

Appendix F

Public Comment on the Regional Water Plan

January 2004

Comments Received from the Interstate Stream Commission



Memorandum Interstate Stream Commission

To: Mary Helen Follingstad, Manager, Regional Water Planning Program
From: Kevin Flanigan, Rio Grande Bureau
Date: January 12, 2004
Subject: Review of the Draft Middle Rio Grande Regional Water Plan, 2000-2050

The following comments are provided for your use in evaluating the Middle Rio Grande Regional Water Plan for acceptance by the Interstate Stream Commission.

Chapter 5

Section 5.4.2, page 5-7: The description of the 1906 Treaty Convention between the United States and Mexico should include the caveat to the requirement to deliver 60,000 acre-feet (AF) annually to the Acequia Madre: except in case of "extraordinary drought".

Section 5.4.4, page 5-9: The last paragraph at the bottom of the page contains a discussion of credit water in storage in Elephant Butte Reservoir that is misleading (sentence beginning: "Over 75 percent ..."). Without specifying a date, this sentence implies that 75 percent of storage in the reservoir is always credit water owned by New Mexico and Colorado that is not available for release for downstream irrigation use. In addition, the relinquishment agreement executed April 23, 2003 between New Mexico and Texas renders this discussion inaccurate and moot. This discussion should be deleted from the paragraph.

Section 5.6.1, page 5-13: The discussion of the Silvery Minnow issue should be updated as follows:

Third bullet: It is suggested that this discussion be updated as follows:

The September 2002 District court decision ordered the US Bureau of Reclamation to "meet specified (water) flow requirements" to keep the Minnow alive. The 10th Circuit Court of Appeals subsequently issued a stay of that decision in October 2002. The decision was appealed and ultimately affirmed by the Circuit Court in June 2003. The latest decision, in January 2004, vacated that affirmation, returning jurisdiction to the District Court. However, the issue must ultimately be resolved ...

Fourth bullet: The citation for this text is incorrect. The text is from the September 2002 decision, not the April 2002 decision as referenced. It is recommended that this material be deleted from the plan since it does not supply the reader with a clear

understanding of the issue. In addition, as noted in the third bullet, this issue is still unresolved and is likely to be subject to further appeals.

Fifth bullet: This discussion is irrelevant and should be deleted.

Section 5.8.1, page 5-15: The final bullet in the discussion of MRGCD water rights should note that the storage right at El Vado reservoir under OSE File No. 1690 was conveyed to the United States in 1963 (see the attached correspondence dated August 15, 1963).

Section 5.8.1, page 5-15: The discussion of the MRGCD water bank should incorporate the OSE's position on that bank as discussed in the Legal Issues report¹. The last sentence should be deleted and the following text added:

“The OSE has taken the position that the Conservancy Act does not allow reallocation of use outside of MRGCD boundaries. In addition, the OSE has further taken the position that the quantity of rights vested within the MRGCD water bank cannot be quantified until the total beneficial use of MRGCD is established.”

Section 5.9.7, page 5-18: This section is mislabeled. None of the sub-topics (Pueblo Water Rights, Regional Water Bank, MRGCD Water Bank or Reclaimed Water) are new sources of water. They are, as noted in the Legal Issues report², merely potential new water markets or mechanisms for reallocating the existing supply in the basin.

Chapter 6

Section 6.1.3, page 6-3: The third bullet regarding San Juan-Chama (SJC) project water inflow is nonsensical and irrelevant. SJC water allocated to the middle valley totals 75,400 acre-feet per year (AFY) as follows: Albuquerque – 48,200, MRGCD – 20,900, Cochiti Reservoir recreational pool – 5,000, Belen – 500, Los Lunas – 400, Bernalillo – 400. The reason only about 55,000 AFY was delivered to the middle valley during the period from 1972 through 1997 was not because there was insufficient supply available (as implied by the bullet text – i.e., that SJC water was required to fill Heron Reservoir and not available for release), but because there was no call for greater deliveries by those entities listed above. There was not, nor is there, any requirement to fill Heron Reservoir. Some of these contractors, such as Belen and Bernalillo, did not execute contracts until late in the 1972 – 1997 accounting period (1988 and 1990, respectively).

Section 6.1.3, page 6-3: The sixth and eight bullets are redundant.

¹ Kery, Susan C., J.W. Utton, P.C. Chestnut, S.E. Umshler. Legal Issues Specific to the Middle Rio Grande Water Planning Region. Prepared by Daniel B. Stephens and Associates for the Mid-Region Council of Governments. February, 2003.

² Ibid.

Section 6.1.4, page 6-4: The last bullet (“Outflows”) should include a notation that this is a calculated value that did not consider the change in storage in Elephant Butte Reservoir during the time period of the budget. (That change in storage is significant: at the end of 1971 storage in the reservoir was at 177,000 AF. At the end of 1997, storage was at 1,927,000 AF, or an average increase of 67,000 AFY.)

Section 6.1.5., page 6-5: In the list of contributors to the water budget, Karl Martin’s name is misspelled.

Section 6.4, page 6-9: The caption for Figure 6-3 should be edited to remove the reference to the 1950’s drought. See the (October 2, 2002) technical memorandum (attached) from SSPA on this issue, which concludes that the 1950’s drought is one of the more severe droughts experienced in the middle Rio Grande over the past 2,000 years.

Chapter 7

Section 7.4.1, page 7-5: In the first bullet, the discussion of the filling of Heron Reservoir should be deleted, as discussed in the comment to Section 6.1.3, page 6-3 above.

Chapter 9

Section 9.3.2, page 9-22: The last sentence of this section should be deleted. A water right is not an absolute right, but rather a right with a priority attached to it in accordance with Article XVI of the Constitution of the state of New Mexico. The Rio Grande Compact was executed between the states of New Mexico, Colorado and Texas in accordance with Section 10 of Article I of the Constitution of the United States. Apportionment by Compact supercedes private water rights within the subject stream system. A priority call within a stream system cutting off junior rights to ensure that a Compact is not impaired is thus in accordance with the New Mexico and Unites States Constitutions and does not constitute a “taking” that requires compensation. This principle was stated earlier in the Plan (at page 5-8):

“No matter how vested a water right might be, if using it violates a compact, it cannot be used.”

Section 9.3.4, page 9-23: The discussion in the fifth bullet is inaccurate. The Rio Grande Compact did equitably apportion the waters of the basin. Water consumed by (Elephant Butte Reservoir) evaporative losses is not an asset of nor is it charged to any of the planning regions within the basin.

Section 9.4.2, page 9-27: The description in the third paragraph of the modeling effort by SSPA is incorrect. SSPA did not construct a surface flow model, they constructed a

probabilistic model of the water supply available to the middle valley and the effect that different policies or practices may have on that budget.

Chapter 10

Section 10.1.4, page 10-2: See the comment on Section 9.3.2, page 9-22 above.

Section 10.2.5.4, page 10-5: Same comment as on Section 9.3.4, page 9-23. Water consumed by Elephant Butte Reservoir evaporative losses is not an asset of nor is it charged to any of the planning regions within the basin.

Section 10.2.10.1, page 10-9: Article VII of the Rio Grande Compact does not constrain upstream storage when storage levels fall below 400,000 AF, but when Usable Water falls below 400,000 AF. Usable Water is that water legally available for release for downstream use and is defined as the combined content of Elephant Butte and Caballo Reservoirs less any New Mexico or Colorado credit water and less any SJC water in Elephant Butte Reservoir.

NEW MEXICO INTERSTATE STREAM COMMISSION

MEMORANDUM

Date: December 18, 2003

To: Middle Rio Grande Council of Governments – Water Resources Board and Middle Rio Grande Water Assembly

From: Mary Helen Follingstad, Manager, Regional Water Planning Program

CC: Rhea Graham, Estevan Lopez

RE: Comments on the Draft Middle Rio Grande Regional Water Plan – Chapter 12, Draft Rio Puerco and Rio Jemez Subregional Water Plan

Chapter 12, *Draft Rio Puerco and Rio Jemez Subregional Water Plan* (Subregional Plan) of *The Middle Rio Grande Regional Water Plan*, submitted for agency review and comment in October 2003, is incomplete with respect to the Interstate Stream Commission *Regional Water Planning Handbook* (hereinafter referred to as “Handbook”).

The Rio Puerco and the Rio Jemez are tributaries of the Rio Grande. The two sub-regions (Rio Puerco and Rio Jemez) are part of the Middle Rio Grande Region, one of five regions in the Rio Grande Basin. The sub-regions are largely rural and were created to assure water planning specificity with respect to their relative isolation from the Rio Grande Valley. There is a considerable amount of government land ownership in the sub-regions and all or parts of several pueblos – Zia Pueblo, Jemez Pueblo and Santa Ana Pueblo. Some lands of the Navajo Nation are also present in the Rio Puerco sub-region.

The following comments are provided for your consideration in completing the Sub-regional water plan for acceptance by the Interstate Stream Commission (ISC).

In general, the Sub-regional Plan requires considerable editing and re-organization.

Some requirements of the ISC *Water Planning Handbook* (1994) are not addressed and others are not adequately addressed.

There is jargon in some of the sub-titles and text (example: “snippets”) and editorializing regarding the water supply and demand issues.

The Executive Summary – not submitted.

MEMORANDUM

- 1) Introduction - no comment
- 2) Public Involvement Program – no comment
- 3) Background - This section describes the physical setting, the geology, and stream characteristics. This could be combined with the Historical section.
- 4) Historical Characteristics – This section describes Pueblo and Spanish settlement and current land uses and ownership. Land ownership map could be in color. This could be combined with the Background Section. Sub-sections describing water use and depletions and the tables illustrating this should be presented in the Water Demand Section.
- 5) Legal Issues – these are presented and combined with other issues in Section 12.11. The Legal Issues should be presented separately and a paragraph or two added regarding how these constrain the supply. Section 12.11 does not address how the Endangered Species Act affects the sub-regions.
- 6) Water Supply – The issue here is the lack of data in the *Middle Rio Grande Water Supply Study* (SSPA, 2000) specific to these tributaries. We suggest you investigate other data sources from the Office of the State Engineer library and the USGS. Issues presented in the introduction to this section should be combined, along with public concerns raised in the Issues and Constraints section (12.11), with the Background section or with the Public Involvement Program section since the Water Supply section should be confined to facts. In most regional plans, stream flow hydrographs are presented as appendices.

The discussion of drought belongs in the Water Demand section.

A discussion of water quality both for surface water and ground water belongs in this section. See Table 12.19

- 7) Water Use – see comment above on the Tables in Section 12.4. The Water Use Arrangements (12.6.5) should be in the Legal Issues section.

Discussion of Acequias, the Treaty of Guadalupe Hidalgo, Adjudications, Prior Appropriation doctrine, the Rio Grande Compact, and all other legal issues should be presented in the Legal Issues Section. Issues of public concern should be presented in the Public Involvement Section.

Section 12.6.6 appears to be a water use projection but the analysis is incomplete.

- 8) Water Demand – Population trends analysis does not isolate specific figures for the Sub-regions. There is editorializing about growth in Rio Rancho but no numbers regarding growth in the sub-regions. In order to address the public welfare of the sub-region, figures need to be presented that show how any shortages will be met by the various alternatives.

Section 12.8 does not actually quantify the projected demand but presents a number of methods. These methods belong in an appendix. The selected method and the result is what should be presented in this section. Again, there is editorializing about Rio Rancho.

MEMORANDUM

The sub-region plan should show the water needs for the sub-region. There are several pages of text that look like an analysis of the issues – these belong with the public involvement section. There is also redundant text.

The Tables on pp. 12.8-12 and 12.8-13 have a misleading subtitle – “Existing” Depletions. If these tables are the water use projections this should be changed to “Projected” Depletions. Analysis should be then be provided in the form of a water budget for the sub-regions.

Section 12.9 Mission, Goals and Alternatives. Mission and Goal statements are part of Public Involvement. All that is necessary for the Sub-region Plan is the statements. The process (evolutions) can be put into an appendix.

- 9) Alternatives – Process can be put into an appendix.

Section 12.10 –Scenarios/Vision – Summarize for the Executive Summary. Put the text in an appendix.

Tying the Goals to the Preferred Alternatives is a good step and Table 12.10.3 is a good list of action items. However, while the benefits of the actions are listed, there is no technical analysis of the alternatives provided, the time frame is vague, there is no estimated wet water yield pursuant to the alternatives, and there is no estimated costs of implementing these alternatives provided– especially those that are capital investments such as upgrading the ground water model, implementation of watershed management programs, impoundments, ditch improvements, measuring and metering programs, improvements to sewage treatment, and small water system improvements.

Section 12.11 – Issues and Constraints. This text belongs in the Legal Issues section and in the issues and concerns in the Public Involvement Section.

- 10) Section 12.12 - Tools, Ideas and Recommendations – incomplete
- 11) Section 12.13 – Sample Projects – incomplete
- 12) Appendices are not populated with text.

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P. 2

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UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

REGIONAL OFFICE, REGION 5
P. O. BOX 1609
AMARILLO, TEXAS

1963 AUG 15 AM 8:09
STATE ENGINEER OFFICE
SANTA FE, N.M.

IN REPLY
REFER TO: 5-420

AUG 15 1963

Mr. S. E. Reynolds, State Engineer
State of New Mexico
State Capitol
Santa Fe, New Mexico

Attention: Mr. M. B. Compton
Surface Water Rights Supervisor

Dear Mr. Reynolds:

In accordance with your request of June 12 to the Middle Rio Grande Conservancy District, enclosed is a completed copy of the form, Application for Extension of Time in Which to Perfect an Appropriation of Surface Waters.

The water rights, File No. 1690, formerly held by the Middle Rio Grande Conservancy District, were transferred and assigned to the United States by instrument dated May 28, 1963. Enclosed for your records is a copy of this instrument.

Sincerely yours,

Regional Director

Enclosures 2

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
P. O. BOX 1609
AMARILLO, TEXAS 79105
OFFICIAL BUSINESS

Sep 17 03 01:50p

(FD-042463)
(Amended 4-29-67)

COPY
TRANSFER AND ASSIGNMENT

THIS CONTRACT, made this 27th day of May 1953, between the MIDDLE RIO GRANDE CONSERVANCY DISTRICT, a body corporate and political subdivision of the State of New Mexico having its principal office in the City of Albuquerque, New Mexico, acting hereto pursuant to the Conservancy District Reclamation Contract Act as amended (75-32-1, et seq. New Mexico Statutes, Annot), herein referred to as the "District," and the UNITED STATES OF AMERICA, herein referred to as the "United States."

WITNESSETH:

WHEREAS, the District and the United States executed Contract No. I78r-423 dated September 24, 1951, herein styled the repayment contract, Article 28 of which reads in part as follows:

"The District has made certain water filings including filings for storage and use of water in the El Vado Reservoir and it shall cause any and all such filings made in the name of the District to be assigned to the United States for beneficial use in the project and for Indian lands in the project area, and which shall be held primarily for domestic, irrigation and municipal use in the project and for Indian land in the project area, and for such use and development of hydroelectric energy by the United States as may be made of the waters thus appropriated, incident to the storage, carriage and distribution to and for such domestic irrigation and municipal use."

and

WHEREAS, Section 75-32-2, New Mexico Statutes, Annot., authorizes a contracting district to grant and convey to the United States water rights or any interests therein, either without monetary consideration therefor or in partial consideration of the privileges derived from a reclamation contract or for other consideration; and

WHEREAS, it is the intent of the District under authority of New Mexico Law to comply with its Reclamation contract commitment;

NOW, THEREFORE, in accordance with Article 28 of Contract No. I78r-423 dated September 24, 1951, between the Middle Rio Grande Conservancy District and the United States, and in consideration of the privileges derived from the repayment contract, the District does grant and convey to the United States and its assigns the following rights, titles, and interests in and to water rights serving the district area:

Water rights as described in Application for Permit No. 1690, a copy of which is attached hereto and made a part hereof.

(FSTO42463)
(Amended 4-29-63)

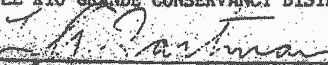
COPY

TO HAVE AND TO HOLD, all of the rights, titles, and interests in and to the water rights hereinabove specifically described, unto the United States, and its assigns, forever.

IN WITNESS WHEREOF, the parties hereto do execute this Deed as of this, the day and year first above written.

MIDDLE RIO GRANDE CONSERVANCY DISTRICT

By



Vice-President

(SEAL)

ATTEST:


Secretary



Memorandum

Date: October 2, 2002
From: Karen Lewis, Debbie Hathaway
To: Kevin Flanigan, ISC; Mike Velasquez, ACOE
Subject: Severity of the 1950s drought

There has been recent discussion in the water planning community concerning the severity of the 1950s drought in the context of the paleo-climate record in the Middle Rio Grande region. Some have suggested that the 1950s drought was representative of "average" precipitation over the past 2000 years, and that this period is a poor representation of what should be expected in a drought. From examination of published paleo-climate data, it appears that this position is not supported; rather, the long-term paleo-climate data indicate that the 1950s drought is one of the worst droughts on record over the past 2000 years. This memo discusses the paleo-climate record and conclusions regarding the severity of the 1950s drought in the context of this record.

In his latest publication (Grissino-Mayer et al., 2002), Grissino-Mayer uses the El Malpais tree ring record, combined with tree ring records from the Sandia and Magdalena Mountains, to reconstruct the division 5 Palmer Drought Severity Index (PDSI) for the Middle Rio Grande basin. In this publication, severe multi-year droughts (and wet periods) were objectively determined by converting the annual series to standard deviation units, fitting the data with a 10-year spline, and measuring all periods that had at least four consecutive years when the standard deviation levels from the 10-year spline fell below the -1.1 ($+1.1$) sd level. Beginning and ending years were pinpointed by inspecting the non-smoothed reconstruction values. Each period was weighted by its duration and drought index values to come up with a ranking. Based on this approach, Grissino-Mayer ranks the 1950s drought as the third worst drought on record since A.D. 622, running from 1945 to 1963. It is exceeded by the 1500s drought, which lasted for 23 years, and the 1200s drought, which lasted for 26 years. Figure 1 illustrates a 10-year running average of the raw Grissino-Mayer reconstructed precipitation data (data from the World Data Center for Paleoclimatology, online; analysis in Grissino-Mayer, 1996). The 1950s drought can be easily seen on this figure and appears to be on par with many of the extended droughts of the past 2000 years.

To: K. Flanigan, M. Velasquez
Date: October 2, 2002
Page: 2

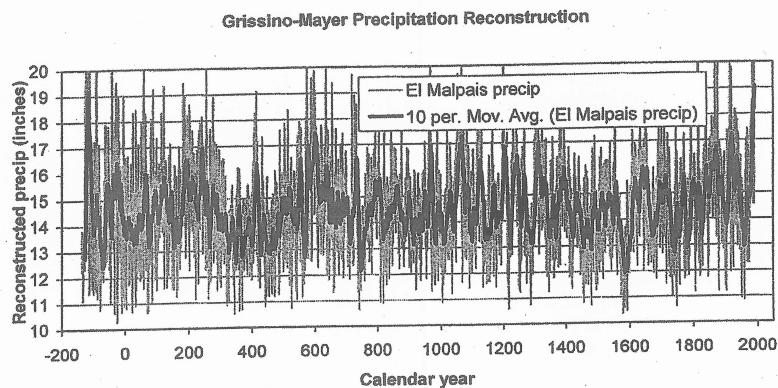


Figure 1: Raw Grissino-Mayer El Malpais reconstructed precipitation (grey) and 10-year running average (black).

However, an alternate depiction of these reconstructed data in the recent publication "Taking Charge of Our Water Destiny" (Belin, Bokum and Titus, 2002) leads to the interpretation that "precipitation for that 1950s drought was close to the long-term average" (p. 5). This interpretation is based on a 100-year smoothing of reconstructed precipitation data (Henri Grissino-Mayer, 1996), reproduced as Figure 1 in Belin, Bokum and Titus (2002). It appears that, because the 100-year smoothed data has been presented without reference to the smoothing it represents, it has been erroneously assumed to represent actual past conditions, rather than a long-term smoothing of past conditions. Since the past two centuries have been abnormally wet, as compared to the full 2129-year reconstructed record (Grissino-Mayer, 1996; Grissino-Mayer et al., 2002), a 100-year smoothing will artificially raise the 1950s drought, making it appear less significant.

We have discussed the use of the Grissino-Mayer data in the Belin, Bokum and Titus report with one of the report authors, Frank Titus. On further review of the data, Dr. Titus agreed that the 100-year smoothed graph was not a good representation of decadal trends, and that their conclusion regarding the lack of severity of the 1950s drought was not supported. However, he also indicated that their report "was not intended to be read as a scientific publication, but rather was to insist that water planning and negotiated problem solving are possible, and are essential if



To: K. Flanigan, M. Velasquez
Date: October 2, 2002
Page: 3

New Mexicans are to preserve their ambiance of enchantment and their river environment” (Titus, personal communication).

In summary, long-term paleo-climate data indicate that the 1950s drought is one of the more severe droughts experienced in the Middle Rio Grande region over the past 2000 years. For planning purposes, analysis of alternatives given hydrologic conditions akin to those observed in the 1950s should provide a reasonable “test” of impacts under drought conditions. Further discussion of the paleo-climate trends and implications for water planning can be found in our memo of November 8, 2001 to Mike Velasquez and Kevin Flanigan, prepared as part of the Middle Rio Grande Water Supply Study, Phase 3.

References:

Belin, Alletta, Consuelo Bokum, and Frank Titus, 2002. *Taking charge of our water destiny: A water management policy guide for New Mexico in the 21st century*. Cottonwood Printing, Albuquerque.

Grissino-Mayer, Henri D., 1996. A 2129-year reconstruction of precipitation for Northwestern New Mexico, USA. *Radiocarbon*, pp. 191-204.

Grissino-Mayer, Henri D., Christopher H. Baisan, Kiyomi A. Morino and Thomas W. Swetnam, 2002. *Multi-century trends in past climate for the Middle Rio Grande Basin, AD 622-1992*. Final Report, submitted to the USDA Forest Service, Albuquerque, New Mexico.

MEMORANDUM
OFFICE OF THE STATE ENGINEER
Hydrology Bureau

DATE: December 9, 2003
TO: Mary Helen Follingstad, ISC
FROM: Ghassan Musharrafieh, Hydrology Bureau *GM*
THROUGH: Tom Morrison, Hydrology Bureau, Chief *TM*

SUBJECT: Review of Draft Reports" Middle Rio Grande Regional Water Plan" October 1, 2003 and " Rio Puerco and Rio Jemez Subregional Water Plan " October 1, 2003.

At your request, we reviewed the above Draft reports on the Middle Rio Grande Regional Water Plan. While the reviewed documents contain good information related to water resources in the region, they are incomplete and poorly organized (the subregional plan, or Chapter 12 is better organized than the regional plan but also incomplete). Some figures, tables, and appendices are missing. Also not included are the executive summaries and the documentation on the Sandia model (SNL) used for evaluating the different alternatives. Accordingly, it was very difficult for us to perform a thorough review of the plan and provide specific comments on the documents. However, based on the reviewed documents the following suggestions are offered.

General Comments:

The purpose of this exercise is to present measures the region should undertake to meet the future demands with supply. Alternative scenarios were developed and evaluated. These scenarios involve many assumptions in the supply/demand estimates. Because the plan briefly addressed the uncertainties involved in these assumptions, we suggest a more detailed analysis be provided. In particular:

- A detailed discussion on the uncertainty involved in the supply/demand estimates and its impacts on the outcome of each alternative scenario is important in this evaluation. Overestimating the supply or underestimating the demands result in an optimistic model output that is unrealistic. As an example, Pueblo water rights, which are senior rights have not been quantified and included in the alternatives evaluated. It is stated that the Pueblos preferred not to participate in the plan and accordingly, no information about their water rights is available. However, Pueblo rights if included could significantly increase the estimated demand and change model predictions. One way the plan may want to address this issue is by evaluating an alternative scenario assuming a conservative estimate of these rights. Also, we believe that the supply

was overestimated in the analysis by assuming that water would be imported to the region from neighboring basins. In fact, the authors acknowledged that the possibility of importing water to the region is still being negotiated and is uncertain.

- Another shortfall of the plan is its failure to consider the physical and institutional constraints and their impacts on future water availability on the local level. While the plan proposed alternative scenarios to meet future demands with the available supply on a regional scale, the water budget method used failed to address issues of supply and demand on the local level. Availability of water on the local level depends on adequate local surface and/or groundwater supplies, water rights, infrastructures, and other factors. For example, MRGCD has been experiencing water shortages in the past few years. Also, significant water level declines have been observed in some areas in the Middle Rio Grande Basin due to groundwater diversions. If the current diversions continued into the future, water would not be available to wells although the average regional supply (recharge) is the same. Institutional constraints might also compound the problem by not allowing the change of points of diversions or the transfer of water rights to other wells. Another institutional constraint could be the decision by localities (municipalities, industries, water users, and the MRGCD) to exercise their full rights in the future that increases the demands on the system. We recommend the plan address this issue in some detail and provide recommendations on the specific measures localities could adopt to meet future demands with the available supply on the local level. Measures on the regional level must be supplemented with similar measures on the local level to ensure effective management of the region's water resources.
- In the discussion on the City of Albuquerque (COA) Drinking Water Project (DWP) "Summary of the Water Supply Considering Legal Limitations" (Page 6-10 Section 6.4) it was suggested that the DWP would result in 94 kafy reduction in surface supply. This is not entirely true. The DWP proposed to divert approximately 96 kafy from the Rio Grande, 48 kafy of which is the City's entitlement of the San Juan Chama water and the remaining 48 kafy is native Rio Grande water. Native Rio Grande water would be returned to the river via the City's wastewater treatment plant. Actually, the DWP is not anticipated to increase depletions from the Rio Grande if properly managed. This correction should be made in the plan.
- A water budget showing stream depletion effects due to existing and projected ground diversions under the plan is important in this evaluation. The budget should also include the extent these effects are being offset and if future effects could be offset under the different alternative scenarios evaluated. It is certain that in the future water users need to acquire water rights for offset purposes due to their continued groundwater diversions. The ability to acquire these rights is highly uncertain in this region due to physical, institutional, and economical constraints. The plan should discuss this issue in detail and propose measures that could be taken to protect the fully appropriated stream system from additional depletions.

- The plan proposed different measures to increase the supply and reduce future demands in the region. Some of these measures could result in conflicts among the different water users. We recommend the plan address potential conflicts and provide an insight or an approach on resolving them.
- A summary table quantifying anticipated reduction in future demands or increases in supply due to the proposed measures would be very informative in this context. This would help quantify the effect each measure has on the system and aid in formulating alternative scenarios to meet the objectives of the plan.
- The administrative role of the Office of the State Engineer (and other government agencies) and its responsibilities in managing the region's water resources should be addressed in the plan. It is recommended that specific Office of the State Engineer's actions in relation to the plan be discussed in the report.

MEMORANDUM

New Mexico Office of the State Engineer *Water Use and Conservation Bureau*

Date: December 15, 2003
To: Maryhelen Follingstad, ISC
From: Brian C. Wilson, Chief, Water Use and Conservation Bureau
Subject: Middle Rio Grande regional water planning reports.

Per your request, the following comments are offered with regards to the draft Middle Rio Grande Regional Water Plan dated October 1, 2003.

Page 5, Table of Contents: Under Section 7.2 change "by" to "for".

Page 1-3, Section 1.3.1: In the last bullet statement, delete "through".

Page 1-6, Section 1.3.8: Third paragraph, second sentence, delete "such".

Page 1-14: Under "Future Water Demand" change "taken" to "made".

Page 1-18, Section 1.9: Because definitions of several of the terms in the Glossary are not consistent with the way they are normally defined by water resources administrators there is a potential for confusing readers. For example, *consumptions* and *depletions* are defined as if they are two different things. They are one in the same. Also, *diversions* do not apply to just surface water they also apply to groundwater. The definition of evapotranspiration is only partially correct. Evapotranspiration is the unit amount of water consumed on a given area in transpiration, building of plant tissue, and evaporated from adjacent soil. Note that there are two components (evaporation and transpiration) to the process not just one.

Page 6-5: The text and numbers in the water budget illustrated in Figure 6-2 are so small and indistinct that they are very difficult to read. This is an important figure. Suggest that it be presented as a full page illustration.

Page 6-10, Section 6.4: In paragraph one, change "55,000 kafpy" to "afpy"; in paragraph three, change "surfaced" to "surface" and delete the "are" after we.

Page 7-1, Section 7: Second bullet, change "Future Water Uses by" to "Future Water Uses for".

Page 7-3, Section 7.2: Change "by" to "for" in the heading, as above.

Page 7-4, Section 7.3: Make same change as above.

Pages 7-8 through 7-20: The use of the term "Net" at the end of each table is very ambiguous. What does that mean? I would suggest that "Net" be replaced with a more descriptive term such as "Residual" and provide some additional annotation that indicates that when the residual is positive there is a surplus in the water supply, and when it is negative, there is a deficit in the water supply.

Page 7-21: In the sample computer output illustrated in Figure 7.5, there is no explanation for what the "units" represent. Suggest that this be explained in the heading above the table.

Page 8-1, Section 8: Need to put a space between "applyinga".

Page 8-1 Section 8.1: After "44" delete "candidate".

Page 8-2, Section 8.1.1: A hyphen needs to be inserted in the range of costs in the last bullet item on the page.

Page 8-3: In the last group of bullets listed under "Other Considerations" suggest you add "Conveyance of water under drought conditions when segments of the riverbed are dry."

Page 8-11: Under Irrigation Efficiency, item number two, replace the existing text with "Laser level fields to reduce the depth of water that is applied to cover high spots and fill low spots."

Page 9-45, Section 9.3.1, Subsection C.3: Regarding drought planning the text states that "For reference, we consider the historical period from 1950 to 1959, the famous drought. For drought planning we will assume a ten year period with inflows and precipitation being 8 inches and 7 inches, respectively." First of all, only the period from 1950 through 1956 were drought years as indicated by the attached sheet that shows the total annual rainfall for each year from 1950-59 at the Bernalillo, Albuquerque, and Belen weather stations. Total annual precipitation from 1957-59 was normal or above normal. Thus, to simulate drought conditions, only the weather record from 1950-56 should be considered. This would reduce the rainfall down in the valley to between 5 and six inches depending on which weather stations are used.

Page 9-46, Section 9.3.3: Change "sinks" to "faucets".

Page 9-47, Section 9.3.5: In the text after the fourth bullet delete the "e".

Page 9-48, Section 9.3.7: In the text that is italic, change "If remove Pueblo lands from any reduction" to "If Pueblo lands are excluded from any reduction".

Page 10-1, Section 10.1.3: Change "watr" to "water".

Page 10-2, Section 10.2.1.4: Regarding San Juan Chama water, the text states that "In summary, we assume that the entire contracted amounts [of San Juan Chama water] will be available." Climatologists are telling us that we may be headed into a long-term dry cycle that could persist for two to three decades and maybe longer. Thus, it seems it would be more appropriate to look at the outcomes of two scenarios, the first would assume that all of the San Juan Chama water allocation is available, and the second, would reflect a drought condition, such as occurred in 2002 when only 7% of San Juan Chama allocation was available.

In the Appendix entitled "Ground-Water Resources of the Middle Rio Grande Basin, New Mexico" by James R. Bartolino et al. there are several typographical errors. I have attached copies of these pages and circled the things that need to be corrected.

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Bernalillo weather station, 1950-59.	
Year	Rainfall (Inches)
1950	6.1
1951	6.69
1952	8.69
1953	5.76
1954	6.97
1955	4.21
1956	4.39
AVG	6.12
1957	11.4
1958	8.37
1959	10.12
Albuquerque weather station, 1950-59.	
Year	Rainfall (Inches)
1950	4.1
1951	5.38
1952	8.09
1953	5.08
1954	4.47
1955	6.51
1956	4.06
AVG	5.38
1957	10.61
1958	10.12
1959	10.14
Belen weather station, 1950-59.	
Year	Rainfall (Inches)
1950	2.02
1951	4.93
1952	6.43
1953	5.86
1954	5.83
1955	5.96
1956	2.15
AVG	4.74
1957	14.16
1958	8.56
1959	7.98
Three station average.	
	Rainfall (Inches)
Bernalillo	6.12
Albuquerque	5.38
Belen	4.74
AVG	5.41