
3.0 INDIVIDUAL WATERSHED DESCRIPTIONS & IMPAIRMENTS

TMDLs were developed for assessment units for which constituent (or pollutant) concentrations measured during the 2002 water quality survey, as combined with quality outside data, indicated impairment. Because characteristics of each watershed, such as geology, land use, and land ownership provide insight into probable sources of impairment, they are presented in this section for the individual 8-digit hydrologic unit code (HUC) watersheds within the San Juan River basin. In addition, the 2004-2006 Integrated §303(d)/§305(b) listings within the San Juan River basin are discussed (NMED/SWQB 2004a).

3.1 Animas River Watershed (HUC 14080104)

The headwaters of the 1,357 square mile (mi²) Animas River watershed originate in Colorado. According to available Geographic Information System (GIS) coverages, the New Mexico portion of the Animas River watershed (Photo 3.1) is approximately 277 mi² and includes several ephemeral tributaries. As presented in Figure 2.1, land ownership is 34% private, 60% BLM, and 6% State. Land use includes 56% forest, 8% agriculture, 29% rangeland, 5% built-up land, 1% water, and less than 1% wetlands and barren land (Figure 2.2). The geology of the Animas watershed is predominantly comprised of the Tertiary Nacimiento Formation with limited areas of the San Jose Formation near the northeast section of the New Mexico portion of the watershed (Figure 3.1).



Photo 3.1 Animas River at Boyd Park, September 2003.

The New Mexico portion of the Animas River was divided into two assessment units (AUs). SWQB established two stations in each AU. Data from these stations were combined with readily available data from other sources that met quality control objectives, and assessed using established assessment protocols to determine whether or not designated uses were being met. As a result, the Animas River (San Juan River to Estes Arroyo) was included on the Integrated 2004-2006 CWA §303(d)/§305(b) list for nutrients and fecal coliform, and the Animas River (Estes Arroyo to Colorado border) was included on the Integrated 2004-2006 CWA §303(d)/§305(b) list for temperature (NMED/SWQB 2004a). No TMDLs have previously been established for the Animas River. Therefore, TMDLs were developed for inclusion in this document for the following assessment unit in the Animas River watershed:

- ***Fecal coliform***: Animas River (San Juan River to Estes Arroyo)

TMDLs for nutrients impairment in the Animas River between the San Juan River and Estes Arroyo, and temperature impairment in the Animas River between Estes Arroyo to Colorado border, are under development for inclusion in future TMDL documents.

Animas Watershed HUC - 14080104 Geology

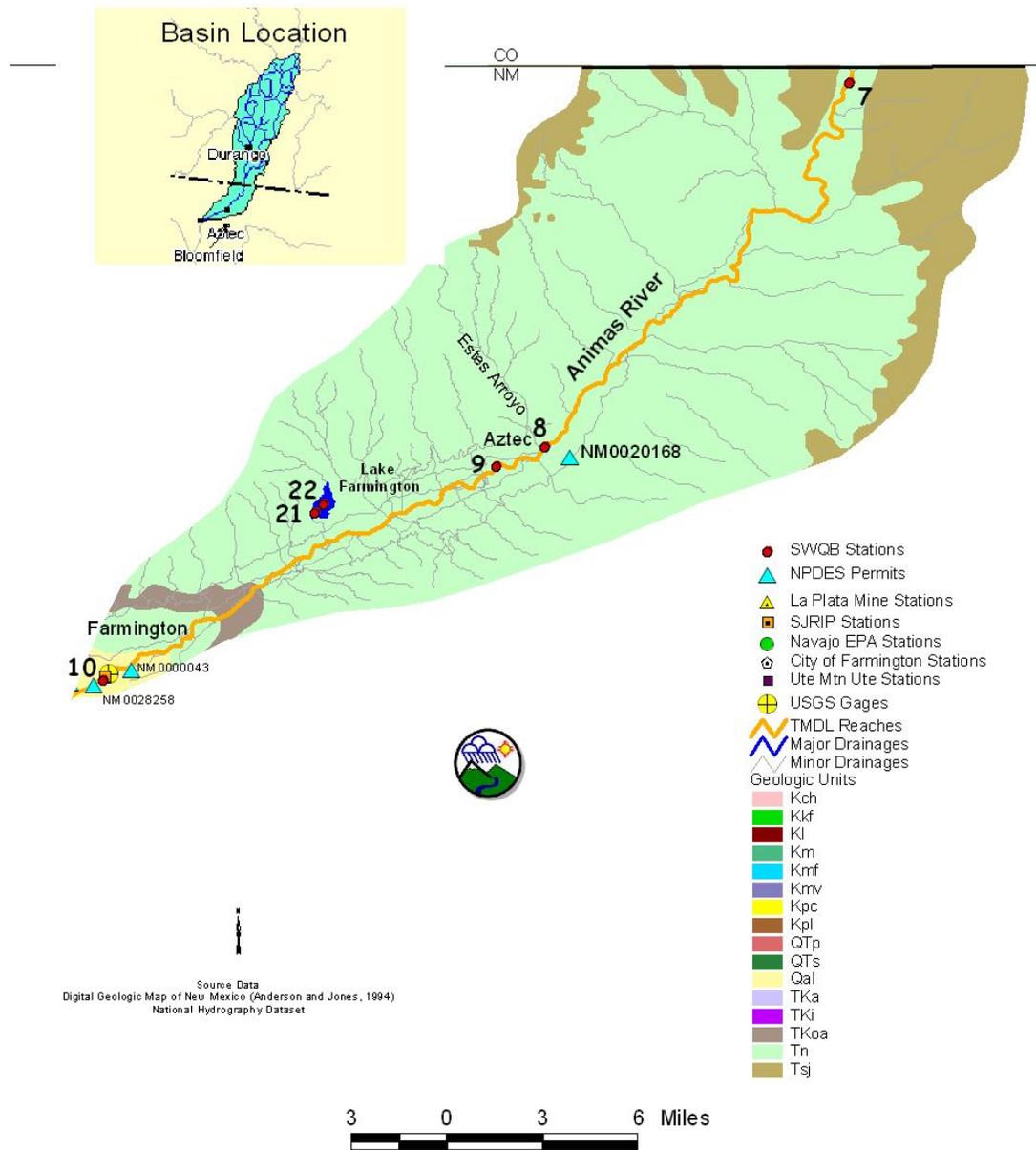


Figure 3.1 Animas River Basin Geology (see Table 2.1 for definitions)

3.2 Middle San Juan River Watershed (HUC 14080105)

The Middle San Juan River watershed includes the La Plata River and San Juan River between the Navajo Nation boundary at the Hogback and the Animas River (Photo 3.2). The headwaters of the 583 mi² La Plata River watershed originate in Colorado. According to available GIS coverages, the New Mexico portion of the La Plata River watershed is approximately 162 mi² and includes several ephemeral tributaries. As presented in Figure 2.1, land ownership is 29% private, 45% BLM, 20% Native Lands (Ute Mountain Ute) and 6% State. Land use includes 48% forest, 6% agriculture, 45% rangeland, <1% built-up land, <1% water, < 1% wetlands and, <1% barren (Figure 2.3). The overall San Juan River watershed above Hogback is 8,171 mi². According to available GIS coverages, the New Mexico portion of this watershed is approximately 4,298 mi² and includes several ephemeral tributaries and the La Plata drainages. Overall land ownership statistics for the New Mexico portion of the San Juan River above the Navajo Nation boundary at the Hogback are 6% USFS, 7% private, 37% BLM, 45% Native Lands (Navajo Nation and Ute Mountain Ute) and 5% State. Overall land use includes 52% forest, 1% agriculture, 46% rangeland, <1% built-up land, <1% water, < 1% wetlands and, <1% barren (Figure 2.3). The geology of the Middle San Juan River watershed consists of a complex distribution of Tertiary and Cretaceous formations, with Nacimiento Formation as the most predominant layer (Figure 3.2). The Navajo Nation at the Hogback forms the western border of the study area. The hogback is formed by steeply tilted Cliffhouse sandstone, which is part of the Mesaverde group (Chronic 1987).



Photo 3.2 San Juan River near the Hogback, October 2003

The New Mexico portion of the La Plata River was divided into two AUs (Photo 3.3). SWQB established one station in the lower AU and two stations in the upper AU. Four stations were established in the San Juan River between the Hogback and the Animas River. Data from these stations were combined with readily available data from other sources that met quality control objectives and assessed using established assessment protocols to determine whether or not designated uses were being met. As a result, the San Juan River (Navajo Nation boundary at Hogback to Animas River) was included on the Integrated 2004-2006 CWA §303(d)/§305(b) list for fecal coliform. The La Plata River (McDermott Arroyo to Colorado border) was included on the Integrated 2004-2006 CWA §303(d)/§305(b) list for fecal coliform and dissolved oxygen. La Plata River (San Juan River to McDermott Arroyo) was included on the Integrated 2004-2006 CWA §303(d)/§305(b) list for fecal coliform and sedimentation/siltation (NMED/SWQB 2004a). This lower La Plata River AU was also listed for dissolved oxygen, but the designated use marginal coldwater fishery is not existing or attainable in this stream reach. Accordingly, a change to the water quality standards will be proposed in future triennial reviews.



Photo 3.3 La Plata River near La Plata, NM, November 2003

No TMDLs have previously been established for the any of these AUs. Therefore, TMDLs were developed for this document for the following assessment unit in the Middle San Juan River watershed:

- ***Fecal coliform***: La Plata River (San Juan River to McDermott Arroyo), La Plata River (McDermott Arroyo to Colorado border), San Juan River (Navajo Nation boundary at Hogback to Animas River)
- ***Sedimentation/siltation***: La Plata River (San Juan River to McDermott Arroyo)

A TMDL for dissolved oxygen impairment in the La Plata River between McDermott Arroyo and the Colorado border is under development for inclusion in future TMDL documents.

Middle San Juan Basin HUC - 14080105 Geology

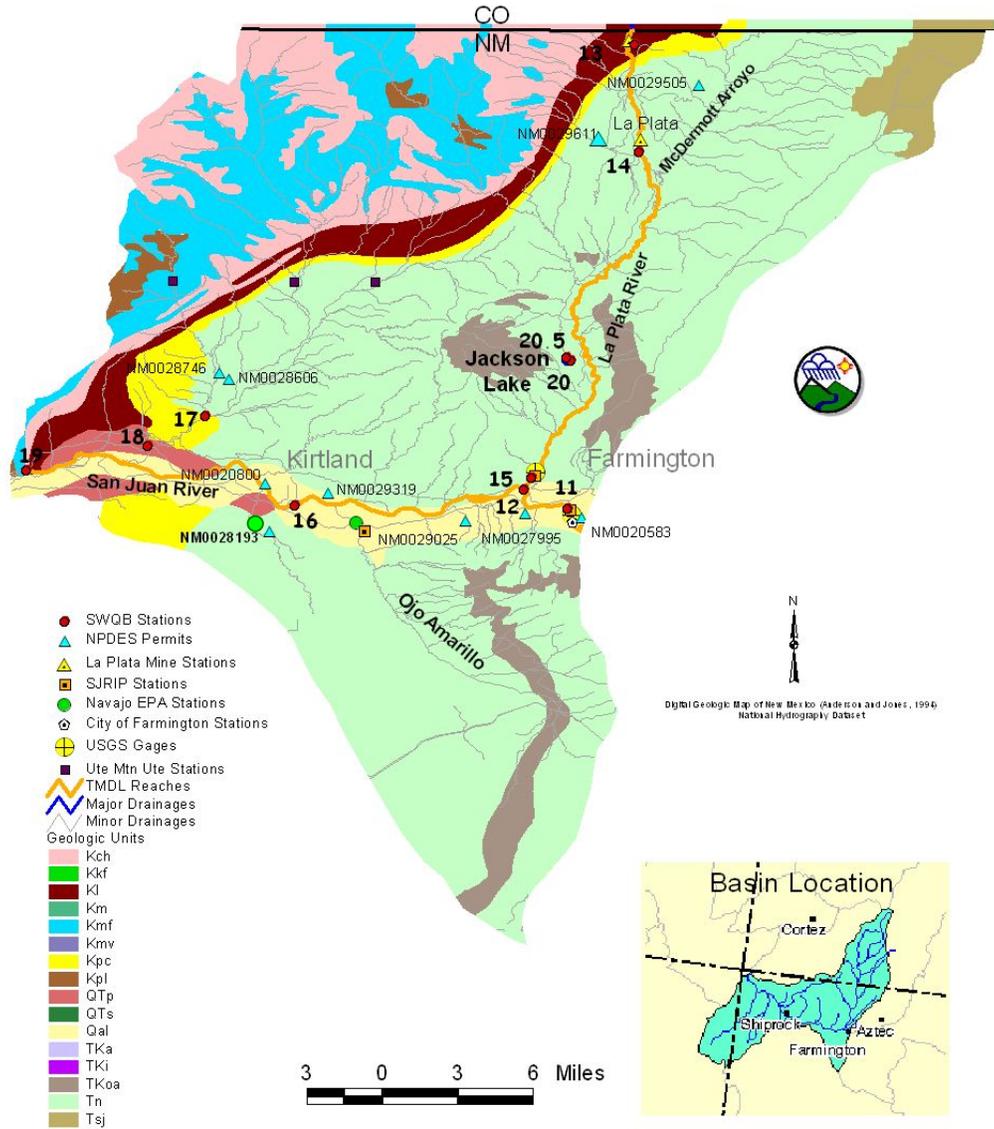


Figure 3.2 Middle San Juan River Basin Geology (see Table 2.1 for definitions)

3.3 Upper San Juan River Watershed (HUC 14080101)

The Upper San Juan River watershed includes the Gallegos Canyon and San Juan River above the Animas River (Photo 3.4 and 3.5). Gallegos Canyon originates on the Navajo Nation. The San Juan River originates in Colorado. Navajo Dam was constructed in 1963 to create Navajo Reservoir. This hydrologic alteration resulted in a world-class trout fishery immediately below the dam. Cañon Largo enters the San Juan River from the southeast near Blanco, New Mexico.

The San Juan River watershed above the confluence with the Animas River is 5,825 mi². According to available GIS coverages, the New Mexico portion of this watershed is approximately 3,533 mi² and includes several ephemeral tributaries and Cañon Largo. As presented in Figure 2.1, land ownership is 8% US Forest Service, 7% private, 31% Bureau of Land Management (BLM), 49% Native Lands (Navajo Nation) and 5% State. Land use includes 61% forest, 2% agriculture, 36% rangeland, 1% built-up land, <1% water, < 1% wetlands and, <1% barren (Figure 2.4). The geology of the Upper San Juan River watershed consists primarily of the Nacimiento Formation and San Jose Formation (Figure 3.3). The latter is a sandstone/shale conglomerate which erodes easily by wind and wind-driven rains (Chronic 1987).

The specific geology of the Gallegos Wash watershed is discussed in more detail in the Selenium section.



Photo 3.4 San Juan River at Soaring Eagle, October 2003

This portion of the San Juan River was divided into two AUs – San Juan River (Animas River to Cañon Largo) and San Juan River (Cañon Largo to Navajo Dam). SWQB established four stations in the downstream AU and two stations in the upstream AU. Gallegos Canyon (San Juan River to Navajo boundary) was sampled near the confluence with the San Juan River. Data from these stations were combined with any readily available data from other sources that met quality control objectives and assessed using established assessment protocols to determine whether or not designated uses were being met. As a result, Gallegos Canyon was listed for selenium on the Integrated 2004-2006 CWA §303(d)/§305(b) list (NMED/SWQB 2004a). The San Juan River (Animas River to Cañon Largo) was listed for fecal coliform, and remained listed for sedimentation/siltation based on the USDA NSL study (see Section 4.0 for details).



Photo 3.5 Installing thermograph in San Juan River at Bloomfield Bridge, June 2002

No TMDLs have previously been established for the any of these AUs. Therefore, TMDLs were developed for the following assessment units in the Upper San Juan River watershed:

- ***Sedimentation/siltation***: San Juan River (Animas River to Cañon Largo)
- ***Fecal coliform***: San Juan River (Animas River to Cañon Largo)
- ***Selenium***: Gallegos Canyon (San Juan River to Navajo boundary)

Upper San Juan River Basin HUCs -14080101 and 14080103 Geology

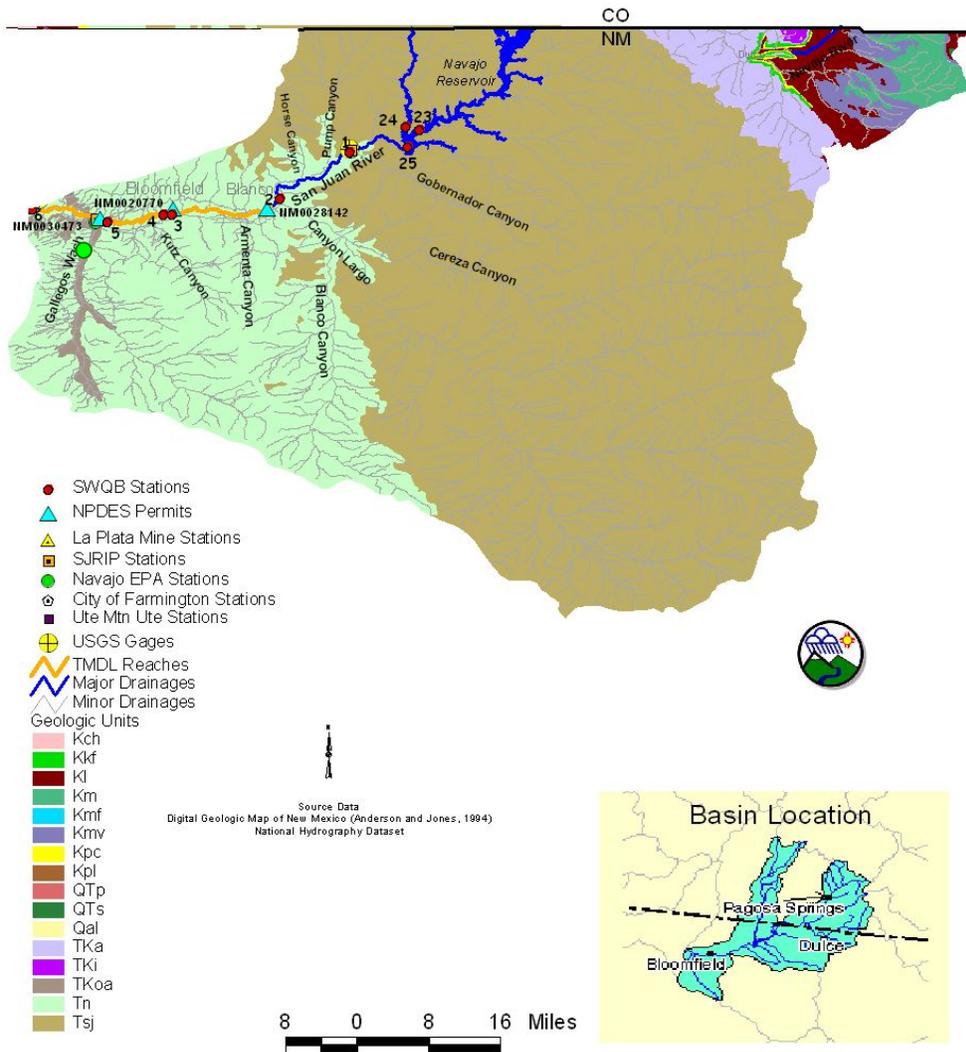


Figure 3.3 Upper San Juan River Basin Geology (see Table 2.1 for definitions)