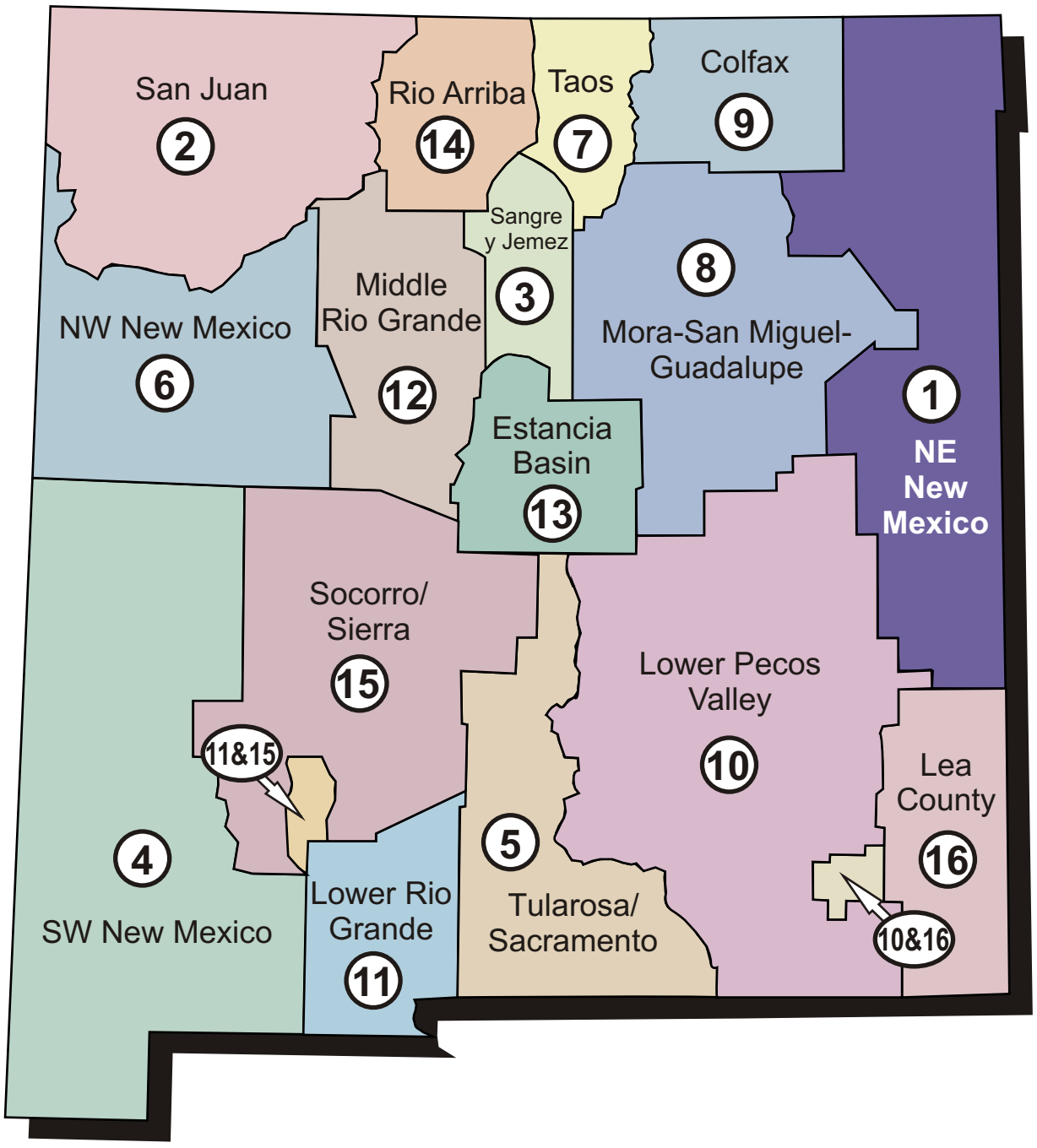
1. Introduction

The Mora-San Miguel-Guadalupe Water Planning Region, which includes all of Mora, San Miguel, and Guadalupe Counties (Figure 1-1), is one of 16 water planning regions in the State of New Mexico that are in the process of developing a regional water plan. Regional water planning was initiated in New Mexico in 1987, its primary purpose being to protect New Mexico water resources and to ensure that each region is prepared to meet future water demands. Regional water planning activities have been funded through and are overseen by the New Mexico Interstate Stream Commission (ISC).

The designated fiscal agent for the Mora-San Miguel-Guadalupe Water Planning Region is the Tierra y Montes Soil and Water Conservation District (SWCD). The Tierra y Montes SWCD retained the team of Daniel B. Stephens & Associates, Inc. (DBS&A), Rosemary Romero Facilitation Services, Southwest Planning and Marketing, Amy C. Lewis, and Sheehan, Sheehan and Stelzner to develop the regional water plan. All of the regional water planning activities have been overseen by a Steering Committee consisting of representatives of the counties, municipalities, acéquias, other agricultural water users, state and federal agencies, and others with water interests in the planning region. Additional information on the Steering Committee is provided in Section 2.

Initial water planning efforts in the area began in 1990. At that time, the planning region encompassed only Mora County and the western two-thirds of San Miguel County; the eastern portion of San Miguel County and all of Guadalupe County were included in the Northeast New Mexico planning region. The current regional water planning effort that is the focus of this plan began in 2002. During this current phase of planning, the Steering Committee in conjunction with the ISC decided to expand the planning region to include all of San Miguel County and all of Guadalupe County. The reasons for this change were (1) to evaluate policies that could most easily be applied on a county-wide basis and (2) to include Guadalupe County, which is largely dependent on the Pecos River, within a planning region that is already evaluating Pecos River issues.

Regional water planning in New Mexico is guided by the template outlined in the ISC *Regional Water Planning Handbook* (NM ISC, 1994), which defines the scope and content of regional water plans. According to the template, a regional water plan must address five key questions:



Explanation

1 ISC Planning Region

MORA-SAN MIGUEL-GUADALUPE WATER PLANNING REGION

Location of Mora-San Miguel-Guadalupe Water Planning Region

Daniel B. Stephens & Associates, Inc.

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Figure 1-1

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1. What is the water supply available to the region?

2. What is the region's current and projected future demand for water?

3. What are the region's alternatives for using available supplies to meet projected future water demands, including reduction of demand, to the extent needed, to live within available supplies?

4. What are the advantages and disadvantages of each alternative with respect to local values and criteria?

5. What are the best water supply alternatives and how will they be implemented?

This report is organized to be consistent with the regional water planning template (NM ISC, 1994):

- Background information regarding the public involvement process and the characteristics of the planning area are provided in Sections 2 and 3, respectively.

- To address the first question, this report discusses both the water rights and legal constraints that affect the availability of water (Section 4) and the physical availability of surface water and groundwater, as well as water quality constraints (Section 5).

- To address the second question, historical and current water demand in the planning region was evaluated, projected population and economic growth were analyzed, and projections of future water demand were developed, all of which are presented in Section 6.

- A discussion of the water budget of the planning region, which links the regional water supply to the regional water demand, is included in Section 7.

- To address water planning questions 3 through 5, the final section specified in the ISC handbook (NM ISC, 1994) is an analysis of possible alternatives for closing the gap

between supply and demand and recommendations for further action. This information is included in Section 8.

1.1 Regional Water Planning Issues

The Mora-San Miguel-Guadalupe Water Planning Region is unique compared to other planning regions in New Mexico. Some of the key water issues facing the planning region, which are further discussed in subsequent sections of this plan, are:

- *Acéquias.* About 150 acéquias are present in the planning region and use 89 percent of the region's water depletions (excluding reservoir evaporation). The acéquias play an important role in the area from a cultural and economic perspective, and protection of acéquia water rights is a key planning issue. With conveyance efficiencies as low as 30 percent, inadequate diversion structures, lack of measurement, and outdated application systems, the acéquias can benefit from renovations that can improve their efficiencies and make them less vulnerable during droughts.

- *Drought vulnerability.* More than 95 percent of the water supply in the planning region is supplied by surface water, and storage of surface water for use within the region is fairly limited. Drought vulnerability is therefore a key planning issue.

- *Watershed management*. Because a significant portion of the planning region's surface water supply originates in upland watersheds within the region, watershed management to protect water quality and potentially to enhance yield is an important component of the planning effort.

- *Pecos River Compact.* Much of the planning region is located within the Pecos River Basin. The State of New Mexico is required to make deliveries in accordance with the Pecos River Compact as directed by the Supreme Court; consequently, water resources management options within the basin are limited by Compact obligations.

- *Water rights litigation and protection of water rights.* Much of the planning region has either not been adjudicated or is in the process of being adjudicated (Section 4). In particular, adjudication of water rights issues in the Las Vegas area has been ongoing.

The resulting uncertainties regarding water rights ownership create complexities in the planning process. Efforts to protect water rights and ensure that water resources remain within the planning region were identified as priorities in the planning process.

- *Water quality.* There is considerable interest within the planning region in protecting and/or enhancing water quality. Septic systems in some rural parts of the planning region are jeopardizing public health and water quality and will require a community approach to address.

- *Data gaps.* Lack of information about water use, water depletions, and extent of water resources causes uncertainty in water planning efforts, especially regarding the potential to develop groundwater.

1.2 Previous Water Planning in the Region

As mentioned above, prior to 2002 the current region was divided into two separate planning regions. A summary of previous water planning efforts in each of the former regions is provided in Sections 1.2.1 and 1.2.2.

1.2.1 Mora-San Miguel Region

Initial regional water planning efforts for Mora County and the western two-thirds of San Miguel County began in 1989 with the creation of the Mora-San Miguel Water Plan Committee. With funding from the ISC, this committee spearheaded completion of several studies:

- The *Mora-San Miguel Regional Water Study and Forty Year Water Plan,* also referred to as Phase I of the regional water planning effort, was completed by Martinez (1990). This study primarily focused on water rights and legal issues. The Phase I report included a list of acéquias with their approximate location and contact person and a discussion of cultural issues in the planning region.

- Glorieta Geoscience, Inc. and Jim Siebert (1990) prepared the *Hydrologic Assessment of the Mora/San Miguel Water Plan Area, Volumes 1 and 2.* This report provides a

general overview of the hydrogeology of the water planning region, including a discussion of the population projections and future demands.

- A summary report prepared in 1991 by the Mora-San Miguel Water Plan Committee summarized the work by Martinez and Glorieta Geoscience and provided recommendations for various categories of water use, including acéquias, domestic systems, industrial uses, private wells, Storrie Project water use, mineral uses, and municipal systems.

- The *Mora-San Miguel Regional Water Plan, Phase II,* was submitted in 1994. The Phase II work focused on inventorying the irrigated agriculture by surface waterbodies in the planning region. Based on the list of acéquias developed in Phase I, the Phase II work provided a description of each of those acéquias, including information such as the type of irrigation that is occurring, the ditch condition, and in some cases, the number of acres being irrigated. The Phase II report also included recommendations for water conservation measures.

- A Phase III report (Easton, 1999) focused on water quality issues in the planning region, identifying nonpoint and point source concerns. In particular, water quality issues related to septic tanks were identified. Recommendations for private well testing, wellhead protection, septic tank installation, and protection and disinfection of private water supplies were included in the report.

These earlier planning reports were initiated prior to the development of the current guidance for regional water planning and did not address all of the technical and legal components that are included in this plan.

In addition to previous regional water planning efforts, a number of earlier studies contributed information relevant to water resource planning. Early investigations into the hydrogeology of the Mora-San Miguel Water Planning Region focused primarily on surface water:

- Reports by USDA (1940) and Hinderlider (1945) documented the acéquia systems and economic potential of irrigation in the region.

- The City of Las Vegas's dependence on the Gallinas River and the associated potential vulnerability during drought periods inspired investigations into other sources of water, particularly the potential for developing groundwater:
  - Jansen (1935) and Griggs & Hendrickson (1951) investigated the occurrence of groundwater in San Miguel County.
  - Jansen (1935) also evaluated drought vulnerability in the Las Vegas area.
  - Mercer et al. (1970; Mercer and Lappala, 1970) investigated groundwater resources in Mora County.

  Other reports that are focused primarily on the City of Las Vegas water supply situation include Molzen-Corbin and Lee Wilson (1985) and Lazarus et al. (1986, 1997).

- GEI Consultants (1990) performed an environmental assessment for a project to use deep wells to supply the Mora fish hatchery. This report includes a detailed geohydrological investigation with aquifer tests and a water rights study along the Mora River.

1.2.2 Northeast New Mexico Planning Region

As discussed previously, the eastern third of San Miguel County and all of Guadalupe County were previously part of the Northeast New Mexico planning region. Prior to current water planning efforts, the Eastern Plains Council of Governments prepared a regional water plan for the previously defined Northeast region (EPCOG, 2000). The 2000 plan focused on recommendations for augmenting supplies in the region. The plan also included a brief overview of water resources in the area, but did not include the detail currently required by the ISC.

Other information pertinent to eastern San Miguel and Guadalupe Counties is listed in the bibliography included in Appendix A. Some of the key publications include:

- Griggs and Hendrickson (1951) investigated the occurrence of groundwater in San Miguel County; their document includes coverage for the entire county.

- Trauger (1972) discussed the geology and occurrence of groundwater in east-central New Mexico, including Guadalupe County and much of San Miguel County.

- The groundwater resources of Guadalupe County were studied by Dinwiddie and Clebsch (1973).

- Risser (1987) evaluated possible changes in groundwater flow to the Pecos River caused by impoundment of water at Santa Rosa Lake and discussed in detail geology and aquifer properties for an area including central Guadalupe County and southern San Miguel County.

1.3 Data Sources

To answer water planning questions 1 and 2, reference materials pertaining to the water supply, water quality, and water demand in the Mora-San Miguel-Guadalupe Water Planning Region, including those mentioned in Section 1.2, were compiled and reviewed. A bibliography of those reference materials is included in Appendix A.

Much of the information used in the water supply and water quality assessment was derived from climate and hydrologic records available electronically from state and federal agencies:

- Climatic data were obtained through the National Climatic Data Center (NCDC) web site (www.ncdc.noaa.gov), a subscription service administered by the National Oceanic and Atmospheric Administration (NOAA) that compiles climate data from various sources and provides them electronically. Climate data were also obtained directly from the Western Regional Climate Center (WRCC) web site (http://www.wrcc.dri.edu).

- Streamflow data through water year 2002 were obtained from the United States Geological Survey (USGS) web site (http://nm.waterdata.usgs.gov/nwis). Provisional streamflow data for water year 2003 were also obtained from the USGS web site.

- Water quality data were obtained from the New Mexico Environment Department (NMED) web site (www.nmenv.state.nm.us) and the New Mexico Water Quality Control Commission (NMWQCC, 2002).

- Information on water rights and wells was obtained from the New Mexico Office of the State Engineer (OSE) Water Administration Technical Engineering Resource System (WATERS) Database (http://seowaters.ose.state.nm.us/awdProd) and individual water right owners.

- Monthly Palmer Drought Severity Index (PDSI) data from 1900 through 2003 were obtained from the National Climatic Data Center web site (http://www.ncdc.noaa.gov/paleo/usclient2.html).

- Information on National Pollutant Discharge Elimination System (NPDES) permits, underground storage tanks (USTs), and total maximum daily loads (TMDLs) was obtained from the NMED web site (http://www.nmenv.state.nm.us).

- Land use, geology, and other reference maps were prepared by the New Mexico Water Resources Research Institute (WRRI) (Appendix B) and by DBS&A geographic information system (GIS) technical staff.

- Information on water rights administration and administrative decrees was provided by OSE staff and Sheehan, Sheehan and Stelzner, who prepared the majority of Section 4 of this report.

- Information on historical water use was obtained from OSE publications and directly from water users within the planning region. Records regarding municipal water use were obtained directly from the municipalities, and records regarding agricultural and livestock water use were obtained from the New Mexico Department of Agriculture (NMDA) (www.nmdaweb.nmsu.edu) and the New Mexico Agricultural Statistics Service (NMASS) (www.nass.usda.gov/nm/nmbulletin).

Additional information on the sources of data and information used in this report is included in Sections 4 through 8.