based on my research, there are substantial potential negative relationships between further reductions in Colorado River streamflow and agricultural land uses through irrigation ditch failures, impacts to development directly dependent on river and reservoir views and usage. These are documented in communications with the Grand County ranching community. ³² (See comments SE-1 and SE-9.)

Countywide Analysis. The few socioeconomic impacts that are reported are presented on a countywide basis. This approach misses the significance of impacts that may seem small on a countywide basis but comprise the economic lifeblood of smaller communities and some economic sectors. For example fishing and boating along some reaches of the Colorado River are significant areas of summer economic activity in the relatively small communities of Hot

Sulphur Springs and Kremmling. The *Public Scoping Report* expressly mentions concerns about impacts on these communities.

Cumulative Effects Analysis. The DEIS states that the “cumulative socioeconomic effects were evaluated” but provides only the results of this analysis. The analytical steps are excluded from the DEIS and the *Socioeconomic Technical Resource Report*, so it is not possible to analyze the results.

1.10 MITIGATION

In the visual, land use, recreation and socioeconomic impacts, the DEIS provides very few mitigation solutions because it quantifies very few impacts, as summarized below.

While there is a relative broad remark about negotiating a fair market value for any property impacted, it is reasonable to interpret the meaning to focus only on land required for outright purchase by the property.

SUMMARY OF MITIGATION RECOMMENDATIONS IN GRAND COUNTY	
TYPE	WGFP MITIGATION & CUMULATIVE EFFECTS MITIGATION
Land Use	“No specific mitigation ... other than what may be needed for land acquisitions or county land use requirements, including special use review, location and extent review and 1041 permitting.” (p 3-229) Compensation for acquisition of property or homes impacted by project facilities (p. 3-229)
Recreation	“...curtail Colorado River diversions during the annual Big Gore Race...held in August if flows at the Kremmling gage are below 2,200 cfs.” (P 3-253)
Visual	“Minimize amount of grand clearing, reclamation and restoration of areas disturbed during construction.” (P 3-272)
Socioeconomic	“... negotiate a fair market value for acquisition of any property or homes that would be impacted by implementation of any alternative.” (p 3-290) “...curtail Colorado River diversions during the annual Big Gore Race...held in August if flows at the Kremmling gage are below 2,200 cfs.” (P 3-290)
Source: DEIS, various pages listed above.	

If the DEIS is amended to acknowledge and quantify the range of remarks identified above, then there are a host of mitigation solutions that may minimize and in some cases, eliminate negative impacts. If impacts are not acknowledged, then extensive monitoring arrangements should be implemented to assure that the DEIS conclusions hold true with automatic and mandatory mitigation actions if the conclusions do not hold true.

2.0 SPECIFIC COMMENTS BY PAGE

2.1 LAND USE IMPACTS

Comment LU-1, Page 3-223.

New Reservoir Impacts Only. "...effects to existing land uses were evaluated based on anticipated changes at reservoir sites." "None of the alternatives would directly affect land use at locations outside of those needed to support project facilities." The analysis assumes that land uses are only impacted by new construction. Our findings show that ranchers with irrigation ditches along the Colorado River and real estate developments that rely on fishing as a feature or singular summer activity are directly impacted by changes in Colorado River streamflows. Also, summer visitors who have come to enjoy the stretch of US 40 in Grand County because of its National and Colorado Scenic Byway designation may also be impacted.

Comment LU-2, Page 3-223.

Agricultural Impacts – WGFP. This section acknowledges that water diversions would affect Colorado River streamflows downstream of the Windy Gap diversion but states without any proof that "No new facilities would be constructed along the Colorado River that would affect land ownership and land uses." This ignores the relationship between the flow of water and directly related irrigation ditch structure failures. The original Windy Gap Project acknowledged this relationship and provided \$500,000 in mitigation funds to correct problems. The DEIS finds no problem with further reductions in streamflows. Our investigation verified that reduced streamflows and irrigation ditch structure failures are related.

Comment LU-3, page 3-227, 3-228 and 3-229.

Construction Impacts. Construction impacts for 38 months are mentioned in Alternatives 3, 4, and 5 including periodic traffic delays and congestion. However, there is no mention of (a) potentially adverse effects to residential properties; (b) financial impacts on the County due to reduction in assessed valuation from between 70 and 530 acres of private land, and; (c) mitigation solutions.

Comment LU-4, Page 3-229.

Agricultural Impacts – Cumulative Effects. "Reasonably foreseeable water-based actions on the West Slope would affect streamflows in the Colorado River, but would not have any direct incremental effect on land ownership or use that overlap the effects of the WGFP." If ditch irrigation systems cannot function, then there is a direct and significant impact on agricultural land uses, as described above.

Comment LU-5, page 3-229.

Land Use Mitigation. There are no land use mitigation recommendations, even though there are acknowledged impacts.

2.2 RECREATION

Comment R-1, page 3-230.

Data Sources / Method. “Emphasis was given to water-based recreation because the greatest potential for recreation impacts would occur to activities such as boating and fishing.” This remark is unsubstantiated, ignores specific remarks in the Public Scoping Document, and significantly understates the significance of water to recreation in the Grand County economy.

Comment R-2, page 3-231.

Colorado River – Reach #1. “This 7-mile reach ... is mostly private land with no designated recreation sites. Fishing opportunities are present primarily on private land...such as Orvis.” With these statements, there is no recognition that the 1,553-acre Shorefox development by Orvis is directly dependent on a healthy Colorado River, not only for fishing but also for its passive scenic beauty as it traverses through residential lots and golf courses. This development features the Colorado River as its primary asset and is an example of the inextricable connection of the local recreation-based Grand County economy to its river corridors.

Comment R-3, page 3-231.

Colorado River – Gold Medal Stream Designation – Reach #2. “This reach is designated as a Gold Medal stream for outstanding fishing opportunities.” There is no follow-up as to whether the WGFP or cumulative impacts would threaten this valued designation that has direct socioeconomic effects on the local tourism sector in the summer months.

Comment R-4, page 3-231.

Colorado River – Gold Medal Stream Designation – Reach #3. “Gold Medal waters for fishing are present upstream of Troublesome Creek ... Private lands adjacent to the river, such as Elk Trout Lodge property, also provide opportunities for fishing access and guided fishing.” There is no follow-up as to whether the WGFP or cumulative impacts would threaten this valued designation or impact the high-profile Elk Trout Lodge. The commercial guest ranch referenced is a 22-guest resort that was established 25 years ago. It attracts affluent people seeking a high-quality fishing experience and is among the largest employers in this area. Also, outfitters make needed supplemental income by providing fishing guide services on this vital Gold Medal stretch of the Colorado River.

Comment R-5, page 3-231

“Preferred Flows.” Table 3-114 introduces a category called “preferred minimum flows.” The term, which is used in subsequent sections, seems internally inconsistent. No explanation of the term is provided. The *Draft Grand County Stream Management Plan – Phase 2*³³ provides clearly documented definitions of minimum and optimum streamflows. The authors should review and consider use of this report.

Comment R-6, page 3-233

Commercial vs. Total Usage. This section of the DEIS reports both commercial boating and commercial fishing data and total visitation data for Reach 4. Total visitation data, which

presumably includes commercial and private visitation, is 44% higher than commercial only data. The remainder of the DEIS focuses on only commercial boating and commercial fishing information. Private visitation has similar socioeconomic impacts as commercial visitation. If total visitation data were used throughout the discussion of recreation, then the impact analysis would be more complete and reliable.

Comment R-7, page 3-233.

Fishing Guides. The DEIS reports that 15 companies offer guided fishing trips in Reach 4, totaling about 30,000 to 40,000 annual user days. There is no discussion about the potential of reduced fishing activity in the recreation section and the ripple effect in the local economy in the subsequent socioeconomic section. The relationship between fishing activity and the Colorado River is a function of daily flows, water temperature, clarity, and fish, not a singular function of fish habitat. ³⁴ The *Draft Grand County Stream Management Plan-Phase 2* ³⁵ provides well-researched information about optimum flows for angling.

Comment R-8, page 3-233.

Commercial Boating Only. Socioeconomic effects considered commercial boating and fishing only. Boating and fishing are core summertime visitor activities. What about the impact of reductions in private boating and fishing. This likely has a significant visitor impact.

Comment R-9, page 3-235.

Water Surface Area Impacts. The DEIS states, “In general, a decrease in water surface area would be considered a negative effect, although it is difficult to quantify any change in visitor use.” The researchers appear to have made no effort to quantify potential effects, even though there is recent relevant experience in the Lake Granby area from 2002 and 2003. ³⁶

Comment R-10, page 3-235.

Wild & Scenic River Designation – Colorado River Designation. All five reaches of the Colorado River are under consideration for “Wild and Scenic River” designation by the BLM. The DEIS makes no attempt to evaluate the impacts of the WGFP or the cumulative effects against the criteria being used by the BLM to determine eligibility. This is a potentially significant designation that could generate substantial visitor revenues for Grand County. While not usurping BLM’s analysis, the DEIS should compare eligibility requirements against anticipated effects of the WGFP and the cumulative effects.

Comment R-11, page 3-236.

Land-Based Recreation. The DEIS states that “the effects to water-based recreation would have limited direct impacts on land-based recreation activities such as camping, picnicking and hiking. ... There could be a decrease in camping in upper Colorado River campgrounds during periods when streamflow is less than preferred for boating.” While these two statements are in the same paragraph. They seem to conflict with each other.

Visitors may come (or not come) to Grand County for water-based recreation such as fishing and boating and then participate in land-based recreation as complimentary activities. There is no effort to determine whether this is true or false.

Comment R-12, page 3-236.

Grand Lake and Shadow Mountain Reservoir – Water Quality. “Reduced water clarity and algal growth has been a concern in Grand Lake and Shadow Mountain Reservoir that may contribute to a diminished recreation experience.” There is no further attempt quantify the current recreation usage of Grand Lake and Shadow Mountain Reservoir or to quantify and impacts from the WGFP. As described earlier in this memorandum, there is ample secondary research to analyze this concern.

Comment R-13, page 3-236.

Grand Lake and Shadow Mountain Reservoir – Fishing. “The assessment of aquatic resources ... determined that the predicted water quality changes in Grand Lake and Shadow Mountain Reservoir would not adversely impact fish, and therefore, there would be no effect on fishing opportunities in these lakes.” Recreational fishing relates to the environmental quality of the experience as much as the presence of fish. With continued deterioration in water clarity and algal growth, fishing may become less attractive to anglers, regardless of whether there are fish in the water bodies.³⁷

Comment R-14, page 3-236.

Lake Granby Surface Area. The DEIS states that in an average year, the water surface area of Lake Granby would be 140 acres (2%) less under the No Action Alternative, 351 acres (6%) less under the Proposed Action Alternative and 167 acres less under Alternatives 3 to 5.

- It is unclear how the Existing Conditions surface area acreage was derived.
- The DEIS reports that it is “unlikely to noticeably affect recreation use or the quality of the recreation experience.” This is unsubstantiated.

Comment R-15, page 3-236.

Lake Granby Water Level – Dry Years. The DEIS states that Lake Granby water level could decline by up to 18’ under No Action and 23’ under Proposed Action in consecutive dry years.

- There is no correlation with these water level figures and surface acres and so the reader cannot evaluate the magnitude of this remark.
- It can take a community years and considerable public relations effort to overcome a bad visitor impression such as this. Our interviews with members of the local business community indicate that visitor impact of a few dry years can last multiple years thereafter. The DEIS ignores this very real possibility.

Comment R-16, pages 3-236-237.

Lake Granby – Boat Ramp Access. There are 3 public boat ramps on Lake Granby (page 3-230). The DEIS states that the Arapaho Bay ramp would be affected under all alternatives. In successive dry years, Arapahoe Bay, Stillwater and Sunset boat ramps would be not function. (This is 100% of the public boat ramps.) The DEIS states that boat ramp access would be affected and it may reduce the quality of the recreation experience. If all boat ramps are affected, it appears to be an understatement that the circumstance “may” reduce the quality of the recreation experience. Also, there is no quantification of this effect or its ripple effect in the economy in the subsequent socioeconomic section.

Comment R-17, pages 3-237.

Lake Granby – Recreation Experience. The DEIS states that the “relatively small percent reduction in boatable area in most years is unlikely to noticeably affect recreation use or the quality of the recreation experience under any alternative. Additional exposed shoreline at lower water levels could reduce the aesthetic value. Lower water levels under all alternatives would not substantially affect accessibility for shoreline fishing but in periods of success dry years, lower water levels would affect boat ramp access which may reduce the quality of the recreation experience.”

- This contains a substantial amount of judgment based on one personal communication with a recreation manager with the US Forest Service There is substantial case example information available.
- Recent low water years for the Lake Granby (2002 and 2003) appear to have been excluded from the analysis of baseline hydrological conditions, making any impact conclusions questionable.

With many reservoir choices, reductions in aesthetic value will likely impact the visitor experience not only in the year that water levels are low but for multiple years thereafter as the visitor experience is remembered and shared with fellow travelers.

Comment R-18, page 3-238.

Colorado River Reach #1 Monthly Streamflow & Fishing. The DEIS states monthly streamflow for Colorado River Reach 1 would decrease up to 6% under the No Action Alternative and up to 11% under other Alternatives. It states that because this reach is not a popular boating destination, there would be negligible boating impacts; it does not mention fishing impacts. The DEIS also fails to consider the impact on private fishing from the Shorefox development by Orvis, which uses the Colorado River as its feature asset for fishing and aesthetic value.

Comment R-19, page 3-238.

Colorado River Reach #2 (Byers Canyon) – Monthly Streamflow. In Colorado River Reach 2, average monthly streamflow reduction data is not provided in the DEIS but is provided in the *Recreation Resources Technical Report* (ERO Resources, Page 40, Table 18). This reach would experience among the most significant decreases in average monthly flow.

Comment R-20, page 3-238.

Colorado River Reach #3 – Monthly Streamflow. In Colorado River Reach 3, average monthly streamflow would decrease up to 13% under the No Action Alternative, up to 15% under the Proposed Action and up to 18% under the other action alternatives. The DEIS reports limited boating activity but does not address fishing along this visible stretch. Fish are already compromised due to lower streamflows; monthly streamflow data is inadequate to make any definitive claim about fishing impacts in this or other reaches.

Comment R-21, pages 3-238, 3-239 to 3-244, 3-247 to 3-252.

Baseline Data for Reductions in Preferred Streamflow for Kayaking and Rafting. For Colorado River Reaches 2, 4 and 5, the DEIS provides extensive data regarding the number of days that the preferred streamflow would be below preferred and acceptable levels for kayaking and rafting for the Windy Gap Firming Project and for Cumulative Effects. The baseline data upon which streamflow reductions are measured extends only from 1950 to 1996. If more recent data shows lower streamflow levels, then the magnitude of the calculated impacts should be adjusted.

Comment R-22, pages 3-238, 3-239-44.

Effects of Preferred Streamflow Reductions for Kayaking and Rafting – WFPF Effects. Refer to the earlier discussion in Section 1.7 of this memorandum.

Comment R-23, page 3-246.

Common Cumulative Effects - Fishing. “Potential effects to aquatic resources from changes in streamflow and reservoir storage ... are unlikely to adversely impact sport fishing under any alternative based on assessed impacts to fish habitat.” No substantiation for this assertion is provided.

Comment R-24, pages 3-246 – 3-247.

Lake Granby – Cumulative Effects. The DEIS reports the No Action Alternative would trigger a surface area decrease of 190 acres (3%), the Proposed Action, 431 acres (7%), and the Action Alternatives, 4%. In a dry year, surface area decrease would be 7% for the No Action, 9% for the Proposed Action and 4% for the other alternatives. The DEIS provides no quantification of potential effects of these impacts and does not follow-through in the socio-economic impact analysis. It simply states that “Lower water levels and reduced surface areas could reduce the quality of the recreation experience...”

Comment R-25, pages 3-247 – 3-252

Effects of Preferred Streamflow Reductions for Kayaking and Rafting – Cumulative Effects. Refer to the earlier discussion in Section 1.7 of this memorandum.

2.3 VISUAL QUALITY

Comment V-1, page 3-266.

Issues. “Issues of concern identified during scoping were the potential effect to existing visual quality near the reservoir sites ...and the impact to scenic resources from hydrological changes.” The DEIS contains no follow-through related to this concern.

Comment V-2, page 3-268 and 3-270.

Grand Lake – water clarity and algal growth. The DEIS states that “predicted small reductions in water clarity and increased algal growth” in Grand Lake may contribute to diminished visual quality. There is no quantification or follow-through from this remark. Substantial research is available regarding the relationship of water clarity, visitation and property values. ³⁸

Comment V-3, page 3-268 and 3-270.

Shadow Mountain – Water Clarity. The DEIS states that there would be no change in water clarity at Shadow Mountain and water quality changes would not likely be noticeable. There is no quantification of the amount of water quality changes and no substantiation of the conclusion. As stated above, there is research available regarding the relationship of water quality and visitation.

Comment V-4, page 3-268

Lake Granby – Shoreline - WGFP. In an average year, the DEIS states that visible shoreline will increase by 37% with the No Action alternative, 93% with the Proposed Action Alternative, and 53% with Alternatives 3, 4 and 5. In successive drought years, comparable data was not provided. It is critical to provide comparable data for drought years. Also, the DEIS simply provides a qualitative statement that lower water levels “would reduce the visual quality of the reservoir for some viewers compared to existing conditions.” The magnitude of these impacts suggests that the unsubstantiated statement is not justified. This potentially significant impact needs to be addressed in a quantitative and rigorous manner.

Comment V-5, page 3-269.

Colorado River Streamflow. The DEIS reports only single figures for average monthly streamflow reductions in feet. This data is incomplete and misleading.

- There are no figures for Existing Conditions; percentage changes cannot be observed in context.
- Visual impacts do not occur in monthly average statistics but in daily experiences.
- Since only one average monthly streamflow figure is provided per remark, the implication is that it is calculated over 12 months. Winter streamflows are not relevant because visitors do not focus on the visual impacts at this time.

Comment V-6, page 3-269.

Willow Creek Streamflow. The DEIS reports average annual streamflow reductions in percentage terms. The No Action Alternative would decrease annual average streamflows by 7%, the Proposed Action streamflow would decrease by 14%, and Alternatives 3-5 streamflow would decrease 12% relative to Existing Conditions. Average annual statistics are not meaningful indicators for measuring visual impact because they include winter conditions when visitors are

not viewing Willow Creek. They mask the higher streamflow reductions in the summer months.

Comment V-7, page 3-270.

Lake Granby – Shoreline – Cumulative Effects. The DEIS states that the visible shoreline from the cumulative effects will be greater than from the WGFP. In an average year, the DEIS states that visible shoreline will increase by 55% with the No Action Alternative, 120% with the Proposed Action Alternative, and 57% with Alternatives 3, 4 and 5. Similar to above, the DEIS provides a modest qualitative impact remark “changes in shoreline exposure would decrease the visual quality of the reservoir ... for some viewers.” There is no attempt to quantify related visitor impacts due to reductions in visual quality and no follow-through in the socioeconomic impacts section. As described above, there is ample secondary data as well as direct data about Lake Granby from the recent low water years, 2002 and 2003.

2.4 SOCIO-ECONOMIC IMPACTS

Comment SE-1, page 3-278.

Agricultural Impacts. Lower streamflow and additional irrigation ditch structure failures is a relationship that the Subdistrict does understand. The Municipal Subdistrict paid \$500,000 to upgrade diversion structures for ranches below the Colorado River as part of the original construction of Windy Gap Reservoir. However, the potential for additional irrigation ditch structure failures is not acknowledged.

Comment SE-2, page 3-279.

Narrow Recreation Impacts. The DEIS acknowledges “potential effects to the recreation economy include changes in recreation boating, fishing opportunities and other related land-based activities such as camping and sightseeing.” The DEIS only quantifies effects from loss of commercial boating on three Colorado River reaches and camping on one Colorado River reach. It concludes that any other type of impact is “too speculative” or “too difficult to quantify.”

Comment SE-3, pages 3-280 – 3-281.

Annualized Cost or Benefit - Kayaking and Rafting Days Lost. The DEIS estimates numbers of visitor days lost related to reduced kayaking and rafting opportunities by river reach and reports annualized equivalent figures. (Table 3-139). This is based on the analysis of days that streamflow is below preferred levels that are presented in the Recreation Section. There are several unresolved issues regarding these figures. (a) The DEIS and the Socioeconomic Resources Technical Document provide insufficient information to understand these calculations. Having received an oral explanation of mathematical steps from the author, a significant math error that underestimates values was found in the Byers Canyon information. (b) This table should include Existing Conditions so that these figures can be placed into context. (c) If the figures are added, and with the corrected information about Byers Canyon, then the Proposed Action Alternative costs the community \$14,905 per year in visitor expenditures lost. (e) There is no mitigation recommendation to counterbalance this annual loss

which will be concentrated in the small communities of Hot Sulpher Springs (2007 population, 956) and Kremmling (2007 population, 1,564).

Comment SE-4, page 3-282.

Colorado River Angling. In the same paragraph, the DEIS appears to make four seemingly inconsistent or, at a minimum, confusing statements:

- "Projected changes in streamflow on the Colorado River below Granby Reservoir under all of the alternatives would result in a loss of fish habitat."
- "The anticipated reduced flows, which are greatest during the high runoff period, are not expected to adversely impact fish populations or fishing opportunities."
- "Projected effects to fish habitat are not predicted to translate to loss of angling opportunities or fishing success."
- "Lower flows in some months could diminish the aesthetic value of the river for some visitors and possibly affect the quality of the recreation experience."

Whatever the message is, the DEIS does not quantify potential impacts and does not reference this issue in the summary remarks. Are these figures based on average monthly flows, which would understate the impact on fish populations? Angling relates to an experience that is based not only on the presence of fish population but also on daily flows, water temperature, water clarity, the presence of slippery moss and algae, and other issues. The DEIS statements appear to be inconsistent and are unsubstantiated in the socioeconomic impact section.

Comment SE-5, page 3-282.

Three Lakes Recreation Usage. The DEIS states that "reduced water clarity and algal growth ... may contribute to a diminished recreation experience...It is unknown whether these issues would translate to a loss in visitors and associated economic effects." This issue is dropped without justification or follow-through. It is not mentioned in the summary chapter. The implication is that there is no effect.

"Chronic toxin levels could have an economic effect, but there is currently not enough information to determine whether this is true." Again, this issue is dropped.

There is secondary data that provides a relationship between water clarity, algal growth and toxin levels, and recreation and property values. This scholarly research was not considered.

EPA Guidelines for Economic Impacts clearly state that if an impact cannot be quantified, that an explanation as to why it cannot be quantified is recommended and the qualitative remark should continue to be represented in the analysis. That is, it cannot be dropped just because it is not quantified.

Comment SE-6, page 2-283.

Lake Granby Recreation Usage. "Sufficient information is unavailable to determine if lower Lake Granby water levels would directly affect visitor use." The statement was made, even though (a) there is recent experience at Lake Granby that was not pursued or considered; (b) the remark

was highlighted in the *Public Scoping Report* as a point of concern, and; (c) the EPA *Guidelines for Economic Impacts* caution against ignoring an impact just because it is not quantified.

Comment SE-7, page 3-283.

Three Lakes Fishing Usage. “Predicted minor changes in physical and water quality conditions are...unlikely to affect the fish communities. Thus, there would be no effect to recreational fishing opportunities.” There is no obvious justification for this statement in this section.

Comment SE-8, page 3-286.

Cumulative Effects Analysis. The DEIS states that the “cumulative socioeconomic effects were evaluated” but provides only the results of this analysis. The analytical steps are excluded from the DEIS and the Socioeconomic Resource Report, so it is not possible to analyze the results.

Comment SE-9, page 3-287.

Agricultural Production – Cumulative Effects. The DEIS reports that additional water diversions from cumulative effects “would have no cumulative effect to existing agricultural production or farm income in Grand County.” This statement is contrary to our research, which shows a direct relationship between streamflows and irrigation ditch operations.

Comment SE-10, page 3-287.

Colorado River – Tourism – Cumulative Effects. “...no adverse impact to boating or fishing in the Colorado River that would impact the tourism-related expenditures is likely for any alternative.” This appears to be contrary to the subsequent section 3.22.3.4.

Comment SE-11, page 3-288-3-289

Cumulative Impacts. The DEIS evaluates cumulative impacts against the No Action Alternative which already includes substantial impacts relative to Existing Conditions. This seriously reduces the magnitude of the impact. Note that in an earlier section, the DEIS evaluates WGFP against Existing Conditions.

Comment SE-12, page 3-289.

Annualized Costs or Benefits – Kayaking and Rafting Days Lost – Cumulative Effects. Table 3-142 (Section 3.22.3.4) reports annualized costs from commercial kayaking and rafting. In my judgment, there are several unresolved issues with this information:

- (a) The DEIS and the Socioeconomic Resources Technical Report provide insufficient information to understand these calculations. Having received an oral explanation of mathematical steps from the author, a significant math error that underestimates values was found in the Byers Canyon information.
- (b) This table should include Existing Conditions so that these figures can be placed into context.

- (c) Data for kayaking in the Pumphouse reach is not provided in the DEIS upon which to make the annualized calculations.
- (d) If the figures are added, and with the corrected information about Byers Canyon, then the Proposed Action Alternative costs the community \$148,817 per year in visitor expenditures lost.
- (e) There is no mitigation recommendation to counterbalance this significant annual loss which will be concentrated in the small communities of Hot Sulpher Springs (2007 population, 956) and Kremmling (2007 population, 1,564).

SUMMARY OF ERO'S FINDINGS – SOCIOECONOMIC IMPACTS ON THE EXISTING RESERVOIRS IN GRAND COUNTY <i>DEIS Socioeconomic Section, 3.22</i> <i>(This table does not provide additional information that is not presented above.)</i>					
Lake/Reservoir	Lake Granby	Shadow Mountain	Grand Lake	Willow Creek	Windy Gap
Boating (p 3-282, 3-290)	Unlikely to affect use	No mention	No mention	No mention	No mention
Fishing (p 3-283)	No impact	No impact	No impact	No mention	No mention
Camping	No mention	No mention	No mention	No mention	No mention
Other (p 3-282)	Aesthetic value may be reduced; don't know if visitor use affected	Diminished recreation experience possible	Diminished recreation experience possible	No mention	No mention

SUMMARY OF ERO'S FINDINGS – SOCIOECONOMIC IMPACTS ON THE COLORADO RIVER <i>DEIS Socioeconomic Section, 3.22</i> <i>(This table does not provide additional information that is not presented above.)</i>					
Reach #	#1	#2	#3	#4	#5
Location of Reach	Lake Granby to Windy Gap	Windy Gap Res. to Williams Fork River (Byers Canyon)	Williams Fork River to Kremmling	Kremmling to Pumphouse (Big Gore)	Pumphouse to State Bridge (Pumphouse)
Land Use (p 3-287)	No impact	No impact	No impact	No impact	No impact
Boating – Rafting (p 3-280, 3-281, 3-288, 3-289)	No mention	No mention	No mention	Some visitors days lost	Some visitors days lost
Boating – Kayaking (p3-280, 3-281, 3-288, 3-289)	No mention	Some visitor days lost	No mention	Some visitors days lost	Some visitor days lost
Camping (p 3-282)	No mention.	No mention.	No mention.	No mention.	Some visitor days lost
Fishing (p 3-282, 3-289)	Possible; no measurable effect.	Possible; no measurable effect.	Possible; no measurable effect.	Possible; no measurable effect.	Possible; no measurable effect.
Other	None	None	None	None	None
NA = No Action; PA = Preferred Alternative; 3-5 = Alternatives 3, 4, and 5.					

¹ Krysel, Charles, Goyer, Elizabeth Marsh, Parson, Charles and Weele, Patrick. 2003. *Lakeshore Property Values and Water Quality: Evidence from Property Sales in the Mississippi Headwaters Region*. May 2003.

² Terrill R. Hanson, Luther Upton Hatch, Howard C. Clonts. 2002. *Reservoir Water Level Impacts on Recreation, Property, and Nonuser Values*. *Journal of American Water Resources*, Volume 38, No. 4, 1007-1018, 2002)

³ P. Joan Poor, Keri L. Pessagno, Robert W. Paul. 2006. *Exploring the hedonic value of ambient water quality: A local watershed-based study*. *Environmental Economics*, 2006, available at www.sciencedirect.com, pp 8-9.

⁴ Holly Michael, Kevin Boyle, Roy Bouchard. 1996. *Water Quality Affects Property Prices: A Case Study of Selected Main Lakes*. Maine Agricultural and Forest Experiment Station, Misc. Report 398, February 1996, University of Maine.

⁵ Environmental Protection Agency. 2000. *Guidelines for Preparing Economic Analyses*. Office of the Administrator, EPA 240-R-00-003, September 2000, page 21.

⁶ Conversation with Bill Thompson, Grand County rancher and water commissioner, December 2006.

⁷ Tetra Tech, Walsh Aquatic Consultants, Inc., Habitech, Inc. *Draft Report – Grand County Stream Management Plan – Phase 2*. April 2008, pages CR4-2, CR5-2.

⁸ Dean Runyon Associates. 2004. *Economic Impact of Travel on Colorado: 1996 – 2003*, prepared for the Colorado Tourism Office, June 2004, page 41.

⁹ 2003 Travel Expenditures in Grand County, \$169,700,000 / 2003 retail sales in Grand County, \$316,668,000 = 54%. Retail sales data are from the Colorado Department of Revenue.

¹⁰ Data provided by Colorado Department of Revenue web site.

¹¹ Tetra Tech, *Ibid*.

¹² Senate Document 80, 75th Congress, 1st Session, Colorado-Big Thompson Project, June 15, 1937, page 3.

¹³ Conversation with Mayor Clark, December 2006.

¹⁴ BBC Research & Consulting, *The Economic Impacts of Hunting, Fishing and Wildlife Watching in Colorado*. 2008. Prepared for the Colorado Division of Wildlife.

¹⁵ Fishing Experts and Fishing-Related Business Representatives. Conversation with owners of Mo Henry's Trout Shop, other experienced and knowledgeable anglers in Grand County and experts knowledgeable about fishing in Grand County. December 2008.

¹⁶ Tetra Tech, *Ibid*, pages CR4-4, CR5-3, CR6-4.

¹⁷ Terrill R. Hanson

¹⁸ Kevin Boyle, Jennifer Scheutz and Jeffery Kahl. 1997. *Great Ponds Play an Integral Part of Maine's Economy*. University of Maine Water Research Institute Report #473.

¹⁹ Conversation with Dan Murphy, owner of the Fishing Hole in Kremmling, December 2006.

²⁰ Colorado Wildlife Commission Policy, "Wild and Gold Medal Trout Management", effective date: September 18, 1992; revised date: June 12, 2008.

²¹ Environmental Protection Agency. 2000. *Ibid*.

²² National Center for Environmental Economics. 2008. *Guidelines for Preparing Economic Analyses – External Review Draft*. Office of Policy Economics and Innovation, US Environmental Protection Agency, September 12, 2008.

²³ Environmental Protection Agency, *Ibid.* page 27.

²⁴ *Ibid.*, page 175.

²⁵ Terrill R. Hanson.

²⁶ Kevin Boyle.

²⁷ Senate Document 80, *ibid.*

²⁸ Lake Granby Business Community. Telephone conversations with Granby Chamber of Commerce staff, Granby area motel operator and other business representatives indicate that there is a direct relationship between surface water acreage and visitors. (November 2008)

²⁹ Sharon Brenner, President, CEO, Greater Granby Area Chamber of Commerce. December 2008.

³⁰ <http://www.americanwhitewater.org>. _

³¹ Coley/Forrest, Inc. 2007. *Grand County: Its Economy and Water Resources*. Prepared for Grand County Colorado.

³² *Ibid.*

³³ Tetra Tech, *Ibid.*

³⁴ Fishing Experts and Fishing-Related Business Representatives, *Ibid.*

³⁵ Tetra Tech, *Ibid.*

³⁶ Lake Granby Business Community.

³⁷ Terrill R. Hanson, Kevin Boyle.

³⁸ Charles Krysel, Terrill R. Hanson, P. Joan Poor, and Holly Michael.

EXHIBIT G

Table Comparing Flows below Granby Reservoir

Monthly Averages of 1951 Fish and Wildlife Service Report Flows Below Willow Creek Reservoir, Joint Report Biological Floor Flows Below Willow Creek Reservoir, 1961 Principle Flows as Compared with Grand County SMP Optimal and Critical/Minimum Flows (all flows represented in c.f.s.)					
	1951 Report(1)	Biological Floor Flows from Joint Report(2)	1961 Principles(3)	Grand County SMP(4)	
				Optimal	Crit/Min
Oct.	97.0	56.2	27	100	60
Nov.	74.8	42.8	27	100	60
Dec.	54.4	31.4	27	100	60
Jan.	47.0	27.0	27	100	60
Feb.	42.1	24.1	27	100	60
Mar.	47.6	27.3	27	100	60
Apr.	84.7	48.5	27	200	100
May	123.4	70	75	200	100
Jun.	130.0	74	75	200	100
Jul.	122.4	69.5	75	200	100
Aug.	117.3	66.9	40	200	100
Sep.	102.3	58.9	20	200	100

(1) *Recreational Use and Water Requirements of the Colorado River Fishery Below Granby Dam, Colorado in Relation to the Colorado-Big Thompson Diversion Project: Field Work and Report by the Office of River Basin Studies, Region 2, United States Department of the Interior, Fish and Wildlife Service, Albuquerque, New Mexico, May, 1951, Table 7, page 56 (includes flows from Colorado River and Willow Creek).*

(2) *Fish And Wildlife Service and Bureau of Reclamation Joint Report Concerning Fishery Flows Below Granby and Willow Creek Dams Colorado-Big Thompson Project Colorado, circa 1953 (unsigned), Table 3, Page 66 (includes flows from Colorado River and Willow Creek).*

(3) *Principles to govern the Release of Water at Granby Dam to provide Fishery Flows immediately Downstream in the Colorado River, January 19, 1961 (includes flows from Colorado River and 7 cfs from Willow Creek Oct-Apr).*

(4) *Grand County Stream Management Plan, Phase 2, April 2008, Segment CR 3.*