USE ATTAINABILITY ANALYSIS

AQUATIC LIFE USES FOR PERENNIAL REACHES OF STREAMS IN THE GALISTEO WATERSHED

INTRODUCTION

The perennial reaches of Galisteo Creek and its perennial tributaries in Santa Fe County are currently classified in segment 121 in New Mexico's *Standards for Interstate and Intrastate Surface Waters* (NMAC 2012):

- 20.6.4.121 RIO GRANDE BASIN Perennial tributaries to the Rio Grande in Bandelier national monument and their headwaters in Sandoval county and all perennial reaches of tributaries to the Rio Grande in Santa Fe county unless included in other segments and excluding waters on tribal lands.
- **A. Designated Uses**: domestic water supply, high quality coldwater aquatic life, irrigation, livestock watering, wildlife habitat and primary contact; and public water supply on Little Tesuque creek, the Rio en Medio, the Santa Fe river and Cerrillos reservoir.
- **B.** Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: specific conductance 300 μ S/cm or less; the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

The applicable temperature criteria are 4T3 temperature 20°C (68°F) and maximum temperature 23°C (73°F) (20.6.4.900 H (1) NMAC).

Galisteo Creek is currently listed on the 303d list as impaired for the high quality coldwater aquatic life use due to temperature and specific conductance exceedences (NMED/SWQB 2012a). It was first listed prior to 1998 for stream bottom deposits, reduction of riparian vegetation and stream bank destabilization. The stream was intensively surveyed in 2001 and assessed in 2004. As a result of the assessment, the stream bottom deposits listing was removed and the temperature and specific conductance listings were added. Galisteo Creek was placed in Category 5B which means that the designated use may not be existing or attainable and that the water quality standards for the water body may need to be revised (NMED/SWQB 2012b).

A designated aquatic life use (that is not an existing use) may be removed or changed to a use with less stringent criteria only if a Use Attainability Analysis (UAA) demonstrates that the use is not attainable due to one or more of six factors listed in 40 CFR 131.10 (g) (**Appendix A**). High quality coldwater is the most stringent aquatic life use in New Mexico's water quality standards (WQS); proposed changes to a less stringent use requires a UAA.

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¹ "Designated" means a use specified in 20.6.4.9-899 (20.6.4.7 NMAC).

² "Existing" means any use attained in the water body since Nov 28, 1975 (20.6.4.7 NMAC).

³ "Attainable" means achievable through effluent limitations and best management practices (20.6.4.7 NMAC)

The purpose of this UAA is to determine the most protective aquatic life use(s) attainable in perennial reaches of Galisteo Creek, as well as perennial reaches of its tributaries. The UAA presents: 1) a watershed description, 2) a data review, 3) an ecoregion analysis and 4) modeling of attainable water temperatures. Maps and photos are contained in **Appendix B**. A map of locations referred to in this UAA is shown in **Appendix B**, **Figure B1**.

The UAA demonstrates that the **high quality coldwater** aquatic life use is attainable in perennial reaches of Galisteo Creek and perennial reaches of its tributaries in the upper watershed. These reaches are appropriately classified in 20.6.4.121 and no change is needed. The UAA also demonstrates that **coolwater** is the most protective aquatic life use attainable in the middle and lower portions of the watershed. The high quality coldwater aquatic life use is *not* attainable in the middle and lower watershed because of 40 CFR 131.10 (g)(1): "naturally occurring pollutant concentrations prevent the attainment of the use...." (**Appendix A**). Thermal pollution (heat), in this case, is naturally occurring due to ambient air temperatures.

WATERSHED DESCRIPTION

The Galisteo watershed is located east of the Rio Grande in north-central New Mexico. It is part of the U.S. Geological Survey (USGS) Rio Grande-Santa Fe hydrologic unit (hydrologic unit code or HUC13020201) in the Upper Rio Grande basin. The watershed covers 730 sq. miles south of Santa Fe, mainly in Santa Fe County, with small parts in Sandoval and San Miguel counties (**Appendix B, Figure B2**).

The upper watershed is located in the southern tip of the Sangre de Cristo Mountains and contains the highest point in the watershed at 10,554 feet. High gradient headwater streams including Apache Canyon and Deer creek join Galisteo Creek near Cañoncito at an elevation of 6800 feet. From this point, streams are lower gradient as they enter the middle and lower watershed. The middle watershed includes the areas of Lamy, Galisteo village and San Cristobal Arroyo. Many tributaries join Galisteo Creek downstream of the village of Galisteo, including San Cristobal, Los Angeles, La Jara, Cunningham, and San Marcos Arroyos. The lower watershed includes Madrid, Cerrillos and the Kewa Pueblo⁴. A small part extends into the Ortiz Mountains. Galisteo Creek enters the Rio Grande at an elevation of 5,180 feet. The total length of the Galisteo Creek mainstem is 53 miles. The last 10 miles above the confluence with the Rio Grande are located within the boundaries of Kewa (Santo Domingo) pueblo. Stream flows vary throughout the watershed and may be perennial, intermittent or ephemeral.

Geology, groundwater aquifers and vegetation in the watershed are shown in **Appendix B**, **Figures B3 - B5**. The main geologic groups are volcanic in the upper watershed, alluvium (sediment) in the middle and lower watershed, and sandstone-shale- mudstone in the eastern watershed. Vegetation types vary from conifer forests in the upper watershed to wood-, shruband grasslands in the middle and lower watershed.

The Galisteo watershed has been settled for centuries, and impacted by many land and water uses. A Watershed Restoration Action Strategy (WRAS) was formulated in 2005 by Earth Works Institute (EWI) under a 319 grant to address erosion, water table draw down, and erosive

⁴ Waters on the Kewa pueblo are not surface waters of the state.

flooding (EWI 2005). A Wetlands Action Plan was completed in 2010 (NMED/SWQB, EWI 2010). There is one NPDES permitted facility in the watershed: LAC Minerals is permitted to discharge into Cunningham Creek, an ephemeral tributary in the lower watershed. Water supply for residents in the watershed is currently provided by numerous wells. Cerrillos Reservoir impounds a spring on San Marcos Arroyo for a public water supply (M. Medina, email Feb 2008). Overall, groundwater recharge in the watershed is less than withdrawals and thus the water table is lowering (Stephens 2003). In an interagency report on the watershed, the Office of the State Engineer (OSE) reported no current irrigation diversions (EMNRD 2008).

DATA REVIEW

New Mexico Environment Department (NMDED) Surveys

In 2001, NMED surveyed Galisteo Creek at Cerrillos, CR 55A, Galisteo village and Canoncito; and San Cristobal Arroyo (NMED/SWQB 2004). For this UAA, NMED collected data from the previously surveyed sites in Cerrillos, CR 55A, Galisteo, and Canoncito; plus Apache Canyon and an additional site in Canoncito (**Appendix B, Figure B1**).

Water quality data

NMED collects and analyzes data for a number of water quality parameters. Detailed water quality data are contained in **Appendix C**. Sondes are used for single-visit⁵ or extended data collection for temperature, pH, specific conductance, dissolved oxygen and turbidity. Macroinvertebrate population data collected in 2001 indicated that Galisteo Creek was no longer impaired for stream bottom deposits (sediment) (see Introduction, p. 1).

NMED temperature data are included in **Table 4** and **Appendix C**. Single-visit sonde temperature measurements provide a snapshot but usually not a large enough data set to fully characterize the water body. NMED uses thermographs for a more comprehensive record. Thermographs measure air or water temperatures continuously over several months and are usually deployed throughout the summer. NMED has four sets of water thermograph data: Galisteo Creek in Galisteo village (2003, 2010), Galisteo Creek in Canoncito (2012) and Apache Canyon (2011). A thermograph was deployed at each survey site in 2001 but all were lost in flood events (N. Schaeffer, email communication 2003).

Hydrology

Isolated perennial reaches occur throughout the watershed. These reaches have no flow immediately upstream, indicating that they are sustained by groundwater input. Perennial reaches on Galisteo Creek occur in the areas of Waldo, Cerrillos, County Road 55A, Galisteo village and Cañoncito. Other perennial reaches occur on San Cristobal Arroyo (public comments), Apache Canyon and Deer Creek (Vrooman 2006). As part of the UAA investigation, NMED applied the hydrology protocol (NMED/SWQB 2011) at several locations (see Figure B1). Results are shown in **Appendix D**.

USGS data are available for eight gauges in the watershed, as shown in **Appendix E**. Over 30 years of daily data for Domingo (1941-71) and below Galisteo Dam (1970-current) show 73% and 53% respectively of all days were zero flow days. The gauge above Galisteo Reservoir near

⁵ Single samples are also referred to as grab, discrete or instantaneous samples.

Waldo shows six years of perennial low flow. Only annual peak flow data are available for the remaining six gauges, which are insufficient to illustrate the overall hydrology.

NMED also reviewed aerial photos (RGIS 2011) and the Google Earth application which showed flow in several tributaries⁶.

Aquatic life

Waters in the Galisteo watershed have been described as a fishery resource. Kewa Pueblo tradition states that until the mid-19th century trout (a coldwater fish), catfish (a warmwater fish) and turtles were all regularly caught for food along the mainstem. More recently, biological surveys conducted in Apache Canyon and Deer Creek identified native trout (B. Salter, email communication 2010). A landowner in Cañoncito recently had a New Mexico Department of Game and Fish (NMDGF) permit to stock trout, some of which reportedly still inhabit the upper watershed (T. Sigstedt, personal communication 2011). NMED conducted electrofishing in 2001 at each of three perennial reaches of Galisteo Creek at Cerrillos, CR 55A and Galisteo village. At each location, only flathead chub (*Platygobio gracilis*) were collected (see Appendix C). Flathead chub is native to the Rio Grande basin, and prefers an intermediate water temperature (NMDGF 2012). NMED commissioned a search of historical records from the Museum of Southwestern Biology (UNM 2010) and several other databases (G. Schiffmiller, email communication 2010) but no additional fish records were found.

ECOREGION ANALYSIS

Ecoregions (Griffith et al., 2006) are large geographic areas of similar ecosystems. Each ecoregion is characterized by its elevation, air temperature, precipitation, terrain, geology, soils, vegetation and fauna. A Roman numeral hierarchical scheme from I to IV is used for increasing levels of ecological detail. Level III is denoted by a number and level IV is denoted by a letter. Ecoregions describe the great diversity of the natural landscape in New Mexico, which includes forested mountains, semiarid shrub- and grass-covered plains, glaciated peaks, woodland- and shrubland-covered hills, lava fields and volcanic plateaus, river floodplains, and arid deserts. Detailed descriptions of all ecoregions in New Mexico are in **Appendix F**.

Maps showing the ecoregions and NMED stream assessment units of the Upper Rio Grande basin and the Galisteo watershed are shown in **Appendix B, Figures B6** and **B7**. The characteristics of ecoregions containing Segment 121 and the Galisteo watershed are summarized in **Table 1**. The Upper Rio Grande basin is contained mostly in ecoregions 21 (Southern Rockies) and 22 (Arizona/New Mexico Plateau). Ecoregion 21 contains the highest elevations and the lowest air temperatures in the Upper Rio Grande basin. These conditions support forests and alpine vegetation. Streams in this ecoregion are mostly high gradient perennial streams with rocky substrates. Stream assessment units with the high quality coldwater and coldwater (shown in blue), including segment 121 (shown in purple) occur mainly in ecoregion 21. Ecoregion 21d represents a transition between 21 and 22.

⁶ Dates provided on this imagery refers to the date that Google purchased the imagery and not to the date of the photo (Z. Stauber, email June 2012).

The Galisteo watershed is in the southernmost part of the basin, mostly in ecoregions 22 and 26 (Southwestern Tablelands). Ecoregions 22 and 26 are lower elevation and warmer and consist mainly of low mountains, hills, slopes, mesas and canyons. Natural vegetation is mainly woodland, shrubland, savannah and grassland. Streams are mostly intermittent or ephemeral. Due to the soils of these ecoregions, streams are more likely to have sandy substrates. Marginal coldwater and coolwater (green), warmwater (orange) assessment units, and most of Galisteo Creek occur mainly in ecoregion 22. A small portion of the southwestern Galisteo watershed in the Ortiz Mountains is contained in ecoregion 23, which is warmer and drier than other mountain ecoregions.

The number of miles and percentages of each segment 121 stream occurring in each ecoregion is shown in **Table 2**. By far, most segment 121 streams are in the forested, mountainous ecoregion 21. The headwaters of the Galisteo watershed are in ecoregions 21c and the transitional ecoregion of 21d. Most of the watershed is in ecoregions 22 and 26, where natural conditions are warmer and drier. The thermograph that led to the temperature listing of Galisteo Creek was located well within ecoregion 22, ten miles from ecoregion 21. Significantly, Galisteo Creek is the only stream in segment 121 impaired for temperature.

The lower Rio Quemado and the upper Santa Cruz assessment units in segment 121 are contained entirely in ecoregion 22h. Although unimpaired for temperature, a closer look at these systems is warranted. The Rio Quemado is divided into two segments at a political rather than hydrologic boundary; most of this river is actually in ecoregion 21. The Santa Cruz River assessment unit is a 1-mile section just below ecoregion 21. Both the Rio Quemado and the Santa Cruz River are influenced by cool canyon-bound upstream flow originating in ecoregion 21.

Segment 121 specifically excludes Rio Grande tributaries "classified in other segments." Several such tributaries⁷ are classified in segments 113 or 114 with the marginal coldwater aquatic life use. Like Galisteo Creek, these streams are contained well within ecoregion 22. Unlike Galisteo Creek, these streams are meeting their temperature criteria.

In summary, the forested, mountainous ecoregion 21 contains Apache Canyon, Deer Creek, most of the waters in segment 121, and many other high quality coldwater streams. The warmer and drier ecoregions 22 and 26 contain most of the Galisteo watershed. The fundamental natural differences between the Galisteo watershed and other segment 121 streams ultimately affect water temperatures and attainable aquatic life uses. The naturally occurring ecoregion conditions described in this section indicate that the high quality coldwater aquatic life use is likely not appropriate or attainable for most of the Galisteo watershed.

⁷ Rio Tesuque, Pojoaque River, Cienega Creek, lower Santa Cruz River, and lower Santa Fe River.

Table 1. Ecoregions containing segment 121 assessment units and the Galisteo watershed (based on Griffith et al. 2006)

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Code	Name	Primary Vegetation	Land Cover	Physiography	Hydrology	July Ave Air Temp	Min Elev	Max Elev	Galisteo Watershed	Other Segment 121
21	Southern Rockies									
21a	Alpine Zone	alpine	rock, meadow, forest	High mountains with steep slopes, ridges, and exposed rocky peaks above timberline.	Some wetlands and glacial lakes. High gradient headwater streams with boulder, cobble, and bedrock substrates.	15.8	11,000	13,161		X
21b	Crystalline Subalpine Forests	spruce, fir, aspen	forest	High mountains with steep slopes.	High gradient headwater streams with boulder, cobble, and bedrock substrates.	16.0	9,000	11,500		X
21c	Crystalline Mid- Elevation Forests	ponderosa pine, fir, aspen	forest	Low mountain ridges, slopes, and outwash fans.	Moderate to high gradient perennial streams with boulder, cobble, and bedrock substrates.	17.5	7,600	10,100	Х	X
21d	Foothill Woodlands and Shrublands	pinon-juniper	wood, shrub	Hills, ridges, and footslopes. Transitions into Ecoregion 22.	Moderate to high gradient perennial, intermittent, and ephemeral streams with cobble, gravel, and sandy substrates.	19.7	6,000	8,500	X	X
21h	Volcanic Mid- Elevation Forests Arizona/New Mexico	ponderosa pine, fir, aspen	forest	Low mountain ridges, slopes, and outwash fans.	Moderate to high gradient perennial streams with boulder, cobble, and bedrock substrates.	17.5	7,500	10,000		X
22	Plateau									
22h	North Central New Mexico Valleys and Mesas	pinon-juniper	wood, shrub, grass	Mesas, valleys, piedmont slopes, deep canyons, a few scattered hills.	Some perennial and many intermittent streams from surrounding mountain ecoregions.	21.7	5,300	8,052	X	X
23	Arizona/New Mexico Mountains									
23c	Montane Conifer Forests	ponderosa pine, oak	forest	Open low mountains and high mountains with steep slopes, numerous canyons.	Mostly moderate to high gradient intermittent and some perennial streams with bedrock, cobble, gravel, and sandy substrates.	18.9	7,000	9,600	X	
23e	Conifer Woodlands and Savannas	pinon-juniper	wood, shrub, grass	High hills and low mountains, numerous canyons.	Mostly moderate to high gradient intermittent streams with bedrock, cobble, gravel, and sandy substrates; a few perennial rivers.	20.1	6,000	9,220	X	
26	Southwestern Tablelands									
26h	Pinyon-Juniper Woodlands and Savannas	pinon-juniper	wood, shrub, grass	Dissected plains and tablelands with some scattered ridges and hills.	Mostly intermittent streams and some perennial streams that are spring-fed or that originate in mountain ecoregions.	21.6	5,000	8,720	X	

Table 2. Miles/percent of segment 121 AU s per Ecoregion

Stream	21a	21b	21c	21d	21h	22h	total stream mi	% in 21	% in 22
Alamo Canyon				7.1	6.7	0.9	14.7	94%	6%
Capulin Creek				8.2	3.1	1.7	13	87%	13%
Galisteo Ck (Perennial reaches above Kewa Pueblo boundary)				8.4		33.2	41.6	20%	80%
Little Tesuque Creek		1.5	3.9	2.8		0.1	8.3	99%	1%
Medio Creek				5.1		1.1	6.2	82%	18%
North Fork Tesuque Creek	0.5	1.7					2.2	100%	0%
Rio Chupadero (USFS boundary to headwaters)			2.3				2.3	100%	0%
Rio Frijoles (Rio Medio to Pecos Wilderness)		3.7	6.4	2.2		1.5	13.8	89%	11%
Rio Medio	0.3	3.1	9.5	2.1		2.4	17.4	86%	14%
Rio Nambe (Nambe Pueblo boundary to headwaters)	1.5	1.3	5.6				8.4	100%	0%
Rio Quemado (Santa Cruz River to Rio Arriba Countyboundary)						3.8	3.8	0%	100%
Rio en Medio (Aspen Ranch to headwaters)		0.8	0.2				1	100%	0%
Rio en Medio (non-pueblo lands Pojoaque River to Aspen Ranch)			4	1.1		1	6.1	84%	16%
Rito de los Frijoles (Rio Grande to Upper Crossing)				6.7	0.9	0.4	8	95%	5%
Rito de los Frijoles (Upper Crossing to headwaters)					6		6	100%	0%
Santa Cruz River (Santa Cruz Reservoir to Rio en Medio)						1	1	0%	100%
Santa Fe River (Nichols Reservoir to headwaters)	0.5	5.4	5.8				11.7	100%	0%
South Fork Tesuque Creek		1			-		1	100%	0%
Tesuque Creek		1.2	3.3	2.3			6.8	100%	0%

WATER TEMPERATURE MODELING

The six aquatic life use subcategories and associated temperature criteria for New Mexico's surface waters are listed in **Table 3**.

Table 3. Aquatic Life Use Temperature Criteria °C

Criterion	High Quality Coldwater	Coldwater	Marginal Coldwater	Coolwater	Warmwater	Marginal warmwater
4T3	20	-	-	-	-	-
6T3	-	20	25	-	-	-
TMAX	23	24	29	29	32.2	32.2

New Mexico's aquatic life temperature criteria are expressed as 4T3, 6T3 and TMAX, EPA (1972) recommends chronic temperature criteria based on the maximum weekly average temperature (MWAT). TMAX is the maximum temperature, 4T3 is the 4-hour maximum temperature that occurs for 3 consecutive days, 6T3 is the 6-hour maximum temperature that occurs for 3 consecutive days, and MWAT is the maximum seven-day running average temperature. The reference data is the first date that the measurement occurs. These statistics are derived from water thermograph measurements.

For many surface waters in New Mexico, the maximum weekly average temperature (MWAT) is nearly equal to the July average air temperature at that location (NMED/SWQB 2012). July average air temperatures for any geographic coordinate location within the continental United States may be modeled using PRISM (http://www.prism.oregonstate.edu). NMED recently developed a correlation model using PRISM air temperatures (ATEMP) to predict TMAX, 4T3 and 6T3 on July 15⁸ for water bodies without thermograph data (NMED/SWQB 2012). The following formulae are used:

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MWAT=ATEMP

TMAX = 1.07 * ATEMP + 4.95

4T3 = 1.06 * ATEMP + 1.82

6T3 = 1.03 * ATEMP + 1.30
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The effect of air temperatures on aquatic life uses may be generalized as follows:

- high quality and coldwater uses may be attainable if ATEMP is $\leq 18^{\circ}$ C;
- marginal coldwater and coolwater uses may be attainable if ATEMP is ≤23°C;
- warmwater may be the most restrictive use attainable if ATEMP is >23°C.

Surface water influenced by cold springs, microclimates or groundwater will be cooler than predicted by this model (NMED/SWQB 2012c). For such water bodies, the actual measured MWAT will be *less* than PRISM, and the difference may be used to estimate the cooling influence of the groundwater at that location.

⁸ The model uses July 15 as a reference date on which the highest annual temperature typically occurs.

NMED applied the air-water correlation model to ten locations within the watershed, shown in Table 4. Available thermograph data show measured MWAT to be an average of 2.05 °C cooler than the predicted MWAT from PRISM data. This number was subtracted from the predicted TMAX, 4T3, 6T3 and MWAT at each location to estimate groundwater cooling effects.

Table 4. Water temperatures						
	REFERENCE					
LOCATION	DATE	TMAX	4T3	6T3	MWAT	PRISM
Galisteo Creek @ Domingo	Г	1		I	1	
Predicted		29.9	26.5	25.3	23.3	23.3
Predicted w groundwater		27.9	24.5	23.3	21.3	
Galisteo Creek below Galisteo Dam		1			1	
Predicted		29.3	25.9	24.7	22.8	22.8
Predicted w groundwater		27.3	23.9	22.7	20.7	
Galisteo Creek @ Cerrillos		_				
Predicted		29.0	25.6	24.4	22.5	22.5
Predicted w groundwater		26.9	23.6	22.4	20.4	
Galisteo Creek @ CR 55A						
Predicted		28.6	25.2	24.1	22.1	22.1
Predicted w groundwater		26.5	23.2	22.0	20.1	
Galisteo Creek @ Galisteo village						
Thermograph	7/25/03	29.0	24.8	22.0	20.0	21.7
Thermograph	7/20/10	29.7	24.8	22.6	19.0	21.7
Predicted		28.1	24.8	23.6	21.7	
Predicted w groundwater		26.1	22.7	21.5	19.6	
San Cristobal Creek						
Predicted		27.6	24.3	23.1	21.2	21.2
Predicted w groundwater		25.6	22.2	21.1	19.2	
Galisteo Creek @ Cañoncito (JC)			•			
Predicted		26.5	23.2	22.1	20.2	20.2
Predicted w groundwater		24.5	21.2	20.0	18.1	
Galisteo Creek @ Cañoncito (TS)						
Thermograph June-July (interim upload)	7/20/12	23.6	18.7	17.8	16.9	20.1
Thermograph June-Sept	9/3/12	25.0	22.1	20.8	19.1	20.4
Predicted		26.7	23.4	22.3	20.4	
Predicted w groundwater		24.7	21.3	20.2	18.3	
Deer Creek						
Predicted		24.6	21.3	20.2	18.4	18.4
Predicted w groundwater		22.5	19.2	18.2	16.3	
Apache Canyon						
Thermograph	7/22/11	17.5	15.8	15.4	14.4	17.1
Predicted		23.2	19.9	18.9	17.1	
Predicted w groundwater		21.2	17.9	16.9	15.1	
	•	•		•	•	

DISCUSSION

PRISM air temperatures and predicted water temperatures at Domingo and at Galisteo dam are the highest in the watershed. Domingo is on the Kewa pueblo and the reach is not included in New Mexico's water quality standards. Galisteo Creek above and below the dam is ephemeral and no thermograph data are available. Predicted temperatures for any perennial reaches that may exist, adjusted for the likely event of groundwater influence, meet marginal coldwater or coolwater.

Air and water temperatures in Apache Canyon and Deer Creek are the lowest in the watershed. Thermograph measurements at Apache Canyon meet the high quality coldwater criteria, and predicted temperatures at Deer Creek meet high quality coldwater where groundwater influenced. The characteristics of the mountain and foothill ecoregions in which these streams occur support this aquatic life use. Public comments stated that resident trout populations may exist in these streams. High quality coldwater aquatic life is appropriate for perennial streams in the upper watershed including Apache Canyon and Deer Creek. These reaches are already classified in segment 121 and do not need to be reclassified.

Galisteo Creek at Cerrillos, and one mile above CR 55A, are perennial reaches sustained by groundwater. San Cristobal Creek is a major tributary of Galisteo Creek in the middle watershed. These locations do not have thermograph data. Predicted temperatures meet the marginal coldwater and coolwater criteria with or without groundwater influence. Galisteo Creek in the village of Galisteo is a perennial reach sustained by groundwater. Predicted temperatures here also meet the coolwater and marginal coldwater criteria with or without groundwater influence, although the thermograph TMAX slightly exceeded (<1°C) the criteria. Resident flathead chub species identified in these waters have intermediate temperature preferences. The characteristics of the xeric ecoregions where these streams occur, plus the cooling influence of groundwater, support the coolwater and marginal coldwater aquatic life uses.

The Cañoncito area located within a transitional zone between the middle and upper watershed, in a foothills ecoregion where different types of geology, soils, vegetation, topography and elevation converge. Air and water temperatures reflect this transition. NMED sampled two Cañoncito area sites approximately 1 mile apart: Cañoncito 1 at JC residence, and Cañoncito 2 at TS residence where a thermograph was deployed in 2012. Predicted temperatures at both locations meet coolwater and marginal coldwater with or without considering groundwater influence. Interim data uploaded in July exceeded the high quality coldwater criteria but met the coldwater criteria (see Appendix C). The thermograph was retrieved in mid-September and the complete dataset analyzed. Compared to the interim upload, the complete dataset exhibited unusually high temperatures and large diel temperature swings characteristic of a thermograph exposed to air, suggesting that this reach went dry during the 2012 midsummer drought. NMED censored 623 data points (July 24 to Aug 18) and calculated the statistics from the remaining 1782 points. The results exceed high quality coldwater, slightly exceed (=1°C) coldwater, and

meet coolwater and marginal coldwater. High quality coldwater is probably not attainable for the Cañoncito area, but coldwater may be attainable, especially in pools. By contrast, other locations analyzed clearly exhibit the attainable aquatic life use of coolwater and marginal coldwater. Finally, complete water quality surveys have not yet been conducted in the Cañoncito area. Therefore NMED proposes to reclassify only the reaches downstream of Cañoncito. The proposed segment break is located 2.2 miles upstream of Lamy, as shown in **Figures B8 - B10** (**Appendix B**). An arroyo from the west joins Galisteo Creek at coordinates -105.858807 and 35.5077693. A railroad bridge crosses this arroyo immediately above the confluence with Galisteo Creek. The location is marked by a benchmark at 6610 feet.

Definitions of coolwater and marginal coldwater from New Mexico Water Quality Standards are:

"Coolwater" in reference to an aquatic life use means the water temperature and other characteristics are suitable for the support or propagation of aquatic life whose physiological tolerances are intermediate between and may overlap those of warm and coldwater aquatic life.

"Marginal coldwater" in reference to an aquatic life use means that natural intermittent or low flows, or other natural habitat conditions severely limit maintenance of a coldwater aquatic life population or historical data indicate that the temperature in the surface water of the state may exceed 25°C (77°F).

Marginal coldwater describes habitat that would otherwise be coldwater, but is limited by habitat conditions such as low flow. Coolwater describes habitat that is naturally intermediate between cold and warm, regardless of flow. Therefore "coolwater" is the best description of the attainable use in the middle and lower watershed.

CONCLUSION

The Galisteo watershed is a complex hydrological and geological system, coupled with a long history of human use and impacts. Watershed degradation, groundwater withdrawals and natural conditions all affect the water quality, quantity and the attainable aquatic life use. Nonetheless, surface water temperatures are ultimately limited by natural ambient air temperatures.

NMED therefore proposes that perennial reaches downstream of the confluence of Galisteo Creek and the unnamed arroyo as described above, be reclassified into a new segment with the coolwater aquatic life use. All other uses and criteria from segment 121 should be retained except for the specific conductance criterion, which applies only to the high quality coldwater aquatic life use.

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20	12c. Lower Dry (Cimarron Use A	Attainability A	analysis. Ma	arch 2012.	
20	11. Hydrology Pi	rotocol for the	Determination	ı of Uses su	pported by	Ephemeral,

Intermittent and Perennial Waters. May 2011. Santa Fe, NM.

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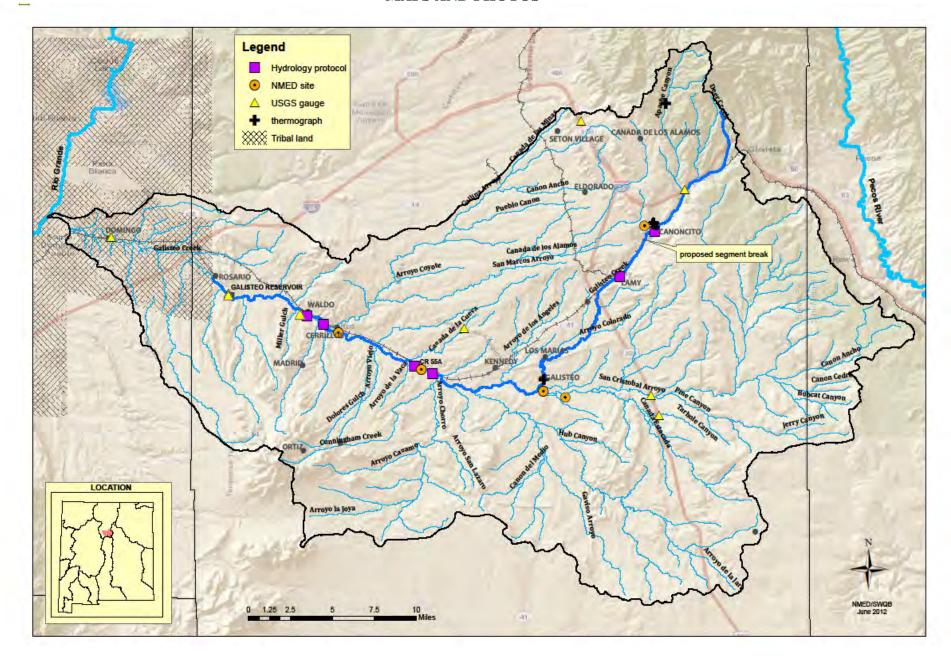
Vrooman, S. and EWI. 2006. Assessment and Plan for the Creation, Restoration and Protection of Wetlands in the Galisteo Watershed. July 2006.

APPENDIX A UAA FACTORS

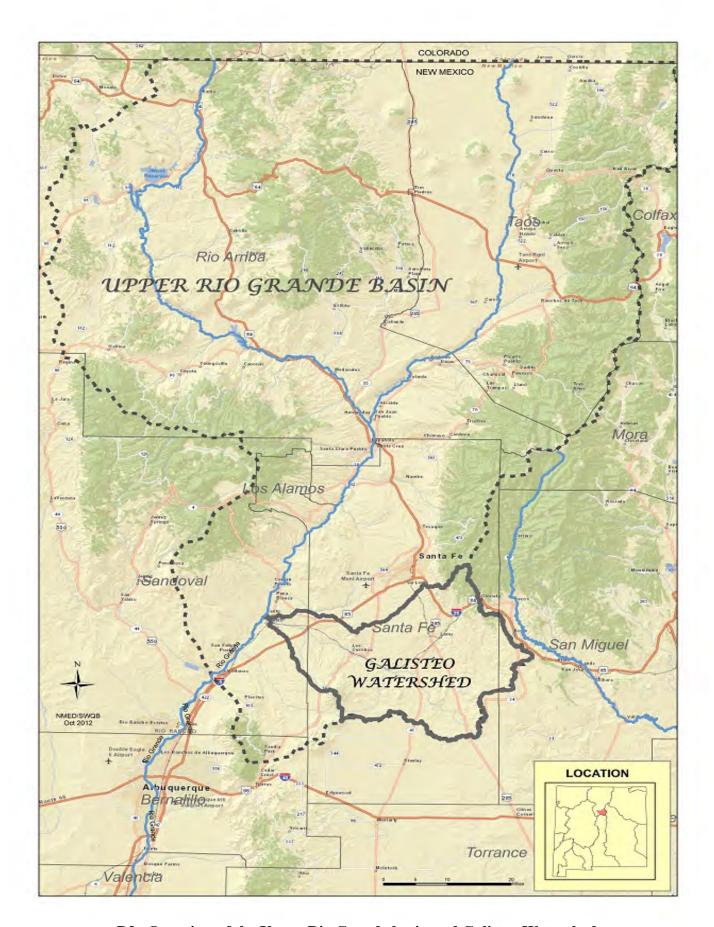
40 CFR 131.10(g):

- (g) States may remove a designated use which is not an existing use, as defined in Sec. 131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:
 - (1) Naturally occurring pollutant concentrations prevent the attainment of the use; or
- (2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or
- (3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
- (4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or
- (5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or
- (6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

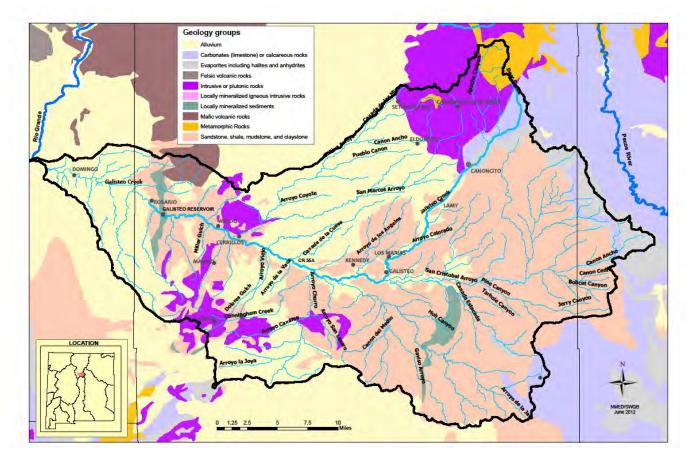
APPENDIX B MAPS AND PHOTOS



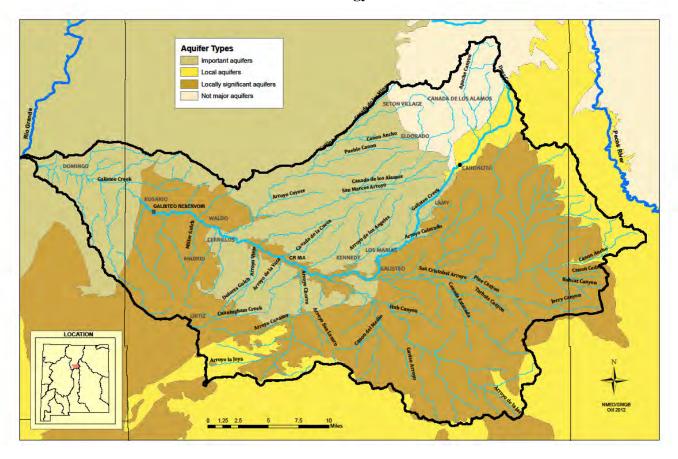
B1. Locations referred to in UAA



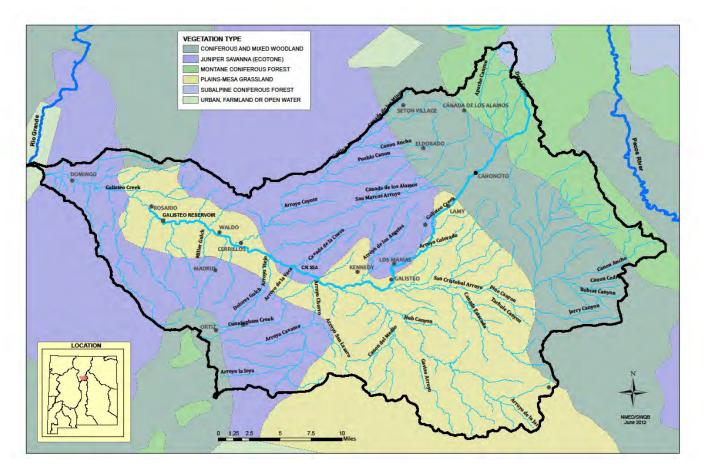
B2. Overview of the Upper Rio Grande basin and Galisteo Watershed



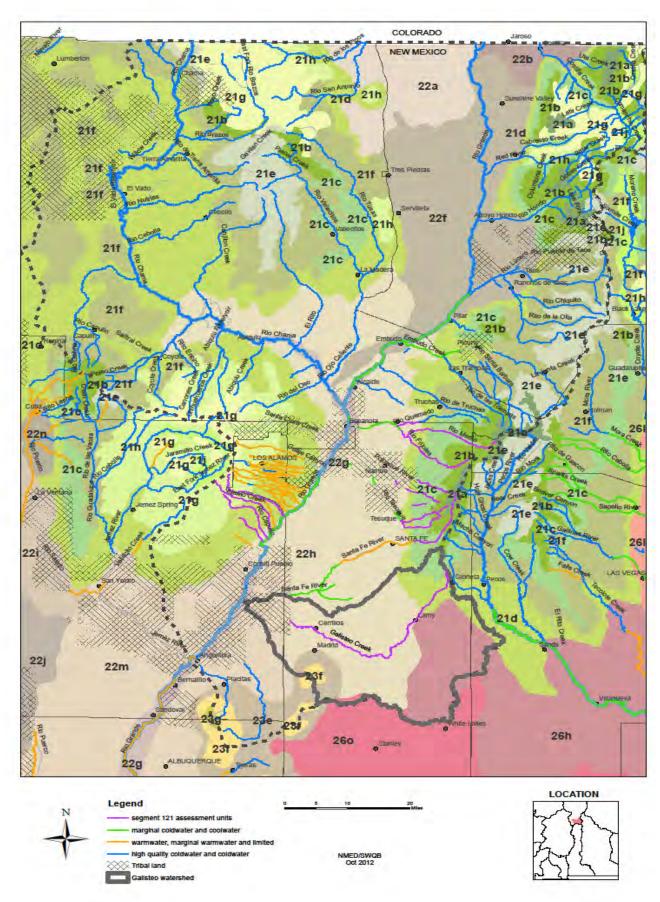
B3. Geology



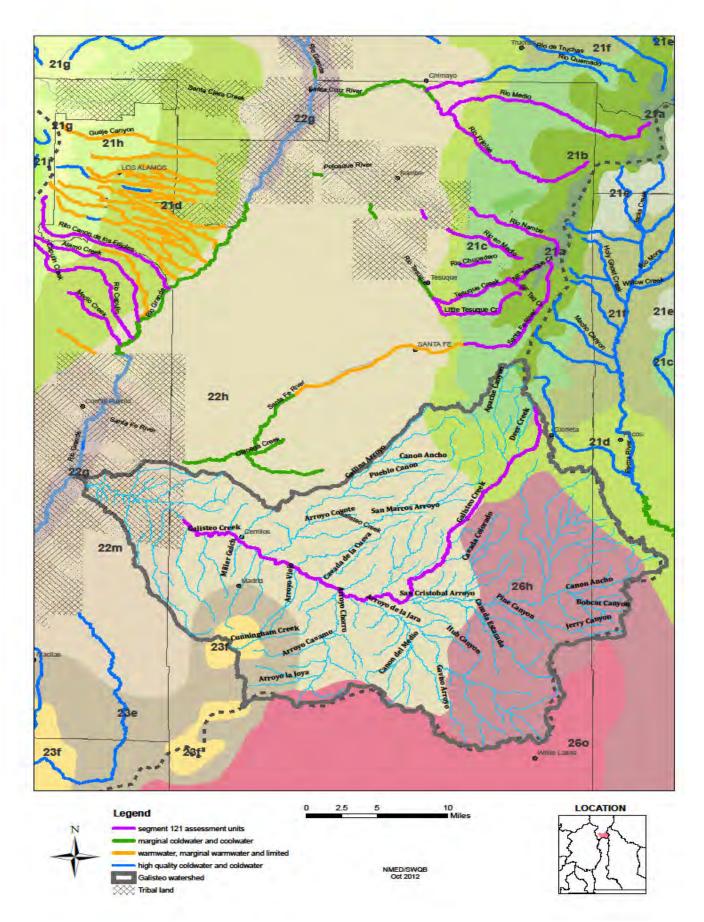
B4. Aquifers



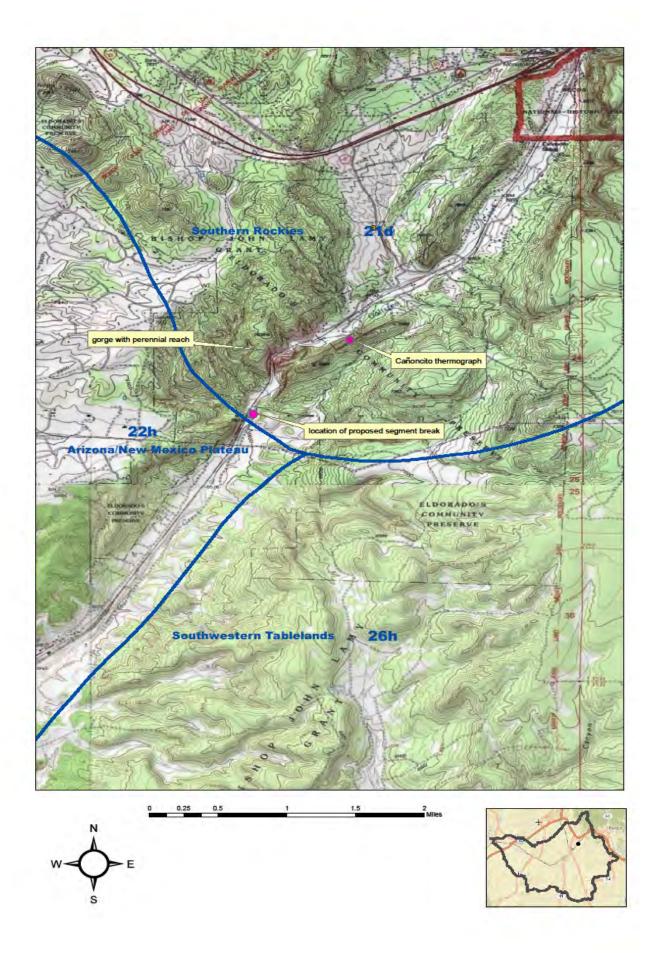
B5. Vegetation



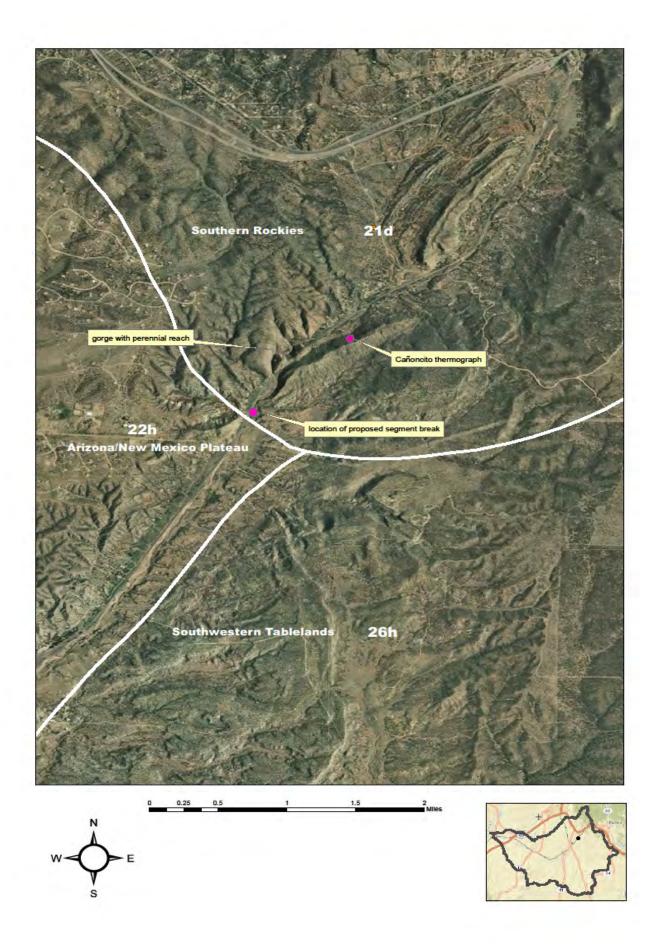
B6. Ecoregions and assessment units of the Upper Rio Grande basin map



B7. Ecoregions and assessment units of the Galisteo watershed map



B8. Map of proposed segment break location



B9. Aerial photo of proposed segment break location



B10. Proposed segment break location

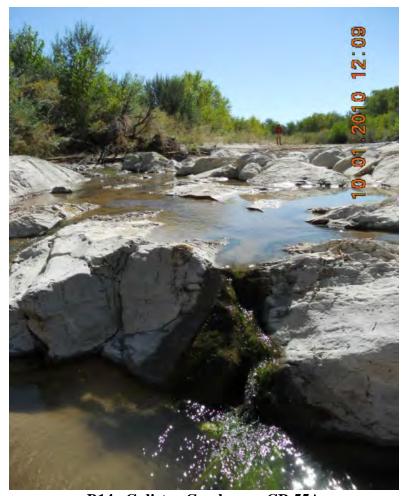




B12. Galisteo Creek channel incised below I-25.



B13. Galisteo Creek at NM 14 in Cerrillos. April 2010.



B14. Galisteo Creek near CR 55A



B15. Galisteo Creek in Galisteo village. April 2010.



B16. Galisteo Creek in Cañoncito (site 1). April 2010.



B17. Galisteo Creek in Cañoncito (site 2). June 2012.





B19. San Cristobal Arroyo at NM 285. June 2012

APPENDIX C NMED WATER QUALITY DATA

Table C1. Single samples

LOCATION	DATE	На	sc	TEMP	DO	DO sat	TURB	DATA SOURCE
Apache Canyon	7/22/2011	8.2	173	14.80	7.4	96.0	2.50	NMED
Galisteo Creek above dam	6/28/74 0:00	0.2	170	24.00		00.0	2.00	USGS
Galisteo Creek above Rio Grande	6/30/1995 1345	8.4	550	20.00	3.4	36.9		NM Dept of Health and Environment
Galisteo Creek above Rio Grande	8/23/1995 1525	8.0	465	28.50	6.3	79.8		NM Dept of Health and Environment
Galisteo Creek at Richardson property above CR 55A	5/24/2001 10:00	8.2	1563	19.35	8.5	92.2		NMED
Galisteo Creek at Richardson property above CR 55A	11/6/2003 9:00	6.8	1209	11.85	9.6	115.0	7.70	NMED
Galisteo Creek at Richardson property above CR 55A	4/27/2010 12:40	8.2	1467	21.97	7.0	103.9	9.20	NMED
Galisteo Creek at Domingo	8/3/61 0:00			30.00				USGS
Galisteo Creek at Domingo	8/4/63 0:00			25.60				USGS
Galisteo Creek at Domingo	7/19/66 0:00			21.10				USGS
Galisteo Creek at Domingo	7/17/67 0:00			20.00				USGS
Galisteo Creek at Domingo	8/14/68 0:00			27.00				USGS
Galisteo Creek at Domingo	8/23/69 0:00			24.00				USGS
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001 10:25	8.2	1639	18.60	9.1	98.0		NMED
Galisteo Creek at Hwy 14 near Cerrillos	5/23/2001 11:17	8.2	1562	21.87	7.9	90.0		NMED
Galisteo Creek at Hwy 14 near Cerrillos	5/24/2001 9:40	8.1	1103	18.28	8.1	86.4		NMED
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001 10:40	8.2	385	19.01	7.8	84.3		NMED
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001 10:25	7.9	1576	19.33	7.2	78.7	0.98	NMED
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003 10:20	7.4	1290	13.66	9.8	123.0	0.00	NMED
Galisteo Creek at Hwy 14 near Cerrillos	4/27/2010 11:30	8.2	1517	19.74	7.2	103.0	34.20	NMED
Galisteo Creek below dam	8/20/71 0:00			25.50				USGS
Galisteo Creek below dam	7/10/72 0:00			31.50				USGS
Galisteo Creek below dam	8/31/73 0:00			26.50				USGS
Galisteo Creek below dam	8/6/74 0:00			29.00				USGS
Galisteo Creek below dam	7/15/75 0:00			30.00				USGS
Galisteo Creek below dam	8/27/76 0:00			29.00				USGS
Galisteo Creek below dam	8/15/77 0:00			28.00				USGS
Galisteo Creek below dam	8/11/78 0:00			24.00				USGS
Galisteo Creek below dam	8/17/79 0:00			19.00				USGS
Galisteo Creek in Galisteo	5/22/2001 12:20	8.1	505	21.74	7.3	83.4		NMED
Galisteo Creek in Galisteo	5/23/2001 8:10	8.0	432	11.36	8.1	74.1	3.61	NMED
Galisteo Creek in Galisteo	5/24/2001 12:20	8.1	591	22.60	7.3	85.1	3.22	NMED
Galisteo Creek in Galisteo	8/14/2001 13:10	8.0	312	24.68	6.6	79.8		NMED
Galisteo Creek in Galisteo	8/15/2001 11:45	8.1	615	23.40	6.8	80.4	9.80	NMED
Galisteo Creek in Galisteo	9/25/2001 11:20	8.1	619	17.34	7.3	76.4	3.91	NMED

LOCATION	DATE	pН	SC	TEMP	DO	DO sat	TURB	DATA SOURCE
Galisteo Creek in Galisteo	9/26/2001 10:50	7.9	588	16.04	7.4	74.9	1.76	NMED
Galisteo Creek in Galisteo	9/27/2001 10:15	8.0	564	14.49	7.6	74.7	4.33	NMED
Galisteo Creek in Galisteo	11/5/2003 14:00	7.3	551	15.36	8.2	106.3	0.00	NMED
Galisteo Creek in Galisteo	4/27/2010 14:00	8.2	727	21.36	7.0	102.6	9.10	NMED
Galisteo in Canoncito JC residence	4/27/2010 14:00	8.4	319	19.70	7.4	104.6	16.40	NMED
Galisteo in Canoncito TS residence	3/28/2012 15:50	nd	766	17.30	8.5	112.0	-2.60	NMED
San Cristobal Creek at Hwy 41	5/22/01 11:41	7.2	4840	17.06	6.1			NMED
San Cristobal Creek at Hwy 41	5/23/01 9:10	8.3	4884	13.94	5.4		8.25	NMED
San Cristobal Creek at Hwy 41	5/24/01 11:40	7.9	5119	21.35	6.4		4.63	NMED
San Cristobal Creek at Hwy 41	8/14/01 13:50	8.1	357	20.59	8.3			NMED
San Cristobal Creek at Hwy 41	8/15/01 12:10	8.2	549	18.63	8.1		667	NMED

Table C2. Lab analysis

Station	DateTime	Analyte name	conc	Units	Less than	SampleType
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Alkalinity	190	mg/l	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Bicarbonate	231	mg/l	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Calcium	125	mg/l	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Carbonate	0	mg/l	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Chloride	28.2	mg/l	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Fluoride	0.97	mg/l	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Hardness	494	mg/L CaCO3	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Magnesium	44.1	mg/l	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Potassium	5	mg/l	TRUE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Sodium	1	mg/l	TRUE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Sulfate	629	mg/l	FALSE	Ions (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Total Dissolved Solids	1200	mg/l	FALSE	Ions (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Total Suspended Solids	3	mg/l	TRUE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Phosphorus, Total	0.03	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Total Kjehldal Nitrogen	0.136	mg/L	FALSE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Total Organic Carbon	3	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Aluminum	0.02	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Antimony	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Arsenic	0.001	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Barium	0.1	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Beryllium	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Boron	0.2	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Cadmium	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Calcium	150	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Chromium	0.001	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Cobalt	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Copper	0.01	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Iron	0.1	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Lead	0.001	mg/L	TRUE	Metals (total, full suite)

Station	DateTime	Analyte name	conc	Units	Less than	SampleType
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Magnesium	44	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Manganese	0.032	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Mercury	0.0002	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Molybdenum	0.005	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Nickel	0.01	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Selenium	0.005	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Silicon	7.4	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Silver	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Strontium	1.8	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Thallium	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Tin	0.1	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Uranium-234/235/238	0.011	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Vanadium	0.002	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Zinc	0.01	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Aluminum	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Antimony	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Arsenic	0.001	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Barium	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Beryllium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Boron	0.2	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Cadmium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Calcium	150	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Chromium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Cobalt	0.001	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Copper	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Iron	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Lead	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Magnesium	46	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Manganese	0.03	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Molybdenum	0.006	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Nickel	0.01	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Selenium	0.005	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Silicon	7.5	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Silver	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Strontium	1.8	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Thallium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Tin	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Uranium-234/235/238	0.011	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Vanadium	0.003	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	5/22/2001	Zinc	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Alkalinity	211	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Bicarbonate	257	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Calcium	141	mg/L	FALSE	Ions (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Carbonate	0	mg/L	FALSE	Ions (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Chloride	25.5	mg/L	FALSE	Ions (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Hardness	531	mg/L CaCO3	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Magnesium	43.4	mg/L	FALSE	Ions (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Potassium	5	mg/L	TRUE	Ions (full suite)

Station	DateTime	Analyte name	conc	Units	Less than	SampleType
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Sodium	153	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Sulfate	593	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Total Dissolved Solids	1160	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Total Suspended Solids	3	mg/L	TRUE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Phosphorus, Total	0.03	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Total Kjehldal Nitrogen	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Total Organic Carbon	3	mg/L	TRUE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Aluminum	0.03	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Antimony	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Arsenic	0.002	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Barium	0.1	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Beryllium	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Boron	0.3	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Cadmium	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Calcium	150	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Chromium	0.002	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Cobalt	0.001	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Copper	0.01	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Iron	0.1	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Lead	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Magnesium	41	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Manganese	0.21	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Mercury	0.0002	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Molybdenum	0.006	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Nickel	0.01	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Selenium	0.005	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Silicon	8	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Silver	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Strontium	1.8	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Thallium	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Tin	0.1	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Uranium-234/235/238	0.009	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Vanadium	0.1	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Zinc	0.01	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Aluminum	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Antimony	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Arsenic	0.002	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Barium	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Beryllium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Boron	0.2	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Cadmium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Calcium	170	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Chromium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Cobalt	0.001	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Copper	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Iron	0.1	mg/L	TRUE	Metals (dissolved)

Station	DateTime	Analyte name	conc	Units	Less than	SampleType
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Lead	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Magnesium	45	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Manganese	0.21	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Molybdenum	0.006	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Nickel	0.01	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Selenium	0.005	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Silicon	8.8	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Silver	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Strontium	2.1	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Thallium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Tin	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Uranium-234/235/238	0.009	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Vanadium	0.002	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	9/25/2001	Zinc	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Alkalinity	112	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Bicarbonate	124	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Calcium	73.5	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Carbonate	12.2	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Chloride	10	mg/L	TRUE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Hardness	229	mg/L CaCO3	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Magnesium	11.1	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Potassium	5	mg/L	TRUE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Sodium	26.6	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Sulfate	115	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Total Suspended Solids	23000	mg/L	FALSE	lons (full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Ammonia	0.103	mg/l	FALSE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Nitrate + Nitrite (N)	0.45	mg/l	FALSE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Phosphorus, Total	6.29	mg/l	FALSE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Total Kjehldal Nitrogen	0.918	mg/l	FALSE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Total Organic Carbon	14.2	mg/l	FALSE	Nutrients (total)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Aluminum	300	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Antimony	0.001	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Arsenic	0.03	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Barium	6	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Beryllium	0.02	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Boron	10	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Cadmium	0.01	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Calcium	870	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Chromium	0.18	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Cobalt	0.17	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Copper	0.3	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Iron	200	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Lead	0.25	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Magnesium	160	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Manganese	11	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Mercury	0.0003	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Molybdenum	0.01	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Nickel	0.5	mg/L	FALSE	Metals (total, full suite)

Station	DateTime	Analyte name	conc	Units	Less than	SampleType
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Selenium	0.005	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Silicon	76	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Silver	0.01	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Strontium	3	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Thallium	0.002	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Tin	0.1	mg/L	TRUE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Uranium-234/235/238	0.019	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Vanadium	0.2	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Zinc	0.7	mg/L	FALSE	Metals (total, full suite)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Aluminum	0.05	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Antimony	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Arsenic	0.001	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Barium	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Beryllium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Boron	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Cadmium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Calcium	44	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Chromium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Cobalt	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Copper	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Iron	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Lead	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Magnesium	7	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Manganese	0.002	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Molybdenum	0.003	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Nickel	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Selenium	0.005	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Silicon	4.1	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Silver	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Strontium	0.5	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Thallium	0.001	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Tin	0.1	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Uranium-234/235/238	0.001	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Vanadium	0.007	mg/L	FALSE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Zinc	0.01	mg/L	TRUE	Metals (dissolved)
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Alkalinity	111	mg/L	FALSE	lons (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Bicarbonate	121	mg/L	FALSE	lons (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Calcium	76	mg/L	FALSE	lons (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Carbonate	14.4	mg/L	FALSE	lons (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Chloride	10	mg/L	TRUE	lons (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Hardness	236	mg/L CaCO3	FALSE	lons (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Magnesium	11.3	mg/L	FALSE	lons (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Potassium	5	mg/L	TRUE	Ions (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Sodium	26.6	mg/L	FALSE	Ions (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Sulfate	115	mg/L	FALSE	Ions (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Total Suspended Solids	22100	mg/L	FALSE	Ions (full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Ammonia	0.1	mg/l	TRUE	Nutrients (total), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Nitrate + Nitrite (N)	0.44	mg/l	FALSE	Nutrients (total), dup

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Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Phosphorus, Total	3.94	mg/l	FALSE	Nutrients (total), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Total Kjehldal Nitrogen	0.599	mg/l	FALSE	Nutrients (total), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Total Organic Carbon	11.8	mg/l	FALSE	Nutrients (total), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Aluminum	300	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Antimony	0.001	mg/L	TRUE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Arsenic	0.03	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Barium	6	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Beryllium	0.02	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Boron	10	mg/L	TRUE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Cadmium	0.01	mg/L	TRUE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Calcium	870	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Chromium	0.15	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Cobalt	0.15	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Copper	0.2	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Iron	210	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Lead	0.24	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Magnesium	160	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Manganese	11	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Mercury	0.0003	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Molybdenum	0.01	mg/L	TRUE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Nickel	0.4	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Selenium	0.005	mg/L	TRUE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Silicon	68	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Silver	0.01	mg/L	TRUE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Strontium	3.1	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Thallium	0.003	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Tin	0.1	mg/L	TRUE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Uranium-234/235/238	0.019	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Vanadium	0.2	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Zinc	0.6	mg/L	FALSE	Metals (total, full suite), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Aluminum	0.12	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Antimony	0.001	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Arsenic	0.001	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Barium	0.1	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Beryllium	0.001	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Boron	0.1	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Cadmium	0.001	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Calcium	44	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Chromium	0.001	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Cobalt	0.001	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Copper	0.01	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Iron	0.1	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Lead	0.001	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Magnesium	7	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Manganese	0.003	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Molybdenum	0.003	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Nickel	0.01	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Selenium	0.005	mg/L	TRUE	Metals (dissolved), dup

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Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Silicon	4.5	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Silver	0.001	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Strontium	0.5	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Thallium	0.001	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Tin	0.1	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Uranium-234/235/238	0.001	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Vanadium	0.007	mg/L	FALSE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	8/14/2001	Zinc	0.01	mg/L	TRUE	Metals (dissolved), dup
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Alkalinity	211	mg/L	FALSE	lons
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Bicarbonate	257	mg/L	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Calcium	150	mg/L	FALSE	lons
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Carbonate	0	mg/L	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Chloride	21	mg/L	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Fluoride	1.02	mg/L	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Hardness	559	mg/L CaCO3	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Hardness (Ca & Mg)	559	mG/L CaCO3	FALSE	lons
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Magnesium	44.7	mg/L	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Potassium	5	mg/L	TRUE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Sodium	170	mg/L	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Sulfate	637	mg/L	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Total Dissolved Solids	1190	mg/L	FALSE	Ions
Galisteo Creek at Hwy 14 near Cerrillos	11/6/2003	Total Suspended Solids	3	mg/L	TRUE	Ions
San Cristobal Creek at Hwy 41	5/22/2001	Alkalinity	179	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Bicarbonate	219	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Calcium	1	mg/l	TRUE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Carbonate	0	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Chloride	33.9	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Fluoride	0.59	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Hardness	6.6	mg/L CaCO3	TRUE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Magnesium	1	mg/l	TRUE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Potassium	5.04	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Sodium	1	mg/l	TRUE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Sulfate	3130	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Total Dissolved Solids	4720	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Total Suspended Solids	14	mg/l	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	5/22/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/22/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/22/2001	Phosphorus, Total	0.034	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/22/2001	Total Kjehldal Nitrogen	0.712	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/22/2001	Total Organic Carbon	7.04	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/24/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/24/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/24/2001	Phosphorus, Total	0.034	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/24/2001	Total Kjehldal Nitrogen	0.608	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/24/2001	Total Organic Carbon	9.04	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/15/2001	Calcium	82.7	mg/L	FALSE	Ions (TDS/TSS)
San Cristobal Creek at Hwy 41	8/15/2001	Hardness	253	mg/L CaCO3	FALSE	lons (TDS/TSS)
San Cristobal Creek at Hwy 41	8/15/2001	Magnesium	11.3	mg/L	FALSE	Ions (TDS/TSS)

Station	DateTime	Analyte name	conc	Units	Less than	SampleType
San Cristobal Creek at Hwy 41	8/15/2001	Total Dissolved Solids	410	mg/L	FALSE	Ions (TDS/TSS)
San Cristobal Creek at Hwy 41	8/15/2001	Total Suspended Solids	225	mg/L	FALSE	Ions (TDS/TSS)
San Cristobal Creek at Hwy 41	8/15/2001	Ammonia	0.1	mg/l	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/15/2001	Nitrate + Nitrite (N)	0.11	mg/l	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/15/2001	Phosphorus, Total	0.194	mg/l	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/15/2001	Total Kjehldal Nitrogen	0.318	mg/l	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/15/2001	Total Organic Carbon	6.1	mg/l	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Phosphorus, Total	0.034	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Total Kjehldal Nitrogen	0.551	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Total Organic Carbon	7.96	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Phosphorus, Total	0.049	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Total Kjehldal Nitrogen	0.576	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	5/23/2001	Total Organic Carbon	8.08	mg/L	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/14/2001	Alkalinity	90.4	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Bicarbonate	94.4	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Calcium	64.5	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Carbonate	15.6	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Chloride	10	mg/L	TRUE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Hardness	190	mg/L CaCO3	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Magnesium	6.97	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Potassium	5	mg/L	TRUE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Sodium	7.03	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Sulfate	107	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Total Dissolved Solids	250	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Total Suspended Solids	2700	mg/L	FALSE	lons (full suite)
San Cristobal Creek at Hwy 41	8/14/2001	Ammonia	0.1	mg/l	TRUE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/14/2001	Nitrate + Nitrite (N)	0.13	mg/l	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/14/2001	Phosphorus, Total	1.93	mg/l	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/14/2001	Total Kjehldal Nitrogen	0.664	mg/l	FALSE	Nutrients (total)
San Cristobal Creek at Hwy 41	8/14/2001	Total Organic Carbon	7.8	mg/l	FALSE	Nutrients (total)
Galisteo Creek in Galisteo	8/15/2001	Calcium	54.3	mg/L	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	8/15/2001	Hardness	202	mg/L CaCO3	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	8/15/2001	Magnesium	16.1	mg/L	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	8/15/2001	Total Dissolved Solids	362	mg/L	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	8/15/2001	Total Suspended Solids	6	mg/L	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	8/15/2001	Ammonia	0.1	mg/l	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	8/15/2001	Nitrate + Nitrite (N)	0.1	mg/l	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	8/15/2001	Phosphorus, Total	0.03	mg/l	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	8/15/2001	Total Kjehldal Nitrogen	0.1	mg/l	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	8/15/2001	Total Organic Carbon	3	mg/l	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/26/2001	Calcium	70.6	mg/L	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	9/26/2001	Hardness	241	mg/L CaCO3	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	9/26/2001	Magnesium	15.8	mg/L oacoo	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	9/26/2001	Total Dissolved Solids	424	mg/L	FALSE	Ions (TDS/TSS)
Canalas Orosit in Canalas	0,20,2001	. Star Diocontoa Collas		iiig/L	. / (LOL	10.10 (100/100)

Station	DateTime	Analyte name	conc	Units	Less than	SampleType
Galisteo Creek in Galisteo	9/26/2001	Total Suspended Solids	3	mg/L	TRUE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	9/26/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/26/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/26/2001	Phosphorus, Total	0.03	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/26/2001	Total Kjehldal Nitrogen	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/26/2001	Total Organic Carbon	13.5	mg/L	FALSE	Nutrients (total)
Galisteo Creek in Galisteo	9/27/2001	Calcium	70.2	mg/L	FALSE	lons (TDS/TSS)
Galisteo Creek in Galisteo	9/27/2001	Hardness	239	mg/L CaCO3	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	9/27/2001	Magnesium	15.6	mg/L	FALSE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	9/27/2001	Total Dissolved Solids	412	mg/L	FALSE	lons (TDS/TSS)
Galisteo Creek in Galisteo	9/27/2001	Total Suspended Solids	3	mg/L	TRUE	Ions (TDS/TSS)
Galisteo Creek in Galisteo	9/27/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/27/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/27/2001	Phosphorus, Total	0.035	mg/L	FALSE	Nutrients (total)
Galisteo Creek in Galisteo	9/27/2001	Total Kjehldal Nitrogen	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/27/2001	Total Organic Carbon	3	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/23/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/23/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/23/2001	Phosphorus, Total	0.03	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/23/2001	Total Kjehldal Nitrogen	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/23/2001	Total Organic Carbon	3	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/24/2001	Ammonia	0.12	mg/L	FALSE	Nutrients (total)
Galisteo Creek in Galisteo	5/24/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/24/2001	Phosphorus, Total	0.03	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/24/2001	Total Kjehldal Nitrogen	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/24/2001	Total Organic Carbon	3	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/22/2001	Alkalinity	191	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Bicarbonate	233	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Calcium	49	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Carbonate	0	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Chloride	22.8	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Fluoride	0.95	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Hardness	186	mg/L CaCO3	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Magnesium	15.4	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Potassium	5	mg/l	TRUE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Sodium	25	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Sulfate	78.6	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Total Dissolved Solids	378	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Total Suspended Solids	3	mg/l	FALSE	lons (full suite)
Galisteo Creek in Galisteo	5/22/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/22/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/22/2001	Phosphorus, Total	0.03	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/22/2001	Total Kjehldal Nitrogen	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	5/22/2001	Total Organic Carbon	3	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/25/2001	Alkalinity	200	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Bicarbonate	244	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Calcium	68.7	mg/L	FALSE	Ions (full suite)
Galisteo Creek in Galisteo	9/25/2001	Carbonate	0	mg/L	FALSE	lons (full suite)

Station	DateTime	Analyte name	conc	Units	Less than	SampleType
Galisteo Creek in Galisteo	9/25/2001	Chloride	21.4	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Hardness	238	mg/L CaCO3	FALSE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Magnesium	16.1	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Potassium	5	mg/L	TRUE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Sodium	22.4	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Sulfate	75.6	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Total Dissolved Solids	380	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Total Suspended Solids	3	mg/L	TRUE	lons (full suite)
Galisteo Creek in Galisteo	9/25/2001	Ammonia	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/25/2001	Nitrate + Nitrite (N)	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/25/2001	Phosphorus, Total	0.03	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/25/2001	Total Kjehldal Nitrogen	0.1	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	9/25/2001	Total Organic Carbon	3	mg/L	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	8/14/2001	Alkalinity	110	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Bicarbonate	120	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Calcium	56.9	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Carbonate	13.9	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Chloride	10.2	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Hardness	181	mg/L CaCO3	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Magnesium	9.4	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Potassium	5	mg/L	TRUE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Sodium	13.2	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Sulfate	54.3	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Total Suspended Solids	8800	mg/L	FALSE	lons (full suite)
Galisteo Creek in Galisteo	8/14/2001	Ammonia	0.1	mg/l	TRUE	Nutrients (total)
Galisteo Creek in Galisteo	8/14/2001	Nitrate + Nitrite (N)	0.24	mg/l	FALSE	Nutrients (total)
Galisteo Creek in Galisteo	8/14/2001	Phosphorus, Total	2.84	mg/l	FALSE	Nutrients (total)
Galisteo Creek in Galisteo	8/14/2001	Total Kjehldal Nitrogen	0.624	mg/l	FALSE	Nutrients (total)
Galisteo Creek in Galisteo	8/14/2001	Total Organic Carbon	11.9	mg/l	FALSE	Nutrients (total)
Galisteo Creek in Galisteo	11/5/2003	Alkalinity	222	mg/L	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Bicarbonate	271	mg/L	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Calcium	88.4	mg/L	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Carbonate	0	mg/L	FALSE	Ions
Galisteo Creek in Galisteo	11/5/2003	Chloride	20	mg/L	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Fluoride	1.01	mg/L	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Hardness	293	mg/L CaCO3	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Hardness (Ca & Mg)	293	mG/L CaCO3	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Magnesium	17.5	mg/L	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Potassium	5	mg/L	TRUE	lons
Galisteo Creek in Galisteo	11/5/2003		26.7	mg/L	FALSE	Ions
Galisteo Creek in Galisteo	11/5/2003	Sulfate	80.1	mg/L	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Total Dissolved Solids	432	mg/L	FALSE	lons
Galisteo Creek in Galisteo	11/5/2003	Total Suspended Solids	10	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Alkalinity	202	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Bicarbonate	246	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Calcium	169	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Carbonate	0	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Chloride	19.6	mg/L	FALSE	lons

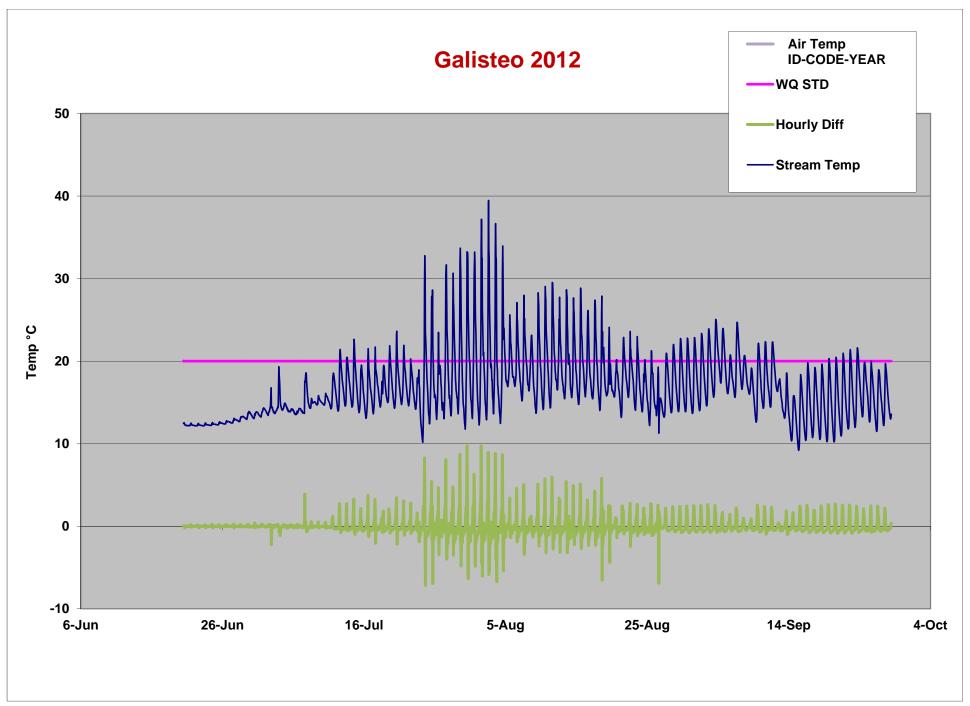
Station	DateTime	Analyte name	conc	Units	Less than	SampleType
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Fluoride	1.09	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Hardness	667	mg/L CaCO3	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Hardness (Ca & Mg)	667	mG/L CaCO3	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Magnesium	59.6	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Potassium	5	mg/L	TRUE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Sodium	15.2	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Sulfate	680	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Total Dissolved Solids	1260	mg/L	FALSE	lons
Galisteo Creek at Richardson property above CR 55A	11/6/2003	Total Suspended Solids	3	mg/L	TRUE	Ions

Table C3. Fish records

Tubic Co. 1.											
FISH RECORDS											
Common name	Native NM basins	Pollution Tolerance	Temperature preference	Location	Date	Catnum	Genus	Species	Spec	Size_From	Size_To
flathead chub	RG, P, C	Т	I	Galisteo Creek at NM 14 at Cerrillos	9/7/2001	48173	Platygobio	gracilis	1	9.5	
flathead chub	RG, P, C	Т	I	Galisteo Creek at CR 55A crossing	9/7/2001	48174	Platygobio	gracilis	6	23	73
flathead chub	RG, P, C	Т	I	Galisteo Creek at NM 41 in Galisteo	9/7/2001	48175	Platygobio	gracilis	3	35	44

KEY: Basins Pollution tolerance temperature preference

С	Canadian	Т	tolerant	W	Warm
Р	Pecos	1	intermediate	1	Intermediate
RG	Rio Grande	S	sensitive	С	Cold



C1. Canoncito Thermograph

STORET LDC - Detailed Data Report

Organization Code:

21NMEX

Organization Name:

N.MEXICO DEPT HLTH & ENV

URG000000505

Station ID: Station Alias: URG000.000505

WESTERN GULF

UPPER RIO GRANDE ABOVE PECOS RIVER

GALISTEO CREEK ABOVE RIO GRANDE

New Mexico

County:

Sandoval

Station Name:

35deg. 32min. 49sec. N

Longitude 106deg. 13min. 45sec. W

Hydrologic Unit Code (HUC):

13020201

Station Type Indicator Description:

Surface Water

Legacy STORET Station Type:

/TYPA/AMBNT/STREAM/BIO

Start Date:

UMK

06-30-1995

Start Time: End Time

1345

End Date Sample Depth:

feet

Effluent Monitoring Code

Replicate Number: Pipe ID:

Composite Method Code

Composite/Grab Number:

Primary/Secondary Activity Category:

Parameter Code	Parameter Long Name	Result Value	Remark Code	Statistic Code
00010	TEMPERATURE, WATER (DEGREES CENTIGRADE)	20.00		D
00095	SPECIFIC CONDUCTANCE (UMHOS/CM @ 25C)	550.00		D
00116	INTENSIVE SURVEY IDENTIFICATION NUMBER	953501.00		D
00300	OXYGEN, DISSOLVED MG/L	3.40		D
00301	OXYGEN, DISSOLVED, PERCENT OF SATURATION %	36.9583	S	D
00400	PH (STANDARD UNITS)	8.43		D
00410	ALKALINITY, TOTAL (MG/L AS CACO3)	151.00		D
00440	BICARBONATE ION (MG/L AS HCO3)	185.00		D
00530	RESIDUE, TOTAL NONFILTRABLE (MG/L)	2528.00		D
00600	NITROGEN, TOTAL (MG/L AS N)	1.30	C	D
00605	NITROGEN, ORGANIC, TOTAL (MG/L AS N)	0.30	C	D
00610	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	0.30		D
00612	AMMONIA, UNIONZED (MG/L AS N)	0.0288995	\$	D
00619	AMMONIA, UNIONIZED (CALC FR TEMP-PH- NH4) (MG/L	0.0351387	\$	D
00625	NITROGEN, KJELDAHL, TOTAL, (MG/L AS N)	0.60		D
00630	NITRITE PLUS NITRATE, TOTAL 1 DET. (MG/L AS N)	0.70		D
00640	NITROGEN, INORGANIC, TOTAL (MG/L AS N)	1.00	C	D
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of 14

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Stream Field Data Form

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Scarrel 7-27-11

APPENDIX D HYDROLOGY PROTOCOL RESULTS

As part of this UAA, NMED applied the recently developed hydrology protocol (NMED/SWQB 2011) at five locations throughout the watershed. These locations are mapped in **Figure B1**.

Perennial site at Waldo. Oct 2010. Not pictured.



D1. Perennial site approx 0.25 mile below San Marcos Arroyo. Oct 2010.



D2. Intermittent site approx 1.5 mi from CR 55A crossing. Oct 2010.





Figure D4. Perennial site in Cañoncito. March 2012.

Hydrology Protocol field sheets

Date: /2-2-	0 8	tream Na	ne: Galiste	0	Latitude: "3.5	5.4473371	
Evaluator(s): 75,7	M s	site ID: &	Ialdo	-		06.148495	
TOTAL POINTS:		ssessmer				(12-mo. 8PI Value):	
NOW: WEATHER CONDITIONS Slotte (lewby rain) cain (steady rain) showers (imen interest School cover k clear/sunny		rain (squady raip)		Has there been a heavy rain in the last 48 h YES			
DICATOR			STREAM	CON	DITION		
	- Stro	n)	Moderate		Weak	Poor	
1.1. Water in Channel 22an ordi		Ibria.glvon ing water is ses but may id throughout	discorbable in areas of greatering offent change in Gent change offent discorbating offent is necessary to		hazhel with signding There is same note of base flows (i.e. as you be flows (i.e. gotsenid, saturated of the Gire is under i, do	Dry channel - No coxional of base flows was found.	
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.2. Fish Found salary leading reach			Found to this gife difficulty and not exasts bridge throughtout the reach.		s 10 or more minotes turnive scarcting to	Fish are not present	
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i. Filamentous Algae/Periphyton	Found edglydn consiste my thic wach.		Found with title citie in fluince consistently throughout the reach,	Takes 19 or more conuces of colonsive searching to lend.		Filamentaus algae anctor pariphyton are not present	
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	3)	2		1	0	
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NMED Surface Water Quality Bureau - LEVEL 1 Stream Determination Field Sheet.

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INDICATOR	βς ₍₁	allo Sho		e eoderste	N CONDITION P	
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1.2. Fish		Found easily and consistently thrules reach.		Hound with liftle difficulty, but not consisted by floroughout the ready.	By Tables 10 or more criticiss of extensive searching to [Feb.]	fish are not present محمد بر
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1.3. Benthic Macroinverte	brates	Figure existly and consistency throughout the reaction of the constant of the		Fuend with little difficu but not consistently throughout the meen.	lly a sec 10 or more minutes of extensive searching to had.	Manto reterioritates and rest present.
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NMEO Surface Water Quality Bureau - LEVEL 1 Stream Determination Field Sheet

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Evaluator(s):	DS TM	Site ID: aby Cathy F		Longitude: 106.04030
TOTAL POIN	14.5	Assessment Unit: Pr	operty	Drought Index (12-mo. SPI Value):
WEATHER CONDITIONS	NOW: storm (fleavy rain)rain (sleady rain)stravers (intermittexclupal covercleav/sunny	PAST 48 HOURS: stoun (heavy rain)rain (steaxy rain)showers (intermittent)%cloud coverclear/sunvy	OTHER: Stream N	to been a heavy rain in the last 48 hours? YES NO Nodifications YES NO NO YES NO NO YES NO

INDICATOR			STREAM	CONDITION	
		Strong	Moderate	Weak '	Poor
1. 1 .	Water in Channel	Flow is evident throughout the reach. Moving weter is seen to rifte areas for may not be as evident throughout the says.	Weten is present in the channel but like is harrly discernable in seess of greatest gradiem change (i.e. sillas) er floating object is necessary to observe flow.	Dry chennal with stending pools. Thomas some condenses of base flows free diparter wegets on growing along channel, securated or maint sediment under rocks, etc.	Dry danner! No markeness of base flows was found.
		6	4	2	(0)
1,2,	Fish	Found easily and consistently throughout the reach.	Found with falle difficulty but not consistently difficulty difficulting four the reach.	Takes 10 or more infinites of extensive searching to (nd.	Einh are pot-account.
		3	2	1	(0)
1.3.	Benthic Macroinvertebrates	Found easily and consists by directghout the reach.	Faund with 90% (\$1000) but not consistently disoughout the reach.	Takes 10 or more minutes of extensive exampling to 11nd.	Macroinvariebretes ereinn prasant
		3	2	1	0
1.4,	Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with this difficulty but not consistently direnging of the reach.	Takes 10 or more minutes of extensive searching to 4nd.	Filamenous-signe end/or penshyson are not present
		3	2	1	(0)
₹6 1.5.	Differences In Vegetation	Creitatic compositional differences in vegetation are present includes the system banks and the adjacent applands. A distitution exists along the entire reach – reparent, aquaric, or walland spaces forming the length of the reach.	A circuit ripation vegetation conidor exets slong period the reach. Reparam vegetation is imerspecies and with unland vegetation along the knight of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigor cusly that vegenation in the adjacent uptambs, but there are no demark compositional differences between the two.	No compositional or density differences un vegetation are present between the streambanks and the adjudent uplands.
	t d	3	1 2	1	0
1.6.	Absence of Rootod Upland Plants in Streambed	Rocced upland plants are absent within the 50 eembed/thalway.	Thore are area recied upland plants present within the streamped@awwag.	Rooted upland plants are considerify dispersed throughout the streambed/thatwag	Recited upland plants are prevalent within thin streambed/halway.
		3	2		0

If the stream being evaluated has a authoral 5.2 at this juncture, attainment of Clean Water Act Section 161(a)(2) uses is not feasible. The abream is determined to be aphanograf. If the abream being evaluated has a subtotal 2.18 at this point, the stream is determined to be perennial.

YOU MAY STOP THE EVALUATION AT THIS POINT. If the abream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

NMED Surface Water Quality Bureau - LEVEL 1 Stream Determination Field Sheet

	4						
Date	<u> </u>	St	ream Nam	e Jamets	ut.	Lalitude: 35	
Eval	luator(s): $\mathcal{O}S$, $\mathcal{T}M$	Sil	te ID: - {	-Ofury R	<u> </u>	Longitude: 👸	<u> 8. 8. 86. 8</u>
· -	TAL POINTS:	As A	s essment	Unit: greates < f		Drought Index	(12-mo. SPI Value):
	rain (ste	s (intermittent)	storm tain (s	HOURS: (heavy rain) sleady rain) sy (internation) stronger	od Distriction OTHER Stream Diversi	YES regregative where the	/E5 ½, NO
 	·				Page 1	., is a new way to 12	N. C. Salania
າທີ່ນີ້ໄ	CATOR	Fine is export the react. Most seen in all the use mo, by as reader the cons	ng water is as out mey	Wayer is present to the channel and flow is set of sourcest specifical chairs, otherwise in the arms of sources say to conserve flow.	To Sale	channe wert standing on. There is some lance of base hinks fun- dae engetation growing of channel, sourced or is sectiment updan is, mo	Dry thriend, Per cycleace of basic Rows was found.
L	!	6		4		2	/ 9/ 1
1.2.	Fish	Found analy and correspondly multiple control of the control of th	c ughout the	Feural with Imfeld files author core is early throughout the readal		es 10 or mare inhales stensive searching to	Peharena: present.
1.3.	Benthic Macroinvertebrates	Found analy are coreasterly nounced:		Found with limb directly and not consistently throughout the reach		es 10 or mere minetes stensiva scart anglic	Magicinverse on the present
1.4.	Filomentous Algae/Periphyton	Found easily and correspently tind read!		2 Found with little difficulation, consisterity throughout the reach		111 111 111 111	Ellamehreria अन्य विश्वकरण panthyton कुरु नहीं passem
<u> </u>		3		2		1	í D
1.5. Differences in Vegetation Vegetation Difference in Vegetation The content of the content		quadra refe- rithe sylenmi djacast ctriperer for exists reach g or wettand	peachuriafe the separation confidence wegetation confidence exists along pain of the ceach. Enperon regulation is inversed and with appearance wegetation along the basis of the peach of the peach of the peach.		solution growing along reading occurring open denotions or growing regionality than leastern in the adjacent growing in the adjacent pression in the adjacent pression in postockal grances between the control of the procession in the control of the control of the control of the control of control	No compositions of density demonstration of vegetal carrier present, between the streamhorts and the edjector upbanes.	
<u> </u>		3		2		1	/ 0
1.G.	Absence of Rooted Upland Plants in Streambed	Rucced upland p obsert within the stressumenthings	•	I nine are a few roose upland alents present within the statement/saysing.	Lei Urr:	atics of and plants are ensembly (hypothed regional the embeddhelives	Robiet unlant plans are praentalt syguethe should be allowed.
<u> </u>	5.1 90HU9U	3		(2)		1	0
				- スノき	UBTO	TAL (#1.1 - #1.6)	5,

If the stream being evaluated has a subtotal SiZ at this juncture, attainment of Clean Water Act Section 101(a)(2) does is not footible. The stream is determined to be ophemoral. If the stream being evaluated has a subtotal ≥ 18 at title point, the stream is determined to be personal. YOU MAY STOP THE CVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continuo the Level 1 Evaluation.

NMED Surface Water Quality Bureau - LEVEL 1 Hydrology Determination Field Sheet



Date: 3 - 2	8-12	Stream Name: Ag/ist	€0 LatHude: 35,51698645
Evaluator(s): DS, NW		Site ID: unofficial	sife Longitude: 105 8486328
TOTAL POIN	TS: 25	Assessment Unit:	Drought Index (12-mo. SPI Value):
WEATHER CONDITIONS	NOW:storm (heavy rain)rain (steady rain)showers (informittan)%cloud covert_rtear/sunny	PAST 48 HOURS:	Has there been a heavy rain in the last AB hours? YES NO Field divaluations should be performed of least 48 hours after the last known major religible event. OTHER: h / 5 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

	STREAM CONDITION						
LEVEL 1 INDICATORS	Strong	Moderate	Weak	Poor			
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffic areas but may not be as evident throughout the runs.	Water is present in the channel but flow is basely descensible in areas of grounds I gradient change (i.e. ntiles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetalion growing along channel, salvrated or moist sediment under rocks, etc.)	Dry chemical No evidence of base flows was found.			
	6	4	5	0			
1.2. Fish	Found eably and consistently throughout the reach.	Found with little difficulty but and consistently throughout the reach.	Takes 10 or more minutes of extensive searching to fird.	Fish are not present.			
	3	2	1	0			
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 40 or more manufes of extensive searching to find.	Meccolnvertabrates are no present			
HILLS CONTROL CONTROL	3	(2)	1	0			
1.4. Filamentous Algee/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more mmutes of extensive searching to find.	Filamentous algae and/or periphylor are not present			
regacti vitalities	(3)	2	4	0			
1.5. Differences in Vegetation	Dramatic compositional differences in regalation are present between the stream banks and the adjacent upands. A clastic ripation regulation currichs exists along the entire reach ripanent, aquelle, or welland apacies dominate the length of the reach.	A distinct ripertan vegetation comfor exists along part of the reson. Hipenan vegetation is interspersed with upland vegetation along the length of the reson.	Vegetation growing along the reach may recur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the law.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.			
	3	2	. 1	0			
1.6. Absence of Rooted Upland Plants In	Roosed upland plants are stream within the streambed thatway.	There are a few moted upland plants present within the streamted the bare.	Rocked upland plants are consistently depended throughout the streambed/finalwag	Rooted upland plants are prevalent within the streambad/malwag.			
Streambed	3	(2)	1	0			
		SUB	TOTAL (#1.1 - #1.6)	15			
If the stream b	ing evaluated has a subtotal \$2 eing evaluated has a eubtotal \$.UATION AT THIS POINT. If the	18 at this point, the strea	m is determined to be PERE	NNIAL			

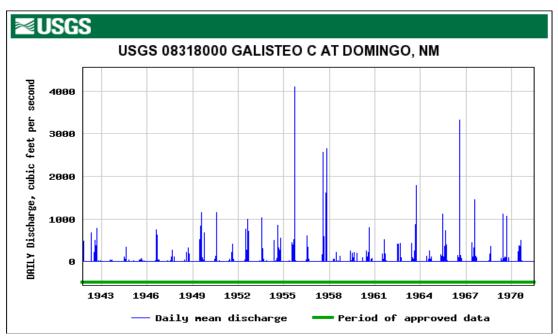
other: RR confined + moved channel + floodyplain

APPENDIX E USGS GAUGE DATA

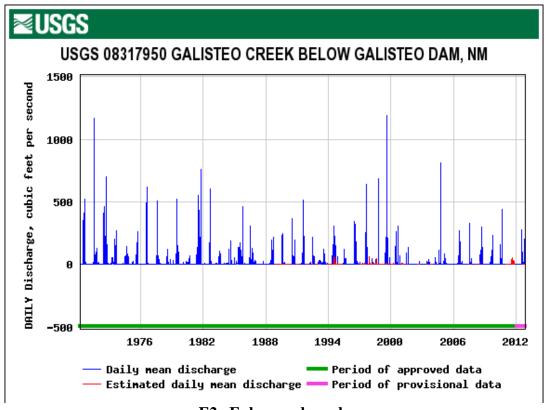
SITE NO	SITE NAME	Begin Date	End Date	Count
<u>08318000</u>	GALISTEO C AT DOMINGO, NM			
	<u>Daily Data</u>	_	_	_
	Discharge, cubic feet per second	1941-10-01	1971-06-30	10865
	<u>Daily Statistics</u>	_	_	_
	Discharge, cubic feet per second	1941-10-01	1971-06-30	10865
	Monthly Statistics	_	_	_
	Discharge, cubic feet per second	1941-10	1971-06	
	Annual Statistics		_	_
	Discharge, cubic feet per second	1942	1971	
	Peak streamflow	1942-07-27	1970-08-03	29
	Field measurements	1960-10-03	1965-09-15	72
	Field/Lab water-quality samples	1960-10-15	1970-08-03	67
08317950	GALISTEO CREEK BELOW GALISTEO DAM, NM			
00011000	Current /Historical Observations (availability statement)	2007-10-01	current	
	Daily Data	2007 10 01	Guitent	
_	Discharge, cubic feet per second	1970-03-20	current	15557
_	Daily Statistics	1970-03-20	Current	10001
	Discharge, cubic feet per second	1970-03-20	2012-01-23	15285
	<u> </u>	1970-03-20	2012-01-23	10200
	Monthly Statistics	4070.00	2012.01	 -
	Discharge, cubic feet per second	1970-03	2012-01	
	Annual Statistics		_	<u> </u>
	Discharge, cubic feet per second	1970	2012	
	Peak streamflow	1971-07-27	2011-08-21	41
	<u>Field measurements</u>	1970-03-20	2012-02-10	429
	Field/Lab water-quality samples	1971-07-01	2010-08-16	77
	Instantaneous-Data Archive **offsite** (dishcharge)	1991-04-01	2007-09-30	370937
	Annual Water-Data Report (pdf) **offsite**	2006	2011	6
08317850	GALISTEO CREEK ABOVE GALISTEO RESERVOIR, NM			
	<u>Daily Data</u>	_	_	_
	Discharge, cubic feet per second	1970-05-01	1976-09-30	2345
	Daily Statistics	_	_	
	Discharge, cubic feet per second	1970-05-01	1976-09-30	2345
	Monthly Statistics		_	
	Discharge, cubic feet per second	1970-05	1976-09	
	Annual Statistics			
	Discharge, cubic feet per second	1970	1976	-
	Peak streamflow	1970-08-21	1976-08-23	4
	Field/Lab water-quality samples	1974-06-28	1975-02-04	2
	- Trotal Lab Water quality campies	1011 00 20	1070 02 01	
08317500	GALISTEO CREEK AT CANONCITO, NM			
00011000	Peak streamflow	1955	2011-07-24	49
		1961-08-22	2010-03-25	7
	Field measurements			1
	Annual Water-Data Report (pdf) **offsite**	1955	2009	
00047000	CAN CRICTORAL ARROYOMS CALICTED ANA			
08317600	SAN CRISTOBAL ARROYO NR GALISTEO, NM	4055	0044.00.00	F0
	Peak streamflow	1955	2011-08-02	50
	Field measurements	1956-06-27	9/16/2009	9
	Annual Water-Data Report (pdf) **offsite**	1955	2009	
08317700	TARHOLE CANYON NEAR GALISTEO, NM			
	_Peak streamflow	1952-08-12	1986-06-26	34
08317720	CANADA DE LA CUEVA NR GALISTO, NM			
	Peak streamflow	1970-08-09	1995-05-29	25

SITE NO	SITE NAME	Begin Date	End Date	Count
08317800	CANADA DE LAS MINAS TRIB NR SANTA FE, NM			
	Peak streamflow	1952-08-12	1982-09-17	29

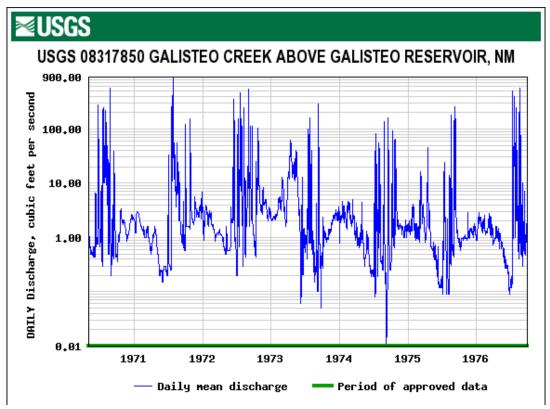
Source: http://nwis.waterdata.usgs.gov/



E1. Ephemeral reach



E2. Ephemeral reach



E3. Perennial reach near Waldo

Summary Table: Characteristics of the Ecoregions of New Mexico

		Summary	able. Characteristics	of the Leolegions of New Mexico
_	COLORADO PLATEAUS			24. CHIHUAHUAN DESERTS
Level IV Ecoregion	Area Elevation/ Surficial and Bedrock Order (Great Group)	Soils Climate Common Soil Series Temperature Precipitation Front Free Mont Temperature	Natural Vegetation Land Cover and Land Use	Level IV Ecoregious Physiography Geology Soils Climate Natural Vegetation Land Cover and Land Use Deviction D
	(square local Relief (miles) 233 Nearly level basizes and valleys, benches, low 4900-9070/ Chaternary collavium with large areas of bedrock Aridicols (Hanlocambids). Entire areas of bedrock Aridicols (Hanlocambids).	Mointere Moan amual Moan amual January min/ma (inches) (days) July min/max (d		Continual Nation Continual N
20b. Shale Deserts and Sedimentary	233 Nearly level basins and vallers, benches, low rounded his, and budinaté. Ephemeral washes and arroyos. 4900-69701 Quaternary collavirum with large areas of bedrock prounded his, and budinaté. Ephemeral washes and arroyos. 100-400 [Quaternary collavirum with valley-field allvirum, some river allvirum and eolian deposits. Creacesus Mancos Shale.	isols Littlehat, Pursayo, and Fordbutte on uplandir, Ravola, Bebeevar, and Tocito en floodplains and terraces of San Juan River.	Salt desert scrub sparsely regetated with mat saltbush, fourwing saltbush, Nuttall's saltbush, greacewood, and shadaciae. Navite grasses included salasi scations, guilet grass, powerly threetom, and disposed, and failure street and street of Saltbush screen, sa	24a. Chihuahuan 1409 Depréspersione or grabes filled with enfinance 1425-5100 Racins and Playar Bacins and Playar Bacins and Playar Bacins and Playar Grade of the properties
Basins 20c. Semiarid			grass, poverty interawn, sand drop-seed, and indust integrass. Baddand areas have little to no vegetation cover. One and Backy Mountain and Utah inspirer come.	De Orthody or mercancy crames. Seeman Superagrams and collections of the collection
Benchlands and	1231 Monte, beacher, (wester, cliffs, and carpens. Monte, beacher, (wester, cliffs, and carpens. South free larger rivers originating in Econogical 21. 5500-7100 Monte, beacher, (wester, cliffs, and carpens. South free larger rivers originating in Econogical 21. 500-8100 Teacher (Zooma, Printersal) and Createness sandstone, (Glapharpin) (G	sents), Weska, Veszilla, Menefee, Orlie, Meszic/ 10-16 120-140 17/41; s Blancot, Persayo, Farb, Farview Usit: Artific, Artific Usitic	One-need, Rocky Mountain, and Utsh junipers, come nivous pines at higher elevation, high gastrouch and Bigelow sagebrush, fourwing saldrouch, shadocale, antelope bitterbrush, galleta, Indian ricegrasi, and blue grama. Expresses woodland and strukhard, Livestock, graming, some impact of the part of the part of the production of the part of	24b. Chihushuan 5019 Floress, high intermeentant busins, allevisia fine. 3155-7200 Quaternary collevium, with valley-fill allevium. Aridoth (Epipheskith, Pereschicith, Pereschich), Pereschich, Peres
Canyonlands	coal-bearing rock in the west.		gas production, coal mining. Mostly public land (BLM) and tribal land (Ute Mountam).	Darent and opposes, Stream segments from occasional mostry anatomy and precinition and precini
20d. Arid Canyonlands	54 In New Mexico, mostly the floodplain and terraces of the San Faux. In the other Four Corner states, narrow carrows, cliffs, benches, Carrows these, narrow carrows, cliffs, benches, and control of the San Faux. (In the other Four Corner states, narrow carrows, cliffs, benches, cliffs, benches, and control of the San Faux.) Courte states, narrow carrows, cliffs, benches, clif	avents), Claysprings, Tocito, Myton, Nakai, Mesic/ 7-9 145-155 15/42; Nageezi, Fruitland, Bebeevar Aridic 7-9 145-155 58/95	Desert scrab with shadscale, mormon ton, four wing shalbush, mean agadward, and some drought tolerand with shadscale mormon ton, four wing shalbush, and sagarbard, and some drought tolerand worth to common in Units and Attorne. Floodylates may contain some New Memore on leve, willow, and Frement contoured.	Grasslands only the storm events. Grassl
	Corner states, narrow canyons, cliffs, benches, mess, and corests. Terrain deeply evoded by major rivers and their tributaries.		is common in Utah and Arizona. Floodplains may contain some New Mexico olive, willow, and Fremont cottonwood.	
21.	SOUTHERN ROCKIES			planter to the control of the contro
Level IV Ecoregions	Physiography Geology	Soils Climate	Natural Vegetation Land Cover and Land Use	24d. Chihuahuan Montane Woodlands Wo
	Area Elevation / Surficial and Bedrock Order (Great Group) Local Relief	Common Soil Serie: Temperature/ Precipitation Maintena Mana annual		WOOGLIBRIDS Procks. Tentran printing-processor, Tentran proprinting-processor, Tentran printing-processor, Tentran printing-printing
21a. Alpine Zone	95 Mostly glaciated High mountains with steen 11000- Quaternary block rubble collaryium and glacial till Incentisals (Dystrocycens)	Penitente, Ptarmigan, Bross, rock Cryic/ 25-55 d-50 2/27; outcrop Udic Deep 38/69	Alpine meadows dominated by alpine avens, bistort, alpine Snow, ice, bare rock, alpine meadows. Recreation, wildlife habitat (including	24f. Rio Grande Floodplain Floodp
	slopes, fidges, and exposed rocky peaks above tumberline. Some wethands and glical lakes. 600-2000 [600-200] [600-20	winter snowpack		24g. Gypziferous 571 Dane field with dozus. transverse. barchan, and problet days with dozus. transverse. barchan, and problet draws. World's largest expanse of gypour, and offensive of seal and offensive of seal and offensive of seal and size. Entirely, Aridiools (Baplegrystek, Calcipysids) (Baplegrystek, Ca
	conglomestate, sancastone, survione, and timestone.			Tosemary mint, and a few Allo Gramme Contonwoods. Monumenty.
21b. Crystalline Subalpine Forests	617 ligh meutanin with steps deper. High gradient permisti yearn symbolistic, cobbis, and bedrock substrates. Monthly Contentury block-cirbbie colluvium, colluvium, and bedrock substrates. Misch (Policyvilli, Giornocci analysis) of the properties of the properti	yalfs, Bundo, Angostura, Tolby, Marosa, Cryiz/ 24-40 50-70 6/30; Nambe, Bracos, Gromes Udic, Ustic Deep 38/70 winter	Englemann space, conbback fir or unbalpine fir, often interspersed with agone grows or mountain mendows. Some areas with limiter piece and Rocky Mountain bristerous prince. Douglas-fir, while fir, and blue space occur at lower olevations. Understories may contain unytile hatchborn some or and econogion. Southy public olivers, once and econogion. Southy public olivers, once and econogion. Southy public.	24h. Lava Malpais 284 Irregular plains of lave flows, cinder coses, lave ubes, collage coses, lave 20-100 University baselic to undestric lave flows. Enrisols (Tomisrthents) Lava Bows and lava reckland, monthly flowed and soils Variables soils occur in man placeties, acts as Adela. Lava Malpais 284 Irregular plains of lave flows, cinder coses, lave ubes, collages pits, coves. Enrisols (Tomisrthents) Lava Bows and lava reckland, monthly flowed and soils Variables soils occur in mediate, control of soils Variables soils occur in mediate, and in mediate placeties, collages pits, coves, and recented to Mostly polic, (ELM, Sone) and mediate placeties, collages pits, coves, and recented to Mostly polic, (ELM, Sone) and mediate placeties, collages pits, coves.
Subapare 1 Steats	617 High meentation with steep clopes. Eight guident performance with the contract collection and believed a solutionist. Mostly Committee State Collection and Collection	snowpack	Engineman reprose, enclosed fine or subalpine for other interepressed in the page review or sometime measures. See the season of the page review or sometime measures, some time the page and to accordance with limber pine and facely Mountain bristiences page, loss Designed, which the first and the segrence occur at lower selections. Understoness many contains mayned backboarry, a loss of the page of	
21c. Crystalline	Brance Brance Towns	yalfs. Bundo Angostura, Tolby, Cypher, Frigid, Cryic/ 18-28, 70-110 9/36; usteots, Abreu, Mirabal Udic, Usinc 42/76	many grass and forb species. Mostly ponderosa pine forest, some areas with pinyon Evergreen and some deciduous forest. Wildlife	25. HIGH PLAINS
Mid-Elevation Forests	728 Low mountain deter, slopes, and currench faur. Moderates to help gladerd presental streams with boulder, cobbile and bedrock substrates. 7600-10100* Questionary block public collections and alterium boulder, cobbile and bedrock substrates. 900-2020 900-2020 1820-2021 1820-2021 1820-2022 1820-202	ustepts, Abreu, Mirabal Udic, Ustic 42/76	Mostly ponderso pine forest; some areas with pinyon pine or jumpers at low electations and south slopes. Understore may include Gambel od, mountain malogamy, anticipes bitterbrash, wars currant; demikbush, wood rose, kimakhamish, mountain malogamy, energy and and miseal elevaration. Mostly shimakhamish, mountain malogamy, energy and proble land (USDAFS Caron and Santa Fe National Ference).	Level IV Ecoregions Physiography Geology Soils Climate Natural Vegetation Land Cover and Land Use
Polests	schist, amphibolite, quartz-muscovite schist, quartzite, granitic gneiss, and granitic rocks.		include areas of Douglas-fir and white fir forests, limber	(Oquers Local Relater Maistures Maistu
21d. Foothill	3787 Hills, ridges, and footslopes. Moderate to high Mostly Quaternary block rubble colluvium, colluvium with Alfisols (Haplastalfs, Paleustal	fs). Trampas, Mirand, Devisadero, Frigid, Mesic/ 12-20 90-100 12/40; sols Espiritu, Wauquie, Hogg, Mara, Uziic, Aridic 48/85		25b. Rolling Sand Plains of the rolling plans with avoidined dames, across and the rolling plans with avoidined plane of the rolling plans with avoidined dames, across and the rolling plans with avoiding plans with plans and the rolling plans and the rolling plans with plans and the rolling plans and the rolling plans with plans and the rolling pla
Woodlands and Shrublands	3707 Hills, rights, and finetologue. Moderan to high guidant personal intermittent. and ophemental streamment and pelmental streamment and createness unadionus, dada, and streams with cobble, gravel, and standy streams and Createness unadionus, dada, and stream and createness unadionus, dada, and stream and createness unadionus, dada, and stream and createness unadionus, dada and stream and stream and createness unadionus, and compensation (some and createness under the createness	ffs). Trampar, Mirand, Devisadero, Espiral, Merick Bolts, Wattoute, Hogg Mara, Rombo, Beryman, Ruson, Elpekto, Stout, Plutto, Menefee, Moutrecito, Capillo, Apache	Pinyon-juniper woodlands, sagebrush and mountain mahogany shrublands, Gambel oak woodlands, Other common low sharbs are service-levery, skunktoost, and sames. Interported are some varied foothill-mountain granishness with being rams, parsing imagens, or western for the property of the	
10.000	Quaternary tuffs, Tertiary basaltic to andesitic lava, and Tertiary intrusive rocks; Precambrian metasedimentary, matasalcanic, and plantage rocks	and the state of t	wheatgrass. SLAN, and most and (Acarilla Apache, Jemez, Picuria).	25c. Moderate Relief Plains 4705-4575 Plains 470
21e. Sedimentary	579 High mountains with steep slopes. High gradient personal treams with boulder, cobble, and beforck instrument of the complete of the comple	cryalfs, Press, Jaroso, Angostura, Diamante, Cryic/ 24-40 50-70 6/30; Mascarenas Udic, Usic Deep winter	Englemann spruce, corkbark fir or subalpine fir, often interspersed with aspen groves or mountain meadows. Some production, recreation, hunting, wildlife habitat	sistemes sancteures calcular le tayaris, and calcular ciprocia est the Optibility remotions.
Subalpine Forests	529 High mountains with steps depose. High gradient periodical treasure with boundar, cobblic and bedrock substrates. 500-1000 Constraint black-robble collowium, collowium, and bodrock substrates. 600-1000 High mountains configurates, uncollowium, and bodrock substrates. 600-1000 High mountains configurates, uncollowing high mountains configurates, uncollowing and chale in the north, in west. Ferrancy (blicecus to Exceed) consistence and configurates, uncollowed and config	stowpack stowpack	Engineman sprace, contheak for or substitute for other interreported with neap sogress or nonstain meadows; some steriopstic only made passed were constructed in the con- cerns with limber pies and Rocky Mountain bristlecoors from Douglade vita first, and constructed white pias post Douglade vita first first of the control of the con- trol of the control of the control of the con- trol of the control of the control of the con- trol of the con- trol of the control of the con- trol	25e. Canadian/ 70 Level to rolling plains, some dissection by 4005/105/ [contensary science deposits over Mollisols (Palearollis, Calcinstollis). Graves, Surray, Spuriock Messic/ 15-17 170-180 [1948; Shorgrass prairie blue black and harry grama. Americal for the content of the plains of the content of the
216 9-16		fr. Darmi Bura Vamer Midnight Briefel Project 14 20 20 20 20	whortleberry and many eracs and forb mories I and (USDA-75 Carson and Santa Fe National Forest's some tribal land (Usba-75 Carson)	Plains Fermany (valueties and Molecule) garbee, sound, salt, cary, stuttowers in studence, studieshing, and calcule suttowers studieshing, salt cary, suttowers studi
21f. Sedimentary Mid-Elevation	2007 More mountain ridges, leges, and outwards from a 5000-2000 Contention ridges in plants produced in terms with booling closely grained present in terms with booling closely distributed in terms with booling closely distributed in terms and the content closely distributed in the content close	ffs. Dargol, Fuera, Vamer, Midnight, Single Crysic 16-29 70-110 1037; isols Spullo, Nabor, Maes, Etoe, Derscho, Udic, Ustic 144/78 Diamante	Monthy ponderson pines forest; some areas the classification in the Cartilla of the Cartilla o	25i. Llano Estacado de por la contra de la contra del contra de la contra del contra de la contra del contra de la contra
Forests	congrommente, and state; some Jurassic sandstone; Permian and Pennsylvanian conglomerate, sandstone, siltstone, and limestone.		Arizona fescue, pine dropseed, and various sedges. Higher elevations include areas of Douglas-fir and white fir forests, and since a personal season of the property of the pr	25i. Llano Estacado 400 Level, elevendo plain, decreasing in elevanian grant elevan
21g. Volcanic	562 High mountains with stees clones. High gradient 9000-11953/ Conternary block-mibble collarium collusium rhvolitic Alfsols (Hanlocroalfs Hanlocroalfs Hanlocro	zalfs) Redoudo, Origo, Marosa, Burnac, Crysc. Frigid' 24-38 50-70 6/30; lis Ess. Rusbach Udic. Usisc Deep winter		
Subalpine Forests	perminal streams with boulder, cobble, and 600-2000 volcamics, and some glacial till. (Cryothenix) Mollisoli (Arginisolis), Eritsol (Cryothenix) Mollisoli (Arginisolis), Eritsol (Cryothenix)	winer snowpack	Indigenant sprace, cardwhark for subalpine fir, often interspersed with speep prove or monation meadows. Some production, exception, burning, wildfire habitat, seas with limber pine and Rocky Mountain trisilectors pine. Douglader, white fir, and conferencier white pine occur at lower developm. Understone my contain myrate some content is made to content for some content is amperious content for lower developm. Generally and the content of lower contents and contents of lower development. Some public lower contents and contents of lower contents and contents of lower contents and lower c	25j. Shinnery Sands 182 Smooth julius, sand lulis and dume. International of the control process of the control p
All Property of the Control of the C			hockieberry, bearberry boneysuckle, currants, grouse whortleberry, and many grass and forb species. Indicate the charge of the	
21h. Volcanic Mid- Elevation Forests	500 Low mountain ridges, isone, and ourseath faces. 1900-100007 Quientumy block-sphiles collustems, collustems, rollustems, blocked, global parameters the stress of the	ralfs). Jemez, Totavi, Cajete, Burnac, Palon. Frigid, Cryic/ 18-28 70-110 9/36; Sods Origo, Calaveras 18-28 70-110 9/36;	Monthy ponderson pine forest. Understonies may include. Combie olds, nonsisten undergoer, and entrople whiterfunch wars current, chemidwath, wood root, kimmkrimich, mountain makly, Amengras, Articona Sectora, Perry's outgrass, and various sodges. Ellus sprince occurs on mesic cities. Douglas- tra and with fire forests and small areas of appen are fronts of and strained forests and small areas of appen are fronts of the strained forests of a small areas The National Forest).	25k. Arid Llano Estacado 250 Lev, decreado plain, decreasaing in deversion Estacado 250 Lev, decreado plain, decreasaing in deversion from west or an internation of the production of the pro
	Quaternary and Tertiary pyroclastic material, breccia, and volcanic ash flows, including basalt, andestic lavas, and water-laid volcanics and conglementes.		mmny, Junegrass, Anzona tescue, Parry's oatgrass, and various sedges. Blue spruce occurs on mesic sites, Douglas- fir and white fir forests and small areas of aspen are found at	25k. Arid Llano Estacado 2190 Level elevanda plain. decreasing in identification of the production of
21j. Grassland Parks		oils, Jarmillo, Tranquilar, Jarolla, Vastine, Frigid 17-24 80-100 6/37;		we use Optimized commonwers, grow produced years, a growing statement of the common statement of the c
	204 Hgh intermentate valleys, suma basish mena- supp in the most Modernit gradual parks of the control of the c	eills, Jarmillo, Tranquilar, Jarolla, Vastina, Frigid 17-24 80-100 6/37; quality and Coary in the Jennez Mountains; Morval, Moroca, Dyran, and Frolic, in the Moreno Valley, Raton and Barela on Johnson Mena.	Grasslands with bunchgrases are dominant and include Parry's congrass, Arizona fencus, Idaho fencus, Turuber fescue, mountain multhy, bluebunch wheatgrass, needle- and-thread grass, Junggrass, and siender wheatgrass,	
	sedimentary rocks. Tertary intrusives, and Precambrian granite and guesis.	AND THE WAS PROMISED AND THE PROMISED AN		26. SOUTHWESTERN TABLELANDS Level IV Ecoregions Physiography Geology Soils Climate Natural Vegetation Land Cover and Land Use
				Area Elevation Surfacial and Bedruck Order (Great Group) Common Soil Series: Temperature Precipitation Proc. Precipitation Proc. Precipitation
22.	ARIZONA/NEW MEXICO PLATEAU			Lead Related (Special Description Descript
Level IV Ecoregions		Soils Climate	Natural Vegetation Land Cover and Land Use	Canadian Breaks Canadian B
2.4	Area (Quars Local Reise (Sor)	Common Soil Series Temperature/ Precipitation Prost Free Mem Temperature/ Moicrarre Man annual Mean annual January min/max (**)		Training consistence, sendeduce, and abule, some literastic (Talpulasepte) and Cettaccous and abule, some all parts of (Talpulasepte) and Cettaccous and abule, and small areas of Territary (Flinceme and Manor code of the Organization and calcidate copying administrary layers and calcidate copying administrary layers and calcidate copying administrary layers and calcidate copying administration.
22a. San Luis	297 Plains, foothills, and some low mountains. 7500-9300' Quaternary colluvium and discontinuous eolian deposits. Aridisols (Haplocalcids, Calcia Mostly enhanced and some intermittent streams. 200-600 Terinary (mostly Pilocene) basalis: to andesitic laya		Big sagebrush, rabbithrush, winterfat, and broom rankeweed occur as well as grasslands of western wheatgrass; green needlegrass, blue granta, and needle-and-fill. M. State).	26f. Mesa de Maya/ 512 Broad mesas, knobs, and dissocratel plains with 4557/320/ Quaternary collisions between London Collisions with 4557/320/ Quaternary collisions between London Collisions Collisions and September 1 (Carrierothearts), Mollisob (Carrie
Shrublands and Hills	flows.		tireso.	26f. Mesa de Maya/ Black Mesa 642 Black Mesa 643 Black Mesa 644 Black Mesa 645 Black Mesa 646 Black Mesa 647 Black Mesa 648 Black Mesa 648 Black Mesa 649 Black Mesa 649 Black Mesa 640 Black Mesa 641 Black Mesa 642 Black Mesa 643 Black Mesa 644 Black Mesa 645 Black Mesa 645 Black Mesa 646 Black Mesa 646 Black Mesa 647 Black Mesa 648 Black Mesa 648 Black Mesa 648 Black Mesa 649 Black Mesa 649 Black Mesa 640 Black Mesa
22b. San Luis Alluvial Flats and	67 Irregular plains. In Colorado, wetlands, springs, and areas with a high water table. A few large 100-400 Messico, mostly fan allevsium. A redisols (Haplargids, Calciarg Aridisols (Haplargids, Calciarg Aridisols (Haplargids, Calciarg Aridisols) (Haplargids, Calc	pids) Tenorio, Fernando, Silva Mesic/ 10-14 115-130 7/36; Aridic, Aridic Ustic	Big sagebrush, blue grama, sand dropseed, some Shrubland, some grassland. Low density investork grazing, some irrigated cropland for hav	
Wetlands 22f. Taos Plateau	mountains 839 Rolling to level platens, some volzmic cones, deep river gerge. Mootly ephemeral and 5900-8500, alluvium, block-rubble colluvium. Alfisols (Haplacakidi, Haplacakidi, Hapla	rgids), Petaca, Servilleta, Chita, Montecito Mesic/ 11-14 100-130 8/38;	Big sagebrush with winterfat rabbitbrush and broom Shrubland. Rangeland with low density	26h. Pinyon-Juniper Woodlands and Savannas (Doubleton with towne contrasted rings and hills. Monty intermentant transmit and severe production and severe production of the contrast of rings and hills. Monty intermentant transmit and exception. 2502 Discorde plains and this licens with mixture plains and licens and transmit and collarization and collarization and contrast transmit and exception. 2502 Discorde plains and this licens with mixture plains and licens and transmit and collarization. Helpolarization. Contrast contrast transmit and exception. 2502 Discorde plains and this licens with mixture plains and licens and transmit and collarization. Helpolarization. Contrast contrast transmit and exception. 2502 Discorde plains and this licens with mixture plains and licens and
1,000	8.39 Rolling to level platens, some volcanic cones, deep river gerge. Mooft wybennearl and unternatived sitessma, a few perennial streams from nearby mountains. 100.4500, 2500,	rgids), Petaca, Servilleta, Chira, Montscito Mesic/ Usic Aridic, Aridic, Aridic Usic Usic Usic Usic Aridic Usic Usic Usic Usic Usic Usic Usic Us	Big sagebrush with winterfat rabbifurush, and troom sunkneeds, some grasses of western wheatgrass, blue grams, galles, alkalis scatton, and sand dropiseed; a few puryon pines and jumper. Shrubland Ramgeland with low density grams, galles, alkalis scatton; made and dropiseed a few puryon pines and jumper. Shrubland Ramgeland with low density grams, galles, property of the proper	Savanmas are spring-fied for this originate in momentum constrain exceptions. Savanmas are spring-fied for this originate in momentum anadomous, utilization, and conglumentate. Some Fermany Challentanial, Highlandial, San Fermany Challentania, Highlandial, San Fermany Challentania, Highlandial, Highlandial, San Fermany Challentania, Highlandial, Highlandial, San Fermany Challentania, Highlandial, Highlandial
22g. Rio Grande	363 River channel and floodplain, low terraces, 4690-6000 Quasternary river alluvium and terrace deposits of sand, Entisols (Torriflavents, Untiltudents, Untiltudents) is the and graved. Torriflamments)	vents, Gilco, Peralta, Aga, Abiquiu, Alcalde Mesic in 8-9 160-190 20/48; in north, Gila, Brazito, Vinton, north, thermic 60/92		261. Upper Candadian Plateau 4650-180, Gusternavy piedment shirting, collaviers with valley. Some volume of coses and shifts Morty interment of the contract of the cost of th
Floodplain		Ustic, Aridic	Booque of contourwood and willow with understories of coyote willow, New Mexico oilve, faite indigo, and seepwillow widely replaced by invasive saltcedar and Russian olives and babitati are a concern for recovery of the Russian olives.	261. Upper Candadian Plateau Series and series of the ser
22h. North Central New Mexico	1387 Mean, vallew, piedment dopen, deepe canyon, 530-5852 Quaternary collevium, eathwarm with valley-full and produced file. Some personnal and manay international treatms from surrounding mountain ecoregions. The control of the co	Lurgids. Parida, Palacid, Florita, Pitavreese, plei Perida, Razio, Prantand, Salvee, Mesick Unite Arbidis, Razio, Printland, Salvee, Unite Arbidis, Pojosague, Punky, El Rancho, Scholle, Hagerinan, Who, Royes, rock	Eustian olive. Phytos-images woodland and juniper invanta with grasses of gallen, findian inceprane, bine grama, black grama, threaswan, and sand dropseed. grama, black grama, threaswan, and sand dropseed. Santa Clara, San Indenton, Poposagia, Nambe, Tempane, Cockhal)	intermittent playas. penetrated by ternary and Quaternary volcanic cones.
Valleys and Mesas	4262 Photos and broken and broken and broken and an arrangement of the state of the	Hagerman, Vibo, Royosa, rock outcrop	Šanta Clara, San fldefonso, Pojoaque, Nambe, Tesuque, Cochui).	Canyons one pergriphide true. Some pergriphid
Tablelands and	9.05 pleases, filests, selectes, coulests, telefolds of the selection of t	Sheppard, Sparank, Farb, Kimbeto, Aridic, some 57/90 Denazar, Blancot, Tsosie, Doakum, Ustic Aridic	Mix of desert scrub, semi-desert shrub-steppe, and semi- desert grassitands. Shadicale, forwaring salibush, mat- salibusal, grasseneoud, pheishal, indian nicegrass, alkali- sacaton, galleta, bias and black gramas. Some one-seed, Uluh, or Rocky Mountain jumpers on higher meas. The state of	Plains Pl
Mesas	shake mudstone, and conglomerate, including Creticeous coal-bearing formations.	Determe	Utah, or Rocky Mountain Junipers on higher mesas. Utah, or Rocky Mountain Junipers on higher mesas.	scatter) umper
22j. Semiarid	8509 Means, plateaus, cliffs, canyons, and valleys. Mostly ephemeral and some intermittent streams. 5200-8748/ Quaternary colluvium with valley-fill alluvium, batalt Alfisols (Haplustalfs), Enrisols flows, colluvium, discontinuous collan deposits. (Conributents, Ustorthents), Ar	idisols Flugle, Pinitos, Silkie, Navajo, Aturque, Celacy, Datil, Jacee, Sols Gowling, Hubbell, Vessila, Viuda, Usic Artific Unic, Usic Artific		26o. Central New Mexico Plains
Tablelands	Mesa, plateau, cliffs, caryons, and valley. Mostly sphemoral and some intermittent stratum. \$00-1500 Mostly sphemoral and some intermittent stratum. \$00-1500 Supercoore, James and Jam	Flugle, Panitos, Silkie, Navajo, indisola Starque, Celacy, Datil J. Arese, Goesling, Hubbell, Vessilla, Viusta, Vessado, Calezon, reck outcrop	land (BLM, State).	Mexico Plains Mexico Plains Mondy/Permin and/tone, ullulone, limentee. Mondy/Permin and/tone, limentee. Mondy/Permin and/tone, limentee. Mondy/Permin and/tone Intervee, limentee. Mondy/Permin
22k. Lava Malpais	239 Irregular plains of lava flows, cinder cones, lava 6300-8200/ 20-100 Holocome basaltic volcanic flows. (Argiuntolls) (Argiuntolls) (Argiuntolls)		Some bare areas, some grasses of blue grama and sideoats grams, thrubto of Agache planne and New Mentico olive, come stunted juryon pian. Doughas dr, and ponderous pine. Some plants sindicative of a 'mesic island' 1e, moister than the land around in Fern may gown in small cracks in shady the land around in Fern may gown in small cracks in the shad around in Fern may gown in small cracks in the shady the shadow in the s	Formation sediments. 26p. Pluvial Lake 515 Flat plains, lake basins 5050-5350 (Datestrancy houstrine deposits of city, and, and pebble Arisinols (Haplocalzids), Entirols (United Arisinols Chapters), Mollisols (Taplocalzids), Entirols (Tourisrdense), Mollisols (Taplocalzids), Entirols (Tourisrdense), Mollisols (Taplocalzids), Entirols (Taplocal
		Viuda of Raton.	some sharited puryon rane, Douglas-dr, and ponderosa pine. (NPS-E) Maipans National Monument, BLM-E) Some plants indicative of a "mesic island" (i.e., moister than the land around it. Fems may grow in small cracks in shady exposures.	Barins (Haphwell) Aride Unic saligno may occur in ather sees. (Haphwell) Aride Unic saligno may occur in ather sees. (Haphwell) Aride Unic Saligno may occur in ather sees.
22L Plains of San	1017 Closed baxin, playa lalke, alluvial fine, piedmont slope. Ephemeral washes and ctreams near the margins from currounding obsolitis. Monthy Monthy Species. 1018 Closed baxin, playa lalke, alluvial fine, piedmont slope. Ephemeral washes and ctreams near the margins from currounding obsolitis. 1018 Closed baxin, playa lalke, alluvial fine, piedmont slope. Ephemeral washes and ctreams near the margins from currounding obsolitis. 1019 Closed baxin, playa lalke, alluvial fine, piedmont slope. Ephemeral washes and ctreams near the margins from currounding obsolition. Inceptional (Haphinterity, Errisolic) (H	isols Telescope, Catman, Hickman, Loarc, Mesic/ 11-13 130-150 18/47; vents), Augustine Aridic Uttic 55/85	exposures.	26q. Southern New Mexico Dissected: Medidoseried irregular plann, numerous draws 1950-500 (Date-transport Colorum) with wilelf-disableman Mexico Dissected on Colorum, chiesens, this colorum, chiesens,
Agustin	maximum ternary tavos and unis. (raspussans)		Some pmyon. Addio Astronomy Observatory).	Plains Airide Unite
22m. Albuquerque Basin	2824 Piles and piedment glaine with allevirid first and one intermittent drivam. Mostly ophemental and intermittent drivam. Mostly ophemental and intermittent drivam. Mostly ophemental and one intermittent drivam. Mostly ophemental and intermittent drivam. Mostly ophemental and ophemental ophemental and intermittent drivam. Mostly ophemental and ophemental ophemental and intermittent drivam. Mostly ophementa	argids, Wink, Turney, Madurez, Pajarito, Thermic, 8-11 170-200 19/49; absols Gila, Kokan, Embudo, Tijeras, Mesic in Gila, Kokan, Embudo, Tijeras, Mesic in Gilo, Zia Griege in the north north	Sand scrub and desert grassland including black grama, and dropteed, meas dropteed, bine grama, gallets, and sage, slikell sacaton, and threeaven. Shrubland and grassland, urban and suburban, barge, slikell sacaton, and threeaven. Shrubland and grassland, urban and suburban, barge, slikell sacaton, and threeaven. Shrubland and grassland, urban and suburban, barge, slikell, sacatin, law, slikell sacaton, and threeaven. Shrubland and grassland, urban and suburban, barge land, sacaton from the sacaton state of the sacaton state	79. MADREAN ARCHIPELAGO
	Mostry 200-600, Quarernary one art. (Commitments, Torriorthents, Ustorthents, Ustorthents)	stgoks, Wink Turney, Maderac, Pajarino, Minkoli Gila, Roban, Embodo, Tigara, Manulo Gila, Roban, Embodo, Tigara, Maria, Gavia, Ziu, Griess, in the north, Planaveles, San Masto, Hederoso, Silver, Harvey, With Sedillo, Placitae, Reyona, Winnace.	windowski have lowered groundwater levels in many areas. Some tribal land (Zia, Santa Ana, Santo Domingo, San Felipe, Sandia,	Level IV Ecoregions Physiography Geology Soils Climate Natural Vegetation Land Cover and Land Use
22n. Near-Rockies	maximim 1000 1000 Symptotic relation of the collustrium and collustrium with Entirols (Ustertheers, Terriore) Ephemeral and intermittent streams. 200-800 valley-fill allustrium. Affisols (Haphatadis), Aridisol	sents) Vesilla Menefee Orlie Florita Mesic/ 10-13 120-140 13/40	One-read and Rocky Mountain improvy Indian recurrent Shruhland assessment mondland and extenses	Ares Elevation Surficial and Bedrock Order (Great Group) Common Soil Series Temperature Precipitation Precipitat
Valleys and Mesas	Ephemeral and intermittent streams. 200-800 valley-fill alluvium. Partary (Eocene, Paleocene) sandstone, shale, and muditone, small area of Cretaceous sandstone and shale	is Penistaja, Travessilla, Weska Aridic Ustic. Ustic Aridic	One-oeed and Rocky Mountain junipers. Indian ricegras, big sagebrush, sand droposed, galleta, threeawns, blue grama, and rabbitbrush. Should be supposed galleta, threeawns, blue natural gas production. Mostly public (BLM) and tribal land (licenila Apache).	79a. Apachian Valleys and Low Hills and Low
	in the far south.		The state of the s	
1.22				
	ARIZONA/NEW MEXICO MOUNTAINS	0.0	National Variation	79b. Lower Madrean Woodlands Voodlands Voo
Level IV Ecoregions	Physiography Geology Ares Developy Local Rollef Developy Surficial and Bedruck Order (Great Group)	Soils Climate Common Soil Series Temperature Precipination Proof Free Mean Imperature Management Management Juneary minima	Natural Vegetation Land Cover and Land Use	
23a. Chihuahuan	(opara Local Relief	Mésirrare Régimes (inches) Mésan semmal Mesan semmal Mesa	On benches and slopes with deeper soil: grasses such Shrubland and grassland. Wildlife habitat	contonwood, sycamore, and willow:
Desert Slopes	766 Ever slopes of Candidige and Sacraments Mountains, or by steps currows, Moderate gradient ephement streams that carry water only after profess forms. Month of the profession of the profes	olis Ector, Lozier, rock outcrop, Tencee, Thermic/ Ustic, Aridic 15-18 180-210 29/52; 180-210 62/85	On bearders and dopes with deeper soil grates such as to but, balck, and ideast grants, pupple foreware. Similard and grant finally Mostly publications in the state of the s	79c. Madrean Pine— 20 Steep mountain ridges, peak, and slopes (along the Centroscate divides in the Animass Steep (along t
-	Sacramento Mountains		theinord gassanass settlem needs singly such as solo, lechignilla, succa, ocotillo, and each. lechignilla, succa, ocotillo, and each. articular descalaro Apache) and military land (Fort Bliss).	Designating vocation in the Child Cardinal Basis. 2 Payment Special Control Control Cardinal Basis Special Control Control Cardinal Basis Special Cardinal Basis
23b. Madrean Lower Montane	4532 Hgh hills and Joen measurates, some deep calcovers. Morey moderate to high probate growth of the control o	tolis, alicids, alicids, pear, nock outcrop, in the west, Luzena, Faraway, Muzzler, Jonale, Lonit, Ruidoo, White House, rock	Mostly Mexican pinyon, one-seed juniper, alligator juniper, gray olis, Gambel olis, Emory olis, manzania, mixed granas, and dresseam. Some ponderou pine ar higher elevations. Some ponderou pine ar higher elevations. Granas and dresseam of the production of the pr	SOURCES: Finch, D.M., and Talant, I.A., address, 1975, Ecology, Growiny, and suntainability of the middle Rise Genule Start Marker, D. 2002, Reachings in Rise Archive Industry and Englander and Start Marker, A. (2002) A complete 1977, Neutral history of El Malpisa National Monuments: Socious, New Marcio, Southwartern Naternaliss, Sanction Start
Woodlands	and sandy substrates; a few perennial rivers. sandistone, and shalle in the west, Quaternary and Terriary sandistone and conglomerate, Terriary volcanic tuffs and lavas.	outcrop.	elevations. Lincoln and Gils National Forestt, BLM, NPS- Carlboad Caverns National Park) and tribal land (Mescaleto Apache).	D.C., Island Press, p. 239-233. Findings, T.S., 1987, The natural history of New Mexico and Management, v. 31-34, p. 315-334. Press, 1549.
23c. Montane Conifer Forests	4312 One for momentum and high momentum with Monthly programmed areas and the momentum and	ollis, Chuska Mountains: Akhoni, Frigid 14-30 90-140 12/44; Tumitcha Klizhin, Zuni Mountains: Ustic Ustic ols Mirabal, Zuni, Tampico, Cinnadale,	Onderoca pine and Gambel oak, mountain mahogamy, Arizona systamore. Some Douglas-flir, southwestern white- pine, and white fit: Siles sprace occasionally found in cool, moist caryous. Some areas of appear at higher elevations. Glia and Cholal Stational Posterio and in Cholal Stational Posterio and in Cholal Stational Posterio and in This Glia and Cholal Stational Posterio and in Cholal Stational Posterio and in This	The manufacture of the colling National Higher Part & Mark, G.H., and Giles, K.A., editors, 2004, The geology of New Marico a geologic history. Socorro, New
	perennial streams with bedrock, cobble, gravel, and sandy substrates. 10244/ 400-2000 breccias, volcaniclastic sedimentary rocks, and Terriary (Hicceae and Mioceae) bavallic to anadesinci laya flower on Mr Tovlor and	olls, Chuska Mountains: Akhoen, talsaft, Tunita, Kiriah, Zuni, Tampico, Cransdale, Harki, Portungate, Connofae, Jeliey, Cebollea Means: Cebollea, Charo, Gall Mountain areas Saulo, Cano Gall Mountain areas Saulo,	pine, and winner in the place of the control of the	Balley, R.G., 1995. Description of the corregions of the United States (2nd 4d.) Mixed-lineaus Publication No. 1991. U.S. Deparation of Against Conference of States (2nd 4d.) Mixed-lineaus Publication No. 1991. U.S. Deparation of Against Conference of States (2nd 4d.) Mixed-lineaus Publication No. 1991. U.S. Deparation of Against Conference of States (2nd 4d.) Mixed-lineaus Publication States (2nd 4d.) Mixed-lineaus Publication States (2nd 4d.) Mixed-lineaus Publication States (2nd 4d.) Mixed-lineaus (2nd 4d.) Mixed-lineaus Publication States (2nd 4d.) Mixed-lineaus (2nd 4d.)
	Cebolleta Mesa, Permian sandstone, silitone, imestone, Precambran granine, grannine, precambran grannine, grannine, case, cheta, and some Triastic candidane, shale and multitone in Tomi	Raton.		(may) (implementary white of may mat descriptions compiled and standard by Michika W.H. and Basing. (E.C.) Experimental Agriculture Proceed Services, see [17,900, New Macrican Services, vice of the Associations of Associa
	Mountains: Tertiary (Oligocene) sandrouse and small areas of Tertiary (Mocene and Oligocene) andesite and basalir and decision (Crusto Mocene and Oligocene) andesite and basalir and Mountains (Crusto Mountains)			Baker WL, 1983, Alpino requestions of Wheeler Pack, New Marcine (USA- gradient madyin; classification, and being promptions). The profit of the properties o
23d. Arizona/New		bornifs, USDA-FS. Wet mapped to series level by Frigid, some Cryst. USDA-FS. 45/76 Ustra. Some	Engelmann spruce, corkbark fir, blue spruce, white fir, and apen. Some Doughts of occurs at lower elevations. Some Doughts of occurs at lower elevations. Wilderness, All in public land (USDA-FS Gila and Cibola National Ferein).	General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, and pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map of primeral sugments in New Matrice Southware Neutralist. General FA, pick-Padds WA. 1979. A map
Mexico Subalpine Forests	600-1800	Ustic, some Udic		Press, 145 p. Hennessey, J.T., Gibbons, R.P., Tromble, J.M., and Cardenna, M., 1983, Vegetation changes from 1935 to 1980 in Survice, Rocky Mountain Forest and Range Experiment Station, General Technical Report RM 257, 130 p. 115 Changement of A mirror land resource against and resource against and resource against and resource against and resource against a survice and resource against a survice against
23e. Conifer Woodlands and	5513 High hills and form nountains, memorius,	65) Chuba Montanto Narbona, Chuba Montanto Narbona, Chuba Montanto Narbona, Chuba Montanto Lingui Chuba Montanto Lingui Cheng Paka Tucer, Wasila San Mane Montantan Annea, Montanto Chuba Manea Montanta Annea, Montanto Chuba Manea Montanta Annea, Montanto Chuba Manea Montanta Chuba Manea M	Pinyon-jumper woodlands with one-need jumper, alligator jumper. Rocky Mountain jumper at higher latitudes and elevations, jumper pine, blue grams, junegrass, galleta, and bortlebruik squirrefaul. Some areas with Gambel ook. Utah jumper and by gagbertan in Clusica Mins. Some poulon. Morona. Zome poulon. (Navayo, Acoma. Zom).	
Savannas	5513 Hgh hill; and low memoranism, removes: Grown Month and San	Celevar, Fixed Trues, Vessilla, San Mateo Mountains: Ameee, Montillo, Trocchil Channer, Cabillars	Priyee—impre recollends with one-need jumpe, allapper, player produced to the control of the con	Brown, D. E., editor, 1994. Block communication of Agricultures—Vasture Resources Conservation Service, Robin States. Disputement of Agricultures—Vasture Resources Conservation Service, STATISGO coils data. U.S. Department of Agricultures—Vasture Resources Conservation Service, STATISGO coils data.
	Mountains and Cobollata Mess. Tentary basalise to andesinic lawa and Creancous sandrance and shale in south: Tentary (Miscene and Oligocene) volcanic lawas, ntffs. Specicias, volcanic lastic sedimentary rocks.	Messar Hackroy, Pagnate, Gila Mountains: Datil, Motoqua, Abrazo, Swila Blei Datil, Motoqua, Abrazo,	elevations, mostly northern San Mateo Mins. On lower and drier sites, areas of yucca and opunta.	Carlon, A.W., 1977, Long-letn in the Ris Arther Annals of the Association of American Geographes, v. 67, no. 2, p. 45-77. The Southwestern Naturality, v. 16, no. 2, p. 218-224. Marcine, The Western Dissure of Geology and Mineral Execution, 2007, Geological Dissury Debt Users Geolds no. 4. Marcine, The Western Dissure of Geology and Mineral Execution, 2007, Geological Survey Debt Users Geolds no. 4.
	nurs, oreccas, voicaniciastic sedimentary rocks.	Thunderbird Sandia/Manzano Mountains: Wilcoxson, Andrews, Taking Egrabona Dinata Salar		Curron, Ir., 1997, Assuming source or two states of supersystems of Agriculture - Number of Conservation Service). Nation Limitation, V. J. no. 3, p. 11-22. Peas, C.P., and Brown, D.E., 1983, Rody Mountain (Persan) and Madram mountains confiler fevents: Deserving Conservation Service).
23f. Rocky Mountain	1657 Open low mountains and high mountains with steep slopes, numerous canyons. Mostly maximum valley-fill allaysum. Haphastolisi, Alfisolis (Haphast	Fekley_Escabosa, Pinata, Salas Sandis/Manzano Mountains: Fekley, Frigid_some 18-28 90-140 17/43; Bls. Sandis-memto and southern mountains: Usis: Usis: 47/77 18-28 18-	Mostly ponderosa pine and Gambel oak with pinyon pine, mountain mahogany, Arizona sycamore and a dense understory. Persects of Douglast, white fir, southwestern invested; pranting. Source of water and	Dick-Polds, W.A., 1993, New Markon Superistion—part present, and finner, Allrequerpus, University of New Marco Development, and finner, Allrequerpus, Univer
Conifer Forests	moderate to high gradient intermittent and some perennial streams with bedrock, cobble, and gravel substrates. 500-2000 Permian and Pennylvanian limestone, sandstone, and stone, gravel substrates. 700-2000 and shale; some Tertiany voicamics, Tertary intrusive rocks, small areas of Cretaceous sandstone and shale.	olit, Sundia-Minzano Mouzanias: Fakiey, Priesd, vone Panta, Cres Coba, Tode currerop, Scaramento and southern moumains: Caballa, Pene, Gainer, Felderinoo, Mencalero, Firo, Gavilan, Monjeau, Doeder, rock outcrop Unit:	pine, incomain mushogany, Arizona sycamore and a dense understop; Feerst of Doughach, white fir, southwave terms are invested, grange Source of water and street of the production of the produc	Geological Service Combridge Cambridge Cambrid
41	martrito		(Isleta, Mescalero Apache).	Septem at 10 mg unter 11 mg un
23g. Rocky Mountain Subalpine	45 High menutine peaks and ridges with onesp clayers. Some discission (Serias Bisheriance) (S	ryolls) Caballo, Blanca, Supervisor Cryic, Frigid 20-30 70-90 13/27; Uptic 20-30 70-90 13/27;	Engelmann spruce, corkbark fit, blue spruce, white fit, and steps. Genes Douglast for occurs at lower elevations; Numerous shrub and forb species at lower elevations; Numerous shrub and forb species. See the species of the species	Dyn., A.J., and Moir, W.H., 1977, Syrmo-fer finnest as in southeart distribution in the Rocky Mountain, New Matter, American Milliand Mountain, v. (P., p. 139-146. End R.A. and Bab. D. 1986. Research and find a function of a
Forests	U.S.). A new small, high-gradient streams with by Pennsylvanian limestone and shale. Sierra Blanca and Capitan Mountains: Tertary intrusives and volcanics.		Forests) and tribal land (Mescalero Apache).	Ext E.A., and Rubb D.L. 1995. Repressor of siligran pringer (hospital pringer (hospital pringer) and principle (hospital (hospital principle (hospital principle (hospital principle (hosp
				State University, 70 p. Southwest: Climate Research, v. 21, p. 219-238. University of Attractor Print, p. 17-100.

York, J.C., and Dick-Padia, W.A., 1969. Ungention changes in southern New Maxico during the past lumined universe, in McCinnies, W.G., and Goldman, B.J., editors, Arid lands in purspective. Tucon. Arizona. University of Arizona Pause. p. 197-166. FOR SALE BY U.S. GEOLOGICAL SURVEY P.O. BOX 25286, DENVER, COLORADO 80225

Ecoregions of New Mexico

segions straight the environment by its probable response to disturbance and the segion of the content of the segion of t

Characterization and acception immagnment influenteement reasons, i.e., and in the control of th Woods, A.J., Omernik, J.M., Butlet, D.R., Ford, J.G., Henley, J.E., Hoagland, B.W., Amdt, D.S., and Moran, B.C., 2005, Ecoregions of Oklahoma: Reston, Varginia, U.S. Geological Survey, map scale 1:1,250,000.



79. Madrean Archipelago



















mostly in the southern mountains and diminushes to the norms, as one as soon,

A. The summer raise assepacially important for benderings pleant. The region is peologically diverse with volcanic, sedumentary, and some
other than the second of the second of the region's stream. Liversical granup, legging, and recreation are the
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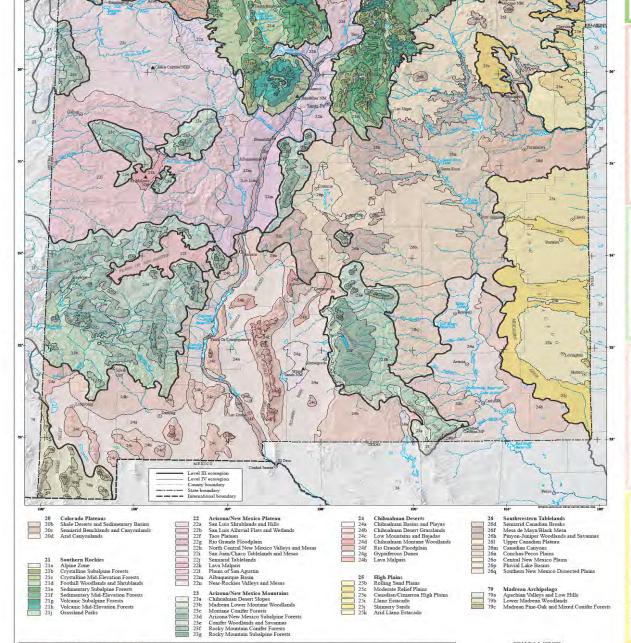
and midgrass prairie vegetation includes jumper, and sagebranh, databashus sumas, and years, along with sideous grams, little blusterms, research washings, taking grants, bufferings, gallets, and shall actuate.

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This project was parually supported by funds from the USEPA-Region VI, Regional Applied Research Effort Program.