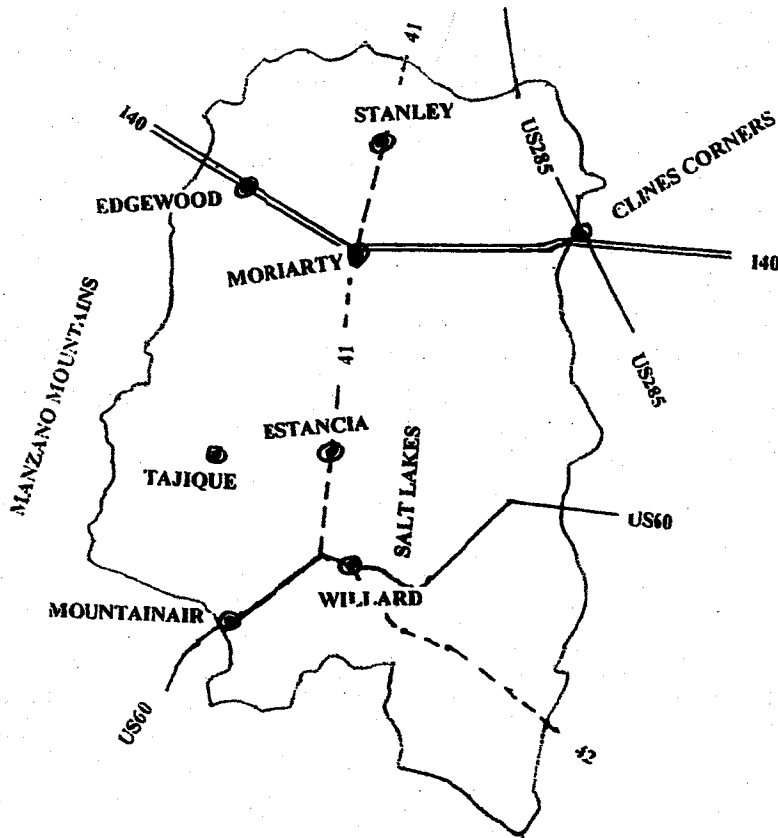


ESTANCIA BASIN
RECOMMENDED REGIONAL
WATER PLAN
(YEAR 2000 TO YEAR 2040)
EXECUTIVE SUMMARY



Estancia Basin Water

Planning Committee

January 8, 1999

Prepared by:
Corbin Consulting, Inc.
Santa Fe, New Mexico

- **BUREAUCRACY – needs to be local effort and local control**
- **FUNDING – Basin specific Water Resources Trust Fund with dedicated sources of funding controlled at the local level**

Given the concerns and recommendations of Basin residents, the Committee compiled and reviewed known data on water resources in the Basin and developed future economic, population and water use projections (Phase I Report); evaluated and summarized the data; developed conclusions, goals and alternatives; applied the New Mexico Interstate Stream Commission Criteria from the NMISSC Regional Planners Handbook and Template to analyze five basic scenarios; developed the Water Plan; presented the Water Plan for public scrutiny and comment; finalized the Water Plan and presented it to the New Mexico Interstate Stream Commission.

PUBLIC INPUT–THE KEY: Public participation has been the key in the development of this Water Plan. The Committee is composed of citizens appointed by the respective County Commissions in each county and by the major stakeholders in the Estancia Basin. Committee meetings have been advertised in the Basin media, have been open to the public, and have been well attended by the appointed committee members and citizens interested in the effort. Newspaper articles, presentations to local civic groups, public presentations, briefings for the Office of the State Engineer and New Mexico Interstate Stream Commission and all three county commissions, and a series of public input meetings (1995, 1996 and 1998) have been conducted to ensure that the Plan reflects the concerns, needs and public welfare of Basin residents. The Water Plan has received positive press coverage in the Basin media and newspapers and has generally been well received by Basin residents.

DECLINING WATER LEVELS: Data indicates that water levels in the Valley Fill Aquifer (the primary aquifer supplying Basin water needs) are declining with a present annual average loss rate of about 45,000 acre-feet per year. The average loss (depletion) rate is projected to increase over the next 40 years to about 50,000 acre-feet per year based on the population and growth projections in and near the Basin by the Bureau of Business Economic Research. Irrigated agricultural acreage, the largest water user, while fluctuating based on market and climatic conditions is projected to remain generally constant over the next 40 years. The Office of the State Engineer's administrative and mined basin policies are projected as likely to continue. Recent presentations by the Middle Rio Grande Council of Governments to the press and media indicate significantly increased development in the northern portions of the Basin and in the areas adjacent to the northwestern portion of the Basin in the next 50 years. The amount of water supply available in the Valley Fill Aquifer is known with a reasonable degree of certainty. The water supply present in the other aquifers is quite uncertain. It is likely that significant amounts of water exist where there is major faulting and fracturing, but that the bulk of the other aquifers may have much less water than some would like to believe. Even if the other aquifers hold significant amounts of water, many residents of the Basin are not in a position to drill to the

depths required to tap these questionable water supplies. The economic hardship on Basin residents to shift to other sources of water (deeper aquifers or transportation of water over significant distances) will create severe economic hardship for many.

DETERIORATING WATER QUALITY: Deteriorating water quality, particularly in the more heavily developed and developing areas, is a concern. Increased nitrate levels have been observed and other contaminants are suspected, although the New Mexico Environmental Department and the counties have no specific evidence of widespread water quality deterioration. Significant concern about abandoned wells, poorly functioning or broken septic systems, the increasingly heavy concentration of septic systems in some areas of the Basin, and brine (salt water) intrusion into the aquifers exists. In addition, an E-coli incident from surface contamination in the Town of Estancia's water supply due to a break in their water supply system occurred last winter. Concern has been expressed about agricultural contamination (pesticides, fertilizers and animal waste) although no significant documented cases exist at this time.

DEMAND (USE) CONCERNS: The bulk of the Basin's current demand and water supply comes from the Valley Fill Aquifer, about 95 percent. Most of that water is used to support irrigated agriculture. The remainder serves the needs of the towns of Willard, Estancia, Moriarty and Mountainair and various individual domestic well users. About five percent of the Basin's water supply requirements are served by the other aquifers. Much of the new development projected over the next 40 years is located in areas that might be served by the other aquifers, assuming that the water is present and reasonably available. Many people believe that these other aquifers are interconnected with each other and the Valley Fill Aquifer, and may be providing some amount of water to the Valley Fill Aquifer. If true, depletion of water from the other aquifers could worsen the problem facing people and businesses who are dependent on the Valley Fill Aquifer. While portions of the Glorieta Sandstone and Madera Limestone Aquifers may be excellent sources of water, there are indications in some areas that yields are dropping and that well levels are declining in these aquifers as well. It is clear from reading the water level logs of wells over time that the water levels in most wells in the Basin are declining, some by as much as 60 feet in the past 30 years. Thus, a conservative approach to water resource management is required to forestall and lessen hardship on Basin residents.

RECHARGE CONCERNS: The recharge of the Valley Fill Aquifer seems to be averaging about 13,000 acre-feet per year based on demand and depletion data. The water level declines in the various wells in the majority of the Valley Fill area seem to bear this out as well. Recharge to the Basin as a whole appears to be about 37,000 acre-feet. While it is possible that this recharge goes into the Madera, Glorieta and other aquifers, it is also possible that invasive vegetation in the western part of the Basin and other activities may be intercepting much of that recharge. The Plan includes monitoring and investigation programs to begin to see if we can find out what's really happening to the recharge. Further, it has been suggested in the public meetings by old time oil and gas drillers and geologists that the other aquifers may not be as extensive as is presently believed. Again, the suggested programs should help to address these questions and concerns.

AN UNCERTAIN FUTURE: Based on the projections and past and current usage data about 120 years of water supply appears to remain in the Valley Fill Aquifer, the Basin's major source of water. The amount of water in storage in the other aquifers has not been determined with any real accuracy. The State Engineer administers the Basin based on the water in storage in the Valley Fill Aquifer and assumes that the Valley Fill Aquifer serves as the recharge mechanism for the other aquifers. Current water management policies ("mined basin," approved exportation of water, appropriation of new water rights) contribute to the continued depletion of the aquifers and do not assist in moving the Basin towards the goal of a sustainable water supply as required by the New Mexico Interstate Stream Commission. About three to four times more water rights have been recognized by the State Engineer than have been put to use, causing further concern. Under the current block water rights appropriation policies it appears that many more acre-feet of water rights could be appropriated than currently exist, causing even more concern.

REQUIREMENT-SUSTAINABILITY/SELF-SUFFICIENCY: The New Mexico Interstate Stream Commission has directed that regional water planning be based on the water supply available in a specific region. The guidelines published in their Regional Water Planning Handbook and Template emphasize that any regional water plan must be based on self-sufficiency and a sustainable water supply. The Estancia Basin Water Planning Committee has combined this guidance with that provided by the three counties (Santa Fe, Bernalillo and Torrance) and the concerns and recommendations received from Basin residents to guide the development of this Water Plan. It needs to be recognized that there is a significant conflict between the New Mexico Interstate Stream Commission guidance and the mined basin and block water rights appropriation policies that the Office of the State Engineer uses to manage the Estancia Basin.

SCENARIO DEVELOPMENT AND EVALUATION: The Committee developed five scenarios:

- Scenario #1 – "Status Quo" where current practices and policies continue
- Scenario #2 – "1910 Condition" where the Valley Fill Aquifer is returned to 8.1 million acre-feet of water supply in storage
- Scenario #3 – "1960 Condition" where the Valley Fill Aquifer is returned to 7.8 million acre-feet of water supply in storage
- Scenario #4 – "Year 2000 Condition" where the Valley Fill Aquifer is maintained at its present level of water supply in storage
- Scenario #5 – "Year 2040 Condition" where some continued mining is accepted over the next 40 years as the programs envisioned by the Water Plan are developed and executed

Figure E1: SCENARIO EVALUATION – SUMMARY

<u>Scenario</u>	<u>Annual Depletion Reduction Goal</u>	<u>Start-Up Costs (Initial)</u>	<u>Annual Cost</u>	<u>Remarks</u>
#1–Status Quo (Depletion of the aquifers continues, approx 4.5 mil ac-ft in storage–Yr 2040)	0 ac.-ft.	\$0	\$2,500K-\$5,000K	Wells dry up & Aquifer runs out of water in about 120 years. <u>Not Acceptable.</u>
#2–1910 Condition (8.1 mil ac-ft in storage by the Yr 2040)	85,000 ac.-ft.	\$1,500K	\$12,250K	Requires new water from the Rio Grande and a massive infrastructure to return to the 1910 water supply in the aquifer. <u>Not feasible.</u>
#3–1960 Condition (7.8 mil ac-ft in storage by the Yr 2040)	75,000 ac.-ft.	\$.1,250K	\$9,625K	Same as Goal #2 except returns to the 1960 water supply level in the aquifer. <u>Not feasible.</u>
#4–Year 2000 (Current level of 6.5 mil ac-ft)	50,000 ac.-ft.	\$1,000K	\$3,615K	Requires an immediate stop to depletion. Holds available water supply at about 6.5 million ac-ft. <u>Not feasible.</u>
#5–Year 2040 (5.2 mil ac-ft remains in storage in the Valley Fill Aquifer by the Yr 2040)	30,000 ac.-ft.	\$920K	\$2,115K	Accepts another 1.3 million ac.-ft. depletion over the next 40 years while programs become operational. Stretches Water supply out 380 years before it runs out. <u>Feasible.</u>

SCENARIO NO. 5 – SELECTED AS THE BASIS FOR THE WATER PLAN!

SUSTAINABILITY/SELF-SUFFICIENCY–NOT ACHIEVABLE IN 40 YEARS

SUSTAINABILITY/SELF-SUFFICIENCY–NOT ACHIEVABLE IN 40 YEARS: The Committee does not believe that the Basin can be brought to a sustainable, self-sufficient water resource posture (available supply and recharge versus projected demand) in the next 40-year period. The Water Plan is based on actions that have worked elsewhere to reduce the aquifer depletion and updated policies which appear prudent. Execution of the Plan should reduce the projected aquifer depletion of 50,000 acre-feet per year to about 20,000 acre-feet per year by the Year 2040. That reduction lengthens the life of the Valley Fill Aquifer from about 120 years to about 380 years. While this Plan does not achieve a sustainable water supply in the next 40 years as stated, the Committee feels this is the least disruptive, most reasonable approach given the unknown and disputed data reference the other aquifers. Executable programs have been developed through a conservative approach based on achieving 50 percent of the reported results of other area water plans. **It is possible that a pro-active locally driven effort may achieve a sustainable water supply in the Basin. The key to success is an unselfish, cooperative commitment by all water users in the Basin aided by local, county, state and federal governmental agencies.**

WATER PLAN PROGRAMS SUMMARY: The programs recommended in the Plan for the next 40 year period will enable us to better educate ourselves on the actual challenges we face and the potential solutions that may lead to a “sustainable, self-sufficient water resource posture” during the next century. The plan is divided into four major program areas with goals, objectives, priorities, time lines and program budget estimates. The four major program areas are summarized in the following chart:

Figure E2: WATER PLAN PROGRAMS – SUMMARY

<u>Program</u>	<u>Annual Depletion Reduction Goal</u>	<u>Start-Up Cost (Initial)</u>	<u>Annual Cost</u>
• Management Program	4,500 ac.-ft.	\$210K	\$355K
• Conservation Program	20,500 ac.-ft.	\$277K	\$1,235K
• Water Development Program	5,000 ac.-ft.	\$297K	\$260K
• Water Quality Program	<u>N/A</u>	<u>\$195K</u>	<u>\$510K</u>
Total	30,000 ac.-ft.	\$979K	\$2,360K

These four major programs were developed with several sub-programs that are intended to be more fully developed and executed by existing local governmental, civic action and private entities. There are ample opportunities for “partnering,” and it is hoped that the Estancia Basin will become a “pilot region” where the state and others find out what really works in a largely rural setting. The Plan is intended to be implemented and is phased to facilitate implementation. The objective is to move the Basin towards a sustainable, self-sufficient water resource posture consistent with state guidance and local needs. Essentially, this is a walk before you run approach that will prevent duplicate efforts and minimize waste.

INFRASTRUCTURE: A fifth program area, Infrastructure, listed in the New Mexico Interstate Stream Commission guidance, was evaluated and eliminated because there are no major existing water resource infrastructure items (dams, canals, main system pipelines) that offer any promise for depletion reduction or development of new water supplies within the Basin. The only candidate would be the elimination of the infrastructure which exports water from the Basin; however, it was felt that the concerns raised by exporting water could be addressed best in the Management Program portion of the Water Plan. There are some infrastructure efforts, but they are included in the various program objectives in the four listed program areas.

PRIORITIES: The Estancia Basin Water Plan offers a comprehensive program to address the water resource needs of the Basin and a cohesive strategy to ensure a successful effort. However, how water rights are addressed will determine the overall success or failure of this Plan. Existing water rights must be protected, the appropriation of new water rights stopped with the exportation of water stopped or significantly limited. Without these fundamental changes in policy any effort to conserve water in a largely rural area with significant irrigated agricultural use and large individual water rights holdings will fail.

WATER RIGHTS – THE CRITICAL COMPONENT FOR SUCCESS

WATER PLAN – CRITICAL PRIORITIES

- **Single Focus Management and Adequate Funding**
- **Special Groundwater Management Area(s)**
- **Conservation, Water Resource Information and Education Programs**
- **Water Rights Program**
- **Comprehensive Monitoring, Metering and Investigations Programs**

- **Single Focus Management and Adequate Funding:** The establishment of a single-focus water resource Basin-wide entity with authority, necessary funding and a long-term approach enabling execution of the Plan and its programs year-after-year is absolutely crucial. (Management Programs—Programs No. 2 and No. 3)

- **Special Water Groundwater Management Area(s):** The Basin needs to be designated a Special Groundwater Management Area by all counties and the State of New Mexico to ensure focus, funding and effective coordinated efforts at all levels to address the concerns of water resource sustainability and self-sufficiency. (Management Programs—Program No. 1)

- **Conservation, Water Resource Information and Education Programs:** Aggressive, volunteer citizen driven Conservation, Information and Education Programs are critical to attain overall success. The amount of water pumped must be minimized, and that which is pumped from the aquifers must be used with maximum efficiency and reused again and again when possible. Residents must understand why it is in their best interests to conserve water, and how to best do so, given their individual circumstances. (Management Programs—Program No. 5; and Conservation Programs No. 1 through No. 7)

- **Water Rights Programs:** Crucial to any Conservation Program's success in a largely rural area is a Water Rights Program(s) that rewards taking water rights out of production and not using existing recognized unused water rights, while protecting the validity and amount of water rights owned by each person or entity in the Basin. Must minimize pumping of groundwater while maximizing reuse. The State policy of "use it or lose it" must be changed. This program is the single most critical element to the success of the Water Plan. (Management Programs—Program No. 7)

- **Comprehensive Monitoring, Metering and Investigations Programs:** Comprehensive monitoring, metering and investigations programs are necessary to find out what is available, what is really being used, how the aquifers really interact and how recharge really works. The comprehensive monitoring program also functions as an "early warning system" in areas where contamination is or may become a concern. (Management Programs-Program No. 4; Conservation Programs-Program No. 4; & Water Development Programs-Program No. 4)

Figure E3: SUMMARY — WATER PLAN PROGRAMS

<u>Programs</u>	<u>Estimated Water Savings Goal</u>	<u>1999 Program Budget</u>	<u>Five-Year Program Budget</u>
<u>Management Programs</u>	<u>4,500 ac-ft</u>	<u>\$210K</u>	<u>\$1,775K</u>
Program No 1—Special Grd Wtr Mgmt Area	(N/A)	(N/A)	(N/A)
Program No 2—Coord, Plning & Oversight	(N/A)	(\$80K)	(\$600K)
Program No 3—Water Trust Fund	(N/A)	(\$80K)	(\$500K)
Program No 4—Comprehensive Monitoring	(N/A)	(\$20K)	(\$500K)
Program No 5—Information and Education	(N/A)	(\$10K)	(\$50K)
Program No 6—Local Codes and Ordinances	(4,500 ac-ft)	(\$20K)	(\$25K)
Program No 7—Geographic Information and	(N/A)	(N/A)	(\$100K)
<u>Conservation Programs</u>	<u>20,500 ac-ft</u>	<u>\$277K</u>	<u>\$6,175K</u>
Program No 1—Audit and Budget	(200 ac-ft)	(\$20K)	(\$100K)
Program No 2—Plumbing Retrofit	(300 ac-ft)	(\$20K)	(\$250K)
Program No 3—Ag Irrigation Efficiency	(5,000 ac-ft)	(\$102K)	(\$325K)
Program No 4—Metering	(5,000 ac-ft)	(\$30K)	(\$500K)
Program No 5—Watering Practices	(500 ac-ft)	(\$5K)	(N/A)
Program No 6—Codes and Ordinances	(N/A)	(N/A)	(N/A)
Program No 7—Water Rights	(9,500 ac-ft)	(\$100K)	(\$5,000K)
<u>Water Development Programs</u>	<u>5,000 ac-ft</u>	<u>\$297K</u>	<u>\$1,300K</u>
Program No 1—Cloud Seeding	(4,000 ac-ft)	(\$120K)	(\$500K)
Program No 2—Terrain & Vegetation Mod	(1,000 ac-ft)	(\$156K)	(\$300K)
Program No 3—Undeclared Area Annex.	(N/A)	(\$11K)	(N/A)
Program No 4—Underground Investigation	(N/A)	(\$10K)	(\$500K)
<u>Water Quality Programs</u>	<u>N/A</u>	<u>\$195K</u>	<u>\$2,550K</u>
Program No 1—Information	(N/A)	(\$10K)	(\$100K)
Program No 2—Monitoring	(N/A)	(N/A)	(N/A)
Program No 3—Aquifer (Well) Protection	(N/A)	(\$10K)	(\$500K)
Program No 4—Septic Tank Remedial	(N/A)	(\$121K)	(\$1,025K)
Program No 5—Sewer System Remedial	(N/A)	(\$20K)	(\$250K)
Program No 6—Septic Tank Effluent	(N/A)	(\$20K)	(\$500K)
Program No 7—Adv Indiv Treatment Sys.	(N/A)	(\$20K)	(\$250K)
Program No 8—Codes and Ordinances	(N/A)	(N/A)	(N/A)
Program No 9—Watershed Management	(N/A)	(\$4K)	(\$25K)

ACTIVITIES-1999: The Year 1999 will be utilized to develop understanding and gain acceptance, support and funding for the Estancia Basin Regional Water Plan, and to develop the programmatic and administrative mechanisms needed to implement the Plan successfully. The programs, projected funding, action items and agencies for the Year 1999 and follow-on efforts and funding for the Year 2000 through the Year 2004 are shown as part of the recommended individual program outlined in the main body of the Water Plan. The Plan is intended to be executed in five-year increments with updates, revisions and reports as necessary. Given the nature of the water resources business it was felt that five years was the best time frame to use for implementation efforts.

FIRST STEP: The Estancia Basin Water Plan is the first step, not the final step towards a practical approach to water resources for the future. The Plan is intended to serve as a guide to start the Basin into the future with respect to sustainable water resources. While the programs and recommendations presented are based on successful programs ongoing elsewhere, it is anticipated that the Plan will be refined, changed and adjusted as we find out what really does and does not work in our Basin. The Plan is not the end, rather it is the beginning of an effort that needs the support and help of all of us to be successful.

LOCAL EFFORT: The intent is to use the existing sovereign entities (counties, municipalities, soil and water conservation districts, governmental agencies, civic organizations and school systems) to develop and conduct the programs under the overall coordination of the Estancia Basin Water Planning Committee, or a similar basin-wide single focus entity. **Further, the Plan recommends control, development and execution of the individual programs at the local level to ensure that the Plan addresses the needs and concerns of the residents of the Basin.** Clearly the Office of the State Engineer needs to provide overview and guidance from the state level as do the Environmental Department and the Department of Finance and Administration. However, only through local acceptance and action will the Plan achieve its goals.

FUNDING: Maximum use will be made of existing federal and state funded grant programs with the possible imposition of impact fees, tax credits, and/or a slight increase in the gross receipts tax in the Basin to establish a water trust fund. A royalties program on water or water rights sold to third parties and a secure funding source such as a water trust fund that can only be used for water and wastewater related activities under local direction are crucial to ensure program continuity, and ultimately Water Plan success. One of the first follow-on steps should be the appointment of an Estancia Basin Water Planning Committee Sub-Committee to study and develop the funding program and Trust Fund, if applicable. This Sub-Committee should be augmented by individuals with considerable expertise in the funding area, an understanding of state government and the legislative process, and legal expertise.

LOCAL PROGRAMS/LOCAL EFFORT: Outlines of programs which have been developed to serve as suggested guidelines for action entities are presented in the Appendix of the Water Plan; however, the specific development and execution of all programs is left to the various action agents at the local level. The Plan addresses “why” and “what,” and suggests some approaches to “how,” but leaves the actual “how” to the local action agents (Basin residents and their established forms of government and action). As an example, one of the Basin’s Soil and Water Conservation Districts will probably function as the administrative and fiscal agent for the Water Plan and its programs.

THE PAST: There are a lot of myths, misconceptions, fears and false communication ongoing in the water resource world. This Water Plan is a practical, pro-active effort to ensure that future generations will have the opportunity to enjoy the lifestyle(s) that today’s residents of the Basin find so appealing. The Plan is not in any way intended as criticism of anyone (individual, entity, local/state/federal governments or corporation). What has happened up to this moment has occurred because all of us and/or our ancestors played a part. The normal and very real tension that has developed between the rural agricultural lifestyle that has been present and formed the basis of much of the Basin’s economy for many years, and a more suburban lifestyle that has become particularly prevalent in recent years in parts of the Basin has made it more difficult to deal with water resource concerns. That tension and the resulting perceptions need to be acknowledged and energies channeled towards creating progressive action plans and executing those plans and programs or success will be impossible to achieve. We also believe that there is no point in fighting among ourselves about the past. It happened! We need to concentrate on the future!

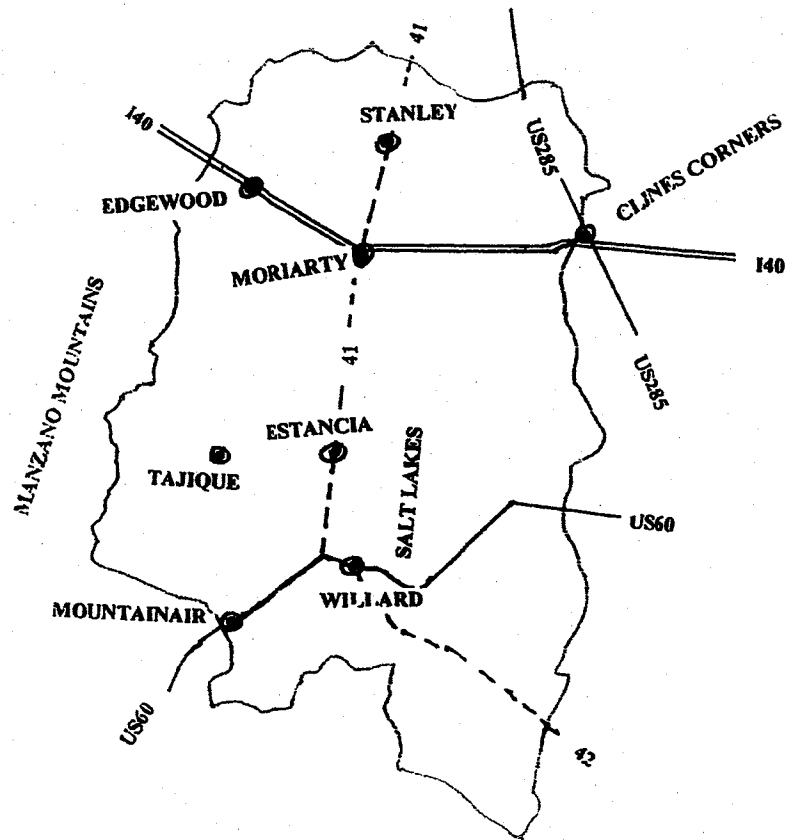
THE FUTURE: In looking to the future we need to work together to develop a sustainable self-sufficient water resource posture or all of us and/or those who follow us may ultimately lose out. The United States is replete with areas where residents failed to work together to solve common water resource concerns. Those areas are easily identified today by the ghost towns, decaying infrastructure and empty, deteriorating buildings that are present.

THE WATER PLAN – BOTTOM LINE

THIS WATER PLAN PROVIDES A PATH AND A FOCUS TO GUIDE US DURING THE NEXT FORTY (40) YEARS AND ON INTO THE NEXT CENTURY AS WE MOVE TOWARDS THE LONG-TERM VISION AND GOAL OF WATER RESOURCE SELF-SUFFICIENCY AND SUSTAINABILITY IN THE ESTANCIA BASIN.



ESTANCIA BASIN
RECOMMENDED REGIONAL
WATER PLAN
(YEAR 2000 TO YEAR 2040)



Estancia Basin Water

Planning Committee

January 8, 1999

Prepared by:
Corbin Consulting, Inc.
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- **Information and Education Program**
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- **Terrain/Vegetative Modification & Management Program**
- **Weather Modification Program**
- **Legislative Program**
- **Watershed Management Program – Example: U.S. Forest Service**

F - Letters and Responses–Public Input

REFERENCES: (Not attached)

- **Public Participation Interim Report (1993-1997)**
- **Phase I Report (Shomaker Report)**
- **Phase II Report (Corbin Report)**
- **Texas Water Plan and Update**
- **East Mountain Wastewater Study**
- **East Mountain Water Study**
- **California Water Plan**
- **Utah State and Regional Water Plans**
- **Colorado Water Plan**
- **High Plains Conservancy District Report and Memo of Discussions**
- **Monterey County, California, Reports and Memo of Discussions**
- **Cloud Seeding Reports (et. al.)**

LIST OF ABBREVIATIONS

Ac.-Ft.	Acre-Feet
AWWA	American Water Works Association
BBER	Bureau of Business and Economic Research
CES	Cooperative Extension Service
Ea.	Each
EPA	Environmental Protection Agency
GIS	Geographic Information System
I-40	Interstate-40
K	Thousand
LANDSAT	Land Satellite
M	Million
MOU	Memorandum of Understanding
MRGCOG	Middle Rio Grande Council of Governments
NMED	New Mexico Environmental Department
NMISSC	New Mexico Interstate Stream Commission
NMSA	New Mexico Statutory Authority
NRCS	Natural Resource Conservation Service
O&M	Operations & Maintenance
OSE	Office of the State Engineer
RFP	Request for Proposal
SWCD	Soil and Water Conservation District
USDA	U.S. Department of Agriculture

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PREFACE

PUBLIC CONCERN: The Recommended Water Plan is the result of public concern about the water resources of the Estancia Basin. Responding to public concern Torrance County appointed an Estancia Basin Water Planning Committee in 1993. In August 1995 Santa Fe and Bernalillo Counties joined Torrance County to formally establish the Estancia Basin Water Planning Committee and provided it with specific guidance (Appendix A) to review the water resources of the Basin and to devise strategies to deal with resulting concerns.

THE COMMITTEE: The Initial Committee formed in 1993 was composed of a broad cross-section of stakeholders appointed by the Torrance County Commission. As pointed out in the Public Participation Section many of those interests fell by the way-side over time. In 1995 when the Committee became a tri-county organization it was reconstituted based on representation by major stake-holder water interest entities (irrigated agriculture, ranching, development and utilities, and local government with a citizen-at-large representative). It was probably inevitable over a five-year period that only those with a vital economic stake and/or commitment to water conservation would "stay the course." As the Basin moves from the development of the Plan to implementation, the opportunity to bring other diverse interests back into the effort exists in the specific development and execution of the sub-elements (programs) of the Plan.

PUBLIC INPUT: The Water Plan's foundation is based on public input. The Committee held public sensing sessions in 1993 to find out the public concerns about water resources in the Basin. In 1995 the Committee held another series of sensing sessions to gain public input about public welfare and conservation water related concerns and solutions. A group of consultants was used to develop what was known about the Basin. That data is presented in the Phase I (Shomaker, et. al.) Report. The Committee then utilized another consultant, Jim Corbin (Corbin Consulting, Inc.), with over 30 years of experience as a senior government decision-maker in public water resource and infrastructure policy and implementation to assist in arriving at conclusions from the data in the Phase I Report, develop possible scenarios and programs, evaluate those scenarios and programs, and then develop an executable Water Plan with strategies for implementation. The consultant was asked to present the Plan in four public meetings during late October/early November 1998 for public comment. A third consultant (Lucy Moore) was asked to facilitate those public meetings and capture the public's input. The Committee and their consultants, Mr. Corbin and Ms. Moore, held a fourth round of public meetings in late November and early December 1998 to inform the public of what had occurred in the previous public input effort and to gain any additional insights from the public. Both Mr. Corbin and Ms. Moore indicated that the Plan was better received than any like efforts they have observed.

STATE OF NEW MEXICO GUIDANCE: The New Mexico Interstate Stream Commission (NMISSC) is the lead agency in the State of New Mexico for regional water planning. The NMISSC provided a Regional Water Planning Handbook with Template to guide regional water planning efforts, and provided a significant portion of the funding of this effort for which the Committee is extremely grateful. The NMISSC staff and that of the OSE also provided guidance and technical feedback which has been extremely helpful while maintaining an “arm’s length” from the Committee’s effort to avoid being overly directive. That has been extremely important since the effort must be a local effort if it is to be successful. It must also fit inside the overall framework of a future State Water Plan. Where state guidance conflicted with local county guidance the Committee used local guidance as the determining factor for the Plan. Where state and county guidance conflicted with public perception and guidance, the public’s input was used as the determining factor in developing the Plan. Every effort was made to resolve conflicts between state, county and public guidance.

CONFLICTS: There are state policies and procedures that are in conflict at the state level and that conflict with perceived county and public needs, concerns and considerations. Where those policy and administrative conflicts could not be resolved within the Plan, they have been pointed out and actions suggested for consideration at the state level for resolution.

- **MINED BASIN:** The Office of the State Engineer administers the Estancia Basin as a mined basin. The New Mexico Interstate Stream Commission requires regional water planning to be based on sustainability and self-sufficiency. The Water Plan complies with the guidance of the New Mexico Interstate Stream Commission to the extent possible. The mined basin policies adopted in 1965 were intended to assist the Basin in developing a strong economic base. They succeeded in doing so. Agriculture, predominantly irrigated agriculture, became an economic base for the Basin. Over the next 40 years with the suburban sprawl of Albuquerque entering the Basin in the northwest portion and likely to extend along I-40 to Moriarty, irrigated agriculture is not likely to be as predominant an economic force. Conservation can not occur in a meaningful way in largely agricultural areas based on the State of New Mexico’s “use it or lose it policies” of water rights administration. The declining existing water levels and deteriorating water quality in the Estancia Basin seem to call for a change as well.
- **WATER RIGHTS:** The Plan points out today’s concerns and conflicts with the block water rights appropriation administrative policies of the Office of the State Engineer. The current philosophy and policies require an individual to declare all the water rights they can and use them to the maximum in spite of declining water levels. The continued application for and appropriation of water rights completely and totally negates any conservation efforts. Based on public input it has also fostered the practice of moving water rights and then developing areas utilizing NMSA 72-12-1 domestic wells (individual or co-op) to provide water. Why

would anyone in their right mind conserve if someone else can declare a new water right and pump the water the first person has saved? The Basin needs to be declared fully appropriated (it is actually over-appropriated based on lowering water levels) and administered to minimize pumping and maximize reuse. The already applied for and appropriated water rights need to be accepted and protected at their present level. Clearly the OSE should still have the latitude based on public welfare to grant exceptions where socio-economic and cultural needs of the Basin outweigh individual concerns, if the available technical data supports an exception.

CONSERVATIVE APPROACH: The mined basin approach worked to establish economic development and help the Basin establish a viable economy. Now it is time to recognize reality and stabilize the Basin's water resources posture. The Water Plan is based on this conservative approach. It would be sheer folly to continue the present policies in the face of presently available indicators. There may be water in the other aquifers in the vast amounts claimed. However, if the aquifers do interact as some suggest then the depletion of the Valley Fill Aquifer is a harbinger of worse days ahead. Until the aquifer interaction and amounts of water in the other aquifers have been established beyond a reasonable doubt, caution and a conservative approach that minimizes the potential for human suffering needs to be applied.

ORGANIZATION OF THE WATER PLAN: The Water Plan is divided into five sections for the sake of clarity.

- **Executive Summary:** The first section presents a stand-alone Executive Summary that briefly discusses the water resource concerns of the Basin, then presents a solution (depletion reduction goal and supporting programs), priorities, time lines and estimated costs.
- **Preliminary Section:** The second section (Table of Contents, Preface, Purpose, Vision Statement) discusses the background concerning the Estancia Basin Water Planning Committee, the guidance on which the Water Plan is based, presents some concerns and conflicts, briefly discusses the public participation effort which is the foundation of the Water Plan, and presents the Plan's format.
- **Introduction and Background:** The third section summarizes the data and conclusions reached about the Estancia Basin's water resources, discusses the public participation process in detail, summarizes the various scenarios and supporting programs and the process utilized to evaluate them, and briefly discusses the selected water supply scenario that forms the basis of the Water Plan.

- **The Water Plan:** The fourth section presents the Water Plan, its goal and supporting programs complete with objectives, priorities, time lines and estimated program budgets.
- **Appendices:** The fifth section (Appendix) presents additional information, suggested outlines to help guide action agents in the development of some of the program elements, and lists some, but not all, of the important references used during the process of developing the Water Plan.

THE PLAN: The Plan presents a careful, thoughtful way to proceed for the next 40 years. The Committee does not believe that water resource self-sufficiency and sustainability can be obtained during the next 40 years. The Plan moves the Basin significantly closer to sustainability as mandated by the New Mexico Interstate Stream Commission. There are flexible safeguards in the approach outlined in the Water Plan to enable either a more relaxed or a more controlled approach depending on what the monitoring and metering, underground investigations, the various pilot programs and conservation versus water usage indicate. A secure funding source, the successful resolution of the water rights and administrative policy concerns, a pro-active conservation program and local control and effort are absolutely crucial to the Plan's success.

PURPOSE

THE MEMORANDUM OF UNDERSTANDING: The Estancia Basin Water Planning Committee was formally established by a three county Memorandum Of Understanding between Torrance, Bernalillo and Santa Fe Counties on August 23, 1995. The Memorandum of Understanding directed the Estancia Basin Water Planning Committee to *"provide for the coordination of water planning activities affecting the Estancia Basin"* with the *"general goal to protect the quality and preserve the quantity of water resources of the Estancia Basin for future generations."* *"Various objectives for achieving this goal include but are not limited to the following:*

- A. Develop a geohydrologic model of the Basin in order to characterize ground-water flow and to calculate the basin ground-water supply;*
- B. Maintain a categorical inventory of water users in the Basin and continuously forecast the consumptive demands on Basin ground water;*
- C. Establish a ground-water monitoring system for collecting data on water table changes, saline water intrusion, and contamination in Basin recharge areas;*
- D. Recommend various techniques of land use management for reducing threats to water resources, especially in vulnerable areas;*
- E. Initiate and conduct a water resource information and education program designed to increase public knowledge of water laws and regulations, water conservation techniques, and the need to develop contamination prevention policies;*
- F. Formulate water resource and conservation management policies for consideration by the various governments with jurisdiction in the Estancia Basin;*
- G. Prepare a compilation of forty-year water development plans from all municipalities, counties, and public utilities operating water supply systems within the Estancia Basin;*
- H. Secure the future availability of usable water resources to maintain and sustain existing customary and cultural uses."*

THE WATER PLAN: The purpose of the Water Plan is to comply with the above directive and complete tasks consistent with the guidance provided by the State of New Mexico as outlined in the New Mexico Interstate Stream Commission Regional Planning Handbook and Template (Appendix B), mindful of the Basin's residents input garnered through five years of open meetings and four rounds of public hearings. The Plan provides a starting point to approach future water resource efforts in the Basin. The Plan provides a framework with specific programs and benchmarks which will guide state agencies, counties, municipalities, businesses, corporations and private citizens in the future and allow them to evaluate their efforts. The Plan is the start of a long road towards sustainability, not the end. As such it needs to be revisited and revised at least every five years to take advantage of lessons learned and opportunities for success.

THE FUTURE: The Water Plan is intended to guide us into the future, not dictate the future. It focuses on water resource self-sufficiency and sustainability as long-term goals to achieve during the next one hundred years, while recognizing that these goals may not be attainable during the 40-year period covered by this Water Plan (Year 2000 to Year 2040).

VISION STATEMENT

LONG-TERM VISION (100 YEARS AND BEYOND)

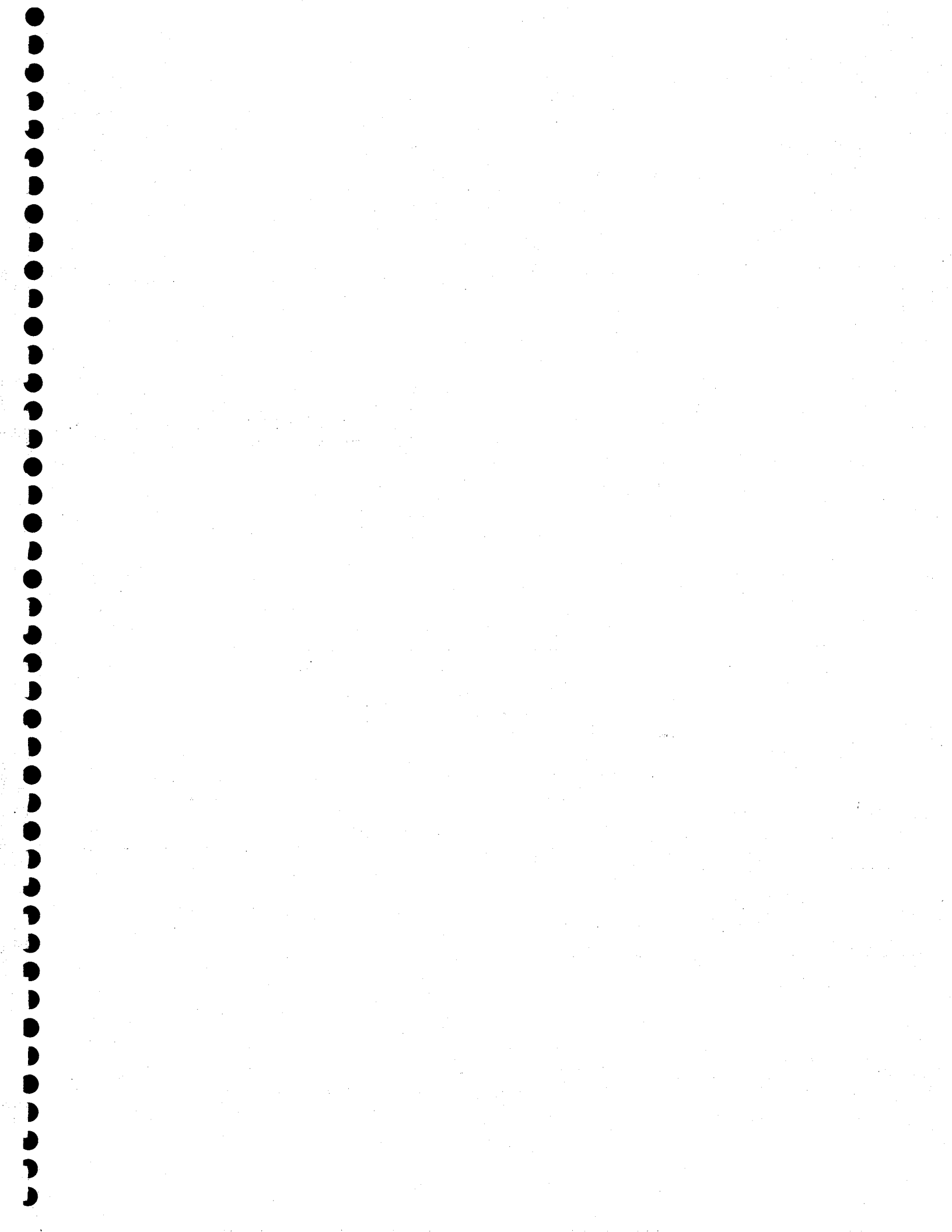
Total Water Resources Sustainability and Self-sufficiency in the Estancia Basin as directed by the New Mexico Interstate Stream Commission.

MID-TERM VISION (40 YEARS – THE LIFE OF THE PLAN)

During the next 40 years move towards a position of Water Resource Sustainability and Self-sufficiency, achieving a 60 percent yearly reduction in the projected annual demand depletion(loss) rate for the aquifer water supply by the start of the Year 2040.

SHORT-TERM VISION (5 YEARS – THE INITIAL IMPLEMENTATION PERIOD)

Gain acceptance of the Water Plan; put in place the management, administrative and funding mechanisms and policies necessary to begin execution of the Water Plan by the Year 2000; complete the initial implementation period (Years 2000 through 2004), evaluate, add/delete/revise/adjust as necessary.



Estancia Basin Draft Regional Water Plan Public Involvement Process

sponsored by the Estancia Basin Water Planning Committee

Facilitator/Recorder: Lucy Moore

Purpose: The Estancia Basin Regional Water Planning Committee is committed to the belief that a regional plan must represent the values, the hopes and the concerns of all those within the region. In order to insure that the Estancia Basin Plan is an accurate reflection of its citizens' beliefs, the Committee initiated an extensive public outreach process throughout the basin, and hired a professional facilitator to help design, facilitate and make a record of the discussion and comments. The purpose of the public involvement process was to provide every citizen with information about the draft regional water plan, and to provide every citizen with an opportunity to express themselves, with a question, a comment or a suggestion.

Outreach Activities: The Committee mounted an extensive outreach campaign to disseminate information about the Estancia Basin Draft Regional Water Plan. The Plan was available in 20 different locations, and executive summaries were prepared and distributed widely. Over 1,100 direct mail invitations to the public meetings were sent to those who had expressed interest in the planning process over the past five years, and to stakeholder groups and community leaders. Announcements of the availability of the Draft Plan, and of the public meetings, appeared in 2 newspapers, on radio, and in over 14,000 electric utility bills. Notices were posted in dozens of locations; presentations were made at local club and organizational meetings. A complete list of the outreach efforts is attached to this report. The Committee sponsored two rounds of four public meetings each, in Tajique, Edgewood, Estancia, and Moriarty. Finally, the Committee sponsored two rounds of four public meetings each, in Tajique, Edgewood, Estancia, and Moriarty, (October 26 - 29, and November 30 - December 3, 1998).

Responsiveness: Written or telephoned comments following the first round of meetings were received through November 13. These comments and ideas were reviewed by the Water Planning Committee, staff Dee Tarr, the consultant Jim Corbin, and the facilitator Lucy Moore. Written comments with responses are attached to the Final Water Plan. Comments made at the meetings themselves are summarized and answered in the Final Plan as well.

Changes made to the Draft Plan as a result of this public comment were identified and discussed at a second round of public meetings held November 30 - December 3, 1998, in Tajique, Edgewood, Estancia and Moriarty. Another opening for comment extended to December 14, 1998. The facilitator of the two rounds of public meetings summarized the points raised at each meeting, and each participant received a copy of that summary.

**First Round Public Meetings
Estancia Basin Draft Regional Water Plan**

Summary of Concerns

Following is a summary of the concerns raised during the four public meetings held in the Estancia Basin, October 26 -29, 1998. Full descriptions of the meetings, and all concerns raised can be found in the meeting summaries. This document is intended to highlight those issues and opinions most frequently heard in this first round of public meetings.

Hydrological Data: Participants expressed concern about several aspects of hydrological data in the Basin.

Aquifer Supply and Drawdown: Those at the meetings expressed confusion about the supply of water in the aquifers, and the rate of drawdown. This also raised questions about the connection, if any, between aquifers, and the need for additional data on aquifers other than the Valley Fill.

Recharge Data: Many felt that there was inadequate information about recharge rates and amounts in the basin, particularly in the area of the Manzanos, and particularly with respect to agricultural applications.

Agricultural Use: There was acknowledgment that there is no accurate information on the amount of water used by agriculture in the Basin — and that there is little incentive for irrigators to determine those amounts. However, most felt that it was necessary to have that data for accurate planning.

Policy Issues:

Sustainability: There was widespread concern about water policies at the state level which seem to provide disincentives for conservation and sustainability of water resources. The Office of the State Engineer promotes a “use it or lose it” policy, and yet the message from the Interstate Stream Commission to regional water planners are to plan for sustainability.

Protection of Existing Rights: Participants agreed that protection of existing rights was paramount in water planning. Many felt that this mandated a prohibition on the further declaration of water rights.

Exportation of Water: The great majority of participants favored a policy to prevent, or at least discourage, exportation of water from the basin. If exportation could not be prevented, there should be a mechanism which would bring compensation to those in the Basin, in the form of impact fees, or other charges.

Double-Dipping: Many felt the State Engineer should address, and prevent, the practice of double dipping — selling water rights, and then drilling a 3 acre foot domestic well on the same land. There was concern that this put an unquantifiable stress on the aquifer.

Local Control: Participants agreed that water planning and decisions concerning water resources should be under local control, rather than state or federal levels. Some favored a Basin Water and Wastewater District as the vehicle for local control. Others feared this might result in an unwanted layer of bureaucracy and taxation. There was some uncertainty about the interest and commitment of the counties in supporting water initiatives and local planning in the basin. There was also a desire to cooperate with local government, and retain a good working relationship.

There were also concerns on the part of some about over-regulation by the state and federal governments, particularly with respect to subdivision regulations and water quality testing.

Wastewater Treatment: Several spoke of the need for wastewater treatment systems in the more populous areas of the Basin. There were concerns about the contamination of groundwater from a proliferation of septic tanks, and the recognition that effluent could be a source of re-use of water.

Implementation of the Regional Water Plan: There was unanimous agreement that the plan, when adopted, should be implemented, and not left on the shelf. There was also considerable concern about how the implementation would be paid for. Participants differed on how to distribute the costs, or raise the funds; they discussed metering, taxing, federal grants and loans, private foundations, the formation of an Estancia Basin Trust Fund, and more.

Future of Agriculture: Many participants were concerned that agriculture not be driven out of business by water policies. They felt that agriculture forms the foundation of the economy, and provides important social and cultural values as well. There seemed to be an understanding that it will be the economy that will dictate agriculture's future.

There were suggestions that conservation by agriculture could make a significant difference in the Basin's longevity. More data about agricultural water use is needed, and a conservation program should be locally developed in a way that brings all interests together.

Public Meetings: Process and Summaries of Discussion:

Introductions and Background: Each meeting began with similar preliminaries, including introductions, background on the committee, description of the public involvement process, and a review of the Draft Plan.

Richard Spencer, Committee Chair, welcomed participants and explained the history, purpose and activities of the Estancia Basin Regional Water Planning Committee. Dee Tarr read the list of locations of the Draft Plan, and offered copies for sale for the cost of copying.

Lucy Moore, facilitator, described the meeting format and all participants introduced themselves. She also explained that there are several ways to comment on the Draft Plan: 1) speak at a public meeting; 2) write to the Committee at Box 129, Mountainair, NM 87036; 3) Call or FAX the Committee (Richard or Dee) at 847-2941, or 847-0615 FAX; or 4) Call or FAX Lucy in Santa Fe at 820-2166 or 820-2191 FAX.

Jim Corbin, consultant and author of the Draft Plan, gave a presentation which covered the context of water planning in New Mexico, and the content of the Draft Regional Water Plan in some detail.

Following is a summary of the discussion among meeting participants, consultant, and committee members at each meeting of the four meetings: Tajique, Edgewood, Estancia, and Moriarty. Copies of the attendance sheets for each meeting are attachments to this report. The "Main Themes" are issues that were discussed at length, or were raised by more than one person. The other comments or questions are listed under "Miscellaneous."

Tajique, Tajique Community Center
October 26, 1998, 7:00 - 10:00 pm

Main Themes:

Recharge Data: Participants were interested in learning more about the recharge patterns in the basin, particularly with respect to the Manzanos. They asked for more emphasis to be put on pilot recharge projects and data gathering projects to determine the amounts of recharge in different parts of the basin. There was particular interest in the amount of irrigated land, the amount of water actually applied to the land, and the amount of recharge. Corbin indicated that the Monitoring, Metering and Investigation Program would help resolve these questions.

Land grant representatives spoke of their ongoing thinning projects (vegetative and land terrain modification) in the Manzanos, in cooperation with the Forest Service. These projects are designed to reduce fire hazard, increase recharge, and generally improve the health of the watershed. There was also interest in cloud seeding in the Manzanos in order to increase the snow pack and the recharge; some residents noted that this might have a negative impact on them as well in terms of floods. Corbin discussed vegetative and terrain modification efforts in Utah, Texas and New Mexico.

Sustainability: Many were concerned about what seems to be a contradiction between policies at the state level and priorities at the local level. The State Engineer promotes a policy that mines groundwater, and yet the Interstate Stream Commission (ISC) requires regional water planners to plan for sustainability. Many local planners want to promote the sustainability concept, and wonder if it is necessary to make legislative changes in order to have that priority supported at the state level. A participant asked if other regions were concerned with the same dilemma, and if consensus among regions might be possible on this issue.

Another participant noted that although the ISC requires a region to plan for sustainability, even Alternative # 5 (scenario) of the Estancia Draft Plan results in eventual depletion of the aquifer. Corbin agreed, and said that the ISC regional planning horizon is 40 years, and that it will be important to review the situation over time, hopefully taking advantage of successful efforts. Then, he said, we should have more data, and know more about the effectiveness of many of the strategies suggested in the draft plan. The Investigations proposed in the plan will be identifying potential new sources of water—other aquifers, deeper drilling, imported water from other basins, treatment of saline water, interaction of aquifers, etc.

A participant suggested that the Draft Plan include incentives for conservation in order to sustain water resources in the basin longer. The group discussed strategies such as retrofitting plumbing and voluntary agricultural audits. There was concern that farmers would not support conservation efforts, if the savings were made at their expense. Corbin and Spencer recommended that any efforts be suggestions rather than demands, and that any decision-making

body formed reflect all the interests in the basin. There was considerable discussion about protecting existing declared water rights, and stopping any further declaration of water rights.

Exportation of Water from Basin: Many felt strongly that there should be a mechanism to prevent, or discourage, exportation of water from the basin. Perhaps a significant transfer fee could be assessed which would at least contribute to some kind of water trust fund for the basin. This issue, said Corbin, is a political one, and citizens need to contact legislators, or perhaps hold a referendum.

Local Control: There was interest in gaining local control over the future of water, and a discussion about forming a Basin Water and Wastewater District ensued. A participant asked when and how that could be done. Corbin responded that it would be difficult to move from the Committee structure to a Water District, and that it would probably be necessary to have legislative support. He recommended beginning the process within the next 6 months, if that is the preferred direction of those in the Basin. Spencer added that state law currently recognizes public welfare as defined by each region, and that this is a reason to pursue a locally controlled mechanism. Corbin discussed water conservancy districts in other states, such as the High Plains Conservancy District in Texas.

Participants speculated that this might be a priority for other regions, and that it might be possible to get support for changing state law from other regions.

Miscellaneous:

Aquifer Drawdown: There was a question about the significant drop in the aquifer in the 1960's. Corbin responded that agriculture before the point had been mostly dry land farming, and that in the 60's there was a technological leap in deep well pumping and irrigation capacity and distribution system.

A Torreon resident noted little, if any, drawdown in his well during irrigation season. He suspected a little impact from subdivisions, but not much. A neighbor about three miles south of Manzano reported significant drops in his well during irrigation season. There was hope that the investigations could produce information about the boundaries and movement between aquifers.

Validity of the Public Involvement Process: A participant asked if there was a genuine opportunity to make changes in the draft plan. A sentence on page 16 of the Draft made the reader think that final decisions had already been made. Corbin apologized for the misleading phrasing, and emphasized that every comment would be responded to, and that the plan might be changed in response to public comments, and that the sentence was only there as a "place-taker" for a discussion of the ongoing public participation effort.

100 Year Flood: A participant said he hoped for a hundred year flood, but then asked where the water would go. Corbin answered it would probably fan out and form a large lake in the valley and evaporate, with some recharge.

Surface Run Off: Participants were interested in capturing surface run-off. Corbin indicated that until we understand what can be gained from cloud seeding and other pilot projects, dams are probably too expensive for the area. Perhaps successful cloud-seeding would justify some surface impoundment, said Corbin.

**Edgewood, Edgewood Elementary School
October 27, 1998, 7:00 - 10:00 pm**

Main Themes:

Wastewater Treatment Needs: Participants discussed the feasibility of wastewater treatment systems in the basin. Large plants are very expensive, said Corbin, and are only feasible with concentrated numbers of users. Smaller, gravity flow, package treatment plants, in areas of development, might be practical. Septic tanks are a serious polluter in many parts of the state, and the Estancia Basin needs to protect against that potential source. Treated effluent can then be used for landscaping, but direct human contact needs to be avoided.

A participant noted that if there were wastewater treatment requirements for developers, for instance, they might plan developments in such a way as to avoid those regulations, causing greater problems.

Double-Dipping Water Rights: Many felt it was unfair that a landowner can sell his land and water rights, perhaps for a subdivision, and then be able to drill 3 acre feet domestic wells. Corbin believed that the State Engineer has not been able to adequately address this apparent double dipping, or over-use of the aquifer. Discussion ensued about the legality of the practice. A lengthy discussion took place where participants stressed that no new water rights should be allowed and that present water uses should be protected.

Projected Life of the Basin Figures: Some participants were confused about the apparent contradictions in years-to-depletion between the 1980 Santa Fe County Plan (40 years) and the Shomaker Study and current draft plan (120 years). Corbin explained that these are best guesses, and that 120 years seems like a good estimate at this point. He hopes that as more data is gathered that figure will become more accurate. The 40 year figure was a planning time frame in the County Plan not an exhaust the aquifer time frame.

There was concern that the plan is based only on the Valley Fill Aquifer, which is only 20-25% of the total land mass of the basin. Other aquifers in the basin may have twice as much

water, some said, but are ignored in this plan. Corbin indicated very precise knowledge of those aquifers is lacking, and believes that in future years the investigations and monitoring programs will produce more information on the supplies in these aquifers. He noted that monitoring of a few wells, to date, in the other aquifer areas, particularly in south Santa Fe County, indicate lowering water tables and don't support the large amounts of water claimed by some.

A resident summed it up by saying, "We just don't know what's down there." Corbin agreed.

Cost of Implementation: There was much discussion about the cost of implementing the plan, and potential sources of funding. Some feared that all water users would be taxed, and were not enthusiastic about spreading the \$ 2 million plus price tag per year among the few users in the basin. Others discussed forming a water district, which could levy taxes and make decisions at the local level. Corbin suggested other ideas including forming a non-profit association which could solicit from foundations, or increasing the gross receipts tax by some small amount.

There was concern that the current Planning Committee could become a taxing entity in the future.

There was recurring concern about the cost of the plan, as other items like metering were discussed. Corbin indicated that cost was a consideration that had to be addressed if the plan was to be useful.

A participant suggested it was time to think creatively about ways to "tap the responsibility" of all those who not only live and work in the basin, but travel through the basin. This could take the form of a tax, or fee, or some other mechanism not yet invented. There was discussion about the need to gain some benefit locally from outside developers who make a big profit on developing the basin, and then leave. Some hoped to be able to force them to "leave more money behind" in the form of impact fees, or contributions to an Estancia Basin Water Trust Fund. Participants hoped that the plan could address some of these mechanisms for raising money for implementation of the plan, while maintaining local control. All seemed to want control at the local level, not in Santa Fe or Washington, DC.

Role of Agriculture: There was a frank discussion about the role of agriculture with respect to the water future of the basin. Since agriculture now uses over 90% of the water that is used in the basin, some feel that is the obvious place to conserve. Irrigators spoke of already taking measures to conserve water, including laser leveling fields, capturing over 95% of runoff, and scheduling sprinkling. Many see agriculture as the economic base of the basin, and predict that when farming is not economically viable, it will begin to disappear in favor of other uses.

There was discussion of financial assistance programs which provide incentives for farmers to conserve. The federal EQIP grants offer 50-60% cost share grants to help farmers

increase their efficiency. One participant called the program, which allocated \$ 150,000 for the entire basin this year, "picking up pennies in the parking lot."

Miscellaneous:

Role of Bernalillo and Santa Fe Counties: A participant was concerned about the commitment of Bernalillo County to the water needs of the Estancia Basin. Their focus is naturally on the other side of the mountain, and the Rio Grande, and some fear that they will not support the efforts of the basin to achieve a secure water future. Bernalillo County has participated actively on the Planning Committee, according to Committee members.

The same concerns, along with resentment about indifference, was expressed toward Santa Fe County Commissioners and government.

Burden of Governmental Regulations: A participant was concerned that local people, and their children, will not be able to subdivide their own property and make a profit because of too many state and county regulations.

Changes in the Law: A participant asked if it is possible to have a decent, effective plan without changing state water law. General opinion was that a change in water rights and basin administration by the State Engineer was necessary.

Sustainability: A participant suggested that the only reliable sustainability would be to use only the amount of water that comes from the sky, and can be counted. Corbin indicated that a sustainable approach in the Basin essentially does that.

**Estancia, Torrance County Courthouse
October 28, 1998, 7:00 - 10:00 pm**

Main Themes:

Costs of Implementing the Plan: Many were concerned about how funds would be raised to pay for steps needed to protect water in the future. The group considered an Estancia Basin Trust Fund, and how to fill it — with taxes (on gross receipts, or water users), grants from government agencies or private foundations, impact fees on the export of water, well permit fees, etc. There was concern that a water users tax would have a serious impact on agriculture, and could even cause bankruptcies and drive people from the basin.

A participant reminded the group that technically all water belongs to the state, and noted that taxing water use might be the fairest way to raise the funds. "The more you use, the more

you contribute to the problem,” was the reminder. Such a tax would probably mean metering all uses, domestic and agriculture included.

Implementation Strategies: Participants asked that the plan include specific steps to protect water resources, protect property rights, and preserve the quality of life in the basin. A committee member added that it is important for the plan to specifically address public welfare and conservation needs with specific programs. “We need work on the ground, not more plans to plan, and more studies to study,” said one participant, and there seemed to be agreement. Corbin indicated that reuse would be covered more fully in the final plan, and that the water rights portion would be strengthened.

Economic Realities of Water: Participants recognized that the value of water depends on the cost of pumping it out of the ground, and that at some point this cost makes farming not feasible anymore. This reality will hit different farmers at different times, depending on their position with respect to the aquifer, and their financial stability. “Those on the margin won’t make it,” said one participant. The plan, Corbin said, wants to have input from agricultural interests in order to make the strategies appropriate for their situations, and places responsibility for many of the agriculture oriented programs on the local farm bureau and soil and water conservation district levels.

A trust fund, as envisioned above, could be used for infrastructure needs and the administration of water rights, but probably not to buy water rights, according to Corbin.

Some questioned the accuracy of assuming in the plan that agriculture will maintain at the current level well into the future. There was a lengthy discussion on possible scenarios, where some farms may fail, or choose to develop.

Conservation: The group understood the importance of water conservation, in all areas, municipal, domestic and agriculture. With over 90% of the water used being applied to agriculture, some felt it was particularly important to institute agricultural water conservation programs. There was agreement that these measures would best be developed and applied locally, and in a way that brings all interests together. Now, some said, it is difficult to know just how much agricultural water is being pumped or applied, particularly in view of the state’s alleged “use it or lose it” water policies.

Exportation of Water: Participants understood that the plan must assume existing laws, which do not prevent exportation, and existing politics which supports municipal dependence on exported water. However, they hoped for a more aggressive position in the plan against exportation, one which looks ahead to an impact fee or tax on exported water, for instance, and/or which places control at the local level.

Formation of Water District: Forming a water district as a tool in fighting exportation of water was discussed. Corbin indicated that there seems to be willingness on the part of Torrance

and Santa Fe counties to consider a district; Bernalillo may be "distracted" at the moment. This solution would require legislation, which is always a challenge. Some feared the district would simply be another layer of bureaucracy.

A woman spoke of the attempt by small water companies to pass legislation which would tax all water companies six cents per 1,000 gallons to help pay for water quality testing to meet very costly federal EPA regulations. The thought was that it was fair to tax everyone to help the small systems in business. The bill was killed by one legislator, at the last minute.

A participant noted that if a tax — even six cents per 1,000 gallons — drives someone out of business that means there will be less money going into the fund. It is important not to make the assessment a burden. Long term effects may not be the ones desired.

Miscellaneous:

Depletion Figures in the valley Fill Aquifer: A participant suggested that the decline rate might look worse than it really is because of the sudden decline in the 50's and 60's. If the decline in the last 20 years is examined, the rate is not so alarming. Corbin indicated that actually the decline beginning in the early 1980's was quite dramatic given the available data, and did not support the participant's view.

Water Supplies in Other Aquifers: A participant observed that there may be large quantities of water in the other aquifers in the basin. Corbin responded that he believes the amount some believe is present in the Madera aquifer is questionable, but that the Plan calls for more extensive investigation of the other aquifers, including the Madera, to address these questions. Even if there are other supplies, he added, there can be high costs to using that water, if it is below the Valley Fill, or otherwise difficult to pump, or of poor quality. Dewatering the Valley Fill could also result in serious subsidence possibly as much as 50-60 feet. Corbin indicated that once dewatered the Valley Fill cannot be re-watered.

Percolation Rates: A participant asked about the recharge time in the Valley Fill Aquifer. Corbin indicated that more studies are needed to give a useful answer to aquifer interaction. It may be that the percolation (recharge) occurs in two or three months, but it may also be true that the recharge in the Manzanos does not reach the Valley Fill Aquifer, at least not in the short term. Corbin suggested that it might be useful to look at the Texas experience, where the High Plains Underground Water District has aggressively metered and monitored and run investigation programs to learn more about protecting the Ogallala Aquifer.

Congratulations to the Planning Committee: A participant complimented the Water Planning Committee for their hard work, and their fair approach to the water problems in the basin, and the excellent draft plan, and their willingness to work with the Basin residents.

The Reality of Power: A participant spoke about the helplessness and hopelessness of

living in the Estancia Basin, where "it is all about money and politics." The majority will rule, and the decisions will be funded "out of our pockets," he said. There is nothing we can do, he continued. "They will come, use the water, and go."

Moriarty, Moriarty Community Center
October 29, 1998, 7:00 - 10:00 pm

Main Themes:

Projections: Some were concerned that the assumptions for the future were too conservative, and painted too bleak a picture. If 50,000 people move to the basin, this may mean a significant amount of land is taken out of production. The water needed for a two acre lot will be much less than would have been needed to irrigate the same amount of land. A participant guessed that five to six acre feet per year per developed lot could be saved.

There was discussion about over-reporting amounts of agricultural water now used and of land being irrigated, in order to protect a water right. A participant suggested that there be a mechanism in the plan to compensate for this inaccurate reporting.

Water Conservation: The group discussed methods of conservation, and requested that this section be clearer in the plan. Specifically, participants identified three ways to conserve water: 1) freezing water rights appropriations at present levels; 2) prohibiting "double dipping;" and 3) an export ban, which could require a change in state law. Participants suggested that creation of a water district could allow for regulations against exporting that were more stringent than state law, and could also control and protect water rights more effectively than at the state level.

Community Wells v. Private Wells: A participant asked if there was any advantage to having a community well, rather than individual private wells. The thinking of the group was that water users are more conscious of conservation and the need to care for the well if they are cooperatively pumping from a community well. The community well may have a limit which is lower. Corbin also warned that users should be careful not to draw too much from one spot and impact the aquifer, if they have a community well. He stressed that more lower production wells spread out over the area would have a less concentrated impact on the aquifer, and therefore buy more time.

There was discussion about the amount of water per family available from the community as opposed to the individual well. Each family may be able to pump more from an individual well, since there is no meter on the 3 acre feet per year per domestic well. Some counties limit community wells to .25 acre feet per year per family in a development. Participants speculated that the argument could be made that each family is entitled to 3 acre feet per year from a community well.

Local Control: The group felt it was very important to keep water resource decisions in local hands, in order to control the destiny of the area. Participants questioned the extent of local authority — either through the county, or the Planning Committee, or a Water District — to set regulations, control export, or issue water rights.

There was discussion about the need to cooperate with and not threaten the three county commissions. The Memorandum of Understanding among the three counties gives a significant degree of responsibility to the Planning Committee, to investigate and recommend policies to local government. Participants understood that a certain degree of compromise may be necessary to retain the confidence of the counties. Corbin stressed that the Plan was based on currently existing government entities executing the Plan (counties, municipalities, SWCD's, etc.) and that there was no intent to infringe on or impact local authorities. The Committee as a single basin-wide entity is intended to plan, budget, and focus efforts and to ensure the plan's execution.

Septic Tanks: A participant asked about the impact of septic tanks on groundwater quality. Corbin answered that this can be a serious problem, especially if septic tanks are not installed properly, and septage leaks into the aquifer. Tanks should be pumped every two or three years, he said. There was a question about recharge from septic tanks, but apparently no credit is given for returning flow to the aquifer through leach fields, or leaking tanks. Corbin indicated that the Plan had a program, hopefully county-run, to begin dealing with septic tank concerns.

The group also discussed cistern collectors to catch runoff from roofs which can then be used for irrigation.

Miscellaneous:

Implementation Specifics: A participant expressed hope that the plan would include specifics about how the recommendations in the plan could be implemented and paid for.

Impact of Limiting Water Rights Appropriations: A participant asked what the impact would be of limiting water rights appropriations. Corbin suggested that this is difficult to answer since there are three significant unknowns: 1) How much water is in the ground? 2) How much is declared? And 3) How much would be granted in an adjudication? Discussion concerning requiring a basin-wide survey and adjudication followed.

Amount of Recharge: A participant asked about the amount and rate of recharge in the Manzanos. Corbin admitted that studies are needed to give these answers, and that now it is not clear how or even if the Manzanos and their underlying aquifer are connected to the Valley Fill Aquifer, in any significant way.

Sole Source Designation: A participant suggested that the Valley Fill Aquifer could be

designated a sole-source aquifer, since the communities in the area are solely dependent on it.

Nature of the Committee: A participant asked about the Water Planning Committee's evolution, and whether or not views had changed during the process. One committee member said that he now felt it was important to look at the export issue more carefully. Another noted that he became aware of the seriousness of the problem, and the need to deal with it now rather than later. An observer congratulated the Committee members on being able to represent distinctly different interests and put forth strong arguments, and yet not fall into personal attacks or bickering.

The Impact of EPA: A participant warned the group that the Environmental Protection Agency could have a great impact on the lives of rural people, and that he believed their activities and influence in the region would increase soon. Corbin indicated that there were recent articles in the Albuquerque Journal indicating that EPA planned to strengthen their presence and efforts in New Mexico.

Annexing Area South of Mountainair: A participant asked about the need to annex the undeclared area south of Mountainair. According to Corbin there is no way of knowing whether or not that area has significant amounts of water. From the point of view of the rest of the basin, he felt it made sense to annex it. He admitted that from the point of view of a few individuals in that area, it might not be desirable to be annexed. In a later individual discussion, it was pointed out that the Office of the State Engineer's administrative control (annexation into the Basin) would to some degree protect existing residents (water users) in the area from over use by others. Their only current protection is the court system.

**Estancia Basin Draft Regional Water Plan
Summary of Issues Raised During Second Round Public Meetings
Tajique, Edgewood, Estancia, Moriarty
November 30 - December 3, 1998**

A second round of public meetings was held in order to review with the public the revisions to the Draft Regional Water Plan which were made in response to the first round of public meetings. Below is a list of the concerns and questions, identified in the margin by place, which were raised by participants during those meetings. These concerns mirror those raised during the first round of meetings, and therefore the responses are not included here. Consultants and Committee members discussed with participants the following issues, and as a result of these discussions, some parts of the draft plan were changed to emphasize a point, or include a new perspective. The reader should understand that the fact that one issue was raised at a particular location does not mean that other locations, where the issue was not raised, might not share that interest.

For a complete perspective on public concerns, please also see Summaries of Public Meetings, October 26 - 29, 1998, and letters received.

Key to location of remark:

**T = Tajique Ed = Edgewood Es = Estancia M = Moriarty
All = mentioned in all four locations**

Plan Development Process Issues:

- All Quality of participation is more important than numbers of participants.
- All What happens to the Plan when it goes to the ISC?
- All What role does the public have after the plan is submitted and accepted?
- All A Plan can't satisfy everyone; you have to start somewhere, and this is a good start.
- All Committee has extended itself to recruit community involvement in the last 20 months, and to solicit responses to draft plan
- All The plan and the planning process should continue to evolve, with new forums that are open and inclusive, and help people move beyond apathy.
- All The plan is a reflection of public concerns, not the invention of the committee.
- T Is there time to consider new alternatives?
- T Is there time or reason for public input, or is this a "done deal?"
- T Is there a commitment to be open to new ideas about how to plan in the future?
- T Seems as if comments about a new approach were never listened to.
- T Presenters can appear defensive about their ownership in the plan; must let go, acknowledge need for change in planning process; more citizen driven.

- T Recommend a process where all interests — citizens, ranchers, farmers, etc. — sit down and talk together about the future, how to impact state policies, etc.
- T Recommend a process which begins with no presentations, only citizens saying why they care about water, and what their ideas are.
- T,M Recommend a process where all regions communicate and work together to make needed changes at state level.
- T Letter of response to comment felt uninviting, dismissive
- Ed Does scope include Cedar Crest and Sandia Park? How might they be impacted?

Data Issues:

All Groundwater Contamination:

- T, Ed Ask Environment Department for data;
- T Not accurate to say there is no problem, or there is no data that shows a problem
- T,M Relationship to amount of useable water — if contaminated, not useable
- T,Ed 1954 Nitrate Contamination Study
- Es,Ed Are septic tanks a cause of contamination?
- Ed What are the impacts of runoff from developments?
- M Diesel contamination at Sedillo

All Water supply:

- All How much water exists in the basin?
- All What are the dynamics among the aquifers in the basin?
- M,Es Where are the monitoring wells? Where will new monitoring wells be?
- M Conflicts between Ballew and Shomaker
- M Where can we get water if we run out? What if we have given water to another basin and then we run out?
- M Need information re hydrostatic heads
- Es Can we recharge effluent?
- Es Is it possible to import water from another basin?
- Ed If this was a giant lake, where did the water go, and is it still going there?

Es Population Projections:

- Are there other sources to show more realistic increase?

- M GIS an important source of data, can tie in with other resources

Potential Loss of Agriculture:

- T,M Need mechanism to stop development's impact on agriculture
- T Don't leave the future up to economics

Mining of the Basin:

- All** Must stop the state policy to mine out the Estancia Basin
- Ed** Concern about subsidence
- T,Ed** Must stop policies which permit exportation
- M** Concern about current exportation plans to the west
- Ed** Does exportation definition apply to transfers within a basin?
- T,Ed** Hope to challenge SEO policies with novel ideas
- Ed** Are we running out of water? If so, when?
- Ed** Are all the water rights allocated in the basin?
- Ed** There is no way to completely stop mining the aquifer.
- Ed** Small Sandia Mountain will suffer first from groundwater mining

Conservation:

- All** Must protect existing property and water rights holders, provide incentives for conservation
- Ed** Is this planning process coordinating with Entramosa and other companies concerning water conservation?
- Ed** Do other states have "use it or lose it" policies?
- M,Ed** Depletion allowance, tax credit for compliance

Implementation:

- All** Need for local control, proactive posture, coordination
- All** What funding opportunities exist? What type of programs might be funded?
- M,Es** Taxing all water users is the only fair way.
- M** Taxing should be equitable, not selective
- Ed** Taxing could drive some farmers out of business
- Ed** Is there room for housing policies or land use planning in the plan?
- Es** It is important that people be educated about infrastructure needs, so they support bond requests, etc.
- M** Groundwater Management Area may have too much authority over water.
- M** Concern for more unnecessary bureaucracy — already hard enough to do business in New Mexico

Miscellaneous:

- Es** Concern for low water pressure in Estancia

**Estancia Basin Regional Water Planning Committee
Public Involvement Process**

Some Observations

Lucy Moore, Facilitator

The Water Planning Committee members have asked me to offer my observations on their public involvement efforts. As designer and facilitator of the last two rounds of public meetings, I am not an objective evaluator, but I would like to answer the committee's request in a limited way.

First, I want to note that the committee's request is indicative of their general spirit of openness and honesty. The members worked for almost five years to produce this water plan, and as I understand it, there were hundreds of hours spent trying to reconcile differences, and create a plan which would serve every interest in the basin. There is certainly no disputing the number of volunteer hours spent in pursuit of a way to protect water in the basin for future generations.

Strengths and Weaknesses: In this spirit of honesty and openness, I would like to comment on what I see as strengths and weaknesses of this planning process with respect to public involvement.

Strengths: The planning process was strong in three areas:

- 1) **Commitment:** The Planning Committee was committed to a legitimate, open public involvement process. Their premise was that the committee itself was composed of the major interests in the basin, and that by having open, well-advertised meetings they could generate interest and create a solid plan which would be representative of the basin itself. To demonstrate their commitment, they hired a public involvement specialist to work with them for the last six months of the planning process, through draft review and final development of the plan.

- 2) **Outreach:** In my opinion, the outreach during the draft review and final development phases was outstanding. Committee staff person, Dee Tarr, spent over 120 hours on public involvement activities. She prepared press releases, notices and flyers, mailed to over 1,100 interested persons, appeared at civic organization meetings, arranged for inserts in over 14,000 utility bills, and made dozens of phone calls. The Committee developed an exhaustive list of interests in the basin, and Dee contacted each one with an invitation, often by phone or in

person. It was clear to everyone who cared to notice that this plan was important, and that there were a variety of ways to participate. [Documentation of the outreach is found in the Final Water Plan.]

- 3) Response: Finally, soliciting public comment is one thing, and paying attention to it is another. In this case, the Committee took care to consider every comment, and respond, either by letter to an individual, or by response at a public meeting, or by changing the plan. Many of the public comments resulted in changes to the plan, and those changes were explained to participants at the second round of public meetings. The Final Regional Water Plan, submitted to the Interstate Stream Commission, includes copies of all written comments, with their responses, as well as summaries of concerns raised at both rounds of public meetings.

Weaknesses: Creating and maintaining a regional water planning committee which is diverse and reflects the population and the interests of the region is always a challenge. In this case, members are very aware of the lack of diversity on their Committee. With the exception of one woman, the Committee is male, Anglo, over 40, and although each represents a different category (local government, development, agricultural, etc.) almost all are engaged in agriculture.* They are quick to point out that there are strong differences among them, and that many of the meetings included heated debates about the water future of the basin.

A factor in the makeup of the Committee was the selection process. Through a tri-county Memorandum of Understanding, committee members were chosen by County Commissions. Other representatives were chosen by their constituencies. Each entity choosing a member was unaware of the total picture that was being created. There may be a lesson here relating to the selection process of committee members. Is there a way to select for diversity, and still allow entities the authority to choose their own representatives?

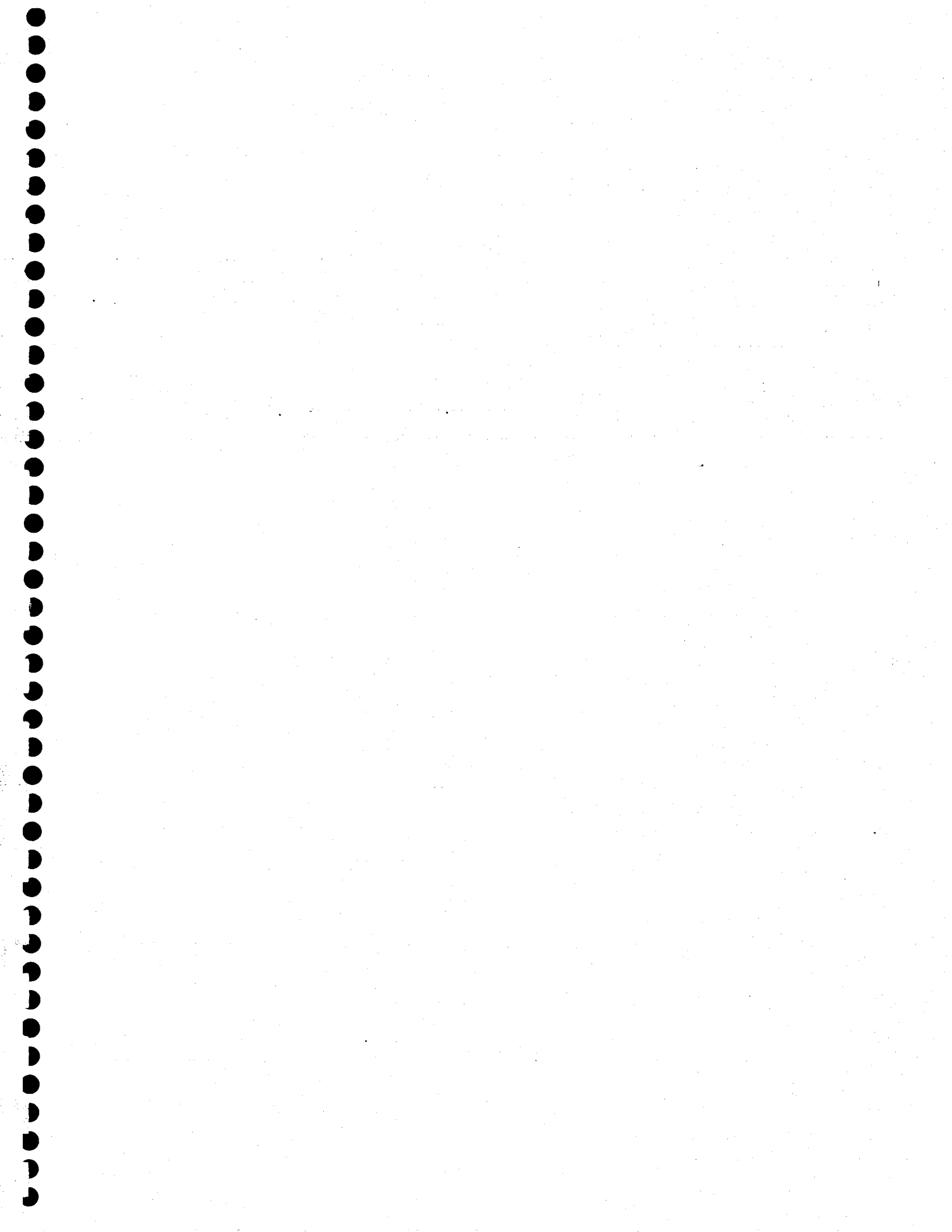
The Committee made a choice which is very understandable. The choice was between struggling to find and maintain more diversity, or getting down to the business of developing a plan. Meetings were always open and visitors were encouraged to contribute to the discussion, but meetings were held during the day, which may have kept some interested people away. As one member expressed it, "In the beginning, the room was full. There were all kinds of people. But after awhile, it was like an hour glass, and those of us willing to sit down and get to work did so." Now, that the Committee has produced a water plan, he sees an opportunity for an enlarging again — which is discussed below.

This lack of representativeness probably hurt the Committee and its product when the time came for review and comment. The thorough public involvement process at that point

* Since 95% of water use in the region is agricultural, it may be inevitable that a water planning committee is going to have a strongly agricultural complexion.

engaged several strong voices who had not participated during the years of planning — for a variety of reasons, including lack of time and energy, lack of understanding of the importance of the process, or a strategic decision not to participate. This put the Committee on the defensive, and they were frustrated as they struggled to explain their efforts, sacrifices, and willingness to include others as co-planners.

Future Opportunities: With the completion of the Estancia Basin Regional Water Plan, the Committee sees new opportunities for opening up the planning process to those who would like to take a turn at leadership. Education and participation go hand in hand, and the planning process to date has served to educate a significant number of citizens in the area of water. These people are ready and able to step into a more active planning role, as the planning process evolves. The Committee foresees constant review of the plan itself, as well as implementation of several programs as funding becomes available. These functions will call for involvement of a greater number of people, on implementation task forces, for instance. The Committee looks forward to this infusion of new energy, and a chance for achieving diversity on the planning group.



INTRODUCTION – THE ESTANCIA BASIN

BASIN DESCRIPTION: The Estancia Basin, roughly 2,400 square miles in area, is located in the semi-arid, north-central portion of New Mexico, approximately an hour's drive east of the City of Albuquerque. The Basin is bowl-shaped rising from lower areas in the central and south-central portions of the Basin to the Manzano Mountains (9,000 feet to 10,000 feet in elevation) in the west and to lower mountains to the east, south and north.

Historically, the salt lakes in the south-central portion of the Basin have been a source of salt for the Native Americans, the Spanish and more recently early settlers. The salt lakes appear to rely on precipitation and runoff (rainfall and snow melt) for recharge, with some recharge possibly coming from underlying aquifers. The salt lakes are about half the size they were in the early 1900's. Their reduction in size appears to be the result of an interception of the surface and subsurface recharge possibly combined with long-term climatic changes to a drier climate.

The rolling foothills of the Manzano Mountains in the western portion of the Basin have slowly changed from fairly open rangeland to pinon and juniper forests over the past 100 to 150 years. Natural springs in the northeastern portion of the Basin and in the foothills of the Manzano Mountains in the western portion of the Basin have ceased to flow or become intermittent over this same period. There are a few intermittent streams or freshwater lakes during heavy snow pack years, but no significant streams exist in the Basin. The above factors combined with a general drying of the area's climate over this period seem to indicate a long-term shift towards less surface water, less recharge and ultimately less groundwater as a long-term trend. Shorter periods of time indicate more dramatic fluctuations between wet and dry cycles.

Historically, since ancient times, the Basin has supported a population that has not exceeded 10,000 individuals. The fluctuation in population has always been in some part based on the availability of accessible water supply, and remains so today. Since the early 1900's, the Basin has supported a similar-sized population with the lowest number, about 5,800 individuals, recorded in the early 1960's. Today, the Basin has grown to about 23,000 individuals, a four-fold increase. Demographic and economic projections indicate a continued population growth over the next 40 years to about 70,000 individuals in the Basin.

Farming, ranching, government, service-oriented and tourist related businesses dominate today's Basin economy. In recent years the Basin has become a rapidly increasing "bedroom community" for the Greater Albuquerque Area adjoining it to the northwest. The Basin's proximity to Interstate 40 (I-40), rural lifestyle and wide open spaces have attracted many new residents. The result has been the introduction of an increasingly suburban lifestyle into what had been largely a rural way of life with the resulting tensions and concerns that always accompany such changes.

Most of the Basin's towns are small and reflect a rural way of life; however, in recent years an east-west corridor astride Interstate 40 in the north-central portion of the Basin from Moriarty in the east to Edgewood in the west and further to the west in the area abutting the Basin have begun to grow dramatically. Indications and projections point to a continuation of this growth with Edgewood, in particular, becoming even more of an extension of the Albuquerque Area.

The hydrographic Basin is located in five counties, and is influenced or influences activities in three more counties. Torrance County is the largest in area (80 percent of the land area of the Basin is in Torrance County) with Santa Fe and Bernalillo Counties also playing a major role in the Basin (largely because of the major population increases occurring in these two counties). The other two counties, San Miguel and Lincoln have little in the way of land area or population. The county seat of Torrance County, the Town of Estancia, is located in the central part of the Basin. Both Santa Fe County's county seat, the City of Santa Fe, and Bernalillo County's county seat, the City of Albuquerque, are located approximately 30 to 40 miles from the Basin.

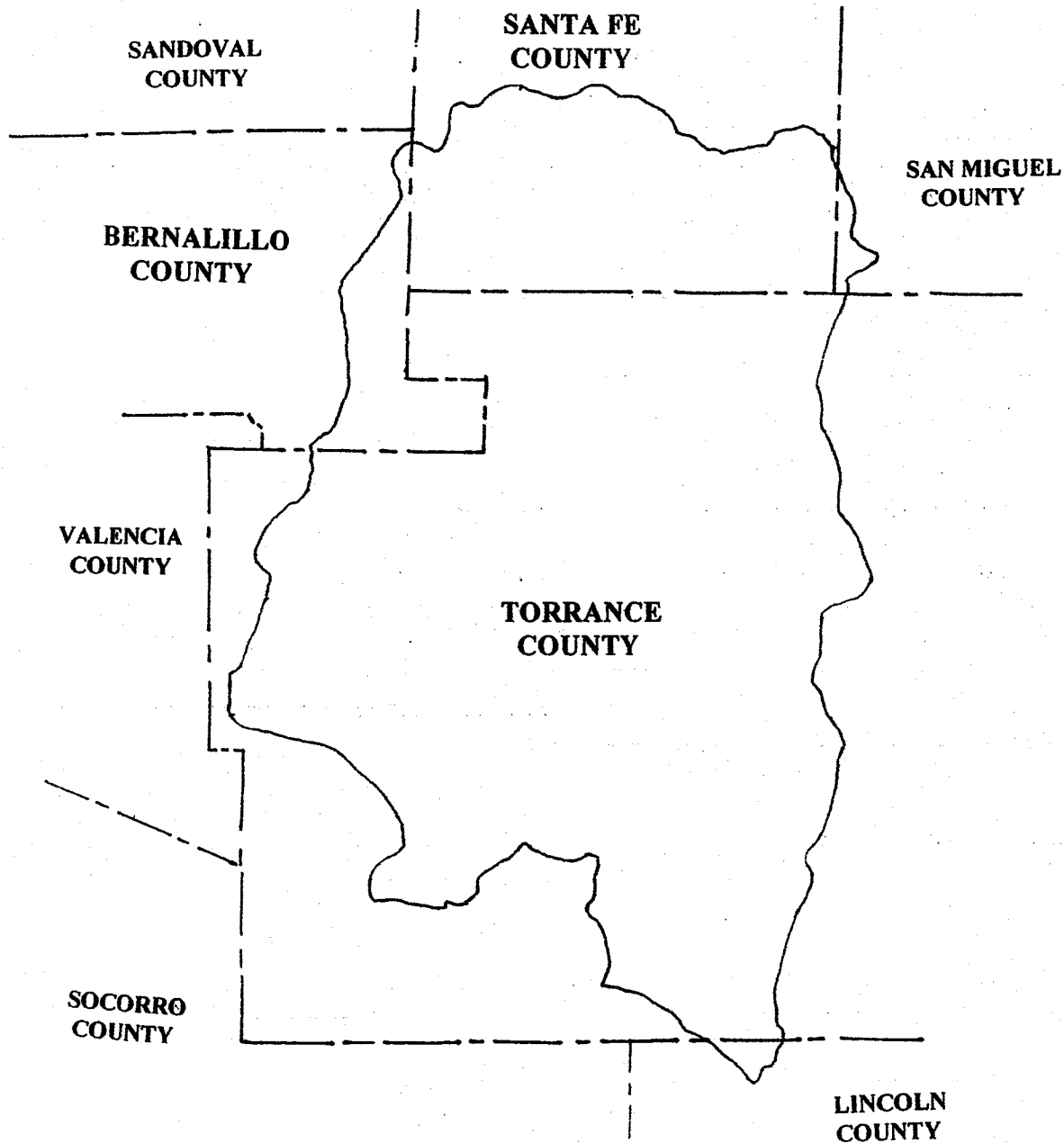


Figure 1: County Map, Estancia Basin

WATER RESOURCE FOCUS: There is no major unified local government water resource management body within the Basin. Most local water resource decisions are made at the county level and are governed by land use codes and policies, as well as political and economic considerations. The Office of the State Engineer administratively manages the Basin's water resources from offices in Santa Fe and Albuquerque. The State Engineer adopted a mined basin water-supply concept and a block declaration administrative water rights declaration system to manage the Basin water resources in 1965. Those policies remain in use today with declared water rights far exceeding (three to four times as many) the amount in use (Shomaker Report, Committee data, OSE records). There are several water utilities of varying sizes and three major water and soil conservation districts that play significant roles in the use of water within the Basin. A large number of individual domestic wells exist within the Basin (NMSA 72-12-1 wells). The total number of wells in the Basin, including what is believed to be a large number of abandoned wells may exceed ten thousand (10,000) in number.

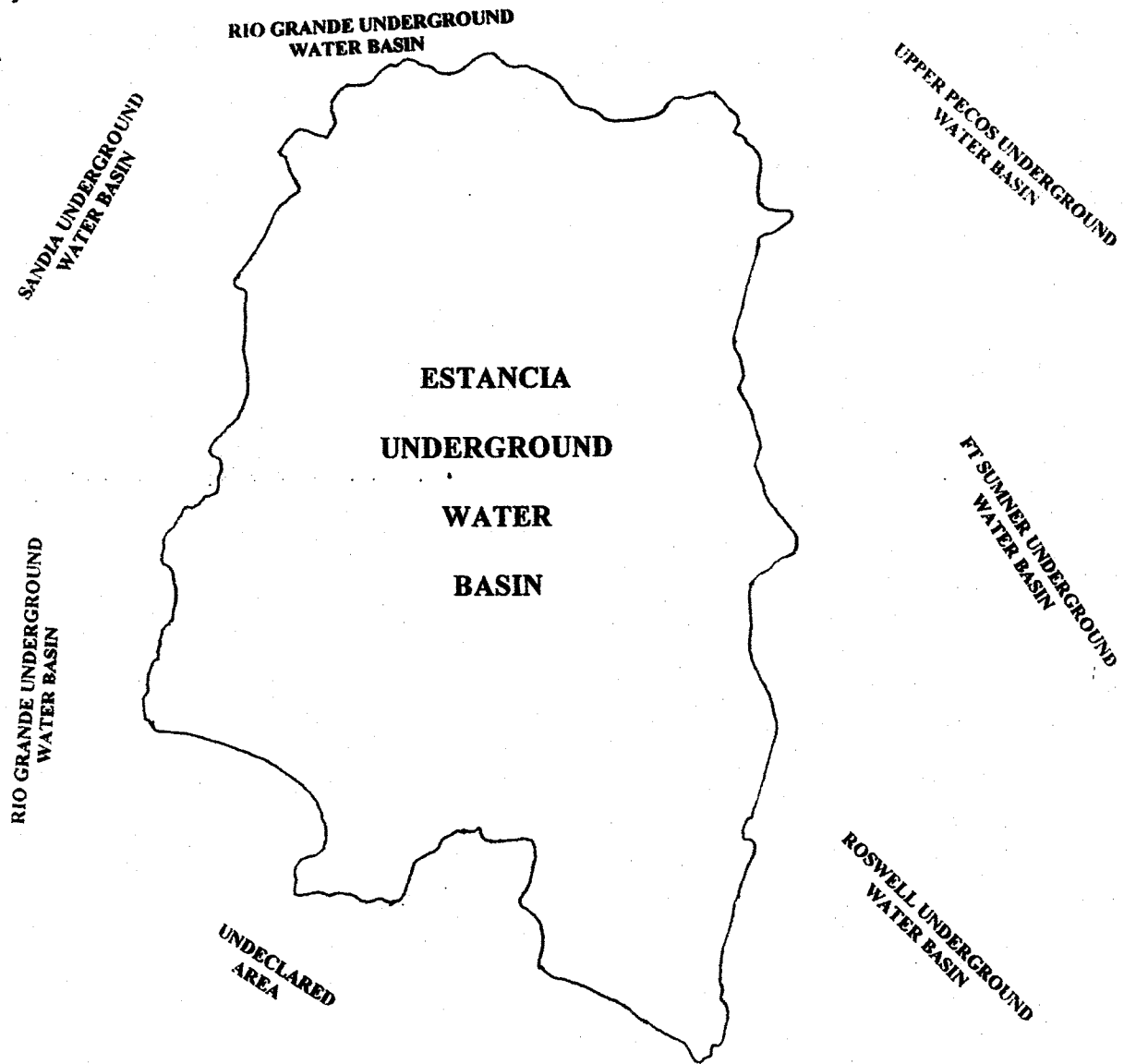


Figure 2: Map Estancia Underground Water Basin and Adjoining Underground Water Basins

WATER RESOURCES: The Basin is an approximately 2,400 square mile closed topographic basin with no major streams or surface sources of drinkable water. Residents rely solely on precipitation and groundwater for water supply. Most of the Basin's present water supply comes from the Valley Fill Aquifer, located generally in the central portion of the Basin. The Valley Fill Aquifer possessed about 8.1 million acre-feet of water supply in storage in the early 1900's. It was reduced to 6.6 million acre-feet of water supply in storage by 1995, with the bulk of the reduction occurring since the mid-1960's (the past 30 years) to support irrigated agriculture in the Basin. The Office of the State Engineer adopted polices (mined basin and block declaration of water rights) that supported the economic needs of the Basin in 1965. With the advent of deep

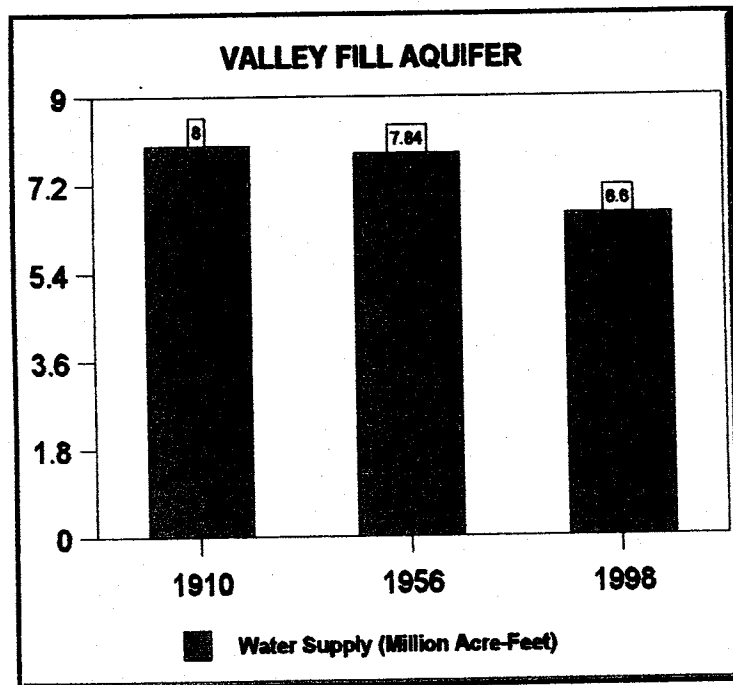


Figure 3: Valley Fill Aquifer Storage

well technology and better and larger pumps and better distribution systems, irrigated agriculture became a major economic force in the Basin. As many as 70,000 acre-feet to 80,000 acre-feet of water was pumped from the Valley Fill Aquifer in the early 1980's.

RECHARGE: Recharge of the Basin's aquifers is dependent on precipitation (rainfall and snow melt). The Office of the State Engineer's administrative model bases all basin recharge on the Valley Fill Aquifer (rain and snow that falls directly on it or that runs down from the surrounding high ground and percolates through the material that makes up the Valley Fill Aquifer). The OSE takes the conservative and reasonable position that the Valley Fill Aquifer recharges the other Basin aquifers. Many other water resources and geohydrologic experts believe that the Madera

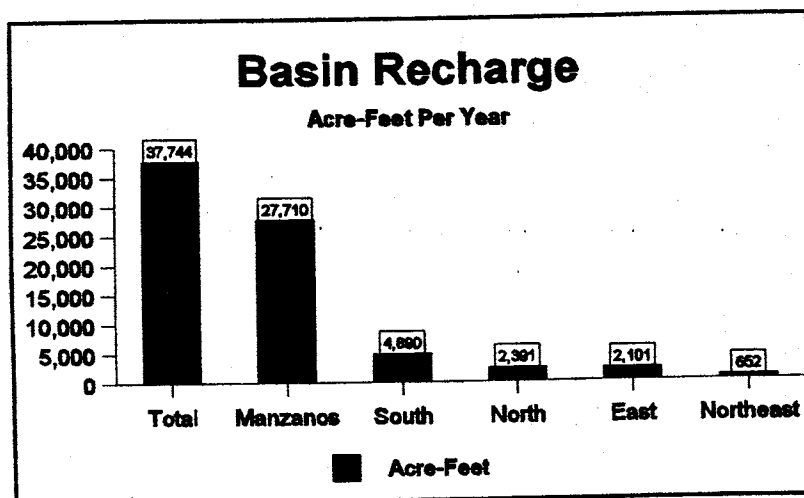


Figure 4: Estimated Basin Recharge by Recharge Area

Limestone and Glorieta Sandstone Aquifers may contribute some recharge to the Valley Fill Aquifer as well. The Valley Fill Aquifer is receiving from about 10,000 acre-feet to about 15,000 acre-feet of recharge on an annual basis, based on the water levels in the Basin over the past 90 to 100 years. It appears that much of the water being used is prehistoric or fossil water and that the bulk of the recharge in the Manzano Mountains is not reaching the Valley Fill Aquifer. It may be recharging the other aquifers or may be used by the significant increase in brushy and woody vegetation that has occurred on the eastern foothills of the Manzano Mountains in the past 100 years, and may be being lost through evapo-transpiration.

The Phase I Report indicates large amounts of water in the other aquifers; however, those amounts of water have not manifested themselves in the Valley Fill Aquifer. If all the aquifers are interconnected as many water resource experts and geohydrologists believe then the Basin is in the mined condition envisioned by the Office of the State Engineer. There is no doubt that some large productive faults exist in the various other aquifers, particularly in the northern and northwestern portions of the Basin. However, there is considerable doubt about the nature of those aquifers between the various faults. The Phase I Report attributes the same characteristics to the non-fault areas of the other aquifers that are attributed to the fault areas. That appears to be overly optimistic characterization. At best, considerable additional exploratory ("mud on the boots drilling and recording") research needs to be conducted.

During the various rounds of public meetings the Committee received vastly differing accounts of water in the other aquifers by well owners. In addition, several individuals who supervised fairly extensive oil and gas exploration of the Basin in the past ten to thirty years have indicated that they hit solid granite immediately beneath the Valley Fill Aquifer in areas that show other aquifers on many of the geohydrologic maps of the area.

The Committee has based this Plan, for the most part, on what is happening in the Valley Fill Aquifer. That is the most conservative approach and the wisest until we really know the extent

and yields that can be consistently expected from the other aquifers. The OSE followed the same approach in 1965 and we believe they were correct in that approach. In addition, the salt water and brine intrusion into large areas of the Valley Fill in the area from near Estancia to below Willard cause serious concerns about how the recharge mechanisms may really be operating.

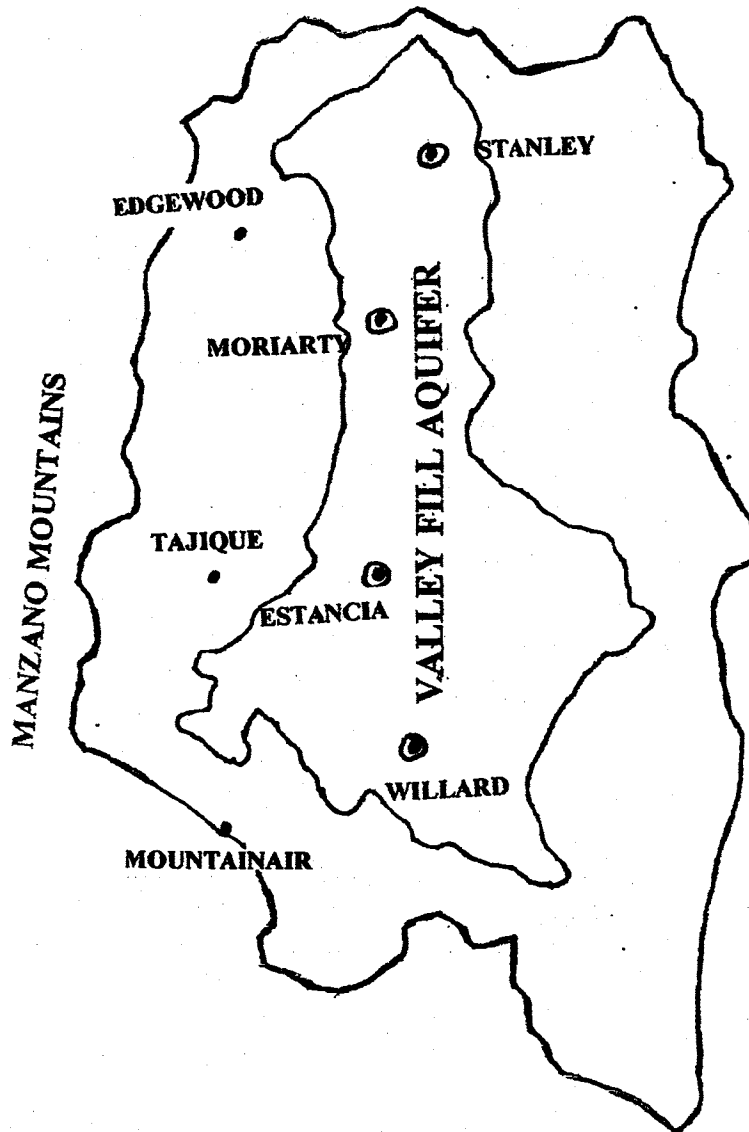


Figure 5: Valley Fill Aquifer Location

AQUIFER DEMAND: The Valley Fill Aquifer is clearly supplying the bulk of the water being used in the Basin at this time, about 95% based on reported usage and water levels over time. The other aquifers are supplying very little water; however, their usage is increasing. That is

particularly apparent in the northern and northwest portions of the Basin where water is being pumped from the Madera Limestone Aquifer to support the increasing development in the Edgewood Area, the Moriarty Area and the East Mountain Area out of the Basin.

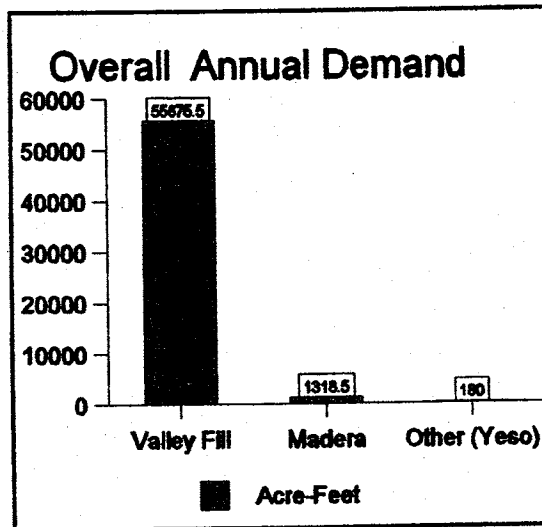


Figure 6: Demand by Aquifer

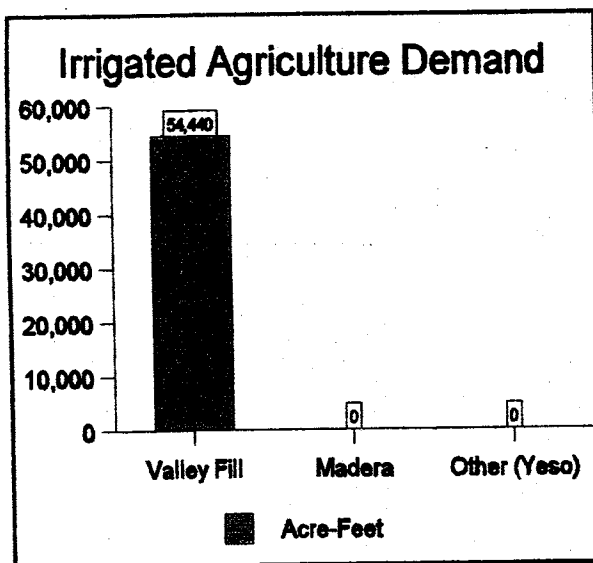


Figure 7: Irrigated Agricultural Demands by Aquifer

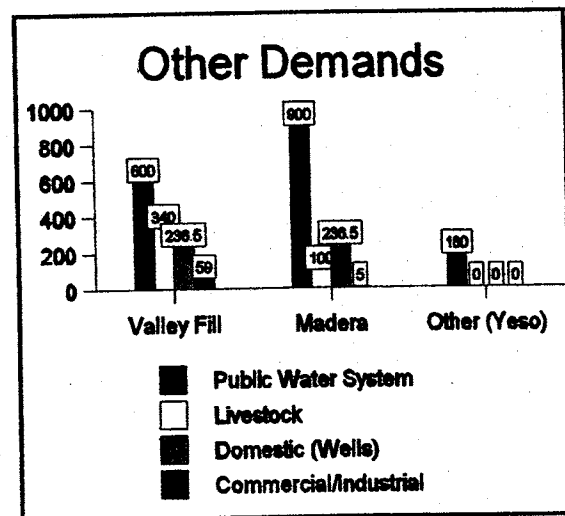


Figure 8: Other Demands by Aquifer

WATER DEMAND AND DEPLETION: In 1995 annual water use equaled 57,174 acre-feet with 14,487 acre-feet of recharge. The net loss or depletion of the Valley Fill Aquifer was about 42,687 acre-feet.

<u>GROUND WATER DEMAND/DEPLETION (1995/1990 Data)</u>		
<u>Use</u>	<u>Demand</u>	<u>Depletion</u>
Irrigated Agriculture	54,440 acre-feet	41,204 acre-feet
Domestic Well Users	473 acre-feet	213 acre-feet
Public Water System Users	1,757 acre-feet	790 acre-feet
Livestock-Wells	440 acre-feet	440 acre-feet
Commercial/Industrial	<u>64 acre-feet</u>	<u>40 acre-feet</u>
	57,174 acre-feet	42,687 acre-feet

Figure 9: Demand/Depletion by Use

Irrigated agriculture (about 95% of the annual water demand) is expected to stay about the same for the next 40 years. Population increases as projected by the Bureau of Business and Economic Research (BBER) from about 23,000 people today to about 70,000 people in the Basin. The population outside of the Basin who are expected to be dependent on the Basin for water is projected by BBER to total about 27,000 people.

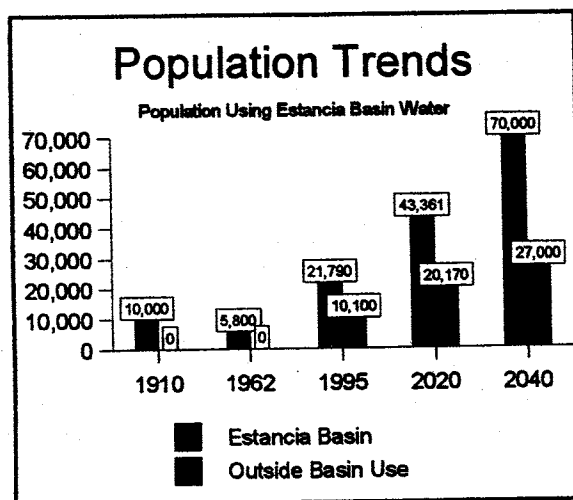


Figure 10: Population Trends – Estancia Basin and Surrounding Areas (Source: BBER)

The Middle Rio Grande Council of Governments in a recent study session (December 8, 1998) with the Torrance County Zoning and Planning Committee indicate larger increases than those projected by BBER.

Based on the above projections, the average annual depletion (loss) of the Valley Fill Aquifer will be about 50,000 acre-feet per year over the next 40 years. The total reduction of water supply in storage is projected to be about 2,000,000 acre-feet of water in the Valley Fill Aquifer reducing the amount remaining in storage to about 4.5 million acre-feet, roughly enough to last another 80 years beyond the Year 2040 (120 years from today).

In actuality, irrigated agriculture while projected to remain essentially stable during the period is likely to experience a moderate decline in irrigated acreage to accommodate housing for the projected significant increases in population. Based on these projections and with climatic conditions remaining relatively the same as experienced over the past 40 years, the depletion rate per year of the Valley Fill Aquifer increases from an average of slightly less than 45,000 acre-feet per year today to an average of 49,000 acre-feet per year for the period 2000 to 2020; with a further increase to an average of 50,300 acre-feet per year for the period 2020 to 2040. For the purposes of this Water Plan we have used 50,000 acre-feet per year as the estimated annual aquifer depletion (loss) rate. While some of the depletion is occurring in aquifers other than the Valley Fill Aquifer we have used it as our barometer of aquifer supply because it supplies about 97 percent of the water in use today.

Even with the depletion increases projected because of increased population, irrigated agriculture is still expected to be the dominant water user in the Basin by 2040 (approximately 85 percent) unless economic conditions force a larger change which could go either way.

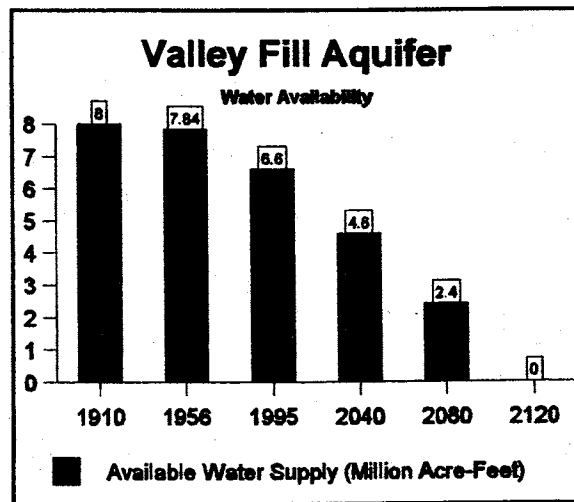


Figure 11: Projected Available Water Supply – Valley Fill Aquifer

That means the water supply in storage in the Valley Fill Aquifer will decline from about 6.5 million acre-feet in the Year 2000 by approximately 2 million acre-feet to about 4.5 million acre-

feet of groundwater in storage in the Year 2040 if nothing is done. Based on the water resource data presently available and assuming that all the water in the Valley Fill Aquifer is drinkable, it is estimated that about 120 years of water supply remains in the Valley Fill Aquifer if nothing is done and present projections hold true. Since the Valley Fill currently supplies the bulk of the water for the Basin this becomes a significant concern. It should also be recognized that the declining water levels and deteriorating quality that caused the citizens of the Basin to ask for some form of action will become quite common during the next 40-year period.

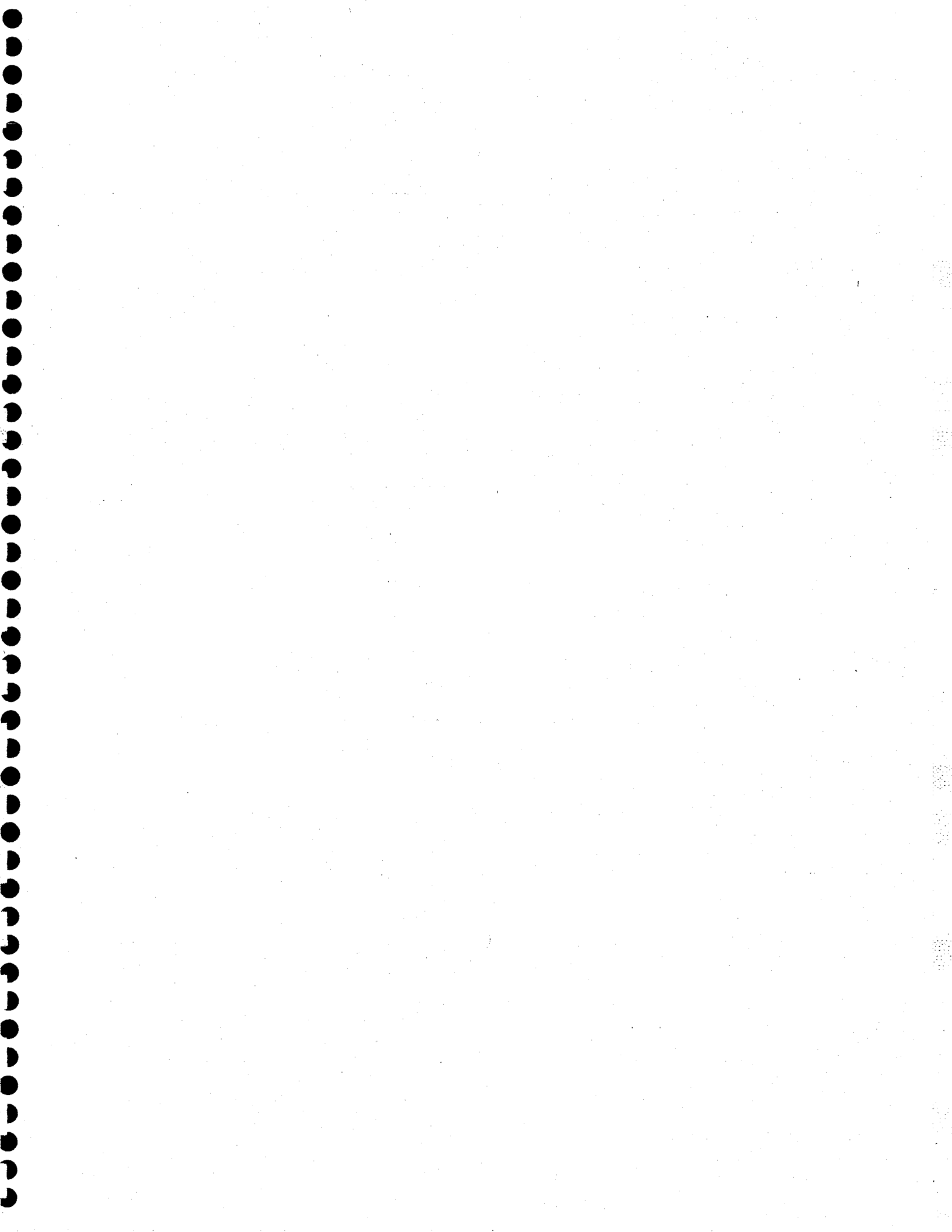
**ABOUT 120 YEARS OF WATER SUPPLY
REMAINS IN THE VALLEY FILL AQUIFER**

CONCLUSIONS:

- If nothing is done, the Valley Fill Aquifer water supply in storage will decline by 2,000,000 acre-feet over the next 40 years.
- The decline in water supply will result in lowered water levels in much of the Basin causing wells to dry up and will likely result in geologic subsidence, some of which may already be occurring in certain areas. Cost of replacing or deepening wells appears to range from \$55 million to \$100 million. An increased energy cost, roughly the same as the cost of deepening or replacing wells, is also likely. The total cost of doing nothing appears to range from \$100 million to \$200 million.
- The decline in water supply will likely cause a deterioration in water quality and significant additional cost to replace dishwashers, water heaters and washing machines on an individual basis, and to treat water to an acceptable level for human consumption (utilities).
- Abandoned wells, already a problem, will worsen as numbers of dry and abandoned wells increase.
- Sewage and wastewater will also begin to pose more of a problem as human consumption (population increase) places more stress on the aquifer.
- Current Office of the State Engineer policies will continue to concern Basin residents:
 - Exportation of water (East Mountain Area).
 - Declaration of additional water rights.
 - Possibility for double dipping—declared water rights and NMSA 72-12-1 domestic wells.

BOTTOM LINE

**CONCERN OVER WATER SUSTAINABILITY
WILL SIGNIFICANTLY INCREASE
WHILE EFFECTS ON THE BASIN ECONOMY,
QUALITY AND WAY OF LIFE
WILL BECOME MORE NEGATIVE CAUSING
SIGNIFICANT DETERIORATION
AND ECONOMIC, EMOTIONAL AND
PERSONAL HARDSHIP FOR MANY
OF OUR BASIN RESIDENTS!!!**



SUMMARY – PROCESS, EVALUATIONS AND SELECTION

THE BASIC FOUNDATION OF THE WATER PLAN

THE NEW MEXICO INTERSTATE STREAM COMMISSION GUIDANCE: The New Mexico Interstate Stream Commission (NMISSC) is the driving force in the State of New Mexico for effective regional water planning, and ultimately a state-wide integrated Water Plan to guide the comprehensive management, development and use of New Mexico's scarce water resources (New Mexico is reportedly the third driest state in our nation after Arizona and Nevada). The Regional Planning Handbook with Template published by the New Mexico Interstate Stream Commission in December 1994 (Appendix B) forms the basis for the Estancia Basin Water Plan. The required assumptions listed here and briefly discussed dictate and control the planning process and ultimately the Recommended Water Plan.

THE REQUIRED ASSUMPTIONS: The Required Assumptions laid out in the New Mexico Interstate Stream Commission's Regional Water Planning Handbook, December 1994, are:

- Adequate Plan for Public Participation Shall be a Prerequisite for Regional Water Planning.
- Plans Shall Be Based on No Change in New Mexico and Federal Law.
- Presume All Future Water Needs Must Be Met by Management of the Region's Currently Available Water Supply.
- Other Sources of Supply May Be Proposed if Feasible (Economics/Engineering) if Future Demand Cannot Be Met by Current Supply.
- Water Conservation—First Item Considered in All Feasible Alternatives, Demonstrating What Portion of Future Demand Can Be Met by Conservation.
- Regional Water Plans—Outline Responsibilities/Authorities of Each Local Governing Body.
- Use Bureau of Business and Economic Research (BBER) Model for Projections.
- Water Demand Analysis Shall Develop:
 - Public Water Supply.
 - Irrigated Agriculture.
 - Commercial.
 - Mining.
 - Reservoir Evaporation.
 - Domestic.
 - Livestock.
 - Industrial.
 - Power.
 - Fish, Wildlife and Recreation.

Of particular interest are the third and fifth bullets of the NMISSC guidance listed above which became central to the development of this Water Plan as more and more was learned about the Basin:

- Presume All Future Water Needs Must Be Met by Management of the Region's Currently Available Water Supply
- Water Conservation – First Item Considered in All Feasible Alternatives, Demonstrating What Portion of Future Demand Can Be Met by Conservation

COUNTY GUIDANCE: A second major consideration in the development of the Water Plan was guidance from the three counties contained in their Memorandum of Understanding (Appendix A) as Item H. which states *"Secure the future availability of usable water resources to maintain and sustain existing customary and cultural uses."*

PHASE I (SHOMAKER, ET. AL.) REPORT: The data presented in the Phase I Report which indicates that the available known water supply in the Valley Fill Aquifer is being significantly depleted became a central feature in the development of this Recommended Water Plan. That report also indicated that there may be large amounts of water in other aquifers as some individuals have suggested; however, the report goes on to state that this water may not be readily available.

PUBLIC PARTICIPATION. Public Participation is what started this planning effort in 1993 and is what has sustained it throughout. The three counties wisely created the Estancia Basin Water Planning Committee from private citizens who represent major stakeholders in the Estancia Basin as shown in the following chart. While the very diverse Committee established by Torrance County in 1993 changed somewhat in makeup over time, the majority of the current Committee has served most of the planning period and have become well versed in the Basin's water resource concerns. They put politics and self-interest aside for the most part, and have worked together to develop a workable approach to the Basin's water resource concerns. The open Committee meetings have been attended by senior citizens, women, young adults and those with strong environmental and conservation views. Their input has been discussed, evaluated and included as the Committee felt warranted. The current consultants have strong ties to the conservation and environmental communities and have provided useful advice in those areas.

ESTANCIA BASIN WATER PLANNING COMMITTEE				
ORGANIZATIONAL STRUCTURE				
(Membership—Stakeholders)				
Memorandum of Understanding between Torrance County, Santa Fe County & Bernalillo County for Coordinated Water Resource Planning in the Estancia Basin (8/95)				
Torrance County	Santa Fe County	Bernalillo County	Soil & Water Conservation Districts	Citizen at Large
<ul style="list-style-type: none"> • Government (1 ea.) • Municipal/ Developer/ Utility (1 ea.) • Agricultural (2 ea.) 	<ul style="list-style-type: none"> • Government (1 ea.) • Municipal/ Developer/ Utility (1 ea.) • Agricultural (1 ea.) 	<ul style="list-style-type: none"> • Government (1 ea.) • Municipal/ Developer/ Utility (1 ea.) 	<ul style="list-style-type: none"> • Edgewood SWCD (1 ea.) • E. Torrance SWCD (1 ea.) • Claunch/Pinto SWCD (1 ea.) 	<ul style="list-style-type: none"> (1 ea.)

Figure 12: Estancia Basin Water Planning Committee

PUBLIC CONCERNS AND INPUT: The critical element on which the Water Plan was based and, in fact, its most important component are the concerns and recommendations expressed by the residents of the Basin during the twenty public meetings held over a three year period.

1995 MEETINGS: The first series of meetings was held in October 1995 at the following locations with the intent of alerting the Basin residents to the effort and gaining their initial input, particularly their concerns:

- | | | |
|------------|------------|---------------|
| * Edgewood | * Moriarty | * Mountainair |
| * Estancia | * Tajiue | * Willard |
| | * Encino | |

Meeting participants were asked to prioritize their critical water issues into three major areas of concern (Public Welfare, Conservation, and Information/Education). A small group develop and report findings format was used. From the identified issues at each meeting participants then developed a top two priority ranking in each of the major areas as indicated below:

EDGEWOOD

- | Public Welfare | Information/Education | Conservation |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. Establish subdivision laws to address water concerns. 2. Water rights protection. | <ol style="list-style-type: none"> 1. Inform public of results of State investigation of water contamination in basin. 2. Develop a newsletter. | <ol style="list-style-type: none"> 1. Maintain sustainable water quantity. 2. Identify well protection zones and sewage, septic systems policy. |

MORIARTY

- | Public Welfare | Information/Education | Conservation |
|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. No new water rights. 2. Amount of water leaving basin and basin recharge. | <ol style="list-style-type: none"> 1. Report amount of water depletion from basin since 1950. | <ol style="list-style-type: none"> 1. Meter all new and reworked wells. 2. Review all old subdivisions. |

MOUNTAINAIR

- | Public Welfare | Information/Education | Conservation |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> 1. Agriculture is main industry and needs to supported by the water resource. 2. Water rights protected. | <ol style="list-style-type: none"> 1. Teach water conservation techniques (cisterns, water harvesting, etc.). | <ol style="list-style-type: none"> 1. Public lands not implementing water conservation measures. 2. Water conservation measures need to be made a part of building code/permits. |

ESTANCIA

Public Welfare	Information/Education	Conservation
<ol style="list-style-type: none">1. Quality of water maintained.2. Quantity of water maintained for the future.	<ol style="list-style-type: none">1. Teach water conservation.2. General information updates.	<ol style="list-style-type: none">1. Encourage more efficient use of water for private and ag. use (meter wells).2. Encourage water conservation methods (water harvesting, landscaping, etc.).

TAJIQUE

Public Welfare	Information/Education	Conservation
<ol style="list-style-type: none">1. Obtain funding for new or improved municipal water system.2. Maintain water quality.	<ol style="list-style-type: none">1. Inform landowners how to conserve water.2. Educate State Engineer and other policy makers about our water problems.	<ol style="list-style-type: none">1. Build a dam to store municipal water supply.2. Meter water use to encourage wise use.

WILLARD

Public Welfare	Information/Education	Conservation
<ol style="list-style-type: none">1. Restrict water transfer from Estancia Basin (closed basin) to another basin.2. Protect water from contamination.	<ol style="list-style-type: none">1. Develop a program to make local people aware of water resource needs.	<ol style="list-style-type: none">1. Meter all wells.2. Develop water conservation and enforcement policy.

ENCINO

Public Welfare	Information/Education	Conservation
<ol style="list-style-type: none">1. Maintain water quality.2. Control water contamination.	<ol style="list-style-type: none">1. Stress fact that water is not an unlimited resource.2. Stress fragile Estancia Basin environment (water, soil, etc.).	<ol style="list-style-type: none">1. Meter all wells and water outlets (towns, agriculture, & private).2. Develop dry land, native vegetation landscaping policy.

A subjective evaluation of the comments of the participants at these public meetings indicated that in October 1995 the top five priorities for Basin residents were:

- Effective all-encompassing conservation program and a comprehensive metering effort.
- The quantity of water needs to be sustained at present levels or near present levels; there should be no transfer of water out of the Basin; and existing water rights need to be protected and used conservatively.

- Water quality needs to be protected with particular concern paid to septic systems, developments and abandoned wells.
- Good information and education programs need to be developed and used.
- Subdivision and land use policies in all counties and at the state level need to stress conservation, force water quality control, and be consistent with actual not hoped for conditions.

1996 MEETINGS: In late October 1996 the Estancia Basin Water Planning Committee held a second set of open public meetings in the following locations to discuss the Phase I Report and to gain additional public input:

- | | | |
|------------|------------|------------|
| * Moriarty | * Edgewood | * Estancia |
| * Tajiue | * Willard | |

The residents of the Basin expressed many concerns; however, the top five concerns in order of expressed priority in the areas of Conservation and Public Welfare by location were:

ESTANCIA

Conservation

1. Initiate changes in water law to encourage conservation.
2. Initiate conservation education.
3. No exportation of water.
4. Identify and protect recharge areas.
5. Encourage conservation projects, native plant landscapes, low flow toilets, building codes, cisterns, incentives for construction of buildings which conserve water.

Public Welfare

1. Maintain control on water quality.
2. Water is a limited resource, limit uses, no frivolous use (i.e., golf courses).
3. Balance consumption with recharge.
4. Ensure a sustainable economy in the Basin balanced with water use.
5. Establish a hierarchy of uses.

TAJIQUE

Conservation

1. Thinning of forests.
2. No transport of water out of Basin.
3. Education (Elementary schools, etc.)
4. Monitor water quality/quantity in Basin (wells).
5. Research and implementation of:
 - Alternative crops
 - Irrigation technology
 - Watershed renovation

Public Welfare

1. Historical/traditional uses of water (land grants, acequias, etc.)
2. Subdivision freeze.
3. Sustainable agriculture future.
4. Sustain a healthy watershed.
5. Enforcement of water policies (penalties).

WILLARD

Conservation

1. Native vegetation landscaping.
2. Tax incentive for conserving water.
3. Excessive consumptive water use of vegetation (cedar/juniper trees)
4. Include water conservation in planning/zoning policy.
5. Education.

Public Welfare

1. No transfer of water out of Basin.
2. Sustain traditional uses of water.
3. Water law changes concerning conservation of water.
4. Education.
5. Initiate limitation on water use.

MORIARITY

Conservation

1. Education.
2. Protect elevated (top) of watershed from development.
3. Limit subdivision lot size to 2.5 acres minimum.
4. Utilize gray water.
5. Meter all wells/change State water law concerning domestic wells (tie).

Public Welfare

1. No transfer of water out of Basin.
2. Let developers buy water rights.
3. Maintain rural life style.
4. Consider private property rights.
5. Change water laws to encourage conservation/ impact fees (tie).

EDGEWOOD

Conservation

1. Utilize gray water.
2. Develop agricultural technology to save water.
3. Change State water law to not penalize people for water conservation.
4. Develop tax incentives for water conservation.
5. Subdivision covenants (i.e., xeriscape landscaping).

Public Welfare

1. Sustain rural life style.
2. Minimum lot size no less than 2.5 acres.
3. Sustain water quality.
4. Water available for our children.
5. Concern over water table dropping.

Based on a subjective analysis of public input received at these public meetings, input from the counties, input from the public meetings held in 1995, and in conjunction with assistance from various geohydrologists and water resources experts in the Basin, the Committee's consultants and input from the staffs of the New Mexico Interstate Stream Commission and Office of the State Engineer, the Estancia Basin Water Planning Committee developed the following top five priorities for the Basin:

- Comprehensive Conservation, Information and Education Programs.
- Management Policies, Funding and Water Rights Incentives/Rebate/Banking Program that encourages conservation and minimizes use.
- Comprehensive monitoring and metering programs to help understand what is occurring while providing maximum protection for the Basin and encouraging conservation.

- Develop a sustainable water supply to protect present lifestyle and promote future economic health.
- Limit exportation of water to the extent that this is reasonable and possible.

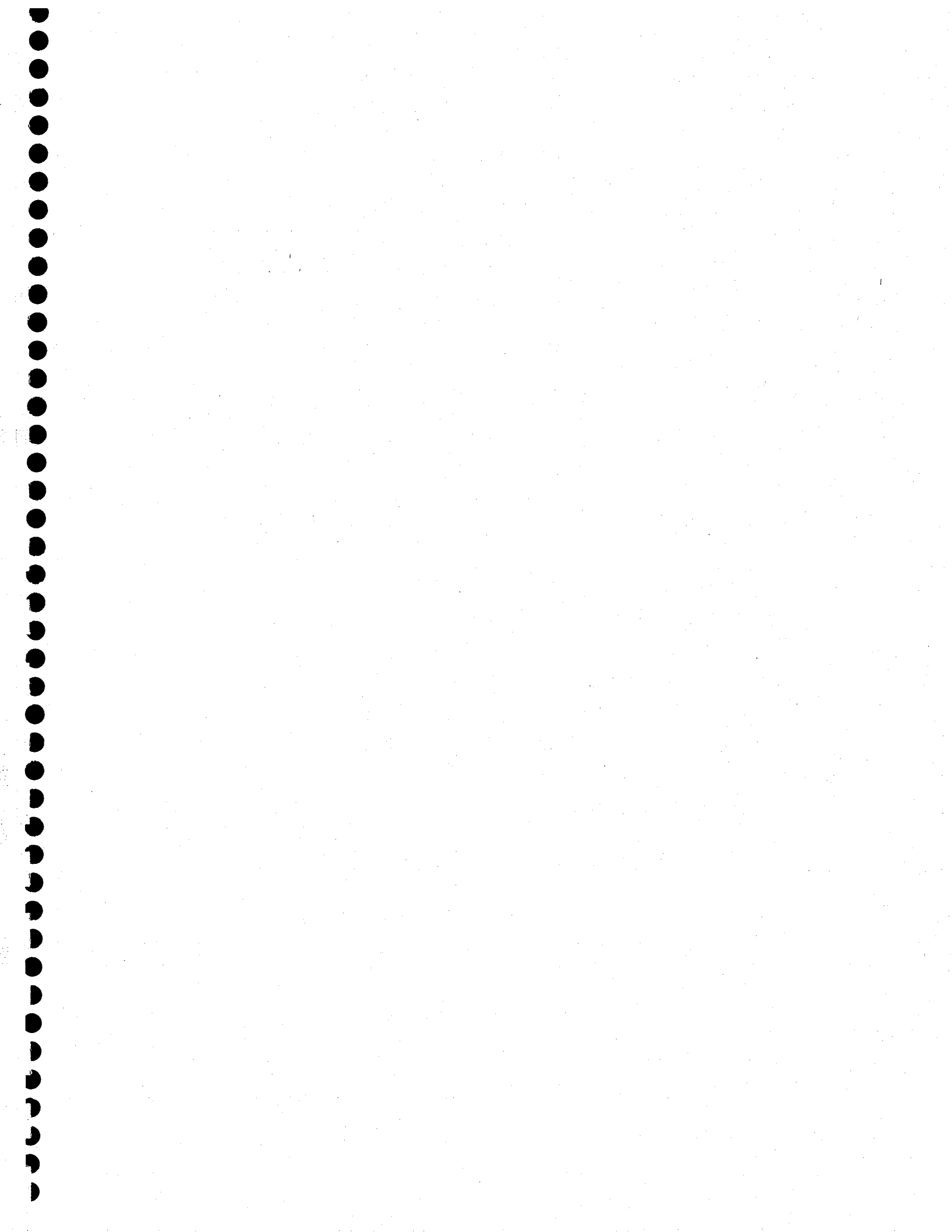
Several members of the public, as well as County Commissioners from Torrance and Santa Fe Counties have attended committee meetings. The Committee also briefed both formally and informally the three county commissions, the New Mexico Interstate Stream Commission, the State Engineer and others during the development of this Water Plan.

It should be noted that the Committee's review and evaluation identified the same concerns as those identified by the public, and that the Basin's residents significantly reinforced their own initial concerns at the second round of meetings in 1996.

In late 1998 the Committee held a third and fourth set of public meetings within the Basin to present and discuss the Draft Water Plan and then to tell the public how their comments had, or had not been incorporated in the Plan. In addition copies were made available to governmental staffs (counties and state) for comment and a "peer review" was conducted utilizing several water resource experts. Draft copies were made available throughout the Estancia Basin at libraries, fire houses, government buildings, utility buildings and newspaper offices. Input from all sources was analyzed and appropriate adjustments made to the Water Plan before presentation to the New Mexico Interstate Stream Commission for acceptance. Meetings were held in Tajiique, Estancia, Edgewood, and Moriarty. These public meetings drew a different group of people than the first two rounds in 1995 and 1996. Written responses were provided to several letters that were received and both are included herein (Appendix C). The major concerns of people were:

- Dropping water levels and deteriorating water quality
- Current Office of the State Engineer policies and administration
- How to fund the plan equitably and how to prevent "mischief"
- More bureaucracy wasn't wanted
- Local effort and local control was crucial to success
- Recharge mechanism, aquifer interaction, amount of water in other aquifers in addition to the Valley Fill Aquifer
- Exportation of water from the Basin was once again the major source of concern.

Comments, oral and written, (Appendix C) have been made part of the record and incorporated into the Water Plan as the Committee felt appropriate. Rationale and response to all comments have been made a part of the record as well as being forwarded to those who originated the comments and all who attended the public meetings in late 1998.



SUMMARY ESTANCIA BASIN-POTENTIAL SCENARIOS

The Estancia Basin Water Planning Committee considered several possible scenarios and criteria. In the end the Committee established five major planning scenarios upon which to base the development and evaluation of alternative programs shown below. The NMSSC requirement for Basin self-sufficiency and sustainability essentially forced the Committee into these scenarios.

SCENARIO NO. 1—"STATUS QUO." This scenario lets the market place, the climate and nature dictate the future. It requires no special behavioral changes and no program, policy or legislative changes. It leaves the water supply and demand outcome to the events that will occur over the next 40 years in the normal course of present day business. If projected trends are accurate, the Valley Fill Aquifer will be exhausted in about 120 years, possibly much earlier in some areas. While water supply in some amount is sure to exist in the other aquifers, that fact will not help people without the money to re-drill their wells or to drill deeper. The significant water supply and quality concerns occurring in some areas of the Basin today that were the initiating force for this effort will become prevalent in most areas of the Basin within the next 50 years.

SCENARIO NO. 2—"1910 CONDITION." This scenario requires very significant behavioral changes in governmental, political and economic approaches at all levels and in individual demand requirements. To balance current and future supply and demand an additional 45,000 acre-feet of annual water supply initially, increasing to 50,000 acre-feet of annual supply during the next 40 years is required. On the average an additional 35,500 acre-feet of recharge or supply per year is required to make up for the existing Valley Fill Aquifer depletion of about 1.42 million acre-feet.

SCENARIO NO. 3—"1960 CONDITION." This scenario requires significant behavioral changes in governmental, political and economic approaches at all levels and in individual demand requirements similar to those in Scenario No. 2. To balance current and future supply and demand an additional 45,000 acre-feet of annual water supply initially, increasing to 50,000 acre-feet of annual supply over the next 40 years, is required. The addition of an average of 25,500 acre-feet of additional recharge or supply per year, to make up for the existing Valley Fill Aquifer depletion (1.02 million acre-feet), is also required.

SCENARIO NO. 4—"2000 CONDITION." This scenario requires significant behavioral changes in governmental, political and economic approaches at all levels and in individual demand. To balance current and future supply and demand an additional 45,000 acre-feet of annual water supply initially, increasing to 50,000 acre-feet during the next 40 years, is required. This scenario accepts past depletions as fact and seeks to maintain the present level of water supply in storage, approximately 6.5 million acre-feet, in the Valley Fill Aquifer.

SCENARIO NO. 5—"2040 CONDITION." This scenario requires local governments and individuals to modify their water use behavior through aggressive, pro-active conservation efforts at all levels. It requires irrigated agriculture to improve delivery efficiencies and investigate alternative less water intensive crops. It requires the Basin to be managed as a Special Ground Water Management Area with administrative policies significantly different than the mined basin policies currently used by the Office of the State Engineer. The intent of this scenario is to

intensively manage the Basin during the next 40-year period (Year 2000 to Year 2040); fixing available water rights at existing levels and protecting ownership of those water rights so that the holders can minimize pumping and maximize reuse without fear of loss of their water rights. It slows the aquifer depletion with savings through conservation (more effective use of the existing water supply); protects the usable water supply that is known to exist; monitors and meters what is occurring so that future decisions can be based as much as possible on fact; conducts an extensive focused investigation of the other aquifers and their interaction; and initiates several small pilot programs that have worked elsewhere to see if new water supply can be developed. This scenario, if successful, results in 5.3 million acre-feet of available water supply remaining in storage in the Valley Fill Aquifer by the Year 2040.

The Scenarios and their water supply goals leading to the Year 2040 are shown in the following graphical presentation. Although Scenario No. 5 clearly appears to be the most reasonable course of action, it does not solve the depletion concern. It does buy some time lessening the present concern while attempting to develop both data and workable programs for future use.

GOALS (40-YEAR ANALYSIS)

Valley Fill Aquifer Storage (Mil. Ac.-Ft.)

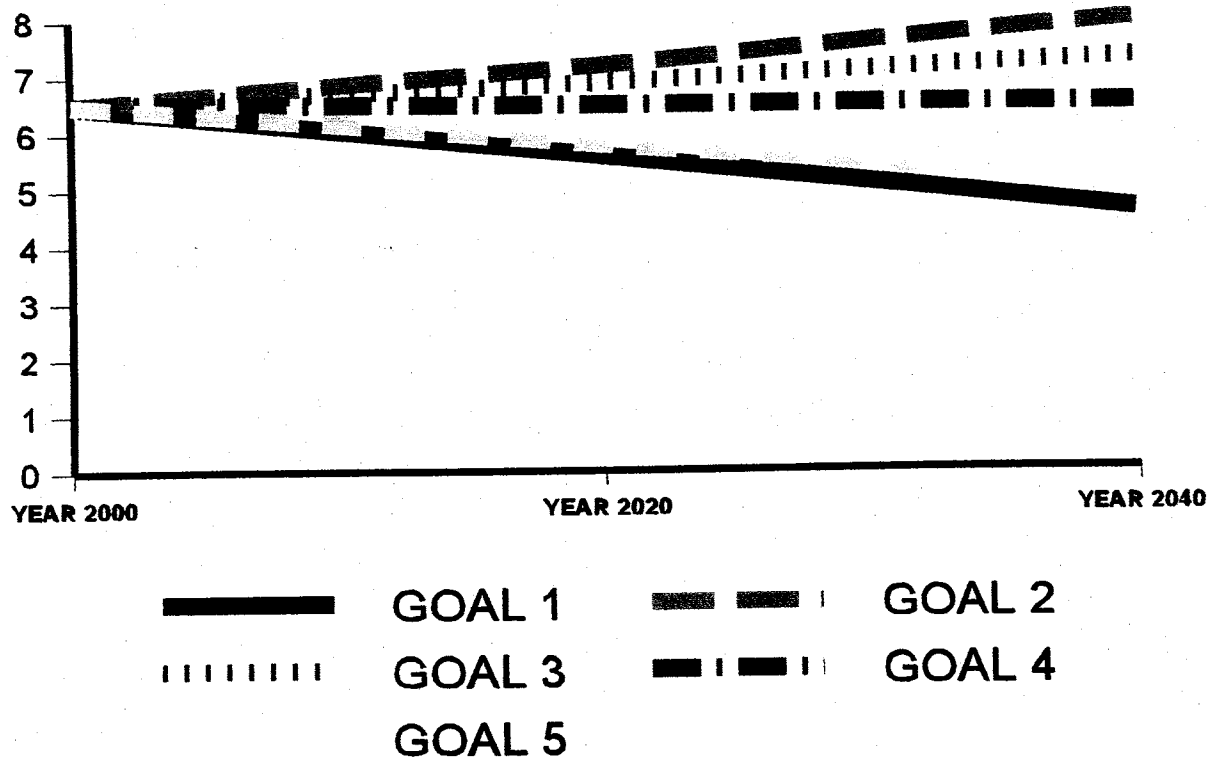


Figure 13: Water Supply Scenarios—Goals

SUMMARY – SCENARIO EVALUATION

BASIS: Several alternatives were developed for each of the five major program areas listed in the New Mexico Interstate Stream Commission Handbook and Template. The program areas were then evaluated using the recommended NMISSC criteria modified by input from the residents of the Basin as presented at the public meetings and in open committee meetings. The most promising of the alternatives based on aquifer depletion reduction, cost, ease of implementation and overall contribution to sustainable, self-sufficient water supply in the Basin were then formed into specific programs with goals, objectives, cost and time estimates, priorities and suggested recommendations for their implementation.

The New Mexico Interstate Stream Commission's Regional Water Planning Handbook and Template suggests that alternatives should be developed in the following major program areas:

- Management
- Water Conservation
- Water Development
- Infrastructure
- Water Quality

The NMISSC further recommend that each of the alternatives should be evaluated as to the following factors:

- Technical Feasibility
- Political Feasibility (issues and evaluation)
- Social and Cultural Impacts (public welfare)
- Financial Feasibility
- Implementation Schedule
- Physical, Hydrological and Environmental Impacts
- Institutional Considerations

TRENDS AND PROJECTIONS: The Plan deals with and is based on trends and projections. Thus the Plan really represents an educated, best guess at the future. Every effort was made to find existing situations, solutions and programs currently being used elsewhere in the country to serve as models upon which to base programs and evaluate the alternatives and goals. In several instances programs appear to yield larger savings or different cost factors than those suggested in the Water Plan. The differences are not errors, rather they are conservative, value oriented judgments that the Committee aided by its consultants feels are prudent. Public input which has been formally received at public meetings and informally received over the past five years in other forums played a major part in Committee deliberations.

While the cost figures and results reported for programs that have been adopted in various parts of the country are known, the conditions in the Estancia Basin are somewhat different. The intent is to utilize a conservative approach which the Committee feels has a chance of success while causing the minimum amount of interruption and disruption to ongoing and planned activities in the Basin.

The New Mexico Interstate Stream Commission's guidance stresses several key factors for consideration in the development of a regional water plan.

- **BUREAU OF BUSINESS AND ECONOMIC RESEARCH (BBER):** Their projections are mandated for use in the development of a regional water plan. Several other future projections were reviewed as well. The other projections all portrayed more growth in the Basin than was projected by the BBER. It appears that a water plan based on BBER projections may show a more favorable picture (less growth and less water demand) than is warranted.
- **WATER CONSERVATION** is mandated as the cornerstone of a regional water plan. While certainly crucial for success, many conservation activities result in one time savings that will quickly be lost if the current Estancia Basin administrative policies are not changed. In a largely rural setting conservation's success hinges on an effective water rights program that includes banking, rebate incentives and buyout programs while protecting existing water rights holders who can then minimize the amount of water pumped and maximize the amount reused. Preventing or limiting new applications for water rights is critical to success of any conservation effort since 95 percent of the present demand, possibly more, comes from large water rights holders (irrigated agriculture and utilities and providers of water).
- **SELF-SUFFICIENCY and SUSTAINABILITY** are mandated as the foundation of each regional water plan in New Mexico. The Office of the State Engineer's (OSE) administrative policies, the approval of exportation of water, the "block water rights allocation system" consistent with the OSE "mined basin" policies all work exactly in opposition to the above in the Estancia Basin. The intent here is not to be critical of these policies or the people implementing them. Rather it is to indicate that in the Committee's opinion and the opinion of most of the Basin's residents these policies have outlived their usefulness, and it is time to change. The Basin is rapidly changing from a largely rural agricultural economy to a suburb of Albuquerque that is developing a significant services economic base. The past thirty years have seen a four-fold increase in population. The next 40 years are projected to see a three-fold increase from a population of 23,000 today to about 70,000 in 2040 (per BBER). The Middle Rio Grande Council of Governments (MRGCOG) projects an even greater population increase. The area immediately adjacent to the Basin to the west is projected to grow even faster with the potential for another 30,000 people who may have to rely on the Basin's aquifers for water supply.

ALTERNATIVES ANALYSIS: Analysis of alternatives developed and grouped under the major program areas suggested by the NMISSC is presented with the exception of an Infrastructure Program. There are no major infrastructure opportunities available in the Estancia Basin. The Self-sufficiency and Sustainability Requirements form the foundation of the Committee's analysis.

MANAGEMENT PROGRAMS

<u>ALTERNATIVES ANALYSIS</u>			
<u>SUMMARY</u>			
<u>Item</u>	<u>Savings</u>	<u>Cost</u>	<u>Cost/Acre-Foot</u>
Special Ground Water Mgt. Area	N/A	\$ 40,000	N/A
* Comprehensive Monitoring Program.	N/A	\$120,000	N/A
Oversight Mechanism	N/A.	\$100,000	N/A
Special Improvements District	N/A	\$ 10,000	N/A
** Estancia Basin Water Trust Fund	N/A	\$ 20,000	N/A
** Water Rights Banking/Incentive Program	4,500 ac.-ft.	\$500,000	\$ 110
Land Use/Development Code Review & New Ordinance	N/A	N/A	N/A
Basin Model/GIS System	N/A	\$ 10,000	N/A
* NOTE: Tied into Basin Model/GIS and the Water Quality Program.			
** NOTE: Also accounted for under Water Conservation Alternatives.			

Figure 14: Evaluation Process—Management Alternatives Summary

DISCUSSION: All Management Alternatives should be pursued and pulled together as a Management Program, irrespective of the Scenario chosen for the Water Plan. Of critical importance is the recognition of the Basin at all levels of government as a Special Groundwater Management Area, and then the stabilizing of water rights as part of that effort. A Comprehensive Monitoring Program that includes a Metering Program that meters all water users is crucial to an understanding of the Basin's water resources. A Trust Fund specifically set up with a long-term funding mechanism, and a single focus (water resource) Management Entity to ensure execution and appropriate funding is critical for success. Counties and the State are grappling with code and ordinance concerns, successfully for the most part. Two Estancia Basin Computer Models exist, and if tied to the Monitoring System through a GIS interface, water resources management could and should be a near real time occurrence at some point in the future.

Another crucial element that must be dealt with is a Water Rights Incentive, Rebate and Banking and Buyout Program that rewards water users significantly for not using their historical allocation of water supply, and which rewards water rights owners for not using water rights not already in use. The Program requires OSE, legislative and executive branch action. Once set up by the State it should probably be administered by the Soil and Water Conservation Districts (agriculture and ranching), the acequias associations for traditional users, and probably the counties for domestic, municipal, co-op, business, industrial and all other users. Special Improvements Districts could be used in areas of critical supply and contamination concerns. Although 4,500 acre-feet might be possible, 3,000 acre-feet is a reasonable water depletion reduction goal for this

effort. It may be that as the Water Plan matures, water rights related efforts should be grouped together and placed in the Conservation Program. That would serve to highlight even more directly the cause and effect of an effective water rights program on conservation efforts in a largely irrigated agriculture dominated use situation.

CONSERVATION PROGRAMS

<u>ALTERNATIVES ANALYSIS</u>			
<u>SUMMARY</u>			
<u>Item</u>	<u>Savings Goal</u>	<u>Cost</u>	<u>Cost/Acre-Foot</u>
Notification letter(s)	0 ac.-ft.	N/A	N/A
Information/Education	0 ac.-ft.	\$ 10,000/year	N/A
* Trust Fund	0 ac.-ft.	\$100,000 (once)	N/A
Free Audit/Water Budget	0 ac.-ft.	\$100,000 (once)	N/A
Retrofit Plumbing/Toilet	350 ac.-ft.	\$ 50,000	\$ 140
Agriculture System Efficiency	5,000 ac.-ft.	\$200,000	\$ 40
* Water Bank/Incentives	4,500 ac.-ft.	\$500,000	\$ 110
Watering Months/Hours	2,250 ac.-ft.	\$ 5,000	\$ 3
Metering	9,000 ac.-ft.	\$500,000	\$ 55
Ordinance/Zoning/Xeriscaping	4,500 ac.-ft.	\$ 10,000	\$ 3
Fire Hydrant Testing	100 ac.-ft.	\$ 10,000	\$ 100

* NOTE: Also accounted for in Management Alternatives.

Figure 15: Evaluation Process—Conservation Alternatives Summary

DISCUSSION: The Conservation Program has both domestic and agricultural conservation components. The domestic component is based on finding and fixing leaks which can be extremely significant in the long term, retrofitting old plumbing (toilets/showers/faucets and plumbing) and metering. Savings ranging from 20 to 40 percent have been reported in most cases. Savings as high as 44 percent have been reported and documented in New Mexico based on metering efforts.

The agricultural component is based on minimizing pumping and maximizing efficient delivery and use of water for irrigated agriculture, reuse of water and metering. Less water intensive crops were explored, but economics really must drive that decision. A pilot program effort has been suggested, but no savings are projected for less water intensive crops at this time.

Utilizing ordinances and codes to ensure ultra low-flow fixtures and plumbing for all new and all rebuilt or renovated construction, xeriscape landscaping and changing watering habits are also critical to success. Savings in the 20 percent range have been reported where pro-active codes and ordinances have been used and enforced. While 25,700 acre-feet of savings might be possible; the Committee feels a goal of about 20,000 acre-feet of depletion reduction is reasonable for the Basin.

WATER DEVELOPMENT PROGRAMS

ALTERNATIVES ANALYSIS SUMMARY

<u>Item</u>	<u>Savings</u>	<u>Cost</u>	<u>Cost/Acre-Foot</u>
Cloud Seeding	6,000 ac.-ft.	\$ 100,000	\$ 20
Terrain Modification/Management	3,000 ac.-ft.	\$ 125,000	\$ 40
Effluent/Recharge	3,200 ac.-ft.	\$ 100,000	\$ 30
Buyout Program	5,000 ac.-ft.	\$ 1,000,000	\$ 200
Exploration	N/A	\$ 2,000,000+	N/A
Importation	50,000 ac.-ft.	\$230,000,000	\$4,600

Figure 16: Evaluation Process–Water Development Alternatives Summary

DISCUSSION: Cloud Seeding has been ongoing in North Dakota, Kansas, Texas, Oklahoma and California since the early to mid 1970's with significant success. Programs report 10 to 20 percent gains in precipitation in target areas with 5 to 10 percent precipitation gains in downwind areas adjacent to the target areas. Most programs target the increased precipitation at fields to increase soil moisture content with some increase in underlying aquifers. Monterey County in California comes closest to the Estancia Basin in terms of mountainous terrain, brushy or fairly small trees for cover. Monterey County is totally dependent on precipitation and groundwater for their water supply just like the Basin. They are beginning to experiment with ground based cloud seeding systems which, if successful, could significantly lower program costs. All other programs are based on plane-induced seeding underneath the clouds that is pulled up into the clouds by updrafts, becomes ice particles and then melts to become rain as they fall to earth. Most programs operators felt a five-year pilot program at about \$100,000 per year would be adequate to properly test the concept. The Basin cloud seeding program should probably be targeted at the high ground, probably the Manzano Mountains in the winter to increase the snow pack (recharge augmentation) and at the Valley Fill Aquifer during the monsoon season to increase soil moisture content and aquifer recharge.

Terrain modification and varied vegetation modification efforts (creation of ponds/playas and removal of water hungry invasive plants) have been successful in Texas, Utah, the Dakota's, California and New Mexico. Coupled with a buyout program aimed at buying up water rights currently in use and banking them for drought emergency could yield about 7,000 acre-feet of demand depletion reduction. The Committee does not feel that the importation of water from outside the Basin is a viable alternative given the lack of infrastructure to distribute that water within the Basin and the prohibitive cost to develop that infrastructure.

A pilot cloud seeding program coupled with a terrain and vegetation modification program might yield significant quantities of new or currently unavailable water supply (10 to 20 percent increase).

INFRASTRUCTURE PROGRAMS

ALTERNATIVES ANALYSIS SUMMARY

DISCUSSION: The infrastructure required under a variety of other alternatives is evaluated as part of those alternatives. There are no specific infrastructure improvements or additions that can impact the Estancia Basin concerns (dam construction/improvement, canals, etc.).

WATER QUALITY PROGRAMS

ALTERNATIVES ANALYSIS SUMMARY

<u>Item</u>	<u>Savings</u>	<u>Cost</u>	<u>Cost/Acre-Foot</u>
Information Program	N/A	\$ 10,000	N/A
Monitoring Program	N/A	\$ 100,000	N/A
Protection Program (Wells)	N/A	\$ 200,000	N/A
Protection Program (Septic Tanks)	N/A	\$ 400,000	N/A
Remedial Program	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Total	N/A	\$, 710,000	N/A

Figure 17: Evaluation Process—Water Quality Alternatives Summary

DISCUSSION: Well capping and sewage treatment systems are critical to protecting the existing water supply in the aquifers. The monitoring program tied to a computer model through a GIS system is important as well. Septic systems generally do not recharge the aquifers and may in time pose a serious health threat both in terms of near-surface or surface contamination. Given the number and proximity of wells, abandoned and in use, to septic systems which may not be functioning properly, aquifer contamination is a serious concern. A septic tank monitoring and pumping program is a major component of the water quality and aquifer protection program.

NOTE: Based on the public input generated during the 1998 public meetings reference aquifer contamination the Committee re-evaluated sewer treatment systems, septic tank effluent treatment systems and advanced individual treatment systems and added them to the Water Quality Programs to be evaluated through pilot program efforts. Also more emphasis was placed on sealing the exterior of well pipes to prevent aquifer to aquifer or surface to aquifer contamination. And, a Watershed Management Program utilizing the existing U.S. Forest Service Program for the Manzano Mountains as an example of already ongoing efforts was added as well (Appendix D).

SUMMARY- ALTERNATIVES

Alternatives were arranged in a variety of groupings to attempt to achieve the maximum depletion reductions in the shortest period of time for the least cost. The following presentation summarizes the total depletion reduction savings and total costs of the various alternatives grouped by program area. Savings and costs are based on what program operators of these programs have reported, and on the judgment of the Committee and their consultant on applicability to New Mexico and the relative probability of success of the various efforts. The total possible depletion reduction shown below might bring the Basin into a sustainable water supply posture, but the cost to do so appears prohibitive and the success of some of the programs is questionable.

<u>ANNUAL POTENTIAL DEPLETION REDUCTIONS AND ASSOCIATED PROGRAM AREA ANNUAL COSTS</u>		
<u>Program Area</u>	<u>Potential Annual Savings</u>	<u>Estimated Annual Program Cost</u>
Management Alternatives	4,500 acre-feet	\$ 800,000
Conservation Alternatives	25,700 acre-feet	\$1,485,000
Water Development Alternatives	17,200 acre-feet	\$1,325,000
Infrastructure Alternatives	N/A	N/A
Water Quality Alternatives	N/A	\$710,000
Totals	47,400 acre-feet	\$4,320,000

Figure 18: Alternatives Summary by Major Program Area

Major importation of water alternatives to satisfy the requirements of two of the scenarios (Scenarios # 2 and # 3) would cost about a billion dollars. The evaluation, estimating and analysis effort to quantify these alternatives was terminated part way through because of the cost of 50,000 acre-feet of water rights (about \$200,000,000) and a main trunk line infrastructure cost to move water from the Rio Grande River or Basin or from the City of Albuquerque Water System of approximately \$230,000,000. To distribute the water throughout the Basin to major water users or to aquifer recharge areas would cost well over \$500,000,000 and may not be technically feasible. Based on the political power of the City of Albuquerque, the Middle Rio Grande Conservancy District and Bernalillo County tapping the Middle Rio Grande Basin for water supply is probably not politically feasible, at least at this time.

SCENARIO EVALUATIONS

The alternatives in the program areas were grouped and evaluated to see what effects they would have in achieving the five potential goals. A summary of that evaluation effort is summarized below:

<u>SUMMARY-SCENARIO EVALUATION</u>					
<u>ITEM</u>	<u>SCENARIO No. 1 (Status Quo)</u>	<u>SCENARIO No. 2 (1910)</u>	<u>SCENARIO No. 3 (1960)</u>	<u>SCENARIO No. 4 (2000)</u>	<u>SCENARIO No. 5 (2040)</u>
Technical Feasibility	Yes	Yes	Yes	Yes	Yes
Political Feasibility	Yes	No	No	Maybe	Yes
Institutional Feasibility	Yes	No	No	Yes	Yes
Social/Cultural Feasibility	Maybe	No	No	Maybe	Maybe
Financial Feasibility	Yes	No	No	Maybe	Yes
Timing - Feasible	Yes	Maybe	Maybe	Yes	Yes
Physical/Hydrological/ Environmental Feasibility	Yes	Maybe	Maybe	Yes	Yes
Water Supply (GOAL)					
Required	None	81,000 ac.-ft.	71,000 ac.-ft.	50,000 ac.-ft.	30,000 ac.-ft.
Generated	None	30,000 ac.-ft.	30,000 ac.-ft.	30,000 ac.-ft.	30,000 ac.-ft.
Shortfall	N/A	41,000 ac.-ft.	41,000 ac.-ft.	20,000 ac.-ft.	0 (**)
Total Cost	\$100-\$200M	\$500M	\$400M	\$145M	\$104M
Cost Per Year	\$1.375M- \$2.5M	\$12.125M (*)	\$9.625M (*)	\$3.615M	\$2.595M
Evaluation	Doable	Not Doable	Not Doable	Maybe	Doable
Rank Order	3	5	4	2	1
<p>NOTE: (*) Neither analysis has evaluated the cost to distribute imported water to the major water users in the Basin. Based on distance and dispersion, infrastructure cost would be at least double. (** *) Still leaves 20,000 acre-feet of demand generated depletion that is depleting the aquifers in the Year 2040.</p>					

Figure 19: Summary Evaluation of Alternatives by Scenario

DISCUSSION: The Committee wanted to achieve the results associated with Scenario # 2 or Scenario # 3; however, those scenarios rely on acquiring large amounts of new water (37,500 acre-feet and 25,000 acre-feet on an annual basis) and a massive infusion of funding to acquire the water rights, develop the infrastructure to bring the new water to the Basin and develop the infrastructure within the Basin to distribute the water. Only the cost to acquire the water rights and get the water to the edge of the Basin has been estimated with any degree of certainty. The dispersion of major water users, particularly irrigated agricultural users, makes any distribution system within the Basin unrealistic. Each of these scenarios results in what would probably become a billion dollar program. Financially that eliminates both scenarios as feasible options for the future. Cultural, social, and political considerations involved in transferring water from the Middle Rio Grande Basin to the Estancia Basin also eliminates both scenarios as feasible.

Scenario # 1 continues the mined basin concept of water supply for the next 40 years or until the cost of re-drilling or deepening wells, finding water, deteriorating water quality and economic concerns result in enough public outcry and pressure to cause corrective action. The cost to maintain the "status quo" (approximately \$100,000,000 to as high as \$200,000,000) is comparable to or exceeds the cost of Scenario # 5. Substantially de-watering the Valley Fill Aquifer over the next 80 years based on future projected trends and completely de-watering it in about 120 years is not acceptable in the Committee's view; thus, Scenario # 1 has been rejected as well.

Scenarios # 4 and # 5 are really the same with Scenario # 5 being a scaled down version of Scenario # 4. Scenario # 5 is really a "let's walk before we run" approach that the Committee feels should be adopted while Comprehensive Monitoring, Metering and an Investigations Programs are undertaken to ascertain many of the unknowns. While water levels are declining in most parts of the Basin and water quality appears to be worsening, it is the Committee's judgment that we have the time in the next 40 years to:

- Develop and implement effective water resources management in the Basin.
- Put in place a decent monitoring program to help us understand what is happening.
- Begin to execute a pro-active protection program for our aquifers.
- Stabilize the water rights situation.
- Develop an Estancia Basin Water Trust Fund and a funding and utilization process.
- Put in place an effective conservation program for domestic and agricultural users.
- Meter every major user and set up an effective water rights program that rewards those who minimize their use of water or use it most effectively while protecting existing water rights holders.

- Accommodate through existing and future county ordinances and policies in all three counties a measured level of growth. A healthy Basin economy is crucial to the success of the Water Plan.
- Inform and educate about water resources (use and reuse).

Cost to accomplish Scenario # 4 appears a bit too high at this point in time to make it reasonable to execute. There also appears to be enough water supply existing in storage in the aquifers to enable the Basin to incrementally move into a pro-active program that will be the outgrowth of Scenario # 5. Scenario # 5 accepts some loss of water supply in storage but extends the life of the Valley Fill Aquifer by at least 300 percent over the present situation (approximately 380 years versus 120 years), and provides the least amount of disruption to the lives and economic plans of Basin residents.

The market place over the next 40 years may place the Basin in an even better position than is envisioned here. If it doesn't, a much better understanding of the Basin's water resources through pro-active management and monitoring programs will assist in making better decisions about the future. Some of the new water pilot programs (cloud seeding and water harvesting -- terrain and vegetative modification and management) offer real promise of help, at least in some areas of the Basin. These programs have worked quite well, adding 10 to 20 percent to the normal precipitation and recharge elsewhere. However, before we accept these figures as fact in the Basin Plan, the Committee feels that "pilot programs" should be executed to see if the savings realized elsewhere can be accomplished in the Estancia Basin.

An aggressive Conservation Program based on a realistic water rights policy for a rural area where the major user is irrigated agriculture, coupled with workable policies and a Basin-wide approach to management should reduce the aquifer depletion by about 40 to 60 percent as reported in other areas. Particular emphasis needs to be applied to the creation of water rights and water use policies based on incentives which will cause users to limit pumping and maximize distribution and use efficiencies, minimizing the amount of water used. Clearly these strategies and policies need to be targeted at irrigated agriculture, water supply utilities, and the other large users of water.

As pointed out by individuals in the 1998 round of public meetings, the Basin should attempt to attract clean industries, probably along the I-40 corridor. The policies and efforts outlined in Scenario # 5 contribute to this type of effort to improve and broaden the Basin's economic base.

**RECOMMENDATION--Base the Water
Plan on Scenario # 5**

SCENARIO NO. 5--"2040 CONDITION"
(INITIAL EVALUATION)

OBJECTIVE: Control and slow the depletion of the Valley Fill Aquifer from an average of 45,000 acre-feet per year to an average annual rate of 20,000 acre-feet per year by the Year 2040. Water supply in storage will be reduced from 6.5 million acre-feet in the Year 2000 to about 5.2 million acre-feet in storage in the Year 2040.

DISCUSSION: This Scenario accepts the fact that the Basin is in an unsustainable condition ("being mined") and that no new supplies of water are immediately available. It significantly reduces depletion through pro-active conservation, metering and monitoring programs targeted at agriculture and domestic use while increasing the awareness and understanding of the Basin's water resources by its residents. Pilot programs combining cloud seeding and terrain and vegetative modifications are undertaken to explore development of new water sources and supplies. The Basin is managed as a special water management area by each county and the Office of the State Engineer to ensure effective use of funding and to keep water rights availability and use under control.

It may be possible by metering, system audits, efficiency modifications and crop selection to reduce annual irrigated agriculture depletions to a level that can bring the Basin's water supply into a sustainable posture by the Year 2040 or at least in the following 40-year period.

Goals (40-Year Analysis)

Valley Fill Aquifer Storage (Mil. Ac.-Ft.)

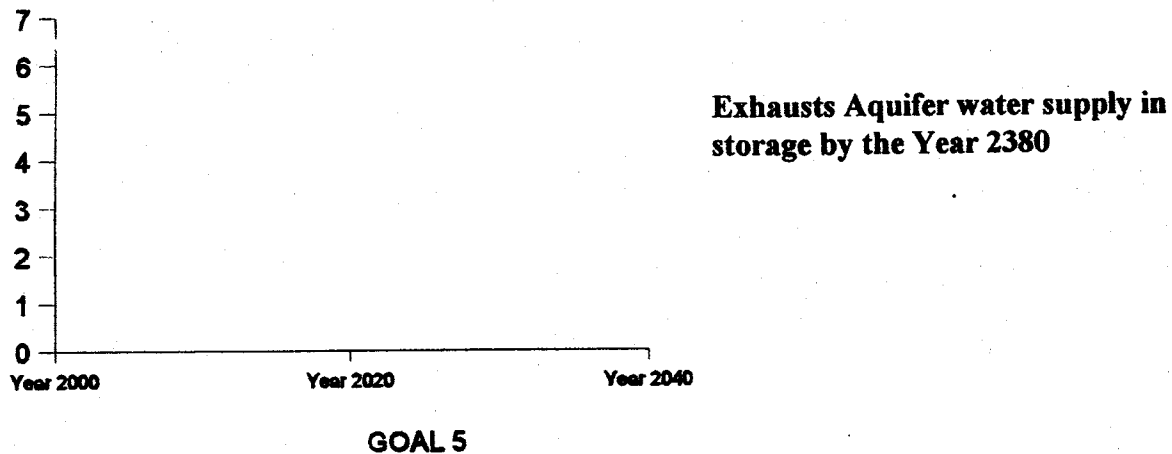


Figure 20: Water Supply Goal in Scenario # 5

SCENARIO NO. 5--"2040 CONDITION" (cont.)
(INITIAL EVALUATION)

DEMAND: 45,000 acre-feet--current demand
 5,000 acre-feet--projected additional demand
 50,000 acre-feet--total demand

<u>SUPPLY:</u>	Annual	Depletion Reduction/Program Cost
Management Alternative:	4,500	ac.-ft./\$ 590,000
Conservative Alternative	14,000	ac.-ft./\$ 820,000
Water Development Alternative	11,500	ac.-ft./\$ 725,000
Water Quality Alternative	0	ac.-ft./\$ 460,000
Infrastructure Alternative	<u>0</u>	<u>ac.-ft./\$ 0</u>
Total Available	30,000	ac.-ft./\$2,595,000

COST: Scenario # 5 has been developed to cut the demand driven depletion to 20,000 acre-feet by the Year 2040. This appears to be an executable program with a reasonable chance of success that could extend the life of the Valley Fill Aquifer to the Year 2380. Irrigated agriculture may be able to reduce their depletion of the aquifers by another 30 percent. Cloud seeding and vegetative management programs might add another 10 to 20 percent in terms of precipitation. The actual recharge to the aquifer will be somewhat less. Heightened awareness has caused demand to drop from 0.31 acre-feet per residence (1993-1994) in Eldorado, NM, outside of Santa Fe to 0.19 acre-feet (1997). That type of reduction in domestic use coupled with some fallowing of irrigated acreage or conversion to housing developments might enable achievement of water resource sustainability by the Year 2040. The program to achieve Scenario # 5 is a pragmatic, pro-active attempt at an achievable, executable program utilizing the major alternatives previously presented.

The goals and objectives for each major program have been conservatively set at from 50 percent to 75 percent of results attained elsewhere to enable the residents, local entities and governments to build programs in a realistic manner through education, information, conservation and "pilot programs" for new water and system efficiencies while developing funding sources to sustain those programs over a 40-year period. The level of effort in all alternatives except the Water Rights Program (100 percent) and Cloud Seeding Program (100 percent) and Terrain and Vegetative Modification and Management Program(100 percent) are reduced by about 40 to 60 percent from those presented in Scenario # 4. Scenario # 5 eliminates the creation of a Special Improvements District (Management), Fire Hydrant Testing (Conservation), Effluent Recharge and Importation of Water (Water Development).

SCENARIO NO. 5—"2040 CONDITION"(cont.)
(INITIAL EVALUATION)

SUMMARY – FEASIBILITY				
<u>CRITERIA</u>	<u>YES</u>	<u>NO</u>	<u>MAYBE</u>	<u>REMARKS</u>
Technical	X			Feasible technology
Political	X			Ease in approach
Institutional	X			Maintains current Institutions
Social/Cultural			X	Requires Info & Ed
Financial	X			Feasible
Time Frame	X			Feasible
Physical/Hydrological/ Environmental	X			Stabilizes water resource situation

Figure 21: Scenario #5 Feasibility

Rating: Feasible
 Program Cost: \$2+ million per
 Time/Cost Schedule: 1998/1999, set up—less than \$1 million
 Annual 2000 to 2040: \$2.2million
 Funds Source: Estancia Basin Trust Fund; Soil & Water Conservation Districts; Counties; State.
 Action Agents: Residents, Water Conservation Districts; State and Counties

Technical Feasibility—All proven technologies. Only question is how much Cloud Seeding coupled with terrain modification/vegetation modification will yield. Water reuse is also critical.

- Political Feasibility—Yes! Eases into water conservation.
- Institutional Considerations—None. Uses in place institutions.
- Social and Cultural Impacts—Some residents will still question the need for any effort. Good information and education program is critical.
- Financial Feasibility—Cost is feasible if an oversight coordinating entity is in place to ensure efficient use of funding and a cooperative effort.
- Implementation Schedule—1998/1999 set up. Begin execution at about \$2.2 million per year in the Year 2000.
- Physical, Hydrological and Environmental Impacts—
 - Physical—Slight (some change in terrain appearance)
 - Hydrological—Major (positive effect)
 - Environmental—Major (positive effect)

Evaluation: Feasible and acceptable! Relatively reasonable cost. Moves cautiously into most of the water resource areas, minimizing the possibility of major mistakes and funding/cost disasters.

WATER PLAN GOAL

OVER THE NEXT 40 YEARS (YEAR 2000 TO YEAR 2040) REDUCE THE PROJECTED ANNUAL AVERAGE DEMAND DEPLETION (LOSS) OF THE VALLEY FILL AQUIFER FROM 50,000 ACRE-FEET PER YEAR TO 20,000 ACRE-FEET PER YEAR.

PROGRAM GOALS:

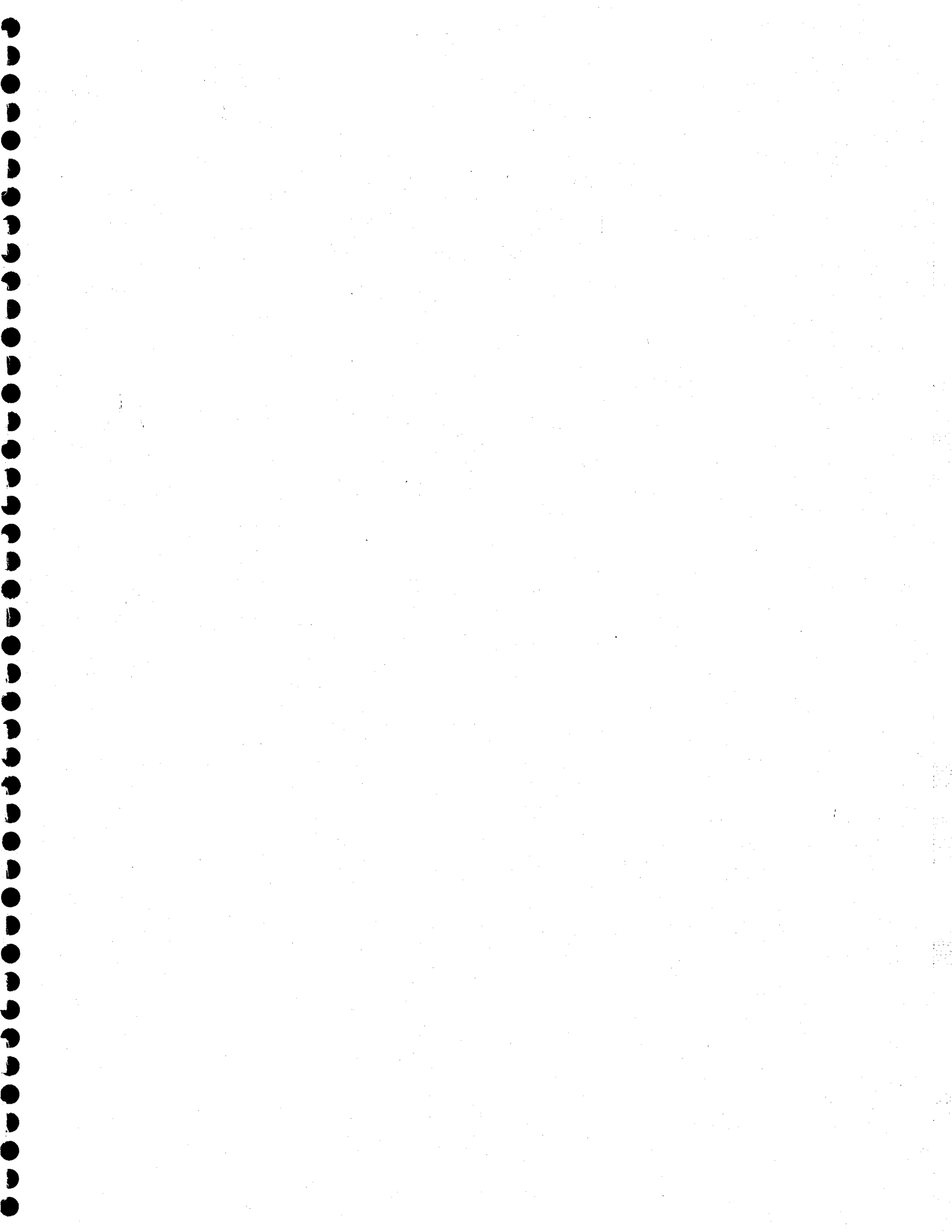
- **Management Program—Goal: 4,500 acre-feet per year reduction**
- **Conservation Program—Goal: 20,500 acre-feet per year reduction**
- **Water Development Program—Goal: 5,000 acre-feet per year reduction**
- **Quality Program—Goal: 0 acre-feet per year reduction (protect existing water supply in storage)**

DISCUSSION: The above goals are different from those presented in the discussion of scenarios in the preceding section. Based on further analysis and public input the Conservation Program offers more opportunity for depletion reduction than was initially estimated. This change also has a very positive financial effect, reducing the annual cost to \$2,360,000 per year from the initial estimate of \$2,595,000 per year (a \$235,000 reduction per year in program cost).

The Water Plan moves carefully into the development and funding of single-focus (water resources) administration, development and use/reuse of water in the Estancia Basin through a comprehensive Management Program ensuring a clear understanding of the aquifer interaction and a clear presentation of that information to the Basin's residents. The stabilization of water rights within the Basin is a major priority as is the establishment of an Estancia Basin Trust Fund ensuring continuity and execution for all programs. Local involvement and development and execution of the various programs is critical for long-term success (must be a local effort).

The savings (depletion reductions) associated with the Conservation Program are based on conservative projections that have been intentionally understated (based on program results achieved elsewhere). There is a strong feeling that accurate measurement of land actually under irrigation and water actually pumped will result in a reduction which is accounted for within agricultural efficiency savings.

Savings (new water) associated with the Water Development Program are the result of very conservative projections of cloud seeding and terrain vegetation management and modification program success coupled with state, county or local buyback of presently in use water rights and production infrastructure to be placed in an emergency/drought water rights bank.



MANAGEMENT PROGRAMS

PURPOSE: Ensure a Basin-wide single purpose focus on water resources that protects the future while serving the present. Intent is to move the Basin's water supply from the present deficit ("mined") posture to a more self-sufficient, sustainable water supply versus demand position by the Year 2040.

GOAL: Develop a focused local management system which will result in a reduction of 30,000 acre-feet in the aquifer depletion rate for the Estancia Basin over the next 40-year period, and which will place the Basin in a position where a sustainable water supply is possible in the next 40-year period.

DISCUSSION: The multiple jurisdictions found in most regions create a very weak link in effective water resources management. The Estancia Basin has five counties, three of whom are major players, three Soil and Water Conservation Districts, several state and federal agencies, several towns, and a few private or co-op utilities as well as gas companies, telephone companies and other entities that deal with water. Most have a need for water and sewer or wastewater services of some type and several play a role in the management of water resources. A coordinating entity that provides basin-wide planning, coordination and oversight in the water resources area was needed and was created in 1995 by the Memorandum of Understanding that Bernalillo, Santa Fe and Tarrant Counties signed. This single focus on water resources on a basin-wide basis has been crucial to the development of the Water Plan and will be even more crucial to its execution. For long-term success it may be necessary to expand the existing Water Planning Committee to reflect a more diverse constituency.

Funding is always the Achilles Heel that destroys good planning. The creation of an Estancia Basin Water Trust Fund funded by an as yet to be developed mechanism on a continuing basis is critical. Long-term funding that is not subject to other priorities, emergencies, or political expediency is necessary. During the public meetings, this was discussed at length with many residents favoring some form of impact fee based on usage. Other residents favored a royalties system similar to that employed in the gas and oil industries where individual water rights holders would not be taxed for water they used for their own purposes (crops, gardens, cattle, domestic uses), but would have to pay a royalty if they sold or leased their water rights or water to a third party. Others favored impact fees on well permits or other water related activities, while still others felt that a slight increase in the Gross Receipts Tax in the Basin might be best. Clearly funding is going to be a difficult and contentious issue that requires considerable additional effort. The Committee recommends that the Counties create either a special committee to develop a funding program, or that they appoint some lawyers, bankers and business people to augment the Committee in this important follow-on implementation effort.

Comprehensive monitoring of the Basin's water resource over time is an absolute necessity for future decisions as are codes and ordinances reviews and updates, and a continuing information and education effort.

MANAGEMENT PROGRAMS (cont.)

MANAGEMENT PROGRAMS – SUMMARY:

- PROGRAM NO. 1 – SPECIAL GROUNDWATER MANAGEMENT BASIN: Designate the Estancia Basin as a Special Groundwater Management Area at all levels of government (county and state) to focus attention, resources and effort, moving the Basin from the current “mined” condition towards a more sustainable water supply posture in the future.
- PROGRAM NO. 2 – BASIN-WIDE PLANNING AND COORDINATING ENTITY: Continue to use the Estancia Basin Water Planning Committee to provide a single focus basin-wide water resource coordinating and planning effort to ensure priority of effort, program development and understanding, funding, and execution of the Water Plan. Utilize an SWCD like the East Torrance SWCD to provide administrative support.
- PROGRAM NO. 3 – BASIN WATER RESOURCE TRUST FUND: Create funding sources and a trust fund to ensure continuity of program funding and execution. Either use the Committee or a separate non-paid Board of Directors to provide oversight of the Trust Fund and utilize one of the Soil and Water Conservation Districts, such as the East Torrance SWCD to provide administrative support.
- PROGRAM No. 4 – COMPREHENSIVE MONITORING PROGRAM: Develop and execute a Comprehensive Monitoring Program that records water levels (quantity) and quality on a quarterly basis and begins to study interaction of the various aquifers and how recharge affects them while providing support to the Water Quality Program through early warning of groundwater contamination.
- PROGRAM NO. 5 – INFORMATION AND EDUCATION PROGRAM: Develop and implement an Information and Education Program to keep residents informed about water resources, water rights, and sewer/wastewater in all of their facets, and which assists the school systems in educating their students about water.
- PROGRAM NO. 6 – CODES AND ORDINANCES: Encourage counties and municipalities to review codes and ordinances ensuring compliance with state and federal Clean Water Act requirements and stressing efficient, economical use of water. Ensure local codes minimize the use of groundwater, stress reuse, xeriscape landscaping, aquifer protection, the capture of precipitation and protect recharge areas (known and suspected).
- PROGRAM NO. 7 – BASIN COMPUTER MODEL AND GIS PROGRAM: Integrate an existing Basin Computer Model (State Engineer’s or Entranosa’s) with the Comprehensive Monitoring System through a Geographic Information System (GIS) interface.

MANAGEMENT PROGRAMS (cont.)

<u>MANAGEMENT PROGRAMS SUMMARY</u>								
<u>Program</u>	<u>Priority</u>	<u>Reduct Goal</u>	<u>Set-up Period Year 1999</u>	<u>Initial Cost</u>	<u>Execution Period Years 2000 – 2004</u>	<u>Annual Cost</u>	<u>5-Year Cost</u>	<u>Remarks</u>
Program No. 1 (Special Groundwater Management Area)	CRITICAL	N/A	Obtain Bernalillo County and State Designation	Work In Kind	Develop focus and priorities for 5-year Water Plan Program	Work In Kind	N/A	Complete in the Year 1999
Program No. 2 (Single focus Oversight Entity)	CRITICAL	N/A	Obtain approvals and set up admin and oversight systems	\$80,000	Provide single point of contact, admin & oversight & develop annual & 5-year budgts	\$120,000	\$600,000	Exist MOU is sufficient for oversight & budget funct.
Program No. 3 (Funding Program, Trust Fund)	CRITICAL	N/A	Develop program & gain approvals expenditures	\$80,000	Collect funds, admin Trust Fund, monitor to develop	\$100,000	\$500,000	Fund. mech is crucial part
Program No. 4 (Comprehensive Monitoring)	CRITICAL	N/A	Develop monitor wells locations & modify as reqd	\$20,000	Collect and analyze. use data	\$100,000	\$500,000	Potential county function
Program No. 5 (Information and Education)	CRITICAL	N/A	Review exist. programs and set up	\$10,000	Execute program	\$10,000	\$50,000	Use exist media & organ, Expand to schools
Program No. 6 (Codes and Ordinances)	CRITICAL	4,500 ac-ft	Review, update exist codes & ordinances	\$20,000	Modify as necessary to minimize use of wtr & maximize reuse	\$5,000	\$25,000	County, state, municipalities responsibility
Program No. 7 (Basin Computer Model and GIS link to Comprehensive Monitoring System)	# 1	N/A	Review options	Work In Kind	Office of State Engr select & integrate models or create a new one & tie to a GIS system & execute	\$20,000	\$100,000	State Engineer best suited to develop & integrate
TOTAL		<u>4,500 ac ft</u>		<u>\$ 210,000</u>		<u>\$355,000</u>	<u>\$1,775,000</u>	

Figure 22: Water Plan–Management Programs Summary

Estimated budget to set up the Management Program in the Year 1999 is \$210,000. Annual yearly estimated budget to execute the program is \$355,000 with a total Five-Year estimated Program Budget of \$1,775,000.

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 1 – SPECIAL GROUNDWATER MANAGEMENT AREA(S)

Rationale: Creates a sense of concern and purpose and helps provide focus on reasonable water resource development and use before a disaster occurs. Each county, the state and most importantly the residents of the Basin need to understand the following:

- The aquifers are interconnected.
- The Basin is being mined and will run out of water and is out of water in some areas.
- Everyone needs to work together to ensure a sustainable water supply, economy and lifestyle.
- Short-term gains for some (declaration of water rights, exportation of water) are short- to mid-term fixes that may ultimately mislead all. It is quite possible that the more heavily pumped areas may run out of water first.
- Focus, conservation, incentives and support for efficient minimum usage and maximum reuse are absolutely necessary.
- Water quality is declining in many areas and may be rapidly impacted in areas adjacent to the salt lakes or areas with significant quantities of brackish water adjacent to aquifers.

Goal: Provide a focused sense of concern on the part of all people and organizations dealing with the Basin. A critical concern is to effectively deal with the water rights issue, fixing the amount of water rights available in the Basin at the presently recognized level developing programs that will reduce use. Provide oversight ensuring an integrated approach to water resources management.

Priority: CRITICAL

Recommended Action:

- Have each county recognize their portion of the Basin as a Special Groundwater Management Area and take those steps they feel are warranted.
- Focus the Office of the State Engineer on doing the same and suspending the granting of new appropriations or declarations of water rights in the Basin. Water rights are not “wet water,” they are a paper right that gives the holder a legal right to look for water in a given location. Whether water is or is not present is a different point. With about three to four times as many water rights declared as are in use in the Basin, there is no reason to declare more water rights, since water levels are declining by as much as two feet per year in areas (Appendix E) where the aquifer is under the most demand generated

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 1 (cont.)

pressure. A moratorium on the declaration of more water rights is required until a definitive inventory of declared or recognized water rights in the Basin is completed. If the inventory shows that significantly more water rights are available than being used or supported by existing known water supplies, then new appropriations should be stopped. This will end to some degree the movement of water rights and drilling of new NMSA 72-12-1 domestic wells in the same areas where water rights previously existed (double dipping), a major concern of many residents who attended the public meetings in 1995, 1996 and again in 1998.

- Focus the State Engineer and counties on a careful review of exportation of water from the Basin. Exportation of water from a basin with significantly declining water levels may seriously mislead those who receive and use the water. They may be the first to be denied water in a crisis, potentially placing them at serious financial risk. (NOTE: Stopping the exportation of water from the Basin was the major concern (the highest priority) on the part of the residents who attended the public meetings in 1995 and 1996, and remains so today as evidenced by the concerns voiced in the 1998 public meetings.)

- Focus everyone on the need for conservation and protection of the aquifer at all levels. Provide information and education to offset myth and misinformation, and provide effective management and funding to Basin-wide water resources development, use and management. Ensure continuity and execution of pilot water development programs which may have long-term positive effects for other parts of New Mexico.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan-Mar 1999 (Action: Bernalillo County & Committee)	N/A	Obtain a designation by Bernalillo County for a Special Groundwater Management Area consistent with those passed by Santa Fe and Torrance Counties.
Apr-Dec 1999 (Action: Committee, Counties & NMISSC/ OSE)	N/A	Obtain New Mexico State Legislature designation and recognition by Governor; NMISSC and OSE and admin polices and practices that protect existing water rights, prevent further declarations, and minimizes mining and exportation out of the Basin.
Jan 1, 2000-Dec 31, 2004 (Action: Committee)	N/A	Explore development of a water/wastewater district similar to the High Plains Underground Water Conservation District No. 1 and other districts in the West.

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 2 – BASIN-WIDE PLANNING AND COORDINATION ENTITY

Rationale: Existing governmental entities have a wide range of social and economic concerns to address that demand immediate efforts (crime, fire, emergency services, roads, schools) which are easier to see and understand. Financial and other resources tend to be prioritized among these other issues. This is not intended as a criticism, but rather as a description of a reality which is unlikely to change. A basin-wide citizen body (such as the Estancia Basin Water Planning Committee) to ensure focus, priority and emphasis on water resource development, use and concerns is an absolute necessity if the residents of the Basin are to effectively deal with the Basin's water resources.

The coordinating entity, whether the current Estancia Basin Water Planning Committee extended into the future as a coordinating and oversight body representing all three counties or another entity, must have the authority to impact decisions and execution of those decisions without usurping the authority of duly constituted legal entities such as county governments, state agencies and soil and water conservation districts. A solution might be to make the water resource entity the budget development and recommending authority for water resource related programs in the Basin. The Committee could by this process be afforded a "NO VOTE" on projects and efforts that they feel will not contribute substantially to achieving Water Plan goals.

The Committee does not require significant execution authority. Execution would still reside with the soil and water conservation districts, counties, state agencies and others. The Committee would ensure proper use of funding from the Estancia Basin Water Trust Fund (if established) or other funding sources consistent with established priorities. If an oversight and coordinating entity isn't created and "mining" of the water resources continues, it is quite likely that a basin-wide water and wastewater district might be necessary such as those established on a basin-wide basis throughout the Plains, the Midwest and the West (example: High Plains Underground Water Conservation District No. 1 in Texas).

Goal: Provide single focused water resource leadership and management for the Estancia Basin.

Priority: CRITICAL

Recommended Action:

- Review the existing Memorandum Of Understanding (MOU) between the counties and make any necessary changes to strengthen the Estancia Basin Water Planning Committee as a basin-wide water resource coordinating and oversight committee.
- Provide \$20,000 per county per year as seed money to enable the Estancia Basin Water Resources Coordinating Committee to function until an Estancia Basin Water Trust Fund or other funding mechanism is established and funding provided.

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 2 (cont.)

- Have a soil and water conservation district such as East Torrance act as the fiscal and administrative agent.
- Ask the New Mexico Interstate Stream Commission and the Office of the State Engineer to match county funding and ask the State Legislature to provide additional funds.
- Look at the creation of the Estancia Basin Water Planning Committee as a not-for-profit entity to be able to secure matching funds from other entities (private, public, foundations, state and federal agencies).
- Consider a staffing level of two full-time employees (an Executive Director and an assistant), probably based in Estancia; or continue to staff through in-kind assistance from state or local entities or soil and water conservation districts. A consultant on a contract basis to work specific issues could accomplish the same under the Committee's control for the first few years and would probably be the most cost effective solution.
- Review and access federal, state and private foundation for grants and matching dollars.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan - Dec 1999 (Action: Committee)	\$60,000	Create support organization, admin and fiscal by-laws, policies as required and develop specific programs listed elsewhere for execution beginning January 1, 2000.
Jan 2000-Dec 31, 2004 (Action: Committee)	\$120,000 per year	Execute programs, providing quarterly report to the Office of the State Engineer and other state and federal agencies.
Jan 2005 and Beyond	Unknown	Continue in five-year increments.

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 3 – ESTANCIA BASIN WATER TRUST FUND

Rationale: The major reason for failure of many programs and plans is a lack of dedicated, protected funding and a lack of an annual source of funds. The implementation of any water plan is absolutely dependent on a dedicated funding source and stream that cannot be interrupted because of controversy, political mischief or short-term emergency priorities or misunderstandings. A special Trust Fund dedicated to water resource conservation, use, development, understanding, protection and management is crucial.

Funds might be collected through a small portion of a percent gross receipts tax increase within the Basin and through specific fees (impact fees) for application for appropriation of water rights, sale of water rights, transfer of water rights, well drilling permits and similar wastewater fund raising applications. Funds should be held and administered by a local entity such as a soil and water conservation district with State Department of Finance and Administration and/or OSE oversight.

The annual budget for execution of the Water Plan using funds from the Trust Fund should be developed by the Estancia Basin Water Planning Committee or whatever basin-wide water resource entity is formed with input from the executing entities such as the counties, the soil and water conservation districts, state agencies, acequia associations and the Committee. Approval of the budget is required by the three counties (each for programs affecting their portion of the Basin), the Committee and the Office of the State Engineer or New Mexico Interstate Stream Commission (whatever the state decides) before being forwarded to the Department of Finance and Administration for disbursement.

The East Torrance Soil and Water Conservation District could handle fiscal and administrative requirements for the Committee. Funds could be disbursed for coordinated programs executed by the Committee, or with the Committee's approval for budgeted, approved programs executed by others, such as the counties, the soil and water conservation districts, and the state agencies.

Goal: Provide necessary levels of funding for execution of the Plan, both short- and long-term and develop independent funding sources.

Priority: CRITICAL

Recommended Action:

- Committee develops legislation to be presented to the next session of the State Legislature after approval by the Office of the State Engineer, New Mexico Interstate Stream Commission and counties for establishment of the Trust Fund, the funding source(s) and program administration. The Water Plan should be established as a five-year "pilot program" beginning January 1st, 2000, and running through December 31st, 2004, with automatic renewal unless an effort to "kill" or "amend" is made.

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 3 (cont.)

- Remainder of 1999 should be used to develop the overall program (the Water Plan), put in place the administrative system, develop the various specific programs and individual budgets, develop a Five-Year Program Budget and obtain execution funding for the program budget projections through the Year 2004.
- Initial funding to execute the Water Plan in 1999/2000 should be presented to New Mexico Legislature in 1999 to get programs established with seed money so that the various efforts can begin while the mechanism for the Trust Fund is being put in place.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan - Jul 1999 (Action: Committee, Counties & New Mexico Interstate Stream Commission)	\$40,000	Committee develops Trust Fund with help from the state agencies, counties and local entities, and presents to New Mexico State Legislature for approval and initial funding for Years 1999/2000. and sets up a soil and water conservation district as the administrative and fiscal agent for the Committee and the Trust Fund.
Jul - Dec 1999 (Action: Committee, State Dept. of Finance and Admin., Office of State Engr)	\$40,000	Administrative mechanisms put in place with funds being collected beginning July 1 st , 1999. Review private foundations and federal grant programs; develop and begin to execute funding strategies.
Jan 2000 - Dec 2004 (Action: Committee and Torrance Soil and Water Conser- vation District)	\$100,000 per year	Administer as required by law, needs and requirements. Funding provides for accounting, audits, grant search software, and search and acquisition of funding.
Jan 2005 and Beyond	\$100,000 per year	Continue in five-year increments.

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 4 – COMPREHENSIVE MONITORING PROGRAM

Rationale: Continuous monitoring of selected existing wells concerning the following should be conducted with quarterly reporting, monthly if funding will allow.

- Water levels
- Water quality
- Aquifer interaction
- Potential agricultural and ranching contamination
- Potential domestic contamination

Approximately 40 to 50 monitoring sites should be established using existing wells. Metering and if necessary modification of the wells needs to be part of the initial capital cost so that any water demand (use) anomalies are clearly evaluated. Use of a contract service (consultant or contractor) to manually take measurements and samples is required although counties or soil and water conservation districts might provide necessary services. Water quality testing requires special training and the use of a laboratory to develop the results. It may be that a state or federal agency can perform these services; however, the work needs to be responsive to local schedules and program requirements; thus a contract service may be best. Data should be entered into a data bank. Some counties or state agencies may already have programs that provide some data.

The Metropolitan Water Board (Santa Fe County and City) ran a water level and quality program for about \$20,000 to \$30,000 per year (one testing occurrence per year involving about 40 sites). The more comprehensive program envisioned here with water and aquifer interaction considerations would probably cost about \$100,000.

Both Santa Fe and Bernalillo Counties have eminently well-qualified geohydrologists who could be tasked along with a Committee member from Torrance County to function as a sub-committee to develop and oversee the program. Quarterly readings as a minimum are necessary to establish annual trends and to cover "water development (cloud seeding) efforts." Without an ongoing monitoring program, the counties and the Office of the State Engineer should adopt a very, very conservative approach to water resource management in the Basin. It may be that federal or state grants, existing utilities, future developers and existing soil and water conservation districts could serve as funding sources for this program.

Goal: Provide a better understanding of aquifer interaction, base-line water level and quality data for measuring long-term Water Plan success, and a protective warning system concerning aquifer and groundwater contamination.

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 4 (cont.)

Priority: CRITICAL

Recommended Action Plan: Ask the three counties to develop a comprehensive water resource monitoring program along with the Committee. They have the expertise to do so.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1999-Dec 1999 (Action: Utilities, Soil & Conservation Districts, Counties & Committee)	\$20,000	Develop locations and set up monitoring program. Develop basin-wide metering program
Jan 1 st , 2000- Dec 31 st , 2004 (Action: Committee & Counties)	\$100,000 per year	Execute program

(NOTE: Ultimately this program should be tied together through a geographic information system (GIS), possibly keyed from electric or gas company remote reporting systems, if available, to a Basin Computer Model located at an OSE location for real time review, analysis and use, see Program No. 6.)

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 5 – INFORMATION AND EDUCATION PROGRAM

Rationale: Myth, misconception, ignorance and greed are the norm when we discuss water in New Mexico. This is due in part to self-serving, misleading comments on the part of some, to a general feeling that water is too complicated and technical, and to informational and educational systems that fail to stress that water is one of the basic life-giving substances on this planet without which we cease to exist. While Earth is the water planet, most people don't realize that only about 1 percent of the Earth's total amount of water is fit for human consumption. That is further exacerbated in New Mexico by our high, dry, semi-arid desert climate. If we don't take care of and minimize the use of water, we are threatening both our future in this area and that of those who follow us. This message needs to be stressed in a low-key, factual presentation of the facts in the media and in our schools if we are to develop the type of public awareness and action that will encourage pro-active solutions.

Goal: Provide accurate, timely information to Basin residents; and educate on the best water use, reuse and protection techniques.

Priority: CRITICAL

Recommended Action:

- Have each governmental entity in the Basin (state, federal and local) discuss water at every opportunity.
- Develop speakers' and writers' bureaus that present articles and discussions at every opportunity to inform, motivate and in some cases even cause concern.
- Ensure monthly articles in every newspaper in the Basin on water.
- Ensure that existing educational materials available through state, local and federal agencies and not-for-profits are made available to the schools, libraries, municipalities and user groups.
- Help motivated teachers establish and conduct "hands-on programs." Students could help conduct water audits, do water level and quality check, act as "water police" to report waste and abuse of water, assist in terrain and vegetation modification programs, conduct surveys for abandoned wells, etc. (NOTE: In Missouri/Illinois in the Mississippi River Valley north of St. Louis, literally thousands of school children are involved in river/river bank clean-up, water testing, pollution reporting, etc. They have even successfully taken polluters to court and have been upheld at the State Supreme Court level forcing violators to "clean up their act.")

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 5 (cont.)

A suggested Informational/Educational Program Outline (Plan) is included as an initial starting point (See Appendix E).

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1, 1999-Dec 31, 1999 (Action: Committee and CES)	\$10,000	Review existing informational and educational programs, establish speakers/writers bureaus and make contact with the school systems. Place monthly articles of interest in all local newspapers. Provide knowledgeable speakers whenever and wherever required on a pro-active basis. Provide funding and material support to schools. Set up a school water program coordinator and develop or help develop hands-on programs for the schools.
Jan 1, 2000-Dec 31, 2004 (Action: Committee and CES)	\$10,000 per year	Continue articles and speakers; ensure pro-active, "hands-on school programs." Implement the suggested Informational/Educational Programs outlined in Tab, or a revised version.
Jan 1, 2005-Dec 31, 2040 (All)	\$10,000 per year	Continue the above program, adjusting it for currency and relevance as water-related events in the Basin unfold over time.

MANAGEMENT PROGRAMS (cont.)

PROGRAM NO. 6 – CODES AND ORDINANCES

Rationale: All three counties have land use codes and ordinances that either presently provide the authority to ensure efficient use of water resources or which could do so. Most codes and ordinances are targeted at large, new development. Counties should review their codes and at least in Special Groundwater Management Areas require all new construction to use the most efficient, proven low flow and ultra low flow water supply/use technology. Any rebuilt properties should also be required to use the best proven technologies. Meters should be required for all water users. Programs within the Conservation Program, administered by counties (domestic, commercial and industrial use) and by soil and water conservation districts (irrigated agriculture) should support this through free audits, rebates, low or no cost loans and tax credits.

Goal: Reduce aquifer depletion by 4,500 acre-feet per year. Ensure water efficient codes in the Basin that stress conservation and maximize reuse.

Priority: CRITICAL

Recommended Action: Each county should review their codes and ordinances and provide the Committee their current codes and ordinances, as well as any anticipated adjustments. The counties could provide the Committee a peer review of each other's codes and ordinances. The Committee could furnish suggested changes and updates for consideration. Then after some period (six to twelve months) hold a series of public meetings where the codes and ordinances could be discussed with Basin residents so they can gain an understanding of the intent and provide substantive input.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1-Jun 30 1999 (Action: Committee and counties)	Work in kind	Counties review, update, modify codes and ordinances, peer review, coordinated approach.
Jul 1-Dec 31 1999 (Action: Committee and counties)	\$20,000	Public information meetings on codes and ordinances, update and rework necessary.
Jan 1, 2000-Dec 31 2004 (Action: Counties)	\$5,000 per year	Update, review, spot check compliance, modify as necessary.

(NOTE: Supportive of and supported by elements of the Conservation Program.)

MANAGEMENT PROGRAMS (cont.)

**PROGRAM NO. 7 – COMPUTER MODEL AND GEOGRAPHIC INFORMATION
SYSTEM (GIS) PROGRAM.**

Rationale: Basin-wide monitoring program on water levels and quality as well as usage (metered major users) needs to be tied to a Basin Computer Model through a GIS program to ensure effective “real time” water resource management.

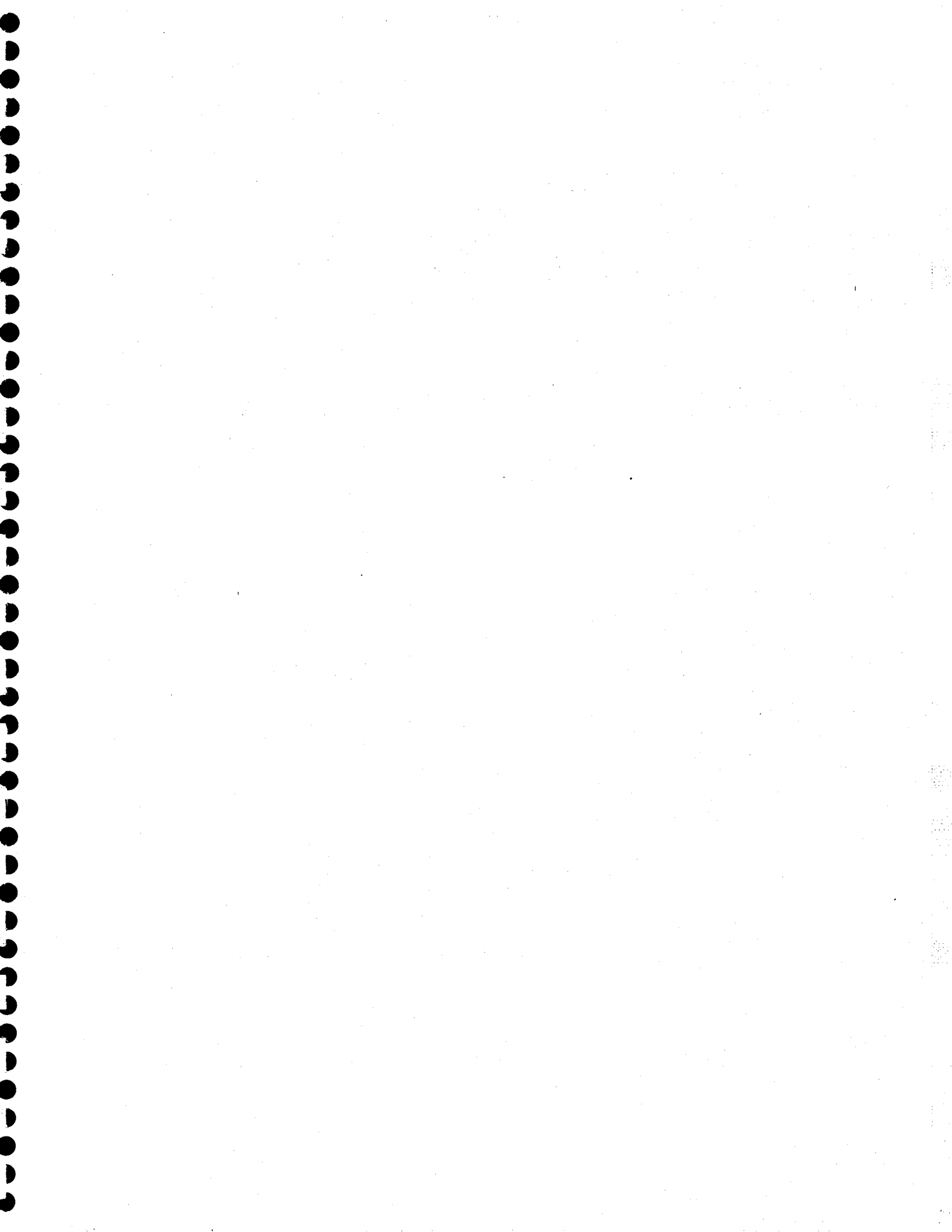
Goal: Provide real time Basin water resource data ensuring real time water resource management.

Priority: Number 1

Recommended Action: Integrate Entramosa and State Engineer computer models, develop GIS interface, possibly through existing or modified electric utility remote reporting program (at least with respect to major agricultural and utility users) with Comprehensive Monitoring Program. OSE staff develop recommended program, time table and funding for integration into Estancia Basin Annual Trust Fund Program or whatever funding mechanism is adopted.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1, 1999-Dec 31, 1999 (Action: Committee, Office of the State Engineer)	Work in kind	Develop program, time table and funding profile.
Jan 1, 2000-Dec 31, 2004	\$100,000 (Start-up)	Integration of computer models, GIS interface and tie-in to monitoring and metering program.
Jan 1, 2005-Dec 31, 2040	\$ 20,000 per year	Maintain files and data currency, provide assistance and update/upgrade as needed.



WATER CONSERVATION PROGRAMS

PURPOSE: Ensure the most efficient use of water in the Basin, minimizing that use to the maximum extent possible.

GOAL: Reduce projected depletion of the Valley Fill Aquifer by 20,500 acre-feet by the Year 2040.

DISCUSSION: The New Mexico Interstate Stream Commission puts the major impetus for a successful regional water plan on public input and an effective conservation program. There are many examples of successful conservation programs throughout the United States and the world. There appear to be none in New Mexico on the regional level. The reason is simply that the policies of the State of New Mexico with respect to the ownership and use of water rights encourage maximum use and minimum conservation. Until these policies are changed there is absolutely no chance for significant success with respect to a conservation effort in largely rural areas where irrigated agriculture is a significant user of water. Agricultural entities to protect their interests must pump the maximum allowed by their water rights, or where surface water is available, divert the maximum amount due them.

This Conservation Program is based on several very successful programs in other sections of the country and for that matter in New Mexico. The Water Audit and Budget and Plumbing Retrofit Programs are patterned after the very successful programs operated by the City of Albuquerque and also followed by the City of Santa Fe. These programs are targeted at individual residences and businesses. Grants from the state or from foundations to underwrite the programs are probably necessary for their success. The Counties and utilities in the Basin should probably execute the program. Intent is to lay out for users what should be used in their house or business (Budget), check their existing water system for leaks and inefficiencies (Audit), and provide the necessary plumbing parts or upgrades to enable users with problems to fix those problems. Savings in the 10 to 20 percent range have been reported with these program elsewhere.

Metering usually reduces demand by about 20 to 30 percent based on American Water Works Association (AWWA) reports. There is a verified case of a 44 percent reduction in use in New Mexico when all the users on a single system were metered. There are significant secondary benefits to individual home owners and businesses in the reduction of energy costs. For utilities metering enables them to stretch their supplies of water further and to better utilize their water rights.

Codes and ordinances need to protect aquifers by stressing proper wellhead protection, use of non-vegetative landscaping or low water use plants, drip irrigation where possible, sewer systems and advanced individual treatment systems where practical. Codes should be subjected to a basin-wide peer review to insure that good ideas and positive practices as well as relative uniformity of action are present throughout the Basin.

Irrigations efficiency programs have been extremely successful in other areas of the country with up to 80 percent reduction in aquifer depletion being reported by some water conservancy organizations.

WATER CONSERVATION PROGRAMS (cont.)

The use of soil moisture content as a determining factor in the amount of water utilized for irrigated agricultural has been a significant factor in depletion reduction in several areas. The High Plains Conservancy District No. 1 in Texas indicates an aquifer depletion reduction from a depletion of 1,250,000 acre-feet per year to 250,000 acre-feet per year. It is hoped that the Soil and Water Conservation Districts and Farm Bureau organizations in the Basin will take the lead in these efforts. It is recognized that without a change in the water rights policies of New Mexico even the most progressive efforts can not be adopted by farmers or other large users of water rights for fear of losing a portion of their water rights through non-use. Under present policies larger irrigated areas and more water intensive crops are likely to result.

WATER CONSERVATION PROGRAMS – SUMMARY:

- PROGRAM NO. 1 – WATER AUDIT/BUDGET PROGRAM: Develop and implement a free or low cost Water Audit and Budget service to help residents and farmers identify concerns, suggest corrective action and help develop viable water budgets.
- PROGRAM NO. 2 – RETROFIT PLUMBING PROGRAM: Develop and implement a free or low cost plumbing, shower and toilet retrofit program throughout the Basin.
- PROGRAM NO. 3 – IRRIGATED AGRICULTURAL EFFICIENCIES: Develop and implement irrigated agricultural programs that minimize pumping while increasing efficiency of water use and maximizing the reuse of pumped water. (NOTE: Without a change in New Mexico's "use it or lose it" policies farmers will continue to pump the maximum amount allowable under their water rights to ensure that there is no way they can lose their water rights. The key to all meaningful conservation efforts is protection of existing water rights so that farmers can be convinced to only pump the amount needed.)
- PROGRAM NO. 4 – METERING PROGRAM: Meter all major users of water (agriculture, utilities, domestic, business) to gain a clear picture of actual use. (NOTE: Requires the policy change discussed under Program No.3.)
- PROGRAM NO. 5 – WATERING PRACTICES: Develop Basin-wide watering practices that minimize loss through evaporation and evapo-transpiration.
- PROGRAM NO. 6 – CODES AND ORDINANCES: Ensure counties and municipalities have ordinances and codes that minimize the use of groundwater, stress reuse, xeriscaping aquifer protection, the capture of precipitation and recharge. (See Management Programs, Program No.6, CODES AND ORDINANCES for time lines, funding and activities.)
- PROGRAM NO. 7 – WATER RIGHTS PROGRAM: Multifaceted program involving legislation, incentives, buyouts, leasing and banking programs—critical to the success of any conservation effort in a largely rural area and to the success of this Water Plan.

WATER CONSERVATION PROGRAMS (cont.)

<u>WATER CONSERVATION PROGRAMS SUMMARY</u>								
<u>Programs</u>	<u>Priority</u>	<u>Reduct Goal</u>	<u>Set-up Period Year 1999</u>	<u>Initial Cost</u>	<u>Execution Period Years 2000 - 2004</u>	<u>Annual Cost</u>	<u>5-Year Cost</u>	<u>Remarks</u>
Program No. 1 (Audit and Budget)	# 1	200 ac-ft	Review exist programs & set up thru counties	\$20,000	Execute program	\$20,000	\$100,000	Indiv homeowner targeted program (domestic)
Program No. 2 (Plumbing Retrofit)	# 2	300 ac-ft	Review exist programs & set up thru counties	\$20,000	Execute program	\$50,000	\$250,000	Indiv homeowner targeted program (domestic)
Program No. 3 (Irrigation Efficiencies)	CRITICAL	5,000 ac-ft	Review exist programs, set up "Pilot programs"	\$102,000	Execute pilot programs, modify as necessary	\$65,000	\$325,000	Targeted at irrigated agriculture
Program No. 4 (Metering)	CRITICAL	5,000 ac-ft	Develop program	\$30,000	100% metering of large users and as many homes as pos	\$100,000	\$500,000	Reduces use by 20% to 40% in most cases
Program No. 5 (Watering Practices)	# 3	500 ac-ft	Develop pilot program	\$ 5,000	Institute program	Work In Kind	None	Voluntary based on understanding & indiv. effort
Program No. 6 (Codes and Ordinances)	CRITICAL	N/A	(NOTE: Specific actions and projected estimated budget are covered in the section outlining Management Programs, Program No. 6.)					
Program No. 7 (Water Rights)	CRITICAL	9,500 ac-ft	Develop prog. funding, and Legislation	\$100,000	Secure Legislation to protect water rights, execute Programs	\$1,000,000	\$5,000,000	The key to a Rural Cons Program is Water Rights
TOTAL		<u>20,500 ac-ft</u>		<u>\$277,000</u>		<u>\$1,235,000</u>	<u>\$6,175,000</u>	

Figure 23: Water Plan–Water Conservation Programs Summary

Initial start-up program budget is estimated at \$277,000 for the Year 1999. The Five-Year Program Budget is estimated at \$1,235,000 per year for a total five-year budget of \$6,175,000. Protection of existing water rights ownership is critical to the success of all conservation efforts in a rural area where 95% of the use is for irrigated agriculture. The success of the entire Plan rests on protecting the individual ownership of each water right holder so that they will minimize the use of water. The "use it or lose" policy must be changed!

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 1 – WATER AUDIT AND BUDGET PROGRAM.

Rationale: Elsewhere in the country significant savings have occurred through leak detection and repair programs (domestic and business programs) as well as the development of water budgets based on what is needed as opposed to what the normal practice has been. Some areas report 20 percent or greater savings in water demand from these programs.

Goal: Reduce aquifer depletion by 200 acre-feet per year.

Priority: Number 1

Recommended Action:

- Set up and implement free domestic programs in each county.
- Set up and implement the same for businesses (commercial and industrial use) as well as governmental entities. Encourage governmental entities to provide a positive example for residents to emulate.
- Encourage counties to require that utilities provide free audit/budget service to customers and ensure that counties check utilities in terms of leaks, pumping and delivery efficiencies.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1, 1999-Dec 31, 1999 (Action: Counties)	\$20,000	Develop criteria and programs. Conduct pilot program audit and budget of all County, municipal and utility systems.
Jan 1, 2000-Dec 31, 2004 (Action: Counties)	\$20,000 per year	Conduct Basin-wide audit, volunteer program using contract employee or service.
Jan 1, 2005-Dec 31, 2040 (Action: Counties)	\$20,000 per year	Continue program.

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 2 – RETROFIT PROGRAM.

Rationale: Urban areas have made tremendous savings through retrofit programs (plumbing, toilets, showers and faucets). While domestic usage is a small portion of the overall demand presently, it is likely to increase significantly in years to come. Some form of incentive/rebate program needs to be instituted in each county to correct current outmoded plumbing concerns. Both the Cities of Albuquerque and Santa Fe have instituted programs that counties could and should use as a basis for county programs, adjusting them to fit their needs and available funding. Savings in the 15 to 30 percent range have been reported consistently throughout the country from mature programs.

Goal: Reduce aquifer depletion by 300 acre-feet per year.

Priority: Number 2

Recommended Action:

- Review existing programs—Albuquerque, Santa Fe and others.
- Develop county/municipality programs.
- Provide rebate or incentive funding.
- Implement programs on a Basin-wide basis. (NOTE: The Estancia Basin could provide Bernalillo and Santa Fe Counties a good “pilot program” on which to base a larger county program at a later date.)

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1, 1999-Dec 31, 1999 (Action: Counties)	\$20,000	Develop criteria; review existing programs; secure ordinances and funding, develop expertise, develop five-year pilot program to execute from Jan 1, 2000 to Dec 31, 2004.
Jan 1, 2000-Dec 31, 2004 (Action: Counties)	\$50,000 per year	Execute program providing retrofit services as agreed upon.

(NOTE: Continue program until response is no longer viable.)

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 3 – AGRICULTURAL EFFICIENCY PROGRAM.

Rationale: The High Plains Water Conservation District No. 1 in Texas reports 80 percent savings over time through a pro-active program that looked at water system irrigation efficiencies as a whole (well, pump, pipe, type irrigation, tail-water capture and return) based on required soil moisture content. All areas of the country report significant over watering by most irrigation methods unless soil moisture content systems drive irrigation. Clearly a different water rights policy is required as well to work in conjunction with irrigation. Given water rights financial incentives, the normal energy incentive, and legal water rights protection, holders of large amounts of water rights would be very willing to economize. Today they could be severely penalizing themselves to do so.

While the folks in Texas were facing survival questions because of the depletion of the Ogallala Aquifer which would have economically devastated large areas in Texas, the Estancia Basin could be facing a similar concern. The report and analysis that has been used as the basis to develop this water plan assumes irrigated acreage as reported and water use factors (2.2 acre-feet per acre of irrigated land) are an accurate reflection of on-going activity. That may not be the case. LANDSAT satellite photos tend to show 10 to 15 percent less irrigated acreage than reported and several farmers indicate less water pumped than reported (i.e., the maximum use of water rights problem exacerbated by a lack of meters). The national average for irrigated agriculture is 1.7 acre-feet per acre of irrigated land (roughly 30 percent less than reported in New Mexico based on the 2.2 acre-feet per acre factor). If there is 10 to 15 percent less acreage under irrigation and 10 to 20 percent less water being pumped, then based on declining water tables there would be significantly less water in storage than currently believed and possibly little or no recharge.

The Basin could face a very bleak future much sooner than most believe. The combination of a Comprehensive Monitoring and Metering Programs will give us that answer in the next five to ten years if pro-actively implemented. In the meantime it is in everyone's best interests to increase irrigated agricultural efficiency, minimizing water pumped to the maximum extent possible.

Goal: Reduce irrigated agriculture aquifer depletion by 5,000 acre-feet per year.

Priority: CRITICAL

Recommended Action:

- Review existing programs implemented elsewhere (particularly the High Plains Underground Water District No. 1 which is dependent on groundwater as well).
- Develop criteria and a common sense program to audit and fix leaks and improve efficiencies in all facets of irrigation such as but not limited to water conveyance systems (pipelines, ditches, gated pipe, sprinklers, and drip irrigation), pumps and water reuse.

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 3 (cont.)

- Implement the program.
- Develop funding—low cost or no cost loans to help those who are not economically able to make appropriate fixes/changes.
- Develop a tax credit/incentives program for those who improve efficiencies.
- Ensure adoption by the State of New Mexico (Legislature and Governor) of a pro-active incentives program addressing water rights as well. (See Management Program—Incentives/Water Rights Objective.)
- Develop demonstration plots to test production, economics, marketing and water efficiency potential for alternative crops.
- Use the locally developed Irrigated Agriculture Conservation Plan (Appendix E) as a baseline starting point for a comprehensive irrigated agriculture conservation planning program model.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1, 1999-Dec 31, 1999 (Action: Committee, Soil & Water Conservation Districts, Farm Bureau)	\$100,000	Develop tax credit and incentives programs. . Develop audit and fix/change programs. Continue the above. Secure legislation in 1999 in conjunction with OSE/NMISSC. Finalize Program and funding.
Jan 1, 1999-Dec 31, 1999 (Action: NRCS, SWCD, Farm Bureau, CES)	\$ 2,000	Identify local farmers interested in implementing new innovative, irrigation management and tillage technology and techniques.
Jan 1 2000-Dec 31, 2004 (Action: NRCS, SWCD Farm Bureau, CES, & Seed and Fertilizer Cos.)	\$10,000 per year	Plan, plant, monitor and evaluate impacts of consensus selected water conservation and management techniques.
Jan 1-Dec 31, 2004 (Action: SWCD, NRCS, Farm Bureau, CES)	\$ 5,000 per year	Identify and contract with agricultural producers to determine economically feasible, water efficient crops.

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 3 (cont.)

Jan 1, 2000-Dec 31, 2004 (Action: Soil & Water Conservation Districts)	\$50,000 per year	Free audits and fix change development, tax credits, low cost loans and grants to stimulate and ensure change.
Jan 1. 2005-Dec 31, 2040 (Action: All)	\$ 50,000 per year	Continue and expand those programs that show promise of success.

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 4 – METERING PROGRAM.

Rationale: Metering programs reduce consumption significantly, in some cases by as much as 50 percent per year. When combined with incentive programs (rebates/tax incentives), the savings have been even more spectacular. In this case we are targeting a 10 percent reduction. Once again an effective water rights incentive program becomes key for all the reasons mentioned elsewhere. If users are over reporting based on the amount of water rights possessed but actually pumping less, a metering program could backfire and force them to pump the maximum to set a high historical usage, unless an effective Incentives/Rebate/Banking Program is in place. The programs which have been developed are mutually reinforcing and all have the long-term goal of reducing the amount of “wet water” used. An accurate metering program is critical in gaining a clear understanding of what is happening in the aquifers and with recharge.

Goal: Reduce aquifer depletion by 5,000 acre-feet per year.

Priority: CRITICAL

Recommended Action:

- Develop a metering program targeted at voluntary metering and at the heaviest users of water. If necessary, go to a mandatory program for all governmental entities, commercial and industrial users, utilities, developments, new construction and irrigated agriculture.
- Develop funding to assist with low cost/no cost loans and possibly a rebate or tax credit strategy.
- Implement programs.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Oct 1, 1998-Dec 31, 1999 (Action: Counties, SWCDs)	\$30,000	Set up program to meter the Basin and secure funding for a five-year program.
Jan 1, 2000-Dec 31, 2004 (Action: Counties, SWCDs Committee)	\$100,000 per year	Set up and execute program to meter the Basin and secure funding for a five-year program. Adjust as necessary for long-term effectiveness.
Jan1, 2005-Dec 31, 2040 (Action: All)	\$100,000 per year	Continue program execution.

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 5 – WATERING PRACTICES.

Rationale: Watering (domestic and agricultural) during the middle of the day (9 a.m. to 5 p.m.), particularly in April through September results in large amounts of water being lost to evaporation and transpiration (50 to 80 percent). A change in watering patterns will minimize these losses.

Goal: Reduce depletion by 500 acre-feet per year by changing water usage techniques.

Priority: Number 3

Recommended Action: Seek county and municipal ordinances that control watering (months and hours of the day) to minimize evaporation and transpiration losses. Ask for assistance from the soil and water conservation districts and the Farm Bureau.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1-Dec 31, 1999 (Action: Counties)	\$5,000	Review ongoing programs and discuss with Soil and Water Conservation Districts, Farm Bureau, municipalities, counties and individual residents. Develop acceptable ordinances and gain approval from the counties.
Jan 1-Dec 31, 2004 (Action: Residents)	N/A	Water in a manner supporting a sustainable water supply in storage in the aquifers.
Jan1, 2005-Dec 31, 2040	N/A	Continue program. Use Information and Education Program and Metering Programs to support this effort.

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 6 – CODES AND ORDINANCES

Rationale: A lack of water-wise County codes can negate any progress achieved by other programs in an area such as the Estancia Basin, particularly under the population pressures that are projected for the next 40 years. One or more large water-hungry industries could over 20 to 40 years significantly deplete the aquifer, devastating the Basin for generations to come.

Goal: Ensure minimum use of water and maximum reuse of effluent are adequately presented in all local codes and ordinances. Reduce potential aquifer depletion by 4,500 acre-feet per year.

Priority: CRITICAL (Potential savings accounted for under Management Programs.)

Recommended Action: See previous discussion on ordinances, codes and enforcement. Water harvesting techniques, gray water reuse and xeriscape landscaping are critical components as are low flow, high pressure domestic systems and sensitivity to recharge areas.

IMPLEMENTATION:

See previous discussion in Management Program. County and state responsibility to ensure conformance with national and international standards and codes and to set the codes and standards for New Mexico and then ensure that they are implemented.

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 7 – WATER RIGHTS

Rationale: The Water Rights Program is composed of several sub-elements: (1) a legislative program to change the way water rights are administered in the Estancia Basin; (2) a buy-out program targeted at water rights that are in use in the Basin; (3) a water rights banking program that places water rights in use in a water rights bank for a set period of time for an annual fee (they can be withdrawn at some point in the future for an emergency or at the end of the banking period); and (4) a water rights leasing program.

All the above programs are based on taking water rights currently in use out of use. The banking, and leasing programs will be based on some set time frames, the longer the banking or lease the greater the yearly payment. The buyout program is intended to take water rights out of use and either retire them permanently or place them in a Basin emergency bank for use in time of drought or contamination for public health and safety (emergency water supply).

The legislative programs are intended to stop the present mined basin policies, and to protect the existing water rights that have been declared in the Basin. It is estimated that close to a million acre-feet of water rights could be declared in the Basin. Presently about 200,000 acre-feet of declared water rights are thought to exist (Balleau, Shomaker, and the Water Planning Committee have all come up with figures from 160,000 acre-feet to over 200,000 acre-feet). The Office of the State Engineer believes that a lower figure is more appropriate. In any case about 55,000 acre-feet to 60,000 acre-feet are in use today, it was as high as 80,000 acre-feet in the early 1980's per OSE records, with water levels continuing to decline throughout the Basin, particularly in the Valley Fill Aquifer. Newer water rights tend to be the ones in use to provide drinking water to developments and towns with the older water rights being used for agriculture. It is highly unlikely in time of drought or when the Basin reaches a "priority call" position that houses and people will be denied water. The current policy and practices have served their economic purpose to support irrigated agriculture and create a solid economic base in the Basin; however, with Albuquerque moving into the area and suburbia well on its way the policies must change or they may decimate the Basin's supply of usable water. Conservation programs can not function effectively to minimize pumping and maximize reuse without significant changes in the water rights and management policies of the Basin.

Goal: Reduce the aquifer depletion rate by 9,500 acre-feet per year.

Priority: **CRITICAL (The most critical single program in this Plan!)**

Recommended Action: Develop a legislative proposal based solely on the circumstances of the Estancia Basin to protect existing water rights, to prevent additional appropriations and to take water rights in use out of use by any of the methods previously discussed: outright buyout, banking, leasing or any other reasonable mechanism that fairly compensates existing water rights owners.

WATER CONSERVATION PROGRAMS (cont.)

PROGRAM NO. 7 (cont.)

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan-Dec 1999 (Action: Committee and SWCD's, et. al.)	\$50,000	Develop specific legislation applicable to the Estancia Basin with respect to water rights for adoption by the State of New Mexico.
Jan-Dec 1999 (Action: Committee, SWCD's, Farm Bureau, Counties and local gov't)	\$50,000	Develop buyout, banking and leasing program criteria and procedures and gain State of New Mexico acceptance. Codify program and gain necessary funding.
Jan 2000 - Dec 2004 (Action: Committee, SWCD's, OSE, et. al.)	\$1 million per year	Execute the various programs over a five-year trial period (pilot program). Continue those programs that appear viable. Modify as req'd. Ensure a citizen oversight and yearly audit of all activities.

WATER DEVELOPMENT PROGRAMS

PURPOSE: Increase the amount of water in the Basin available for use and recharge.

GOAL: Reduce projected depletion of the Valley Fill Aquifer by 5,000 acre-feet by the Year 2040.

DISCUSSION: Since the Estancia Basin is a closed topographic basin with no surface streams transiting the basin and probably closed geo-hydrologically as well, there are limited opportunities to augment the Basin's existing water supplies. Some have indicated that they believe there are vast amounts of usable water in the other Basin aquifers. The Phase I Report seems to indicate that fact as well; however, it caveats that fact with a comment that the water may not be available for use. Others have indicated that the aquifers are not as extensive as most current geologic maps indicate and that for the most part they do not hold water, and what they do hold is suspect with respect to water quality. While it is clear that some faults hold considerable amounts of water, it is unclear about the large areas between the faults. Program No. 4, Underground Investigation Program, is intended to sort out these claims, probably through the use of an independent third party such as the U.S. Geological Survey utilizing federal funding to execute a locally approved and directed program. It also is intended to sort out the potential flow of underground water into the Basin from areas in the northwest and to answer the questions about underground spillage out of the Basin, and find new water if it exists.

Organizations and municipalities in Utah, Oregon, Texas and New Mexico have indicated that they have significantly increased the water available for use by Terrain and Vegetation Modification Programs. There is currently an ongoing U.S. Forest Service program on Rowe Mesa just to the north and east of the Estancia Basin. The U.S. Forest Service in conjunction with the City of Las Vegas, San Miguel County, New Mexico Highlands University and others is conducting a similar program in the Gallinas Watershed that supplies the water to the Las Vegas, New Mexico Area. Those programs should certainly be evaluated for use in the Estancia Basin. The Claunch-Pinto Soil and Water Conservation District in conjunction with the Natural Resource Conservation Service, Department of Agriculture and local land holders is conducting a similar program just to the south and west of the Basin in the Abo Watershed. San Angelo, Texas, reports that after modifying the vegetation of what had been a dry riverbed, the riverbed now yields 20 percent of the water supply of San Angelo, a city of 85,000 people. In a Utah basin after water hungry vegetation was removed the water level reportedly rose ten feet. The Terrain and Vegetation Modification Program should be conducted under carefully controlled conditions to see exactly what the effects are on an area that has been altered. It is suspected that given the significant increase in water hungry, non-native vegetation on the eastern flanks of the Manzano Mountains that this vegetation might be the culprit that is intercepting much of the potential recharge in that area. Only a carefully controlled pilot program will ascertain the truth of the matter.

WATER DEVELOPMENT PROGRAMS (cont.)

Cloud seeding has been ongoing in several areas for as long as 30 years. Proponents in Texas, California, the Dakotas, Kansas, Nebraska, Colorado and Eastern New Mexico indicate a 10 to 20 percent gain in precipitation in target areas. Monterey County, California, comes closest to replicating the conditions found in the Basin (mountainous terrain, brushy vegetative cover, totally dependent on precipitation). They do have some major reservoirs to capture the precipitation and an infrastructure to move the captured water to where it is needed that do not exist in the Estancia Basin.

Most of the ongoing program operators believe the Basin is suited to a ground-mount application where generators could be set on the high ground surrounding the Basin to seed likely clouds. The intent of an Estancia Basin program would be to increase the snow pack in the winter months and possibly to intensify the summer storms that occur over the Valley Fill Aquifer to increase the soil moisture content in the fields being irrigated as well as increasing the direct recharge to the Valley Fill Aquifer during the "monsoon season." Careful control conditions need to be set up so that the effects of the program can be measured and analyzed. The program probably needs to be conducted in partnership with one or more federal or state agencies with the U.S. Forest Service being a likely possibility. Concern was voiced by some residents of the Manzano Mountains about potential floods. That is unlikely given the reports of the ongoing programs. It is clearly more of a concern in New Mexico than in most places and would have to be addressed. The Plan proposes a "pilot program" to address the concerns and usefulness of a cloud seeding program.

Annexation of the undeclared area south of the Basin probably adds little in the way of water, although there may be the possibility that the southern portions of the Estancia Basin suffering from bad quality water (many residents use cisterns to capture precipitation) might find sources of water that could alleviate some of their water supply concerns.

WATER DEVELOPMENT PROGRAMS – SUMMARY:

- **PROGRAM NO. 1 – CLOUD SEEDING PROGRAM:** Institute a ground-based cloud seeding pilot program to increase precipitation in the Basin targeted at the high ground surrounding the Basin with emphasis on the eastern flank and foothills of the Manzano Mountains in the winter and the playas and Valley Fill Aquifer in the "monsoon season" in July through September. Investigate airborne seeding as a follow-on program.
- **PROGRAM NO. 2 – TERRAIN AND VEGETATION MODIFICATION PROGRAM:** Execute a terrain and vegetation modification program to free water being absorbed by invasive water-hungry vegetation and to slow runoff with the intent of increasing soil moisture content and ultimately recharge.
- **PROGRAM NO. 3 – ANNEX UNDECLARED AREA:** Annex undeclared areas immediately adjacent to the southern boundary of the Office of the State Engineer's administrative boundary for the Estancia Basin.

WATER DEVELOPMENT PROGRAMS (cont.)

- **PROGRAM NO. 4 – UNDERGROUND INVESTIGATION PROGRAM:** Institute an aggressive, pro-active subsurface investigation program to develop a better picture and understanding of the geology and hydrology of the Basin, with particular emphasis on the interaction of the aquifers and the recharge mechanism(s) and the amount of usable and unusable underground water.

<u>WATER DEVELOPMENT PROGRAMS SUMMARY</u>								
<u>Programs</u>	<u>Priority</u>	<u>Reduct Goal</u>	<u>Set-up Period Year 1999</u>	<u>Initial Cost</u>	<u>Execution Period Years 2000-2004</u>	<u>Annual Cost</u>	<u>5-Year Cost</u>	<u>Remarks</u>
Program No. 1 (Cloud Seeding)	Critical	4,000 ac-ft	Rev exist prog, RFP, select tech consult.	\$120,000	Execute program, Rpt results	\$100,000	\$500,000	Benchmark exist programs; grnd based effort
Program No. 2 (Terrain and Vegetation Modification)	Critical	1,000 ac-ft	Select sites, devel prog, criteria & funding & clr sites	\$156,000	Maintain & imprv sites	\$60,000	\$300,000	Look at other NM programs
Program No. 3 (Annex Undeclared Area)	#1	N/A	Approach OSE & Legislature, complete admin	\$11,000	N/A	N/A	N/A	Completed in Year 1999
Program No. 4 (Underground Investigation)	Critical	N/A	Develop criteria & program, select sites, mobilize	\$10,000	Execute program, modify based on results	\$100,000	\$500,000	Profiles & new water
TOTAL		5,000 ac-ft		\$297,000		\$260,000	\$1,300,000	

Figure 24: Water Plan–Water Development Programs Summary

Initial estimated cost to set up and begin execution of the above programs is \$297,000 for the Year 1999. Annual estimated program budget is \$260,000 per year with a Five-Year Program budget estimate of \$1,300,000. Funding for the Terrain and Vegetative Modification Programs and the Cloud Seeding Programs might be sought through a local/federal partnership between the Soil and Water Conservation Districts and the U.S. Forest Service. A pilot program of this nature might also appeal to organizations like the Nature Conservancy. There also may be some opportunities for partnering with the traditional communities in the Manzano Mountains and the Land Grant Organizations.

As previously mentioned the Investigations Program needs to be targeted at specific areas to yield specific answers. Funding by the federal government for use of an organization such as the U.S. Geological Survey to ensure impartial results might be possible. The organization(s) that do the investigations of the other aquifers need to be above reproach, and not susceptible to local myths, economic and political pressures.

WATER DEVELOPMENT PROGRAMS (cont.)

PROGRAM NO. 1 – CLOUD SEEDING PROGRAM

Rationale: Cloud seeding programs, largely airborne, have been ongoing since the early 1970's. Texas, North Dakota, Kansas, California and Oklahoma and possibly others have on-going cloud seeding programs that have increased precipitation by 10 to 20 percent in target areas and 8 to 10 percent overall. Monterey County, California, a semi-arid area totally dependent upon groundwater with only 18 inches of annual precipitation, has run both an airborne and ground-based program with excellent results.

The Manzano Mountains along the western portion of Estancia Basin would appear to be a good location for a ground-based seeding program to enhance snow pack precipitation during the winter. Given the southwest and westerly winds and storms associated with the local monsoon season, the Manzano Mountains would also appear to lend themselves to that type of effort as well as the high ground to the east and south of the Basin during the July-September time frame. The accessibility of much of the high ground ringing the Basin is a key factor, allowing use of ground-based equipment on mobile platforms, significantly cutting the capital and operational costs associated with airborne programs.

The existing programs mentioned above indicate that annual funding of about \$100,000 would be sufficient for an Estancia Basin ground-based effort. Most mature programs have staff meteorologists, weather radar systems, planes, ground-based generators and computer-based analytical equipment, as well as remote sensing and sending equipment. Their annual operational costs range from \$200,000 to over \$500,000. The programs in the Plains use playas, potholes and reservoirs to assist in replenishing the Ogallala Aquifer as well as trapping water for surface distribution. Monterey County, California, which is totally dependent on precipitation has two large reservoirs and a distribution infrastructure that moves water to the farming areas and major towns in the Salinas Valley.

An Estancia Basin Program's success would be dependent on the moisture content of clouds, technical expertise of those executing the program, and effective recharge over time since no reservoirs currently exist to capture moisture and there is no infrastructure available to distribute captured water throughout the Basin. A "pilot program" based on a ground-based system targeted at July-September (rain) and December-March (snow) would appear appropriate.

The initial program should be a contract effort using professional contractors and consultants with considerable proven expertise. Federal agencies such as the Bureau of Reclamation who has been heavily involved in these types of efforts elsewhere might also offer a possible avenue with which to approach the effort.

WATER DEVELOPMENT PROGRAMS (cont.)

PROGRAM NO. 1 (cont.)

Goal: Add 4,000 acre-feet of water supply per year to the Basin aquifers.

Priority: CRITICAL

Recommended Action: Develop a criteria for a ground-based program and issue a Professional Services Request For Proposal (RFP) to firms with proven expertise and performance in precipitation enhancement to have the successful firm develop a program to be advertised and bid on by entities with the appropriate precipitation enhancement expertise.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan-Mar 1999 (Action: Committee/ Consultants)	\$20,000	Develop criteria and a Request For Proposals and advertise for assistance.
Apr-Dec 1999 (Action: Committee/ Contractor)	\$100,000	Select best qualified firm; begin program implementation.
Jan 1, 2000-Dec 31, 2004 (Action: Committee/ Contractor)	\$100,000 per year	Execute program; measure and report results

(NOTE: If successful, there will be some short-term gains and the program may replace precipitation that has been lost on an annual basis through climate change since the 1800's to some degree. It may be a long time before significant changes occur in aquifer water levels depending on target areas chosen and aquifer interaction. However, there may be a soil moisture increase in several areas which may help in the short run. Irrigated agriculture in the Plains and High Plains has improved their crop yields and decreased their need and reliance on groundwater somewhat as a result of this program (per discussion with operating officials and published results).)

WATER DEVELOPMENT PROGRAMS (cont.)

PROGRAM NO. 2 – TERRAIN AND VEGETATION MODIFICATION

Rationale: Several programs throughout the U.S. (Texas, California, New Mexico and Utah to name just a few) have undertaken efforts to replace heavy water-using vegetation with less water intensive vegetation. San Angelo, Texas, reports returning water to dry springs and river-beds and supplying 10 to 20 percent of its water supply from previously dry areas through such a program. Areas in Utah, California and New Mexico all report increased water levels when heavy water-using vegetation is removed. Las Vegas, New Mexico, reports significant success in the Gallinas Watershed. The U.S. Forest Service is currently applying these techniques to Rowe Mesa, and there appears to be similar success stories in Southeastern New Mexico.

The eastern foothills of the Manzano Mountains which are now covered by pinon and juniper were open or semi-open rangeland in the late 1800's and early 1900's based on eye witness accounts and early photographs. Some combination of use and climatic change has caused the present juniper invasion. Evidence indicates that these trees and accompanying brush are intercepting and utilizing large amounts of water causing the native herbaceous vegetation to die with a significant increase in erosion. The amount of water removed from the aquifer by this land use change may be quite large. Some terrain enhancement such as check dams, ponds, and recharge wells in combination with vegetative modification would appear warranted. Efforts have already been started in the Basin to combat erosion and non-point source specific pollution (soil sedimentation) in combination with the above.

Goal: Add 1,000 acre-feet of water supply per year to the Basin aquifers.

Priority: CRITICAL

Recommended Action: In conjunction with the Natural Resource Conservation Service, U.S. Forest Service, New Mexico State Land Office and soil and water conservation districts identify areas for brush management program(s), develop necessary Memorandums of Understanding (MOU) or similar documents, and develop the criteria and funding for a land owner cost share brush management and tree control program. Investigate the feasibility of establishing an intermediate bank loan program available through the U.S. Department of Agriculture in New Mexico. Funds would be loaned to land owners at low interest rates (typically 3 to 7 percent) for water conservation land improvements. The Estancia Basin Water Planning Committee would serve as the basin-wide single focus administrative unit for the federally backed bank loan program. Also other federally and state funded programs (grant and loan) should be explored, and national conservation and environmental organizations approached for potential funding assistance and expertise.

WATER DEVELOPMENT PROGRAMS (cont.)

PROGRAM NO. 2 (cont.)

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan-Mar, 1999 (Action: Committee)	Work in kind	Identify brush/tree over-populated water recharge areas; begin land owner discussions; develop program.
Apr-Dec, 1999 (Action: Committee; selected land owners)	\$100,000	Clear brush and trees; develop markets and wood product businesses; modify terrain to retain run-off; reintroduce native herbaceous plants.
Jan 1, 2000-Dec 31, 2004 (Action: Committee; owners)	\$10,000 per year	Maintain and improve area, establish monitoring points and evaluate results.
<p>(NOTE: Because climate change has occurred an annual O&M effort will be required to maintain the pilot areas in their late 1800's/early 1900's condition.)</p>		
Jan-Mar, 1999 (Action: Committee)	\$ 1000	Contact and discuss Intermediate Bank Loan Program with USDA-Rural Development Office in Albuquerque and with local Congressional Delegation.
Apr-Sept, 1999 (Action: Committee)	\$5,000	If feasible, develop a water conservation loan program, establish organizational and legal structure, and complete application requirements.
Oct-Dec, 1999 (Action: Committee)	\$50,000	Establish a functioning loan program.
Jan 1, 2000-Dec 31, 2004 (Action: Committee)	\$50,000 per year	Conduct and evaluate the 5-year pilot program.
Jan 1, 2005-Dec 31, 2040 (Action: Committee)	\$50,000 per year	Continue loan program if necessary and feasible..

(NOTE: Above costs are estimated administrative costs to set up and run the program. Funding of the loan program will be a function of federally available funding and need.)

WATER DEVELOPMENT PROGRAMS (cont.)

PROGRAM NO. 3 – ANNEX UNDECLARED AREA

Rationale: There is a fairly large undeclared area immediately to the south of the Office of the State Engineer's administrative boundary for the Estancia Basin. This area is topographically and probably hydrologically a part of the Estancia Basin, and would best be administered as part of the Estancia Basin. Some geohydrologists believe that a fairly small portion of the groundwater in the Estancia Basin leaks to the south into or through this area. If true that lends even more credence to placing this area in the Estancia Basin. The area could be designated as a Special Water Management Area and could serve as an emergency reserve source of water for drought or widespread contamination emergencies.

Goal: Add an unknown amount of potential aquifer water supply to the administered area of the Estancia Basin. Prevent exportation of water from the Basin to an area outside the Basin that may not be subject to the policies applied to the Basin as a Special Water Management Area.

Priority: Number 1

Recommended Action: Approach the Office of the State Engineer and the New Mexico State Legislature to administratively annex the area into the Estancia Basin.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1999 (Action: Committee)	\$500	Approach the State Engineer and Legislature concerning the feasibility of annexation of adjoining undeclared areas..
Feb-Mar 1999 (Action: Committee)	\$10,000	Draft legislation, develop support and secure annexation of the adjacent undeclared areas.
Apr-Dec 1999 (Action: Committee)	\$500	Complete any administrative requirements and notifications.

(NOTE: Annexation would assist in supporting a state wide survey of New Mexico's water resources and of New Mexico's declared water rights and water supply needs which will have to occur eventually.)

WATER DEVELOPMENT PROGRAMS (cont.)

PROGRAM NO. 4 – UNDERGROUND INVESTIGATION PROGRAM

Rationale: As pointed out in the Phase I Report, by the controversy generated in the current race for Governor, and by most knowledgeable experts and publications, we do not know enough about the subsurface conditions in the Basin. This Water Plan is based on the data which is currently available. There are glaring holes in the data, and in many cases it is non-existent and trends and professional opinions based on experience must be relied upon to develop and execute programs. While we will never know everything that we desire to know as a certainty (the cost is just too prohibitive), we do need to know the extent of the aquifers, their interaction, the recharge mechanism(s) and the stratigraphy of the Basin in more detail than is currently known.

Goal: Develop and execute a selective underground exploration program to ascertain the above.

Priority: CRITICAL

Recommended Action: Set up a citizen panel of Basin representatives, probably five citizens, and an advisory technical board composed of three highly competent geohydrologists to develop the Underground Investigation Program and then to oversee its execution. If possible use a federal agency and federal funds to conduct the program. The initial program should be a five-year effort, renewable for succeeding five-year increments depending on results, execution, cost efficiencies and available funding.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1- Dec 31,1999 (Action: Counties and Committee)	\$10,000	Appoint citizen panel of Basin residents; select technical advisory board, develop Investigation Program (criteria, performance measures, fiscal safeguards, admin support mechanisms, RFP's, federal support, congressional delegation understanding and support).
Jan 1, 2000 - Dec 31, 2004 (Action: Board and Committee)	\$100,000 per year	Execute program under oversight of above citizen panel and technical advisory board.



WATER QUALITY PROGRAMS

PURPOSE: Protect the existing aquifer water supply from serious contamination and water quality deterioration.

GOAL: Maintain acceptable water quality and identify and deal with potential contamination of the aquifer water supplies. Contributes no identified savings or additional water at this time; however, water supply lost through contamination may be lost forever because of the prohibitive cost of reclamation in a rural area. The recommended programs present preemptive, pro-active efforts that are essential for aquifer water supply quality and protection.

DISCUSSION: The Estancia Basin is a rural area that in the past ten years has increasingly become a suburb of Albuquerque. Most of the Basin's programs, practices and codes are based on rural needs. The four-fold increase in population over the past thirty years and the projection by BBER of a three-fold population increase over the next 40 years, mandates more pro-active aquifer protection from contamination. Current concentrations of population are centered on the towns in the Basin. The corridor along Interstate 40 from Edgewood to Moriarty and the northwest portion of the Basin are and will experience the most population growth. Areas immediately to the west of the Basin in the East Mountain portion of Bernalillo County are also experiencing significant growth. Projections in the Shomaker report indicate that approximately 30,000 people outside of the Basin may become dependent on the Basin aquifers for water supply.

At present septic systems serve most of the households in and near the Basin. There are a few small municipal type sewer systems. During the 1998 public meetings residents wanted the Plan to more fully address contamination of the Basin aquifers. The public also suggested that more attention be paid to reuse of water. The Draft Water Plan presented to the public in the 1998 meetings included an Information and Education Program, a Comprehensive Monitoring Program, an Aquifer (Well) Protection Program and a Septic Tank Remedial Program.

After reflection, discussion and evaluation the Committee has added a Sewer System Remedial Program, a Septic Tank Effluent Program, an Advanced Individual Treatment Systems Program, a New Sewer System Program and a Watershed Management Program targeted at the recharge areas. The Codes and Ordinances Program (Management Programs, Program No. 6) addresses the need for county and municipal codes to require advanced individual household treatment systems and sewer systems for new construction and new developments in the Basin, and also suggests that land use zoning in all counties protect known and suspected recharge areas.

The Committee feels that major sewer systems would add too much to the cost of housing to make them feasible for existing developments unless those developments significantly in-fill, increasing their density. If that occurs then the Committee recommends that the counties and municipalities ensure that sewer systems are constructed and put in operation. The recommended Septic Tank Effluent Program that has been added seems to provide the most cost effective solution for already constructed developments. Incentives such as grant programs, low cost loans or tax credits are probably necessary to insure that these programs succeed.

WATER QUALITY PROGRAMS (cont.)

Development and execution of the various programs need to occur at the local level through local governments, local utilities or developers, or local sponsorships of programs. The initial programs undertaken should be limited in scope (pilot programs) and well instrumented so that data can be gathered and analyzed to arrive at meaningful decisions. This also helps ensure consistent funding for these programs, a requirement for success. Reuse of water should be stressed either through subsurface irrigation methods or the development of recharge wells or systems. Thought should be given as to how best to integrate reused water into the water supply systems if that becomes necessary and economically feasible in the future.

Concern was raised by the public about agricultural groundwater contamination from the runoff and percolation of fertilizers and pesticides residues, or at least the nitrates therefrom into the aquifers. Concern was raised about infiltration from livestock feeding and watering locations which tend to concentrate waste and thus potential contamination. Initial efforts associated with the Shomaker Report did not reveal evidence that substantiated this type of pollution in the Basin; however, subsequent investigation has revealed indications of nitrate contamination that might have come from these sources. Since there is considerable controversy about agricultural and ranching induced nitrate contamination in the Basin, the Committee has suggested that the Comprehensive Monitoring Program (Management Programs, Program No. 4) include monitoring to address this concern. There is little doubt that several of the new developing areas where septic tanks are being utilized have nitrate levels exceeding background concentration levels. This is of particular concern since several of these areas are in or near suspected aquifer recharge regions. The Comprehensive Monitoring Program needs to include monitoring of these areas of concern as well.

Recharge areas and suspected recharge areas as well as major arroyos and other water courses need to be maintained to avoid contamination of the aquifers and water supplies. The U.S. Forest Service's Land Use Management Program for their lands in the Manzano Mountains (Cibola National Forest) has a watershed component that is an example of a pro-active effort of this nature (Appendix E). Similar programs enacted by the other state and federal agencies and large land holders in the area would assist in keeping the water supply drinkable. The Land Grants have also begun a watershed management program. The Terrain and Vegetative Modification Program, Water Development Program, Program No. 2, is complementary to this effort. Land use codes should be developed by the Counties and the state that protect these major recharge areas as well.

WATER QUALITY PROGRAMS - SUMMARY:

- PROGRAM NO. 1 - INFORMATION PROGRAM: Implement an Information Program so that the Basin's residents understand the Clean Water Act and appropriate New Mexico Environmental Department and United States Environmental Protection Agency standards and programs. (NOTE: This Program has been included in the Information (Education) Program outlined under the Management Programs in Program No. 8. A brief discussion is included here to indicate the importance that this effort plays in the overall development and execution of Water Quality Programs.)

WATER QUALITY PROGRAMS (cont.)

- PROGRAM NO. 2 – MONITORING PROGRAM: Develop and implement an effective comprehensive monitoring program as a part of the Basin-wide water quality and water level program targeted initially at areas of known or potential contamination. (NOTE: This Program has been included as a part of the overall Comprehensive Monitoring Program described under Management Programs, Program No. 4.)
- PROGRAM NO. 3 – AQUIFER (WELL) PROTECTION PROGRAM: Implement a well identification, capping and plugging program to protect Basin aquifers from surface contamination as a first priority and aquifer to aquifer contamination as funding allows. Also incorporate a wellhead protection program into county ordinances and codes for all counties and ensure enforcement.
- PROGRAM NO. 4 – SEPTIC TANK REMEDIAL PROGRAM: Implement a septic tank inspection, pumping and repair (as needed) program; and explore alternative sewage disposal system demonstration project(s), expanding the more promising technologies as funding allows.
- PROGRAM NO. 5 – SEWER SYSTEM REMEDIAL PROGRAM: Survey existing sewer systems to ascertain current condition and to develop remedial programs as needed to bring the systems to current standards and to ensure future compliance.
- PROGRAM NO. 6 – SEPTIC TANK EFFLUENT PROGRAM: Develop a septic tank effluent pilot program to explore the feasibility of utilizing gravity feed systems to remove nitrates and other serious contaminants as potential aquifer pollutants. Expand the use of this program over time, if feasible.
- PROGRAM NO. 7 – ADVANCED INDIVIDUAL TREATMENT SYSTEMS: Develop several pilot programs using advanced individual treatment systems to replace septic tanks. Expand the program through tax credits or grants or other incentive programs targeted at areas where nitrate levels appear to be a potentially significant concern.
- PROGRAM NO. 8 – NEW SEWER SYSTEMS: The use of sewer systems to handle wastewater should be a part of the County and Municipality codes where housing and population densities make them necessary. (NOTE: This is covered under Codes and Ordinances in the Management Programs, Program No. 6.)
- PROGRAM NO. 9 – WATERSHED MANAGEMENT: Utilizes the existing U.S. Forest Service Watershed Management Program (Appendix D) as an example of an ongoing effort and as a starting point towards a comprehensive watershed management program.

Water Quality Programs will cost approximately \$195,000 to set up during the first year. The annual cost to execute the programs is estimated at approximately \$510,000 with a five-year program cost totaling about \$2,550,000.

WATER QUALITY PROGRAMS (cont.)

<u>WATER QUALITY PROGRAMS SUMMARY</u>								
<u>Program No.</u>	<u>Priority</u>	<u>Reduct Goal</u>	<u>Set-up Period Year 1999</u>	<u>Initial Cost</u>	<u>Execution Period Years 2000 - 2004</u>	<u>Annual Cost</u>	<u>5-Year Cost</u>	<u>Remarks</u>
Program No. 1 (Information Program)	CRITICAL	N/A	Program is included in the Information (Education) Program discussed under the Management Program, Program No. 8.					
Program No. 2 (Monitoring Program)	CRITICAL	N/A	See the Comprehensive Monitoring Program discussion under the Management Program, Program No. 4.					
Program No. 3 (Aquifer (Well) Protection Program)	CRITICAL	N/A	Eval existing prog, Dev data base on wells, establish criteria and priority, develop wellhead ordinances	\$10,000	Execute program based on criteria and priorities, update data base	\$100,000	\$500,000	Continue in 5-year increments
Program No. 4 (Septic Tank Remedial Program)	CRITICAL	N/A	Set-up inspect & fix program, ID participants & useful tech & set up pilot programs	\$121,000	Eval efforts, modify and cont. useful programs	\$205,000	\$1,025,000	Continue in 5-year increment
Program No. 5 (Sewer System Remedial Program)	#3	N/A	Identify and eval. local sewer systems	\$20,000	Take indicated remedial action	\$50,000	\$250,000	Continue as necessary
Program No. 6 (Septic Tank Effluent Program)	#4	N/A	Identify likely areas and set up pilot programs	\$20,000	Construct gravity flow systems and evaluate	\$100,000	\$500,000	Continue if warranted and feasible
Program No 7 (Advanced Individual Treatment Systems)	#5	N/A	Develop pilot locations and programs	\$20,000	Construct system and begin opns and data collect.	\$50,000	\$250,000	Publicize and continue thru incentives program if feasible
Program No. 8 (Codes & Ordinances)	#2	N/A	See Codes and Ordinances Program discussion under the Management Programs, Program No. 6.					
Program No. 9 (Watershed Management)	CRITICAL	N/A	Review existing efforts	\$4,000	Review and coord efforts, assist fund.	\$5,000	\$25,000	Continue as needed
TOTALS				<u>\$195,000</u>		<u>\$510,000</u>	<u>\$2,550,000</u>	

Figure 25: Water Plan--Water Quality Programs Summary

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 1 – INFORMATION PROGRAM

Rationale: Most Basin residents are unaware of contamination potential, state and federal standards and what all the above mean. The residents need to have an opportunity to evaluate the Basin's water resource situation based on plain language, not technical phraseology so that they can cause informed useful decisions and actions at all levels of government and private endeavor, particularly local levels.

Goal: Inform and educate.

Priority: CRITICAL

Recommended Action: Committee will set up a "speakers bureau" and a "writers bureau" from experts who can communicate in understandable terms making these people available to discuss contamination of aquifers with the public (orally and in written articles). Over time develop through the Basin's school systems effective classroom programs with hands-on experience for school students of all ages.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan-Dec 1999 (Action: Committee)	\$10,000	Set up the program. Publish articles and make presentations throughout the Basin.
Jan 1, 2000-Dec 31, 2004 (Action: Committee)	\$20,000 per year	Continue program. Expand into support of water resource education programs in the various school systems throughout the Basin.
Jan 1, 2005-Dec 31, 2039	\$20,000 per year	Continue program in five-year increments, modifying effort based on results and available funding.

(NOTE: Above figures and discussions have been included in the Information (Education) Program discussed under Management Programs, Program No. 8. The above is included here to emphasize orders of magnitude for the reader, but is not included in the Water Quality Program Summary.)

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 2 – COMPREHENSIVE MONITORING PROGRAM

Rationale: One of the gravest threats to any water supply subject to domestic and agricultural usage is contamination, both surface and subsurface. Contamination in the Basin also comes from brine or salt water invasion (mixing and replacement) as the aquifer is de-watered. Once contaminated, the water cannot be returned to a drinkable condition without sophisticated treatment. In California in areas serving several million people desalinization and treatment plants are turning sewage and salt water into drinking water at costs of \$1,500 to \$2,000 per acre-foot. While the technology is viable the economics are not at this time for rural areas like the Estancia Basin. The costs to turn contaminated water into drinking water would be prohibitive for a rural rather sparsely settled area. Monitoring is intended to give early warning and to protect the scarce drinking water supply currently available. It also provides an early opportunity to take preventive or corrective action when necessary.

Goal: Monitor areas of concern, providing timely warning of contamination and/or potential contamination.

Priority: CRITICAL

Recommended Action: Set up as part of the Basin-wide Comprehensive Monitoring Program to ensure economy of scale and more efficient Basin-wide coverage.

IMPLEMENTATION:

See Comprehensive Monitoring Program under the Management Programs, Program No. 4. Cost is included under that program. Action agents are the Committee and the Counties with the New Mexico Environmental Department providing technical assistance and funding if possible, with the possibility of further assistance by other state and federal agencies, or national not-for-profit foundations.

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 3 – AQUIFER (WELL) PROTECTION PROGRAM

Rationale: Wells, whether in use, or not connect the surface to one or more aquifers and may connect aquifers to each other. In a basin where water levels are steadily dropping and the water quality appears to be worsening, any well poses a contamination threat that should be minimized.

- Abandoned Wells—Identify and cap abandoned wells as a minimum to prevent surface contamination. When funding permits, plug wells judged to present the gravest subsurface threat. Intent is to protect the aquifer as much as possible. A secondary benefit, but a very real one, is that this program will make the Basin safer for everyone, especially children.
- Operating Wells—Enact a wellhead protection ordinance in each county to protect the aquifer from contamination. Operating wells present a potential threat to the aquifer that must be addressed. The area outside the pipe needs to be sealed to prevent contamination from infiltrating into the aquifer(s) along the outside of the pipes. This cost should probably be borne by those using the well; however, some form of incentives program may be necessary to gain compliance.

Goal: Prevent and minimize surface and subsurface contamination of aquifers.

Priority: CRITICAL

Recommended Action: Review existing abandoned well capping and plugging programs in use elsewhere such as those used in the High Plains Water Conservancy District in Texas, and set up a program that identifies all known wells (abandoned and in use) on a computer-based Geographic Information System. Evaluate known abandoned wells, establish priorities, secure funding and cap all known abandoned wells as quickly as funding permits. Plug wells that appear to be of most concern in terms of contamination (proximity to known contaminants, connection between aquifers).

Develop a low-cost or no cost loan program or a tax credit program so owners can plug wells they know about. Review existing wellhead protection ordinances and develop a draft ordinance if needed (Committee action) for consideration by appropriate governmental entities. Require corrective action by owners where known contamination poses a threat; and, have well owners/users throughout the Basin seal the outside of their pipes to prevent contamination from entering the aquifers by traveling down the outside of the well pipes. Assist with funding through low cost loan or grant programs, or utilize tax incentives to gain compliance.

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 3 (cont.)

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1, 1999-Dec 31, 1999 (Action: Committee & Counties)	\$10,000	Review existing programs. Identify existing wells and develop a GIS based data base, establish criteria and develop the program. Develop wellhead protection ordinances and procedures and codify.
Jan 1, 2000-Dec 31, 2004 (Action: Committee & Counties)	\$100,000 per year	Update data base; cap known high priority abandoned wells; plug a select few with high contamination potential; conduct on-the-ground wellhead inspections in locations of known contamination; begin well pipe protection program (sealing of outside of well pipes).

(NOTE: Soil and Water Conservation Districts should adopt pro-active programs to protect their members from future New Mexico Environmental Department and U.S. Environmental Protection Agency actions. Once an organization or an individual is cited for a violation, it costs much more to correct than if pro-actively addressed and that individual or business will receive considerable follow-up attention.)

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 4 – SEPTIC TANK REMEDIAL PROGRAM

Rationale: Septic tanks are in use in many areas unsuited to their treatment characteristics. In addition, many are cracked, plugged, leaking and operating as no more than a cesspool. In areas of high concentration (the more populated areas) and in areas where aquifer contamination is more likely, septic tanks need to be inspected and pumped with deficiencies corrected as necessary.

Inspection could be a free service provided by the Counties in the Special Groundwater Management Areas on a five-year rotating basis. Pumping should be at the owner's expense and spot checked by the Counties. If necessary the tanks may need to be pumped by the County and billed to the owner. Counties may want to set up inspection and pumping programs billed to the owners in a manner similar to garbage collection service with the option for the owner to do it themselves and furnish a certified report of completion to the Counties. The potential also exists for tax credit programs or for the use of private entities under an umbrella contract to specific local governmental entities such as soil and water conservation districts, municipalities or local water and wastewater utilities or districts.

Goal: Protect runoff, groundwater in transit, and aquifer water supplies from surface and septic tank contamination.

Priority: CRITICAL

Recommended Action: Set up a free County inspection program, initially on a volunteer basis except in areas of special concern such as recharge zones where it should be mandatory. If corrective action is required, it should be an owner's option on how to accomplish it (at their own direction and expense or done by the County and billed to them). Corrective measures to fix cracked or clogged tanks and non-operational drain fields should be an owner expense through a low cost loan or grant program(s) to make funding available to those who need financial help. A tax credit program may be viable as well to encourage voluntary, pro-active compliance.

Develop demonstration efforts in conjunction with local developers, municipalities, businesses and counties to illustrate proven state-of-the-art wastewater treatment systems and techniques (gray water reuse, constructed wetlands, zeolite filtration, et. al.). Secure federal and state funding to assist in this effort, probably through the U.S. Environmental Protection Agency and the New Mexico Environmental Department. Explore funding opportunities provided by not-for-profit foundations.

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 4 (cont.)

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan 1, 1999-Mar 31, 1999 (Action: Counties)	\$ 1,000	Set up program and identify willing and able alternate sewage treatment program participants (pilot programs).
Apr 1, 1999-Dec31, 1999 (Action: Counties)	\$20,000	Put demonstration alternate treatment (pilot) program in place and secure funding for evaluation phase.
Jan 1, 2000-Dec 31, 2004 (Action: Counties)	\$ 5,000 per year	Conduct follow-up evaluations of alternate sewage treatment demonstration programs.
Jan 1, 2005-Dec 31, 2040 (Action: Counties)	\$20,000 per year	Continue viable programs in alternate methods of sewage/wastewater treatment.
Jan 1, 1999-Dec 31, 1999 (Action: Counties)	\$100,000	Conduct inspections and furnish reports to owners for resolution (pilot program).
Jan 1, 2000-Dec 31, 2004 (Action: Counties)	\$200,000 per year	Continue inspection program; provide assistance as needed based on program adopted by each county.
Jan 1, 2005-Dec 31, 2040 (Action: Counties)	\$200,000 per year	Continue septic tank inspection and assistance programs on a five-year basis, evaluating, modifying and eliminating based on results and efficiencies.

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 5 – SEWER SYSTEM REMEDIAL PROGRAM

Rationale: Although very few sewer systems currently exist in the Basin, an effort should be made to identify and evaluate the effectiveness of those existing systems. If corrective action is required that action should be undertaken early in the Plan's time frame.

Goal: Ensure that existing sewer systems are functioning properly and not contaminating the aquifers. Ensure that those existing systems meet current NMED and EPA standards.

Priority: Number 2

Recommended Action: Have NMED or contractors/consultants hired by NMED identify and evaluate all known sewer systems in the Estancia Basin. They should evaluate the systems against the present EPA and NMED standards and recommend corrective action and provided cost estimates as required. The data should be turned over to the entity inspected, the appropriate county, the Committee and NMED. The above named entities should then work together to develop funding that will enable correction of the concerns. If this program is used as a punitive program by government it will fail. The intent is for all entities to work together to solve the problem, not make it worse.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan-Dec 1999 (Action: Committee, Counties and NMED)	\$20,000	Identify sewer systems in the Basin; develop inspection criteria; secure program authorization and funding; prioritize systems for inspection.
Jan 2000 to Dec 2004 (Action: Committee, Counties and NMED)	\$50,000 per year	Conduct inspections, develop remedial fixes, fix systems as necessary, ensure compliance with appropriate standards.
Beyond 2004 (Action: Committee, Counties and NMED)	Unknown	Continue program if a need exists and the program has proven to be feasible and has been accepted.

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 6 – SEPTIC TANK EFFLUENT PROGRAM

Rationale: Most of the developments that have been constructed in the Basin rely on septic systems and drain fields to treat domestic sewage. There are several areas where the use of septic tank effluent collection and treatment systems might prove cost effective and provide some amounts of treated effluent for reuse through underground or drip irrigation or aquifer recharge through recharge wells. Systems should be gravity flow based and should collect effluent that normally flows into drain or leach fields by 1-inch or 2-inch collector pipes that feed into a local packaged wastewater treatment system that provides tertiary treatment providing irrigation grade water. Systems should be sited such that as the technology to return the effluent to drinking water standards becomes available and cost effective, the treated water could then be used to augment existing water supplies. Care should be taken to only access those septic tanks that can be fed to the local treatment plant by gravity feed. Pumps and grinders will probably render this type of effort uneconomical.

Goal: Protect the aquifers from septic tank contamination and provide treated effluent for reuse.

Priority: Number 3

Recommended Action: Develop some prototype locations where several septic systems can be hooked to a local (package) treatment plant by gravity flow small diameter PVC pipe and the treated effluent can be used for subsurface irrigation or aquifer recharge.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan - Dec 1999 (Action: Committee and Counties)	\$20,000	Select promising technologies and locations, secure sponsors and funding and establish evaluation criteria.
Jan 2000 - Dec 2004 (Action: Committee, Counties, System Sponsors)	\$100,000 per year	Construct and evaluate pilot programs.
Jan 2005 and Beyond (Action: Committee and Counties)	Unknown	Continue as warranted based on the pilot program evaluations.

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 7 – ADVANCED INDIVIDUAL TREATMENT SYSTEMS PROGRAM

Rationale: Most of the Basin utilizes septic systems of varying ages, makes and conditions to provide wastewater and sewage treatment, particularly individual houses. Many if not most of the individual residences are distant enough from their neighbors to make most if not all of the conventional sewer systems uneconomical and not feasible. The current state of the art in individual advanced treatment systems provides some excellent tertiary treatment systems that could take the place of the old septic systems and provide irrigation quality water for drip irrigation usage or for groundwater recharge. Costs of these systems still exceed that of a conventional septic system; but, they have become orders of magnitude more reasonable with respect to cost in the last few years. New construction should certainly be encouraged either through tax incentives, grant or loan programs, and/or local codes and ordinances to utilize these systems.

Goal: Protect the general population and the water supply aquifers from contamination such as but not limited to nitrate contamination.

Priority: Number 4

Recommended Action: Pilot projects utilizing several of these systems need to be developed throughout the Basin to evaluate their usage in the various types of soils and locations found in the Basin. Initial pilot projects need to be underwritten to a level where it is economical for an owner to use the system, if necessary.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan-Dec 1999 (Action: Committee and Counties with assistance from NMED)	\$20,000	Identify pilot program locations and likely sponsors for the prototype systems.
Jan 2000 - Dec 2004 (Action: Counties)	\$50,000 per year	Construct and evaluate prototype system performance; incorporate in local codes and ordinances as warranted.

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 8 – CODES AND ORDINANCES

Rationale: Wastewater and sewer codes and ordinances need to be reviewed and updated to ensure compliance with New Mexico Environmental Department and Environmental Protection Agency standards and practices.

Goal: Ensure that adequate protection is afforded both residents and the aquifers which supply their water.

Priority: Number 1

Recommended Action: Review existing codes and ordinances in all three counties as well as any local codes and ordinances to ensure relative uniformity within the Basin and compliance with appropriate state and national standards. Review should be accomplished by the entities responsible for the codes and ordinances and then the codes and ordinances should receive a peer review by the other like entities within the Basin. It may be that the five Counties or at least the three principal counties in the Basin should form a staff codes and ordinances review group.

IMPLEMENTATION:

Discussion of time lines, action entities, funding and activities have been included in the Codes and Ordinances Program included in the Management Programs under Program No. 6.

WATER QUALITY PROGRAMS (cont.)

PROGRAM NO. 9 – WATERSHED MANAGEMENT

Rationale: The major watershed areas are critical to the quality of water in the Basin. As such they need to be managed with that in mind, since water is a major source of life for all living things in the Basin and is crucial for a healthy ecosystem and a healthy cultural and socio-economic system in the Basin. Without good water the Basin lifestyles deteriorate quickly.

Goal: Protect the watershed areas that hold the bulk of the snow pack and which are suspected to be major recharge areas or components of those areas. Prevention of significant contamination in these areas is crucial to the health of the Basin's water supply.

Priority: CRITICAL

Recommended Action: Convince all the major land holders in the Basin, particularly those in the recharge and suspected recharge areas to adopt and execute watershed management plans. Assist all entities in developing funding and support for their programs. Use the U.S. Forest Service and Land Grant efforts in the Manzano Mountains as the initial pilot program. Engage the environmental and conservation communities in this effort.

IMPLEMENTATION:

<u>Time</u>	<u>Funding</u>	<u>Activities</u>
Jan-Dec 1999 (Action: Committee, Counties, state and federal agencies, large land holders)	\$4,000	Review ongoing watershed management and protection efforts, coordinating and assisting in the development of funding, programs and supporting execution of those programs.
Jan 2000 - Dec 2004 (Action: Committee, Counties, state and federal agencies, large land holders)	\$5,000 per year	Review and assist ongoing efforts; evaluate performance and adjust efforts as necessary.
Jan 2005 and Beyond	Unknown	Strengthen the more successful programs as warranted and secure necessary funding and ensuring pro-active program execution.



SUMMARY — WATER PLAN PROGRAMS

The estimated funding and anticipated water depletion reduction (saving) goals for each program and totals for each program area are summarized in the following chart:

<u>PROGRAMS</u>	<u>ESTIMATED</u>		
	<u>ANNUAL WATER SAVINGS</u>	<u>INITIAL COST</u>	<u>ANNUAL COST</u>
<u>Total Program</u>	<u>30,000 ac.-ft.</u>	<u>\$979K</u>	<u>\$2,360K</u>
<u>Management Programs</u>	<u>4,500 ac.-ft.</u>	<u>\$210K</u>	<u>\$355K</u>
Program No. 1—Special Groundwater Management Areas.	(N/A)	(N/A)	(N/A)
Program No. 2—Single Focus Oversight Entity	(N/A)	(\$ 80K)	(\$120K)
Program No. 3—Trust Fund	(N/A)	(\$ 80K)	(\$100K)
Program No. 4—Comprehensive Monitoring	(N/A)	(\$ 20K)	(\$100K)
Program No. 5—Information and Education	(N/A)	(\$ 10K)	(\$10K)
Program No. 6—Local Codes and Ordinances	(4,500 ac.-ft.)	(\$ 20K)	(\$ 5K)
Program No. 7—Computer Model Development and Geographic System (GIS) Interface	(N/A)	(N/A)	(\$20K)
<u>Conservation Programs</u>	<u>20,500 ac.-ft.</u>	<u>\$277K</u>	<u>\$1,235K</u>
Program No. 1—Audit and Budget	(200 ac.-ft.)	(\$ 20K)	(\$ 20K)
Program No. 2—Retrofit Plumbing	(300 ac.-ft.)	(\$ 20K)	(\$ 50K)
Program No. 3—Agricultural Irrigation Efficiency	(5,000 ac.-ft.)	(\$102K)	(\$65K)
Program No. 4—Metering	(5,000 ac.-ft.)	(\$ 30K)	(\$100K)
Program No. 5—Watering Practices	(500 ac.-ft.)	(\$ 5K)	(N/A)
Program No. 6—Codes and Ordinances	(N/A)	(N/A)	(N/A)
Program No. 7—Water Rights	(9,500 ac.-ft.)	(\$100K)	(\$1,000K)
<u>Water Development Programs</u>	<u>5,000 ac.-ft.</u>	<u>\$297K</u>	<u>\$260K</u>
Program No. 1—Cloud Seeding	(4,000 ac.-ft.)	(\$120K)	(\$100K)
Program No. 2—Terrain and Vegetative Modification	(1,000 ac.-ft.)	(\$156K)	(\$ 60K)
Program No. 3—Undeclared Area Annexation	(N/A)	(\$ 11K)	(N/A)
Program No. 4—Underground Investigation	(N/A)	(\$ 10K)	(\$100K)
<u>Water Quality Programs</u>	<u>N/A</u>	<u>\$195K</u>	<u>\$510K</u>
Program No. 1—Information	(N/A)	(N/A)	(N/A)
Program No. 2—Monitoring	(N/A)	(N/A)	(N/A)
Program No. 3—Aquifer (Well) Protection	(N/A)	(\$ 10K)	(\$100K)
Program No. 4—Septic Tank Remedial	(N/A)	(\$121K)	(\$205K)
Program No. 5—Sewer System Remedial	(N/A)	(\$20K)	(\$50K)
Program No. 6—Septic Tank Effluent	(N/A)	(\$20K)	(\$100K)
Program No. 7—Advanced Individual Treatment Systems	(N/A)	(\$20K)	(\$50K)
Program No. 8—Codes and Ordinances	(N/A)	(N/A)	(N/A)
Program No. 9—Watershed Management	(N/A)	(\$4K)	(\$5K)

Figure 26: Water Plan Summary

SUMMARY — WATER PLAN PROGRAMS (cont.)

The above programs are based on efforts already in place elsewhere in the United States. They are intended only as guides. The Program Estimates are program budgets based on existing programs placed in context in the Estancia Basin as we understand our water resource needs, and are intended to show relative magnitudes of funding. The Initial Budget Estimate is intended to show the relative magnitude of funding necessary to set up the various programs and bring them to a point where they can be executed starting January 1st, 2000. The annual costs are a "best guess" estimate of yearly budgets to sustain the programs and accomplish actual depletion reductions in line with the established goals over time.

In other programs in existence elsewhere the initial start-up funding has come from federal, state and local entities, usually through some form of cost sharing. In most programs in existence elsewhere a dedicated funding source is created through legislation. The dedicated funding source is absolutely crucial to the success of the Water Plan, since by its very nature real, measurable results in most programs will not be available for several years.

There are numerous water related funding mechanisms available ranging from a slight increase in the New Mexico Gross Receipts Tax for activities in the Basin to permits to drill wells, surcharges on the exportation of water, tax or surcharge on water usage above a certain budgeted level that escalates as use exceeds a given water budget. It is neither the charter nor the intent of the Committee to dictate those solutions, rather the Water Plan points out a few methods that have been adopted successfully elsewhere. It is up to the residents of the Basin and their duly formed organizations and elected representatives to decide how to best fund and execute the Water Plan, and frankly to decide how much of it will actually be accomplished.

BOTTOM LINE: The annual estimated funding of \$2,360,000 per year (1998 cost figures) is for the first five-year increment of a 40-year effort with a start-up cost of \$979,000. The total 40-year program budget estimate appears to about \$94.4 million in today's dollars. The effort results in a reduction in the annual demand depletion rate for the aquifers of about 30,000 acre-feet per year by the Year 2040.

While an aquifer depletion of about 20,000 acre-feet per year may still be occurring in the Year 2040, water supply available in storage in the Valley Fill Aquifer will have been extended by about 260 years to the Year 2380 based on what we now know. That compares very favorably to our present course of action in the Basin which may exhaust the Valley Fill Aquifer by the Year 2120, earlier for many in the Basin, at a cost of \$100 million to \$200 million, possibly more.

It is probable that some of the programs may yield significantly more in terms of depletion reduction, and that the goal of a sustainable water supply may be possible towards the end of the 40-year period. The anticipated depletion reductions are based on about 50 percent of the reported depletion rate reductions (savings) reported by programs in other parts of the country.

SUMMARY – WATER PLAN PROGRAMS (cont.)

We believe the pragmatic conservative approach adopted in the Water Plan enables residents of the Basin to move forward in a pro-active manner. We hope that actual results from the monitoring and metering and underground investigations programs will show that the situation is better than the current data appears to indicate. However, many believe that the situation is worse than currently portrayed. That was made abundantly clear to the Committee during the final two rounds of public meetings in 1998. In either case the comprehensive combination of programs outlined in the Water Plan that stress doing what can be done today, executing "pilot or model programs" that will yield hard data on which to base tomorrow's programs, fixing the water rights dilemma, pro-actively managing the Basin, and embarking on an aggressive monitoring, metering and underground investigation program which will move us forward towards a sustainable, self-sufficient water resource position. The Plan provides a framework that will enable us to react in a positive manner in any future situation.