

The Middle Rio Grande River Basin (Figure 2) is a region of rich cultural and environmental diversity, but with increasing levels of environmental stress in recent years from a rapidly expanding human population. The City of Laredo, for example, grew by nearly 60,000 (more than 30 percent) between 1990 and 2000. The entire Rio Grande River Basin population increased during that same period by more than 87,000, or 25 percent. Population in the region is expected to more than double over the next 50 years, from about 1.3 million people to about 3.1 million in the year 2050. The population in the Mexico portion of the Rio Grande basin is expected to increase from about 1.8 million to about 3.7 million by the year 2020 (Rio Grande Regional Water Plan 2001). This rapid population growth has already resulted in critical regional environmental problems related to water supply, wastewater treatment, point and non-point source pollution, and general degradation of the natural environment. The Middle Rio Grande River Basin has International Boundary and Water Commission (IBWC) stream gauges on the Rio Grande River at both the inlet (El Indio, TX and Villa Guerrero, Coahuila; Id No. 08-4587) and outlet (Laredo, TX and Nuevo Laredo, Tamaulipas; Id No. 08-4590) of the watershed (Figure 2a). This watershed occupies an area of 8684 km². Terrain in the watershed consists of the foothills of the Sierra Madre Oriental range to the northwest (820 m) with lower elevations in the valley associated Rio Grande River (108 m) in the middle of the watershed (Figure 2b). Like the Middle Nueces basin the predominant land cover consists of rangeland, most of which is covered by scrub and brush (RNGB - 71%) with subdominant grassy rangeland (RNGE - 22%). Minor areas with agricultural (AGRL - 4 %) and various urban, forest, and water (total = 2%) land covers are also present (Figure 2c). Note that land use / land cover classification largely does not exhibit across the international boundary. Soils are varied across the watershed (Figure 2d). The immediate valley of the Rio Grande River is underlain by the Rio Grande series (TX 471) that is dominated by silt and has a moderately low permeability (4 to 6 mm/hr). On the United States side of the watershed dominant soils include the Maverick (clay/silt

dominated with low permeability < 1 mm / hr; TX 320) and Copita (sand dominated with higher permeability = 17 to 290 mm / hr; TX 113) series. Calcisols and Regosols soils that tend to be sandy and have high permeability dominate the Mexican side of the basin (e.g. MEX 15, 16, 21). To the north adjacent to the foothills of the Sierra Madre Oriental Lepitosol soils dominate that have a higher clay content and the lowest measured permeabilities (e.g. MEX 4).