

New Mexico Water Planning Region 6
Cibola/McKinley Regional Water Plan

EXECUTIVE SUMMARY

“Meeting Future Water Resource Needs”

I.
PURPOSE & PROJECTION

A. Purpose

The State of New Mexico has designated all of Cibola County and most of McKinley County (excluding that portion of McKinley which drains into the San Juan River Basin) as Region 6 for its water planning process¹ (see map on preceding page, and the regional and subregional maps included in the appendices at the end of the *Executive Summary*)². Through the Interstate Stream Commission (ISC), the State is assisting local communities to plan for their water needs on a regional basis. The goal of this process is to create realistic plans for communities to meet their water needs over the next 40 years. The State of New Mexico also recently established a Water Trust Fund as an ongoing mechanism to partially fund water resource projects and efforts around the state. It is anticipated that local communities will have greater access to both this source of State funding and to Federal assistance, for water projects that are part of an ISC-approved regional plan.

The purposes of this Executive Summary are:

- (1) to outline the Cibola/McKinley region’s available water resources, needs, challenges, and alternative options as developed in the Region 6 Water Plan;
- (2) to identify areas where there is a strong potential for collaborative effort on a regional or sub-regional basis; and
- (3) to recommend certain courses of action for governmental and water use entities in the region.

The ISC has stated that it is looking for definitive commitments for local action over the next three to five years as a threshold requirement for approval of an overall water plan. It is

¹ Region 6 also includes a small portion of San Juan County on the south side of the Chuska Mountains. This area is included in Region 6 because it does not drain into the *San Juan River in New Mexico*, but rather is the upper reaches of the *Whiskey Creek Basin*, which drains into the *San Juan in Arizona*.

² The initial map titled “Water Planning Region 6” was created by the McKinley County GIS Center. Included in the appendices attached at the end of this *Summary* is a U.S. Bureau of Reclamation Map depicting the Navajo/Gallup Water Supply Project as well as maps generated by the New Mexico Water Resources Research Institute (NM WRI), showing Region 6 in shaded relief, as well as depicting land use, land ownership, groundwater basins, and watersheds.

hoped that local and tribal governments will be able to concur with and/or add to the alternatives outlined in this *Summary*. The final Regional Plan documents is scheduled to be presented to the ISC for approval on January 21st of 2004. Ultimately, this summary document should paint a picture of the Cibola/McKinley region with which its constituent governments can identify, and which effectively addresses the water resources and challenges of the area. Planning is a continuing process, and comments on this *Summary* are welcome.

B. Projection: Communities in the Cibola/McKinley Region Face Serious Water Resource Challenges, but Can Ultimately Secure Their Water Future.

As outlined below, the Cibola/McKinley region faces serious challenges to meet the water supply needs of its communities over the next century. Water users in the region have traditionally been dependent on finite groundwater supplies and will need to find ways to extend the life of those supplies, or acquire new sources of supply, for long-term stability. The fact that many of the region's current and potential water supplies are the subject of unresolved Tribal and Federally reserved water rights claims is an additional challenge to meeting that goal.

Recognizing the challenges involved, however, the region's communities may secure their water resource future through a combination of:

- (1) water reuse and conservation actions;
- (2) continued groundwater development;
- (3) successful construction of renewable water supply projects such as the proposed Navajo/Gallup Water Supply Project; and
- (4) adjudication or settlement of unresolved water rights claims.³

³ The Region 6 Water Plan recognizes that not all of these items will be appropriate for every community. Particularly, the unresolved litigation concerning water rights claims in much of the Region creates a limitation on certain approaches.

II. OVERVIEW OF NEW MEXICO WATER PLANNING REGION 6 --CIBOLA/MCKINLEY--

A. The Diverse Communities Within the Zuni Range, Mt. Taylor, & Puerco River Watersheds⁴

The Cibola/McKinley region is mostly a rural area typified by rugged landscapes and limited water supplies. Diversity and complexity are the region's two watchwords whether one looks at the region's socio-cultural make-up, its geology and landscape, or its pattern of land ownership and governmental jurisdiction. The region boasts one of the most diverse mixes of culturally distinct communities in the nation. Over many centuries, successive waves of human migration have given the region three separate Pueblo Indian tribes, a significant portion of the Navajo Nation, and large populations derived from Hispanic, European and other cultural heritages. Concurrent with the region's cultural diversity is a very complex pattern of Tribal, State, Federal, and private land ownership and jurisdiction. While the region's patchwork quilt of governmental jurisdictions can create obstacles to coordinated regional efforts, the diversity of cultural backgrounds also gives the region an unequalled opportunity for socioeconomic dynamism for building a vibrant future.⁵

For much of the 20th century, the Cibola/McKinley region enjoyed a significant farming and ranching sector while high-wage mineral extraction industries provided the main engine for the private sector economy. Due to changes in world energy markets and in local climate patterns, however, both of those historic business sectors have declined, and private regional employment is turning towards tourism, retail business, and some value-added light manufacturing. The Cibola/McKinley region has a highly dispersed population, which has created a general transportation pattern in which people commute from their small communities and individual homesteads to regional urban centers for work, shopping, and to haul water.

⁴ NOTE: An intriguing, but potentially confusing, aspect of the Cibola/McKinley region is that it contains part of the *Rio Puerco* watershed on its eastern side, and the upper watershed of the *Puerco River* on its western side. Despite the similarity in names, the *Rio Puerco* and the *Puerco River* are distinct ephemeral streams that are on opposite sides of the Continental Divide. The *Puerco River*, sometimes referred to the *Rio Puerco of the West* or colloquially as the "*Perky*," flows into the *Little Colorado River* in Arizona, while the *Rio Puerco* flows into the *Rio Grande*. NOTE ALSO: For purposes of this Summary, the *Whiskey Creek* and *Puerco* river basins are viewed as one water community.

⁵ See, the shaded relief "Planning Region" and "Land Ownership in the Region" maps produced by NM WRRRI in Appendix A at the end of this *Summary*.

B. Regional Water Challenges

Region 6 has never had sufficient surface water resources to meet its municipal and industrial demands on a sustainable basis. While individual homesteads may have been able to sustain themselves on cisterns and local streams, most of the towns and cities in the region have been pumping groundwater for decades. Moreover, unlike many other regions in New Mexico, the Cibola/McKinley communities do not share one main, or centralized, water supply. Some water users receive a portion of their water supply from surface streams, but most are dependent on limited, and unconnected or remotely connected, groundwater aquifers. Unfortunately, the region's groundwater aquifers do not recharge on anywhere near a human timescale. Over time, most wells lose production as the water pressure in an aquifer goes down. Consequently, many communities have had to periodically relocate their wellfields, or extend their groundwater drilling to ever-deeper strata of saturated soil.⁶ To secure their economic future, communities in the region face the twin challenges of (a) finding practical ways to extend the life of their groundwater supplies, and (b) building water supply lines to tap new sources of water.

Practically Recoverable Supplies. As groundwater mining has continued, most of the less complicated and shallow aquifers have been tapped. Future supplies will need to come from more complex and deeper geologic and soil structures at greater and greater degrees of technical difficulty and cost. The combination of reduced production from current wells and the increased costs of new production raises the question of what is the limit of "practically recoverable" water in the region. Based on projections of population expansion and water use by the Bureau of Business and Economic Research (BBER) at the University of New Mexico, meeting the water demand through the year 2040 would require production of approximately 25% of all the potentially recoverable groundwater in the region. However, this potential amount may be outside the limits of practicality, given the limits of current technology and cost feasibility.⁷

Projecting Demand Based on Current Use Versus Needed Use. Typically, water supply and demand projections are based on current per capita uses. However, there are communities in the Cibola/McKinley region that have exceeded the functional social limit for per capita "conservation." Many residents must currently haul water at horrendous expense (up to \$22,500/year per family). In particular, certain Native American communities have identified the need to increase per capita water availability to avoid socially disruptive levels of outward migration.⁸ Typical projection models, therefore, are not uniformly applicable to Cibola/McKinley communities.

⁶ As discussed in the body of the Region 6 Water Plan, parts of the region overlie different unconnected, or poorly connected groundwater aquifers which are sometimes stacked on top of each other. (See Section IV of Region 6 Water Plan).

⁷ See Region 6 Water Plan, Section V, part B.

⁸ **Comments of Navajo Nation Officials** to Region 6 Water Plan, (Regional Plan Technical Committee Meeting, April 24, 2003). (See also, Water Resource Development Strategy for the Navajo Nation, pp. 3-4 (Navajo Department of Water Resources, July 13, 2000); hereinafter Navajo Nation Water Strategy.) **Comments of Zuni Indian Tribe** to 11/18/03 *Review Draft*, p. 2 of letter from Governor Arlen P. Quetawki, Sr. dated Dec. 19, 2003.

C. Sub-Regional Character

Although communities in the region face similar water resource challenges, there is a strong risk of over-generalizing the conditions in the Cibola/McKinley region. Since the region is not characterized by a predominant watershed, groundwater aquifer, or cultural/economic dynamic, the region should be viewed as comprised of at least three subregions:

Sub-region 6(A) East of the Continental Divide: Encompassing the *Rio San Jose*, *Rio Puerco*, and *Rio Salado* watersheds (extending from the Tohajiilee Navajo community and the Laguna and Acoma Pueblos, through Grants to Bluewater);⁹

Sub-region 6(B) The southern and western drainages of the Zuni Range: Primarily composed of the Zuni Pueblo and Ramah Navajo communities in the *Zuni River* basin;¹⁰ and

Sub-region 6(C) The Puerco River & Whiskey Creek basins: Including communities in western McKinley and southwestern San Juan Counties which would benefit directly or indirectly from the proposed Navajo/Gallup Water Supply Project (NGWSP).¹¹

The community interests of these sub-regions overlap, particularly with regard to groundwater development, but using these sub-regions can clarify groupings of practical water resource alternatives.

1. **Sub-Region 6(A): East of the Continental Divide -- the Rio San Jose, Rio Puerco, Rio Salado, and North Plains Closed Basin Drainages**

a. **Description**

Sub-Region 6(A) encompasses all of the river basins in Cibola and McKinley Counties that eventually drain into the *Rio Grande*, as well as Cibola's portion of the *North Plains Closed Basin*. It is shaped in a rough triangle with the Continental Divide forming its northwestern border, the Cibola county line to the south, and the Cibola and McKinley county lines to the east. This area mirrors the overall complexity of Region 6 from cultural, governmental, and hydrological viewpoints. Along the Continental Divide running north from Thoreau to Ojo Encino are several Navajo Chapters, and to the east of Mt. Taylor the Tohajiilee Navajo Chapter sits on the eastern border of Region 6. In the middle, running from Thoreau to Grants along I-40

⁹ See NM WRI maps for 6(A) in Appendix B.

¹⁰ See NM WRI maps for 6(B) in Appendix C.

¹¹ See NM WRI maps for 6(C) in Appendix D.

are a number of non-Indian communities. Finally, the Acoma Pueblo and Laguna Pueblo lie in the southeastern portion of the area between *the Malpais* and Tohajiilee.¹²

As pertinent to this sub-region, the Region 6 Plan focuses on the water supply and demand considerations of the *Rio San Jose* basin and to some extent the *Rio Puerco* basin, due to the availability of planning information for those basins. While the Region 6 Plan includes analyses of the water supplies in the *North Plains Closed* basin and *Rio Salado* basin, those sources are not as well understood and therefore provide less reliable information on which plans can be developed.

As with the rest of Region 6, most community water use in Sub-region 6(A) is dependent on groundwater. Water planning is more complex in this area because of uncertainty as to both the legal and the physical availability of water. There are significant unresolved water rights claims in this sub-region made on behalf of the Navajo Nation, Acoma Pueblo, and Laguna Pueblo, which cloud the rights of use within the area. Also, the degree to which the area's aquifers may be inter-connected and the rate of aquifer recharge have not been precisely determined.

The Rio Puerco Basin. The *Rio Puerco* basin lies mostly within other water planning regions and also subject to unresolved water rights issues within the *Rio Grande* basin, outside the Region 6 planning scope. With the possible exception of the Native American communities making water rights claims within it, the *Rio Puerco* is not a major source of water for Region 6 communities. Water supply and demand projections for this basin have not been extensively analyzed, or at least not widely shared, and thus are not prominent in the regional plan.

It should be noted, however, that the Navajo Chapters of Little Water, Whitehorse Lake, Torreon, Ojo Encino, and Pueblo Pintado are designated to have water availability from the Cutter Lateral of the proposed Navajo-Gallup Water Supply Project (NGWSP).¹³ The NGWSP is reviewed below in the section on the Region 6(B) *Puerco River* basin sub-region.

The Rio San Jose Basin. This basin is a critical, if not the only, source of both ground and surface water for most of the communities in this sub-region. Despite the uncertainties of litigation, therefore, the water supply picture in this basin is much more extensively analyzed within the Region 6 Plan. Also, the Village of Milan and the City of Grants have utilized the Region 6 planning process, and the information developed from it, to work on their own forty-year plans (the *City of Grants 40-Year Water Plan*, and the *Village of Milan 40-Year Water Plan*).¹⁴ Therefore, the water supply and demand equation for this basin has been much more extensively reviewed, particularly for these communities. These local plans are incorporated as appendices to the Region 6 Water Plan and will be referred to as appropriate.¹⁵

¹² The *Malpais* is indicated by the pink colored National Park Service lands depicted on the NM WRRRI map "Land Ownership in Region 6(A)" in Appendix B, and the larger NM WRRRI "Land Ownership in the Region" map in Appendix A.

¹³ See U.S. Bureau of Reclamation map titled "Navajo-Gallup Water Supply Project-San Juan River PNM Alternative" in Appendix A.

¹⁴ *City of Grants 40-Year Water Plan*, prepared by the Northwest New Mexico Council of Governments 1999; *Village of Milan 40-Year Water Plan*, prepared by the Northwest New Mexico Council of 2003.

¹⁵ These plans look at water needs in from the perspective of the jurisdiction of their respective municipal governments. Therefore, they are local in nature, as opposed to regional. However, they draw very heavily from the regional planning documents produced and submitted to the ISC up through 1998.

b. Sub-Region 6(A) Water Supply Overview

At first glance, the water supply and demand picture looks favorable for the *Rio San Jose* basin. The basin has fairly large, potentially recoverable, groundwater resources with decent water quality. However, as noted by the technical consultants for the 1998 Regional Plan, Shomaker and Associates, it is likely that only a very small amount of this water can actually be produced.¹⁶ Also, significant water rights claims have been made in the basin on behalf of the Navajo Nation, Acoma Pueblo, and Laguna Pueblo. Some discussions have taken place among the area's various tribal and local governments regarding a potential regional multi-source/multi-use approach to meeting collective water demand. Further pursuit of this cooperative "wet-water" option is highly recommended.¹⁷

A positive note, however, is that at least in some localities groundwater recharge and draw-down appear to have reached an equilibrium. The San Andres-Glorieta Aquifer is one of the principal aquifers in the Bluewater groundwater basin. In 1999, the static water levels of the Grants wells in this aquifer did not appear to be declining, and the hydrologically-connected Ojo del Gallo Spring had resumed flowing.¹⁸ The resumption of this spring's flow is thought to be related to the closing of uranium mining operations in the region and the cessation of related groundwater pumping.

Nevertheless, significant water efficiency improvements and conservation programs will be required for some of the communities in this area in order to avoid supply shortfalls over the near and long-term. Although water supply and demand projections were not available for the tribal communities in the region, both the City of Grants and the Village of Milan projected ongoing water supply shortfalls starting within the next few years. Both of these communities have developed a set of conservation proposals in order to at least partially meet the shortfall.

(1) Water Sources

Surface Water: The *Rio San Jose* is generally dry, except immediately after heavy rains. The *Rio San Jose* basin includes most of the eastern portion of Cibola County, and a portion of south central McKinley County.¹⁹ The watershed begins with *Bluewater Creek* which becomes the *Rio San Jose* prior to its confluence with *San Mateo Creek*. It then flows through Grants to Horace Springs and eventually connects to the *Rio Puerco* outside of Region 6 near the Bernalillo/Valencia County line. *Bluewater Lake*, a reservoir constructed in 1927 in the upper basin, is the main storage facility for surface water in the area, with a capacity of 45,500 acre-

¹⁶ Regarding groundwater recovery over the breadth of Region 6, according to Shomaker and Associates: "There is no possibility of extracting even a tiny fraction of this water for use, even if cost were not a consideration. To extract even a small percentage of this water would lead to serious consequences in the form of land surface subsidence." (Region 6 Plan, IVA-17).

¹⁷ Along these lines, the U.S. Bureau of Reclamation spent a number of years during the past decade studying the possibility of building a water supply project using water from the inoperative Atlantic Richfield (Arco) uranium mine at Mt. Taylor. This potential project (the Mt. Taylor Project) was seen as an element in a possible settlement of the water rights litigation in this river basin. That effort has recently stalled, reportedly in part because of uncertainty regarding availability of the Arco rights for sale, and their potential cost.

¹⁸ *Grants Water Plan*, p. 25 and Table 4, p. 26.

¹⁹ See, NM WRRRI "Watersheds in Region 6a" in Appendix B.

feet. However, the surface water flows are very limited and unreliable and not seen as a viable source for municipal supplies in the area.²⁰

Groundwater. The upper *Rio San Jose* surface water basin overlies the *Bluewater* groundwater basin as designated by the New Mexico State Engineer. The lower *Rio San Jose* surface water basin overlies the *Rio Grande* groundwater basin.²¹ Through a patchwork quilt of groundwater aquifers, there are estimated to be nearly 1,380,000 acre-feet of good quality recoverable groundwater (sweet water)²² in this area,²³ although only a fraction of this is recoverable in practical terms.

(2) Water Rights Litigation

The water rights within in the *Rio San Jose* basin have been in litigation since 1982. The various suits have been consolidated into a single case, commonly referred to as the *Kerr-McGee* adjudication.²⁴ As delineated in the table below, the total amount of surface and groundwater water rights claimed in the basin is 221,479 acre-feet.²⁵

TABLE		
Water Rights Claims in the Rio San Jose		
CLAIMANT		AMOUNT (acre-feet/year)
1	United States on behalf of the Pueblo of Acoma	26,525
2	United States on behalf of the Pueblo of Laguna	31,080
3	United States on behalf of the Navajo Nation	4,465
4	Navajo Nation – on its own behalf	111,483
5	Total Indian Water Rights Claimed (lines 1 thru 4)	173,553
6	Non-Indian Water Rights Claimed	47,926
7	TOTAL Water Rights Claimed (line 5 + line 6)	221,479

As noted previously, surface water flows in the basin are very limited, and the total amount of recoverable sweet water is estimated at just under 1.4 million acre-feet. Thus, the total amount of water claimed as an annual right amounts to a little over one-seventh (14%) of the groundwater in total storage. Of course, “claims” do not automatically translate into finally “adjudicated rights.” However, these numbers raise a critical question concerning the rate of annual recharge to the major aquifers in the basin. From a water planning standpoint, a worst-case scenario would be: very low amounts of aquifer recharge; validation of every claim; and maximum production pursuant to every validated claim. Under this scenario, the basin would be

²⁰ See, *Grants Water Plan*, pp. 9-12; *Milan Water Plan*, p. 5.

²¹ See, NM WRRRI map “Underground Water Basins in Region 6a” and “Watersheds in Region 6a” in Appendix B.

²² For purposes of this discussion, “sweet-water” is considered to be water with total dissolved solids (TDS) of less than 1000 milligrams per liter

²³ See, **Table 2, p. 24 of Grants Water Plan.** Recoverable sweet-water in storage in Cibola County, Bluewater and Rio Grande Administrative Basins is estimated at 1,378,930 acre-feet.

²⁴ *Grants Water Plan*, appendix B.

²⁵ *Milan Water Plan*, p. 13.

essentially dry within seven years, a challenge that is further compounded by the practical limits of water pumping; i.e., as noted above, only a fraction of the “recoverable” water in storage can actually be extracted with current technology.

In New Mexico’s legal system of prior appropriation, streams are regularly “over-appropriated.” This means that in most years there are more water rights held than there is water available to meet those rights. In years of scarcity, those with senior rights are “made whole” first with respect to the full amount of their rights, while more junior rights holders are subject to curtailment of their water use based on the remaining water available. In this sub-region, the claims of the United States on behalf of Acoma Pueblo, Laguna Pueblo, and the Navajo Nation (62,070 acre-feet), if upheld, would have the most seniority.²⁶ However, when water production is based on groundwater, stream administration (i.e., water use management by seniority) can be of minimal utility for planning purposes. Therefore, the local rate of aquifer recharge is the critical water factor to balance against demand projections. The magnitude of groundwater claims in the sub-region, however, underscores the legal uncertainty associated with water resources in this sub-region.

c. Case Examples of Groundwater Recharge Compared to Water Demand in Sub-Region 6(A): The Grants/Milan Area.

Much of the focus of water supply estimates concerns aggregate supply in a basin. While this is useful for a broad-brush look at long-term water resources, it doesn’t necessarily reflect local conditions. Groundwater pumping creates an immediate “cone of depression,” into which surrounding groundwater can migrate. However that water must move through varying geologic formations, which can take years depending on the makeup of those formations. Hydrologists with the United States Geological Survey have suggested that for areas with groundwater pumping dispersed over a large area, that the associated aquifers should not be viewed as a single container for planning purposes. Rather, they suggest that planners may find it more useful to view these groundwater supplies as egg-carton shaped packages with multiple cones of depression.²⁷

In reviewing the data from the Grants and Milan Water Plans, it should be noted that the Grants area may have higher recharge rates than other areas in the region. Shomaker and Associates cautions that both recharge rate and productivity at any one location can only be discerned through “specific and local knowledge,” including specific well and water table data for a given location.²⁸

The following summary focuses on the aggregate water supply and demand issues of Grants and Milan. Both the Grants and Milan municipal water plans, however, also placed significant emphasis on water quality protection and utility system requirements to meet peak demands and growth.

²⁶ Milan Plan, p. 12. *See also*, Grants Plan, Appendix B, “Indian Water Rights and Other Legal Matters.”

²⁷ U.S.G.S. Circular 1186, *Sustainability of the Groundwater Resources*, Box D, *High Plains Aquifer–Egg Carton or Bathtub?* W.M. Alley, T.E. Reilly, and O.L. Frank, 1999.

²⁸ *See Region 6 Plan* (1998), page ES-8.

(1) **City of Grants**

(a) **Water Availability and Demand Projections.**

The City of Grants currently has two wells producing potable water pumped from the San Andres-Glorieta Aquifer. The static well levels²⁹ at these two wells indicate that recharge and demand are in balance for this area. Measurements at the main well indicate that this balance has been maintained for some time. For example, although not continually monitored, water level at this well was measured at 167 feet in September 1976, and 22 years later at an average of nearly 166 at various times in 1998.³⁰

Grants currently has permitted water rights of 2,841.2 acre-feet per year.³¹ Yearly pumping from the City's wells (the two wells producing potable water, and an artesian well used for landscape watering) averaged 2,248 acre-feet a year from 1990 through 1998 leaving 593.2 acre-feet of unused permitted rights for future growth.³² Historically, the population of Grants has fluctuated greatly depending on local economic swings. Using a moderate growth projection and a baseline of 205 gallons of per capita use per day (gpcd)³³ Grants expects to water demand to surpass this supply by 2010. From 2010 to 2040 demand will increasingly exceed supply creating a nearly 564 acre-feet annual shortfall by the year 2040.³⁴

(b) **Meeting Future Demands**

The *Grants Water Plan* reviewed alternatives in two main approaches for the City to meet its future demands: (1) purchasing additional water rights; and (2) reducing the per capita daily use through increased efficiency within the Grants water system, and conservation measures. The review of the water purchasing alternative was not encouraging, although sufficient water rights were thought to be on the market. The uncertainties created by the *Kerr-McGee* adjudication indicated that those purchases might be for very junior rights which would rarely, if ever, have actual "wet water" associated with them.³⁵

In analyzing conservation alternatives, the *Grants Water Plan* reviewed the water demand by the different types of users (i.e. domestic, commercial, industrial, and city parks). It also reviewed the amount of system losses that resulted in "unaccounted-for-water".³⁶ Unaccounted-for-water is water that is pumped, but not metered or billed. It includes water that is lost through leaks in the system and evaporation from storage. It also includes general municipal uses such as firefighting and sewer maintenance which are not metered. From 1990 to

²⁹ "Static water level" refers to the water level at well after the well has been shut off for a period of time and the local cone of depression is allowed to stabilize.

³⁰ See Grants Water Plan, Table 4. p. 26.

³¹ Grants Water Plan, p.28.

³² Grants Water Plan, p. 34, Table 1. "Total Water pumped by the City of Grants, 1990-1998,"

³³ Grants Water Plan pp. 46-49. Population projections were provided by a 1999 study by Dr. Adeleamar Alcantara at BBER. The 205 gpcd figure derived from 1990-1998 historical use. NOTE: An alternative projection using a larger rate of 230 gpcd was also developed. However, that projection was based on proposed development projects such as the University of New Mexico/US Defense Department *Lodestar Project*, which have not materialized.

³⁴ See, Grants Plan, p. 49, Table 18 "Shortfalls in Grants' Allowable Water Diversion Rights."

³⁵ Grants Water Plan, pp. 70-71. For a more detailed analysis also see, Grants Water Plan, Appendix C, "Analysis of Water Demand and the Potential for Reduction of Demand Through Conservation."

³⁶ Grants Water Plan, pp. 37-47.

1998 unaccounted-for-water fluctuated between 13% and 24% of water use (from a high of 53 gpcd in 1990, to a low of 30 gpcd in 1995).³⁷ The plan also noted examples of programs that other communities in the Southwest have used to achieve water conservation goals.³⁸ With these examples in mind, the plan determined that Grants would avoid water supply shortfalls if it could reduce it per capita use by 10% by 2005 (to 185 gpcd) and by an additional 10% by 2010 (to 164 gpcd).³⁹ For planning purposes, the plan also provided a menu of recommended conservation measures to meet these targets, including education, retrofit rebates, and changing the City's water rate structure. Specific goals included reducing landscape irrigation by 30% by 2005, and various steps for reducing the amount of unaccounted for water and system inefficiencies.⁴⁰

(2) Village of Milan

(a) Overview

In 2003, the Village of Milan completed its own 40-year water plan. The plan used demand projections based on three rates of projected population growth and included estimates of water demand from the Cibola County Correction Center (CCCC). The analysis determined that the Village will experience supply shortfalls compared to its current water rights starting in 2005, with increasing shortfalls through 2040. Given anticipated recruitment of new businesses, these shortfalls will range from a low of 143.62 acre-feet in 2005, and increase to 848.67 acre-feet in 2040 under the low-growth projection. Under the high-growth projection, the shortfalls will range from 170.46 acre-feet in 2005, and increase to 1,291.73 acre-feet by 2040.⁴¹

Noting the requirements of the New Mexico State Engineer's office (OSE), the plan includes a detailed set of actions for water conservation. Excluding demand by the CCCC and unaccounted for water, Milan starts with a per capita daily use of 170 gpcd.⁴² The OSE recommended setting a target of reducing per capita daily use by 10% (from 170 gpcd to 153 gpcd) as a starting point for planning. The *Milan Water Plan* calculated that anticipated water shortages could be delayed for 10 years if the Village met the 10% target by 2005, and had no new demands from industrial recruitment. However including planned recruitment, the Village could still experience a water supply shortfall of 78 acre-feet by 2005.⁴³ An additional point of concern is that the static water levels for Milan municipal wells have been dropping since 1989. The decline has averaged 1.3 feet per year overall, but over the last 2.5 years the rate has increased to approximately five feet per year. This indicates that the rates of water use are outstripping local recharge and are not sustainable.⁴⁴ Therefore, the Milan Water Plan recommends that the community set goals for an overall reduction in water use, as well as reductions in per capita daily use.

³⁷ Grants Water Plan, p. 45.

³⁸ Grants Water Plan, pp. 60-61.

³⁹ Grants Water Plan, pp. 61-61. *See also*, Table 2 and Figure 1, Grants Water Plan, p. 61

⁴⁰ Grants Water Plan, pp. 73-77.

⁴¹ Milan Water Plan, p. 3.

⁴² Milan Water Plan, p. 17.

⁴³ Milan Water Plan, p. 4.

⁴⁴ See Milan Water Plan, Table 2, p. 7.

(b) Water Supply & Demand

The Village of Milan currently owns 1,151.84 acre-feet of annual permitted water rights.⁴⁵ Total water demand from Milan municipal wells has averaged 681.22 acre-feet annually over the last five years.⁴⁶ Using the five-year average as a baseline, there is a current limit of 470.62 acre-feet of unused permitted water rights for future growth.

The Milan Water Plan calculated three different population growth projections using the methodology developed by the BBER for the Grants Water Plan. This methodology was updated by using 2000 census figures that were not available in 1999 when the Grants Water Plan was completed.⁴⁷ These projections were then further augmented by including the anticipated water demand from the establishment of two to three new industrial employers expected from the Village's business recruitment program.⁴⁸

Under the high growth projection, water demand would exceed the Village's permitted rights by 2025 even without business recruitment. However, with the anticipated new businesses, water demand will exceed permitted rights by 2005 even under the low-growth projection.⁴⁹ In any case, Milan Water Plan recommends a concerted conservation program because current water production does not appear to be sustainable.

(c) Meeting Future Demands

In developing recommendations to reconcile the Village's water supply with future demand, the Milan Water Plan noted that the OSE considers it feasible for every community to reduce their per capita water use by 10-20%. It also noted that in 2001, unaccounted for water (UAW) losses averaged 21% of monthly water demand.⁵⁰ A five to ten percent UAW loss is considered a reasonable range for municipal systems.⁵¹

With these considerations in mind, the Milan Plan outlines a detailed set of actions for a conservation program including water audits, public conservation education, the development of a drought management plan, and an inspection and repair program for the Village's utility system.⁵² The overall goal is to reduce daily per capita water use by 10% by 2005.

Given the anticipated population and business growth, achieving this water conservation goal would extend the lifespan of the adequate water supply, but there would still be a long-term shortfall. To fully meet expected demand, the Milan Water Plan recommends that the Village continue exploring the possible purchase of additional water rights.⁵³

⁴⁵ Milan Water Plan, p. 12.

⁴⁶ See Table 5, Milan Water Plan, p. 14.

⁴⁷ Milan Water Plan, p. 23.

⁴⁸ See, Tables 14 & 15, Milan Water Plan, pp. 25-26

⁴⁹ Milan Water Plan, p. 27. The projected water supply, running up to the year 2040, actually ranges from no shortfall with moderate population growth (but no new businesses), to a shortfall of over 170 acre-feet by 2005 (which would grow to over 1,291 acre-feet by 2040) under a high growth scenario with successful business recruitment.

⁵⁰ See, Milan Water Plan, Table 11, p.22.

⁵¹ Milan Water Plan, p. 30, citing the OSE publication *a Water Conservation Guide for Public Utilities*.

⁵² See Milan Water Plan, Table 19, pp. 36-38, and explanatory discussion pp. 39-47.

⁵³ Milan Water Plan, p. 50.

d. Recommended Actions for Communities in Sub-Region 6(A):

Clearly, the on going *Kerr-McGee* litigation creates enormous challenges for regional and local water planning. Without adjudicated water rights, no community can be secure in the knowledge that the water rights they have down on paper, will translate into produceable “wet-water” over the long-term. This lack of security undermines the willingness of some communities to develop working agreements for collaborative water management in this sub-region. Further, the uncertainty concerning water rights claims in the area, increases the risks associated with purchasing additional rights. All communities that participated in the planning process noted these concerns. However, given the known limitations on water supply in the area, the following are actions that all communities should consider.

- 1) A strong commitment to water efficiency, conservation, and reuse programs.
- 2) Establishing “Water Accounts” to adequately run the water conservation and reuse programs. These accounts should also be used for supplying local cost-share funds to leverage State and Federal grants and loans. These accounts should be funded by dedicated revenue streams. Some communities in New Mexico have established similar accounts by dedicating a percentage of their gross receipts tax, others by dedicating a percentage of their water rates.
- 3) Continued participation in studies to determine the configuration, recharge rates, and water conductance of area aquifers, particularly studies regarding the San Andres-Glorieta aquifer.

2. Sub-Region 6(B): The Zuni River & Largo Creek Basins

The long-term needs of the communities in this sub-region are not well known. At least that information is not available publicly, and may not be for some time. The Zuni Tribe has commented that it has been steadily developing the various components for long-term water planning. However, the water resources of the Zuni River basin are the subject of a lawsuit filed by the United States on behalf of the Zuni Pueblo and Ramah Navajo communities to adjudicate their federally reserved water rights. While current and projected water demands are not the necessarily the basis for federally reserved tribal water rights claims, they are likely to be factors in the litigation, or in any potential settlement negotiations, connected to it. That being the case, the communities involved (the Pueblo of Zuni, and Ramah Navajo) must hold that information in confidence until the litigation is resolved.⁵⁴

As a practical matter, collaborative regional planning to balance water demands and supply in this sub-region is problematical at this time. Once the litigation is sufficiently developed, then the parties may develop a water use and development plan as part of a settlement of the litigation. In particular, the Pueblo of Zuni has indicated that it would welcome a dedication of sufficient resources by the State of New Mexico and the Federal government to expeditiously settle or adjudicate this litigation.⁵⁵

⁵⁴ Comments of Zuni Indian Tribe to 11/18/03 *Review Draft*, Governor Arlen P. Quetawki, Sr. dated Dec. 19, 2003.

⁵⁵ *Id.* p. 2.

However, the potential exists for the communities in this sub-region to realize water savings through collaborative watershed restoration actions.⁵⁶ Collaborative efforts in this area would build planning relationships between these communities outside of their litigation interests. In particular, the Pueblo of Zuni has stated its strong support for a coordinated effort with the McKinley Soil & Water Conservation District and others with regard to watershed restoration.⁵⁷ In addition, Zuni Pueblo indicated a desire for dialogue with McKinley County on its action steps as indicated in the Chart under section III.C below.

3. Sub-Region 6(C): The Puerco River and Whiskey Creek Drainages

a. The Area

Most of the *Whiskey Creek* basin in Region 6 is part of the Mexican Springs Chapter of the Navajo Nation. The Mexican Springs Chapter boundaries are almost evenly divided by New Mexico's water planning regions 6 and 2 (the *San Juan* basin). However, this Chapter, along with much of the *Puerco River* basin, is part of the service area for the proposed Navajo/Gallup Water Supply Project and can be viewed as part of a *Puerco/Whiskey Creek* water community. So for purposes of this *Summary*, the analyses for *Whiskey Creek* should be viewed as being incorporated into the discussion of the *Puerco* river basin.

The *Puerco River*, sometimes referred to locally as the “*Perky*,” flows west from the *Continental Divide* and is part of the *Little Colorado River* basin. It is bounded on the south by the *Zuni Mountains*, and to the north by the *Tohlokai Ridge*, which forms a division between the *Puerco* and *San Juan River* basins. Containing all or part of 15 Navajo Chapters, the majority of land in the *Puerco River* basin is part of the Navajo Nation. The City of Gallup sits alongside the *Puerco River* and approximately in the middle of these Chapters. The large presence of the Navajo Nation within this basin and the need to import renewable water supplies into the area create a strong link between the communities in the *Puerco River* basin and those in the *San Juan River* basin in Region 2 with regard to their water futures.

The multiple jurisdictions in this basin have led to overlapping – and parallel – planning processes by different governmental entities. To help define the water picture of this basin, the Region 6 plan incorporates materials developed in these processes. The reader will be referred to them where appropriate. These additional materials include:

- 1) The Water Resource Development Strategy for the Navajo Nation, (hereinafter, Navajo Nation Water Strategy);⁵⁸
- 2) The Technical Memorandum: The Navajo-Gallup Water Supply Project (hereinafter, NGWSP Technical Memorandum);⁵⁹

⁵⁶ Many of these communities have participated within the Zuni River watershed restoration planning effort led by the U.S. Natural Resource & Conservation Service, some of them also have ongoing watershed restoration programs.

⁵⁷ Comments of Zuni Indian Tribe to 11/18/03 *Review Draft*, Governor Arlen P. Quetawki, Sr. dated Dec. 19, 2003

⁵⁸ Navajo Department of Water Resources, July 13, 2000.

- 3) The Navajo-Gallup Water Supply Project: Appraisal Level Designs and Cost Estimates, (hereinafter, NGWSP Appraisal);⁶⁰
- 4) A Sustainable Water Supply for Gallup: How Do We Get There From Here?: Report of the Gallup Town Hall on Water, (hereinafter, Gallup Town Hall Report);⁶¹ and
- 5) The Background Report for the Gallup Town Hall on Water, (hereinafter, Gallup Background Report).⁶²

The *Puerco* basin area is typified by large daily and weekly commuting patterns. For example, although Gallup's population is a little over 20,000, it serves as the commercial and trading center for approximately 100,000 people in the *Puerco* basin and surrounding areas. While important to the economy of the region, the daily influx of people from outside of the basin creates extra demand on local water resources.

Historically the communities in this basin have viewed each other as competitors for groundwater resources. However, in recent years the governments in this basin have been working much more collaboratively to solve water issues. As a result, a new vision of the *Puerco* basin has emerged. In this vision, problem solving is directed at meeting the water demands for the area as a single water user community. This emerging viewpoint is illustrated in the report from the Town Hall on Water hosted by the City of Gallup in May 2003 and attended by a wide range of residents, including political leaders and water managers from both Gallup and the Navajo Nation. Of the numerous goals and recommendations set out in the report, the two initial goals are that the City of Gallup:

- 1) form "a partnership with its neighboring communities that is a 'world class model' for solving water needs and of how communities should live and grow in a desert environment;" and
- 2) develop "equitable solutions to water issues through partnerships and political alliances with the region's communities, jurisdictions, and tribes."⁶³

Practical outcomes from the developing partnership among the *Puerco* basin governments include: (1) the ongoing collaboration among area governments through the Steering Committee for the Navajo-Gallup Water Supply Project (NGWSP);⁶⁴ (2) the development of a Gallup Regional System (GRS) plan which ties Gallup and its neighboring Navajo communities into a single groundwater production and water delivery system (eventually to serve the ground/surface water conjunctive use system projected for NGWSP); and (3) successful applications to the State of New Mexico for funding for the GRS (described below).

⁵⁹A joint publication by Navajo Department of Water Resources, City of Gallup, the Northwest New Mexico Council of Governments, and the U.S. Bureau of Reclamation. March 16, 2001.

⁶⁰U.S. Bureau of Reclamation, April 2002.

⁶¹ May 29-31, 2003. Sponsored by the City of Gallup with technical assistance from New Mexico First.

⁶² May 29-31, 2003. Mayor's Task Force for the Gallup Town Hall on Water. Principal Author, Jeffrey G. Kiely, Northwest New Mexico Council of Governments.

⁶³ Gallup Town Hall Report, pp. 1-2.

⁶⁴ The NGWSP Steering Committee is led by the NWNMCOG and includes the Navajo Nation; Gallup; McKinley County; the New Mexico ISC; and the U.S. Bureau of Reclamation.

b. Water Overview for the *Puerco Basin*

(1) Water Supply

Unfortunately, the *Puerco River* basin does not have sufficient local water resources to meet demand on a sustainable basis. Streamflows in the *Puerco River* are largely dependent on infrequent rainfall, and are further limited by connected groundwater pumping. Groundwater, therefore, has been the principal source of supply in the area.

The *Puerco* basin overlies the upper part the Gallup Groundwater Basin as designated by the New Mexico State Engineer (Figure 1-C). Within the Gallup basin, principal water production is possible from the Gallup-Sandstone aquifer. Smaller municipal supplies are also derived from the Dakota-Westwater Canyon aquifer. The other aquifers have such low yields that they have not been practical as municipal water sources.⁶⁵

The recharge rate for these aquifers is very limited, so the available groundwater represents a non-renewable resource that is being depleted. This is illustrated by the static water levels in the City of Gallup's well fields. Since the early 1960s, the well levels have steadily declined at an average of 200 feet every decade.⁶⁶ Given this decline, Gallup anticipates it will start experiencing water shortages of up to 1 million gallons-per-day during peak demand periods as early as 2010.⁶⁷

(2) Water Demand

Lack of water availability has drastically limited the water use for many residents in the *Puerco River* basin. This skews the traditional methods for determining projected demands. If new water resources are not made available, lack of water may force some residents to leave the area. However, if new water supplies are developed, the current "under-use" of water by some communities will not be an accurate predicting measure of future use.⁶⁸ Per capita water use in the *Puerco River* basin varies by community, but ranges from moderately low to extremely low when compared to other areas. It is anticipated that if adequate and sustainable supplies are brought into the area, that water use in each community would begin to mirror the per capita use within the City of Gallup.

The current per capita use in Gallup averages 164 gallons per day (gpcd).⁶⁹ This compares favorably to the 175 gpcd that the City of Albuquerque has achieved in the eighth year of its conservation program.⁷⁰ It is a remarkable figure given the large, non-resident water demands imposed on Gallup as the commercial hub for the region.

⁶⁵Region 6 Water Plan, section IV(A) (*See also, Gallup Background Report*, pp. 9-10 for a summary description of potential water production from each of the Gallup Basin aquifers).

⁶⁶*Gallup Background Report*, p. 17. See also, Figure 5 p. 25 depicting a nearly 800 foot decline in water levels between 1969 and 2002 for the Munoz well in Gallup's Yah-ta-Hey well field.

⁶⁷*Id.*

⁶⁸*NGWSP Technical Memorandum*, pp. 24-30.

⁶⁹*Gallup Background Report*, p. 18.

⁷⁰*See, City of Albuquerque, Public Works – Water Conservation Office. November, 2003.*

Per person daily use for area residents outside of Gallup is much less, and may pose health risks to some residents.⁷¹ Per capita daily use for Navajo Tribal Utility Authority (NTUA) systems averages a very low 100 gallons per day.⁷² However, many of the communities and outlying homesteads in the *Puerco* basin area have already exhausted their local groundwater resources. In particular, approximately 44% of households on the Navajo reservation must haul water to meet their domestic needs.⁷³ It is estimated that per capita use for these households is a mere 10 gallons per day.⁷⁴

c. Meeting Current and Future Demands

Importing new water supplies from outside of the *Puerco* basin is vital to securing the future for communities in this area. This conclusion is supported by all of the studies developed by the Region 6 planning process, as well as independent studies by the Navajo Nation, the City of Gallup, and the U.S. Bureau of Reclamation. The limitations on those supplies, as well as the cost to bring them into the basin, dictate that other steps be taken to extend both current and new supplies as much as possible. Conservation, water reuse and river restoration efforts have been identified as methods to extend those supplies.

(1) Bringing in New Supplies: The Navajo-Gallup Water Supply Project

The *San Juan River* represents the best potential source for bringing new, and renewable water supplies into the *Puerco River* basin. Having initially been introduced into the *Congressional Record* by the New Mexico State Engineer in 1957, in 1971 Congress authorized the US Bureau of Reclamation to begin feasibility studies for a project to bring *San Juan River* water to the City of Gallup. A Reclamation study the following year found that there was sufficient water in the *San Juan* to meet Gallup's needs and that providing water to Navajo communities along the supply route should be considered in future studies.⁷⁵ Since then, Reclamation, the Navajo Nation, Gallup, and others have continued to develop a proposal for a water supply project from the *San Juan*. A 1984 study by Reclamation concluded that the *San Juan River* was the only source of water capable of meeting the Navajo and Gallup demands.⁷⁶

The proposed project, called the Navajo-Gallup Water Supply Project (NGWSP), is designed to supply:

- A total of 20,780 acre-feet of water to Navajo Chapters in New Mexico. 14,346 – acre-feet in the *San Juan River* basin, and 6,434 in the *Puerco River* basin;
- 1,200 acre-feet to the Jicarilla Apache Nation in the *San Juan River* basin;
- 7,500 acre-feet to the City of Gallup in the *Puerco River* basin; and
- 6,410 acre-feet to the Navajo Nation in Arizona (from Arizona's *Colorado River* compact apportionment).

⁷¹ Navajo Nation Water Strategy, Executive Summary p.3.

⁷² Navajo Nation Water Strategy, p. 7, Figure 2.3: Regional Water Use and Unit Delivery Costs.

⁷³ NGWSP Technical Memorandum, p. 30.

⁷⁴ Navajo Nation Water Strategy, p. 27. Citing *Navajo Water Resources Evaluation Volumes 1-8*, (Morrison Maierle Inc. 1982); and *Estimated Use of Water in the United States* (Murray, Richard C., USGS Circular 556, 1965).

⁷⁵ NGWSP Technical Memorandum, p.9.

⁷⁶ *Id.* p. 10.

The NGWSP would thus bring a total of 13,934 acre-feet of water annually into the *Puerco River* basin by the year 2040.⁷⁷

The project enjoys strong support from the New Mexico Congressional delegation, and Reclamation is projecting initial construction budgets for fiscal year 2006. However, Congress has not yet authorized this project for construction. It is acknowledged that Congressional authorization will be tied to a settlement of water rights claims made by the Navajo Nation to water from the *San Juan River*. Discussions regarding settlement have taken place between the Navajo Nation, the State of New Mexico, and the U.S. Department of the Interior for several years. A staff level *draft* settlement proposal was made public by the OSE and the Navajo Water Resources Department in early December 2003. That draft is undergoing public comment with the hope that the Navajo Nation and the State of New Mexico can approve a proposal in time for Congressional authorization by the end of 2004.

The NGWSP is conceived as a conjunctive use project that will utilize surface water to augment groundwater supplies and extend their availability. At full development, communities would primarily use renewable surface water supplied by the project, although in times of drought and water shortage in the *San Juan River*, the system would tap into existing groundwater supplies.

(a) The Gallup Regional System

An outgrowth of this conjunctive use concept is the Gallup Regional System (GRS), designed to anchor the water distribution system for the NGWSP in the Gallup area. The GRS is also designed to create local water management flexibility by wheeling groundwater through Gallup to the neighboring Navajo Chapters. The Navajo Tribal Utility Authority, the Indian Health Service, the City of Gallup and the Northwest New Mexico COG have been jointly developing the GRS, with the result that the project has received funding from the State of New Mexico to begin building the first phases of the system. One advantage of this is that Reclamation will credit these State funds towards any non-Federal cost-share required for the NGWSP.

(b) Summary of proposed Navajo Water Rights Settlement⁷⁸

As stated above, the NGWSP would be impossible to implement unless it were incorporated into a settlement of the water rights claims by the Navajo Nation. The proposed settlement of the water rights claims of the Navajo Nation to waters from the *San Juan River* would remove the cloud of uncertainty that currently hangs over water rights in the *San Juan River* basin, and provide for various infrastructure projects to use *San Juan* river water. Therefore, it would have major implications to water planning in both New Mexico Region #6 and Region #2. The major elements of the proposal include, but are not limited to:

- A total of over 620,000 acre-feet resulting in over 320,000 in total diversions for various projects;⁷⁹

⁷⁷ *Id.* p. 26, Table 4.3.

⁷⁸ The following is derived from the summary document prepared by the ISC staff and the Navajo Department of Water Resources. The document can be found on the web site for the New Mexico State Engineer at <http://www.seo.state.nm.us/water-info/NavajoSettlement/NavajoSettlement.pdf>

- Completion of the Navajo Indian Irrigation Project (NIIP) by December 2015;
- Completion of a Navajo Nation Municipal Pipeline from the Farmington water treatment plant to the Navajo Nation’s meter by December 2009;
- Completion of the Navajo-Gallup Water Supply Project by December 2016; and
- Development of conjunctive use groundwater wells within the NGWSP area by 2016.

(2) Water Conservation and Reuse

The Navajo Nation has recognized the need to promote water conservation generally throughout this arid region,⁸⁰ but with water availability so low for Navajo communities, their efforts to date have focused primarily on identifying potential new water supplies.

The City of Gallup, on the other hand, has proactively pursued and developed water conservation strategies. The City has had water conservation and water waste ordinances since 1983 that prohibit certain uses and that allow the City Manager to impose additional limitations under emergency conditions. Also in the early 1990s, the City adopted an “inclining rate structure” for water, which increases the unit cost of water for customers who use greater quantities of water. In mid-1999, a substantial rate increase resulted in a 9% drop in demand, indicating that an inclining rate structure may have significant conservation effects.

For the future, Gallup appears poised to substantially increase its water conservation and reuse efforts. The Gallup Town Hall on Water included specific recommendations for the City to expand its infrastructure for effluent reuse, explore options for a revised water use ordinance, enhance its inclining rate structure; and participate in regional watershed management.⁸¹ The City Council endorsed the Town Hall’s recommendations and created a Water Board specifically tasked with developing a 5-year plan to improve the City’s infrastructure, a city-wide conservation and education plan, and rate structure recommendations to pay for the new infrastructure and stimulate conservation.⁸² It is anticipated that the City Council will act on the Board’s recommendations in 2004.

(3) River Restoration & Water Reuse

Two specific projects prominently featured at the Gallup Town Hall on Water may become part of the conservation landscape along the *Puerco River* to the west of Gallup; the “Canyon Project,” and the “*Puerco River* Restoration Project.”

(a) The Canyon Project.

This project proposal was developed by Gallup’s Joint Utilities Department to reuse treated wastewater to replace potable water now used for landscape irrigation and other uses. Gallup currently discharges about 1 acre-foot per day from its wastewater treatment plant. The Canyon Project would redirect that discharge into a dry canyon and create a system with streams

⁷⁹ More detailed totals are found in the summary document cited above.

⁸⁰ Navajo Nation Water Strategy, p. 64.

⁸¹ Gallup Town Hall Report, p. 6.

⁸² Gallup City Council Resolution No. R2003-11, June 24th, 2003.

and wetlands that would empty into a storage lake at the end of the canyon. That water could then be used to replace water currently used for irrigating city parks. Aside from a net water savings roughly equivalent to one-third of the City's projected demand over the 40-year planning horizon, constructed wetlands may provide an efficient method to meet EPA standards for municipal stormwater quality, as well as to increase wildlife habitat in the area.⁸³ This project was specifically cited in the Gallup Town Hall Report.⁸⁴

(b) Puerco River Restoration.

A potentially related project to restore a portion of the *Puerco River* is being sponsored by the McKinley Soil & Water Conservation District (MSWCD). The project is a collaborative effort between local governments and private interests. Generally it seeks to restore the riparian system by moving Gallup's effluent discharge downstream from a channelized part of the river, removing salt cedar, and replanting native trees and plants. The MSWCD has already sponsored a nonprofit corporation to pursue partnerships that will be needed for the project.⁸⁵ Phase I of the project, already complete, entailed chemical treatment of salt cedar along a two-mile stretch of the river. Revegetation will proceed in the future.

Watershed restoration has been identified by the Region 6 Water Plan, the State of New Mexico, and others as important to promote rain and snowfall infiltration into groundwater storage. However, two large-scale collaborative efforts within Region 6, the federally-led *Rio Puerco* and *Zuni River* restoration projects, have faltered due to lack of funding. The MSWCD hopes to use this smaller effort on the *Puerco River* to highlight the benefits of restoration efforts.

III.

GAINING ISC APPROVAL FOR THE REGIONAL PLAN

A. Planning Targets

The following items are "planning targets" for regional water planning:

- 1) Identification of available "wet-water" that can actually be produced;
- 2) Analysis of the current and projected water demand;
- 3) Identification of obstacles to meeting demand, such as lack of infrastructure or unresolved litigation; and
- 4) An adopted plan which defines the water sources available to meet future demand. Those sources may include conserved water savings.

⁸³ Gallup Background Report, pp. 49-53.

⁸⁴ Gallup Town Hall Report, p. 5.

⁸⁵ Gallup Background Report, pp. 54-55.

B. Synopsis of Planning Status

For much of Region 6, the studies and plans summarized in the sections above probably meet the threshold requirements for the first planning targets. A number of questions still remain which can't be answered at this time, particularly for areas under general stream adjudications. However, the general parameters concerning the long-term supply of produceable water compared to per capita needs are known for much of Region 6.

In the eastern half of the region, Sub-region 6(A), total available water is clearly limited. However some of the local static well levels, and the spring flows at Ojo del Gallo, indicate that a sustainable water yield may exist somewhere between current water production, and the high water production during the boom years for uranium mining in the area. The greatest uncertainty is with regard to the ownership of the rights to that yield. Another uncertain figure is the demand projections for the entire eastern sub-region as a whole.

In the *Puerco River* basin, Sub-region 6(C) the case is simpler: there simply is not enough water available locally to meet current needs, much less anticipated demand. Importation of new water supplies, along with careful conservation of water, is necessary for the future of the communities in this area.

The *Zuni River* basin, Sub-region 6(B), has the greatest number of unanswered questions regarding water production potential and projected demand. This may be because this sub-region was not separately defined in the planning process, and this area's numbers were aggregated with those of the other sub-regions. It is hoped that reconceptualizing Region 6 into sub-regions will facilitate closing this information gap. Indeed, Ramah Navajo is currently developing a localized data base regarding supply and demand, and Zuni Pueblo has indicated that it is as well.

For most of Region 6, however, the greatest concern raised is with regard to planned actions to balance the supply/demand equation in each area. Most communities have taken some concrete steps to either acquire water and/or conserve it. Nonetheless many communities are in a transition phase between fact gathering and a defined set of actions which will guarantee a 40 year water supply adequate to meet their projected needs. To gain ISC approval, we need to closer to that goal.

A second area which could be strengthened for many areas is drought planning. Most of the New Mexico regions have been experiencing drought conditions over the last few years, and tap renewable water sources for a significant portion of their water use. Because of this, the ISC will pay particular attention to how extensive the drought contingency plans are in each region.

Region 6 has argued that the area is in a chronic state of *de facto* drought, and therefore, drought planning is of limited usefulness. For a region dependent on groundwater, it appears that drought planning should be a secondary consideration because the principal source of supply does not fluctuate rapidly with yearly rainfall. Since the goal is to balance recharge with demand, however, groundwater use may merely mask the effects of drought over the short-term. For sustainable water management the same sort of drought contingencies, and trigger points for restricting use, designed for rain and snowfall dependent regions is probably necessary for long-term success.

The ISC has indicated that their definition of a “region” is whatever works for planning purposes. Also, regional plans are meant to be living documents. While the goal is to guarantee a water supply for 40 years or more, the plan is expected to evolve over time. So a region may elect to take smaller steps which move them along in three to five year increments. With those considerations in mind, it appears that much of Region 6 should be able to gain ISC approval, or move to a rolling sequence of approvals for shorter timeframes.

C. Near-Term Action Plan. The following chart summarizes near-term action steps planned within the region. The actions are broken down by major water use or planning entity.⁸⁶

ENTITY AND PROJECT	COST/NEED
Northwest New Mexico Council of Governments (RWP Coordinator)	
<ul style="list-style-type: none"> • Serve as a clearinghouse for conservation information and drought planning. Participate in and assist with coordination of watershed health and drought planning programs hosted by other entities. • Chair the Navajo Gallup Water Supply Project steering committee. Host forums on the Project. • Assist with coordination of the Mt. Taylor Project. • Facilitate applications to the NM Water Projects Fund in support of Region 6 water projects. • Continue to host seminars for water user organizations on facets of local water planning & implementation; provide technical assistance to small systems preparing community water plans. • Provide comprehensive planning assistance to counties within the region. Continue and expand the Grants-Milan-Cibola County Coordinated Planning Process. • Serve as a clearinghouse for information about drought and drought planning. • Assist with coordination of a research effort to study hydrologic availability of water in the San Andres-Glorieta aquifer in the Bluewater Basin in the Grants area. 	\$40,000/yr
City of Gallup	
<ul style="list-style-type: none"> • Appoint, empower and implement the Gallup Water Board to develop and oversee programs and policies emerging from the May 2003 Gallup Town Hall on Water. 	Staffing included
<ul style="list-style-type: none"> • Update, strengthen and implement the City’s water conservation program, to include City staffing, public information and customer incentives; Accelerate revenue development through adopting and implementing a long-term progressive water rate structure. 	\$100,000/year
<ul style="list-style-type: none"> • Treat for arsenic and radon as required by new regulations. 	to be determined
<ul style="list-style-type: none"> • Pursue additional short-term water supplies; drill new wells in the Gallup Sandstone. 	\$2.0 million
<ul style="list-style-type: none"> • Pursue additional short-term water supplies from the Plains State Well Field. 	to be determined
<ul style="list-style-type: none"> • Continue planning for Navajo Gallup Water Supply Project (NGWSP). 	Included
<ul style="list-style-type: none"> • Complete engineering studies of the municipal water system component of the NGWSP. 	\$200,000
<ul style="list-style-type: none"> • Partner with the Navajo Nation, Navajo Area Indian Health Service, Navajo Tribal Utility Authority and the State Water Trust Board to construct the Gallup Regional Water System, a future component of the NGWSP 	Phase 1: \$2.6 m Phase 2: \$1.0 m Phase 3; \$2.0 m Phases 4-8: \$12.0 m
<ul style="list-style-type: none"> • Intensify maintenance, repair and replacement of aging infrastructure. 	\$3,000,000/yr
<ul style="list-style-type: none"> • Establish NGWSP/Water Supply sinking fund to ensure viability of new water supply projects and acquisition of needed water rights. 	Yrs 1-5: \$6.0 m/yr Yrs 6-40: \$14.9 m/yr
<ul style="list-style-type: none"> • Participate in regional efforts to coordinate small systems development, regional drought planning and overall implementation of the Region 6 Plan. 	Included

⁸⁶ Some of these items face administrative or litigation challenges. They are listed because they are planned by the entity in question, not because they are considered a “done deal.”

ENTITY AND PROJECT	COST/NEED
City of Grants	
<ul style="list-style-type: none"> • Provide large-water user audits. • Modify municipal landscaping and irrigation practices. • Modify residential and commercial landscaping and irrigation practices. • Offer education on water conservation. • Decrease unaccounted-for water and system inefficiencies. • Continue water use monitoring. • Develop and adopt a revised water rate structure. • Adopt a water ordinance that includes restrictions on water waste. 	\$20,000 (first year)
<ul style="list-style-type: none"> • Inventory current water rights. • Compile information about the proposed use of the water rights to be purchased. • Develop policies and a protocol for purchasing water rights. • Continue to evaluate the purchase of water rights. • Research additional water rights which may be available for sale or for lease. • Research the potential for buying the "right of first refusal" on water rights. • Pursue sources of funding. • Continue follow-up on the offers that were made to sell rights to the city. 	\$250,000/yr for water rights
<ul style="list-style-type: none"> • Include consideration of source water protection in the upcoming Water and Sewer Master Plan. 	(see below)
<ul style="list-style-type: none"> • Water and Sewer Master Plan • Water tank renovations; New water tank • Water & sewer lines on 1st & 2nd Second streets, Roosevelt Ave., Adams St., Geis St., High & Bradley • Work on the telemetry system 	\$120,000 for plan; see current ICIP for other amounts
<ul style="list-style-type: none"> • Include consideration of drought/water emergency situations in the Water System Master Plan. • Participate in regional efforts to discuss drought planning. 	(see above)
<ul style="list-style-type: none"> • Coordinate on a research effort to study hydrologic availability of water in the San Andres-Glorieta aquifer in the Bluewater Basin in the Grants area. 	to be determined
<ul style="list-style-type: none"> • Participate in regional efforts to learn about water rights and adjudications. • Participate in regional large-scale water projects, such as the Mt. Taylor Project. • Participate in regional small systems development, drought planning and Region 6 Water Plan implementation; Participate in the Grants-Milan-Cibola County coordinated planning process. 	included
Village of Milan	
<ul style="list-style-type: none"> • Continue distribution of educational materials at the Village Hall; Continue ongoing training for Village public works staff. 	included
<ul style="list-style-type: none"> • Complete Milan 40-Year Water Plan, incorporating conservation & economic development plans. 	[completed]
<ul style="list-style-type: none"> • Continue to reduce unaccounted-for water use. 	see current ICIP
<ul style="list-style-type: none"> • Develop and implement water rights acquisition plan; cooperate with neighboring entities where feasible to achieve economy-of-scale and to pool water availability in the future. • Declare any water rights not previously declared. 	\$15,000
<ul style="list-style-type: none"> • Continue collaboration with New Mexico Environment Department in research and monitoring of well contamination in the vicinity of the Village. 	included
<ul style="list-style-type: none"> • Continue ongoing city water infrastructure development 	see ICIP
<ul style="list-style-type: none"> • Support hydrologic research of water availability in San Andres-Glorieta aquifer in Bluewater Basin. 	undetermined
<ul style="list-style-type: none"> • Participate in regional efforts to learn about water rights and adjudications. • Participate in regional large-scale water projects, such as the Mt. Taylor Project. • Participate in regional small systems development, drought planning and Region 6 Water Plan implementation; Participate in the Grants-Milan-Cibola County coordinated planning process. 	included

ENTITY AND PROJECT	COST/NEED
McKinley County	
<ul style="list-style-type: none"> • Provide educational materials regarding water conservation at County buildings and in tax bills. • To support the City of Gallup's conservation efforts, conduct a "water audit" of County facilities on City water, such as the detention centers. Determine if water use could be reduced in these facilities. 	\$15,000
<ul style="list-style-type: none"> • Communicate with agricultural water users in the area regarding their conservation programs. 	included
<ul style="list-style-type: none"> • Define "public welfare" for the county, including unincorporated communities, as part of a comprehensive planning process. 	[included in County Comp Plan]
<ul style="list-style-type: none"> • Review county subdivision regulations and other land use controls as related to water use. • Coordinate with the New Mexico Environment Department to ensure that regulations are enforced. 	included
<ul style="list-style-type: none"> • Continue to address erosion and sedimentation problems through road maintenance and coordination with other entities in the region. • Continue to address solid waste pollution of water bodies through the Environmental Task Force. 	included
<ul style="list-style-type: none"> • Coordinate among small systems in the county. • Support small systems in the area in their need for infrastructure improvements, serving as fiscal agent as needed. Help improve project readiness at the local level. • Pursue options for coordinating reservation and non-reservation small systems. • Collaborate with the City of Gallup to analyze small system and shared well use. • Continue to assist small systems with association formation (of WSD's, etc.). 	\$5,000 initial cost (in assoc. w/ the COG)
<ul style="list-style-type: none"> • Participate in regional efforts to learn about water rights and adjudications. • Participate in Navajo Gallup Water Supply Project and other regional development efforts. • Participate in regional small systems development, conservation and drought planning and Region 6 Water Plan implementation. 	included
<ul style="list-style-type: none"> • Appoint, empower and implement Water Advisory Committee to the County Commission. 	included
Cibola County	
<ul style="list-style-type: none"> • Provide educational materials regarding water conservation, particularly for landscaping. 	\$2,000
<ul style="list-style-type: none"> • Work with agricultural water users in the area regarding their water use and conservation programs. 	included
<ul style="list-style-type: none"> • Define "public welfare" for the county, as part of a comprehensive planning process. • Assist unincorporated communities to secure water rights with funding & administration of purchases. 	[incl. in Comp Plan]
<ul style="list-style-type: none"> • Review county subdivision regulations and other land use controls in relation to water use. 	included
<ul style="list-style-type: none"> • Support small systems in the area in their need for infrastructure improvements, seeking funding and serving as fiscal agent as needed; help improve project readiness at the local level. 	\$5,000 initial cost (in assoc. w/ COG)
<ul style="list-style-type: none"> • Support hydrologic research of water availability in San Andres-Glorieta aquifer in Bluewater Basin. 	included
<ul style="list-style-type: none"> • Participate in regional small systems development, water rights and adjudication efforts, drought & conservation planning and Region 6 Water Plan implementation. 	included
Navajo Nation	
<ul style="list-style-type: none"> • Develop individual 40-year plans for each Chapter in Region 6. 	
<ul style="list-style-type: none"> • Implement the Navajo Nation Water Plan and the Navajo/Gallup Water Supply Project. 	
Rio San Jose Flood Control District	
<ul style="list-style-type: none"> • Coordinate with other entities in the region on conservation programs, as needed. • Provide educational materials to new residents through schools and other sources. • Interview rural residents regarding their knowledge and experience with water use and conservation. 	\$2,000
<ul style="list-style-type: none"> • Continue flood control infrastructure development projects 	\$553,500 (2002)
<ul style="list-style-type: none"> • Coordinate on a research effort to study hydrologic availability of water in the San Andres-Glorieta aquifer in the Bluewater Basin in the Grants area. 	undetermined
<ul style="list-style-type: none"> • Participate in regional efforts to learn about water rights and adjudications. • Coordinate with other entities in the region on drought planning, as needed. 	included

ENTITY AND PROJECT	COST/NEED
McKinley Soil and Water Conservation District	
<ul style="list-style-type: none"> • Coordinate with local and federal government agencies, including the Natural Resources Conservation Service, in developing agricultural efficiency projects. • Address areas erosion in those areas where sufficient partnerships and resources exist to promise success. • Initiate Education and Outreach program regarding watershed health . • Identify, prioritize, and restore riparian areas to native conditions. • Facilitate the formation and meetings of the McKinley County Water Advisory Committee. 	\$2.3 million
Lava Soil and Water Conservation District	
<ul style="list-style-type: none"> • Using federal cost-share programs, implement conservation measures • Work with landowners to stress the need for conservation. 	
Navajo-Gallup Water Supply Project	
<ul style="list-style-type: none"> • Prepare a detailed description of the proposed action. • Consider possible impacts on humans, wildlife, plants, and natural environments, following NEPA process. To include preparation of an Environmental Impact Statement. • Acquire water rights, preferably by new contract with the Department of the Interior. • Acquire appropriate rights-of-way. • Determine repayment obligations and assess the ability to pay for the project. • Obtain authorization. • Obtain Congressional Construction Authorization by the end of 2004. 	\$300,000 per year pre-construction; then \$50 million per year until completion [about 9-10 years]; 80% funded by Navajo Water Rights Settlement [pending]

D. Recommended Future Actions

In July 2001, the NWNMCOG published a Handbook for Local Water Planning (Handbook). The Handbook contains a set of recommended actions for water management developed from a survey of what local governmental leaders believed would be politically feasible to implement. This Handbook is incorporated into the Region 6 Water Plan as an appendix. The following general recommendations are in part derived from the Handbook and from local water plans. Some steps may have already been taken by individual communities. These recommendations are made with the goal of augmenting the action steps outlined above to reach the ISC planning targets, and attain approval on at least a sub-regional basis.

1. Set up Technical Advisory Boards and Citizen Panels.

Nearly every tribal and local water plan referenced in the Region 6 Water Plan stated the need for continuing research with regard to available water resources, and further development of management practices. These are not easy issues, and they need to be updated on a continuing basis. To quantify water savings from specific actions, educate the public, and provide political support for difficult issues, it is recommended that local and tribal governments set up these boards and give them specific mandates to examine these issues and develop proposals. Since the ISC is requesting that water plans specifically quantify the water saved or acquired resulting from local actions, local and tribal plans would benefit from a technical review of proposals.

2. Regional Planning Committee.

Related to the recommendation regarding technical advisory boards, is a recommendation that local and tribal governments establish a regional water planning committee for Region 6.

Planning and research on a regional basis has three main advantages: 1) it can reduce the costs of research and policy development for smaller governmental bodies; 2) it provides a forum for problem solving between communities; and 3) it can provide political leverage for State and Federal assistance, or for making hard policy decisions.

Although this region has many water management issues that might be best resolved on a river-basin level, it also has several overlapping issues that spillover river-basin boundary lines. We recommend that a permanent regional committee be established to continue to update the Region 6 Water Plan. This committee could meet on a quarterly or bi-annual basis, and have sub-committees to work through sub-regional issues on a more regular basis.

3. Establish a Dedicated Funding Stream for Enhancing or Extending Local Water Supplies.

Matching supply and projected demand often requires large expenses for infrastructure or water acquisition. Additionally, most communities in the United States, including Region 6, have not kept up with the needed water service system maintenance and replacement schedules since the Federal government significantly reduced its assistance for these programs in the mid-1980s. Several communities across New Mexico have set up dedicated “water accounts” to help meet their long-term needs and to leverage State and Federal assistance.

Such accounts are often funded through a portion of local gross receipts tax, or through water rate surcharges and inclining rate structures. Appropriately designed, they can build support for conservation and reuse programs.

4. Develop a Plan for Water Recycling and Wastewater Reuse.

The ISC recommends that municipal and local plans set a minimum goal of reducing per capita water consumption by 10%. Region 6 has such acute water limits for its renewable water resources that a 10% reduction goal should probably be considered as too low a standard, at least for municipalities with established well fields. Effluent discharge flows from municipalities in New Mexico range from about 30% of water production for towns such as Gallup with limited irrigated landscape, to about 50% for towns such as Albuquerque with extensive public landscaping and where individual domestic lawns are common. That 30% to 50% of production represents a tremendous potential for water savings.

Many local plans have recommended a goal to reuse this water for municipal landscaping. We recommend that communities in Region 6 extend their thinking beyond this goal to other potential uses. It should be noted that in the growing Colonia communities in Otero County and elsewhere along the U.S./Mexican border, individual households are using solar stills to produce drinking water from agricultural ditch water. These stills, developed by Sandia Labs, transform gray water reuse into full water recycling.

5. Create Regional Water Supply Systems Where Possible

The success of the Navajo Nation and Gallup in gaining State funding for the Gallup Regional System indicates that regional approaches have the ability to leverage State assistance.

In 1998, the Bureau of Reclamation began studies to develop a regional system to deliver groundwater to Indian and non-Indian communities in the *Rio San Jose* basin. This was at least in part due to a suggestion by the office of U.S. Senator Domenici. The thought was that such a project might open an avenue for settling the *Kerr-McGee* litigation. The potential existed that the governments in the region would support of gaining the flexibility of a multiple source/multiple use water system as suggested by Dr. John Shomaker. The possible groundwater production identified by the Reclamation study for the Mt. Taylor area creates the possibility for cooperative regional planning based on current and future needs.

Given the relatively limited groundwater development in the *Zuni River Basin*, a similar potential may exist for proactive and cooperative action by the communities in that basin.

6. Establish a Drought Contingency Plan

The Region 6 Water Plan recognizes that some communities already have daily per person use that represents a health risk to some residents. Because of their already severely restricted water use, drought conservation plans are generally inappropriate for these communities. However, for those communities who have adequate daily water production we recommend adopting a strong drought contingency plan.

The City of Santa Fe is often cited as a model for drought planning. The final section of the Handbook outlines the steps and ordinances that Santa Fe has set in place. However, Santa Fe's plan is greatly predicated upon the impacts of drought on local surface water storage. For most communities in Region 6 we would recommend modifying the "triggers" for drought conservation measures with regard to two concepts: 1) how would drought conditions effect the recharge of local groundwater supplies? and 2) how would drought conditions effect a community's ability to meet peak and emergency demands?

The first concept is predicated on the idea that local or regional planning has established yearly budget for water production based on the expected lifetime of the groundwater supply available in that locality. The expected lifetime should include an anticipation of a certain amount of recharge. Drought conditions will limit that recharge, so drought conservation "triggers" would seek to reduce water use so that the life expectancy of the available groundwater supplies isn't reduced. It is recognized that current modeling for groundwater recharge is not nearly as precise as surface water measurements. Therefore, this element for drought conservation "triggers" would need to be updated on a periodic basis.

The second concept requires an assessment of local system capacity. Would drought conditions limit water production? Would they increase demand on the delivery system? And finally, would drought conditions increase the likelihood of fire or other emergencies creating a spike in peak demand?

7. Watershed Restoration & Maintenance

Many of the governments in Region 6 have recognized the importance of the condition of our streambeds. Healthy conditions promote groundwater recharge by increasing the infiltration of rain and snowfall into the ground. Because of this recognition, most of the local and tribal governments and planning agencies have participated in the *Rio Puerco*, the *Zuni River*, and/or the *Puerco River* watershed restoration program. Extensive planning has been completed for both of these programs, but on the ground implementation has been slowed due to limited funding. This may be due to a programmatic focus on increasing streamflows as opposed to water-table recharge.

It is recommended that a portion of the dedicated “water accounts” called for in Recommendation 3 be set aside to leverage State and Federal funding for these projects. Creating significant surface streamflows may not be possible for much of Region 6, but these projects could be used to demonstrate appreciable increases in local groundwater tables over time.