
EXECUTIVE SUMMARY

Section 303(d) of the Federal Clean Water Act requires states to develop Total Maximum Daily Load management plans for water bodies determined to be water quality limited. A total maximum daily load documents the amount of a pollutant a water body can assimilate without violating a state's water quality standards. It also allocates that load capacity to known point sources and nonpoint sources at a given flow. Total maximum daily loads are defined in 40 Code of Federal Regulations Part 130 as the sum of the individual Waste Load Allocations for point sources and Load Allocations for nonpoint sources, including a margin of safety and natural background conditions.

The Upper Rio Grande watershed is located in north central New Mexico. For practical purposes, the Upper Rio Grande watershed was divided into two investigations (i.e., Part 1 and Part 2). The Upper Rio Grande watershed from Pilar, New Mexico to the New Mexico-Colorado border is Part 1 of the Upper Rio Grande investigation and is addressed in this document. Stations were located throughout the Upper Rio Grande watershed during an intensive watershed survey performed by the New Mexico Environment Department Surface Water Quality Bureau in 2000 to evaluate the impact of tributary streams. As a result of this monitoring effort, several exceedences of New Mexico water quality standards for temperature were documented on Comanche Creek (Costilla Creek to Little Costilla Creek), Costilla Creek (Diversion above Costilla to Comanche Creek), Rio de los Pinos (Colorado border to headwaters), Rio Fernando de Taos (Rio Pueblo de Taos to headwaters), Rio Grande (Red River to New Mexico-Colorado border), Rio Hondo (Rio Grande to US Forest Service boundary), Rio Pueblo de Taos (Rio Grande to Arroyo del Alamo), Rio Pueblo de Taos (Arroyo del Alamo to Rio Grande del Rancho), Rio Pueblo de Taos (Rio Grande del Rancho to Taos Pueblo Boundary), and Rio San Antonio (Montoya Canyon to headwaters). Exceedences of the conductivity¹ criterion were documented on the Rio Fernando de Taos (Rio Pueblo de Taos to headwaters), and Rio Grande del Rancho (Rio Pueblo de Taos to Hwy 518). Conditions at Rio Pueblo de Taos (Arroyo del Alamo to Rio Grande del Rancho) do not meet the narrative stream bottom deposits standard. This total maximum daily load document addresses the above noted impairments. The impaired assessment units and total maximum daily loads are summarized below. A total maximum daily load for stream bottom deposits was previously completed for Cordova Creek (Costilla Creek to headwaters) (New Mexico Environment Department/Surface Water Quality Bureau 1999a). Accordingly, this effort provides total maximum daily loads that address all the above noted impairments.

Additional water quality data will be collected by New Mexico Environment Department during the standard rotational period for intensive stream surveys. As a result, targets will be re-examined and potentially revised as this document is considered to be an evolving management plan. In the event that new data indicate that the targets used in this analysis are not appropriate

¹ The current water quality standards erroneously refer to "conductivity" when the intention was "specific conductance." Specific conductance means conductivity adjusted to 25 degrees C. SWQB proposed changing all references from conductivity to specific conductance at the recent (February 2004) triennial review hearing. This proposal is expected to be accepted by the WQCC and EPA. Therefore, the term specific conductance is used throughout this TMDL document.

and/or if new standards are adopted, the load capacity will be adjusted accordingly. When water quality standards have been achieved, the reach will be moved to the appropriate category on the Clean Water Act Integrated §303(d)/§305(b) list of waters.

The Surface Water Quality Bureau's Watershed Protection Section has and will continue to work with watershed groups to develop Watershed Restoration Action Strategies to develop and implement strategies to attempt to correct the water quality impairments detailed in this document. Implementation of items detailed in Watershed Restoration Action Strategies will be done with participation of all interested and affected parties.

**TOTAL MAXIMUM DAILY LOAD FOR TEMPERATURE
COMANCHE CREEK (COSTILLA CREEK TO LITTLE COSTILLA CREEK)**



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Comanche Creek (Costilla Creek to Little Costilla Creek) NM-2120.A_827 (formerly NM-URG1-30500)
Segment Length	10.3 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	43 mi ²
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Rangeland (33%), Forest (66%), Agriculture (<1%), Built-up/Water (<1%)
Identified Sources	Range grazing, silviculture (historic), road construction/maintenance, placer mining (historic), removal of riparian vegetation, streambank modification or destabilization
Land Management	U.S. Forest Service (99%), Private (<1%)
Priority Ranking	3
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (115.1) + MOS (12.8) = 127.9 j/m²/sec/day

**TOTAL MAXIMUM DAILY LOAD FOR TEMPERATURE
COSTILLA CREEK (DIVERSION ABOVE COSTILLA TO COMANCHE CREEK)**



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Costilla Creek (Diversion above Costilla to Comanche Creek) NM-2120.A_820 (formerly NM-URG1-30000)
Segment Length	18.0 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	230 mi ²
Land Type	Southern Rockies Ecoregion (22)
Land Use/Cover	Rangeland (14%), Forest (80%), Agriculture (2%), Barren/Tundra (4%), Built-up/Water (<1%)
Identified Sources	Range grazing (riparian and/or upland); hydromodification; highway maintenance and runoff; flow regulation/modification; channelization
Land Management	U.S. Forest Service (28%), Private (72%)
Priority Ranking	3
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (70.7) + MOS (7.9) = 78.6 j/m²/sec/day

**TOTAL MAXIMUM DAILY LOAD FOR TEMPERATURE
RIO DE LOS PINOS (COLORADO BORDER TO HEADWATERS)**



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Rio de los Pinos (Colorado border to headwaters) NM-2120.A_900 (formerly NM-URG1-50000)
Segment Length	20.9 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13010005
Scope/size of Watershed	160 mi ²
Land Type	Southern Rockies Ecoregion (21/22)
Land Use/Cover	Rangeland (39%), Forest (61%), Agriculture (<1%), Built-up/Water (<1%)
Identified Sources	Range grazing, removal of riparian vegetation, streambank modification or destabilization, natural, unknown
Land Management	Bureau of Land Management (7%), U.S. Forest Service (91%), Private (2%)
Priority Ranking	3
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (135.7) + MOS (15.4) = 151.1 j/m²/sec/day

TOTAL MAXIMUM DAILY LOADS FOR SPECIFIC CONDUCTANCE AND TEMPERATURE RIO FERNANDO DE TAOS (RIO PUEBLO DE TAOS TO HEADWATERS)



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Rio Fernando de Taos (Rio Pueblo de Taos to headwaters) NM-2120.A 512 (formerly NM-URG1-20210)
Segment Length	21.6 miles
Parameters of Concern	Specific Conductance, Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	63 mi ²
Land Type	Southern Rockies Ecoregion (21/22)
Land Use/Cover	Rangeland (3%), Forest (90%), Agriculture (3%), Built-up/Water (4%)
Identified Sources	Recreation and tourism activities (other than boating); range grazing (riparian and/or upland); natural sources; land disposal; land development; highway maintenance and runoff; habitat modification (other than hydromodification); construction; bank or shoreline modification/destabilization
Land Management	Tribal lands (2%), U.S. Forest Service (81%), Private (17%)
Priority Ranking	3
Threatened and Endangered Species	None
TMDL for:	
Specific Conductance	WLA (0) + LA (111) + MOS (20) = 131 lbs/day
Temperature	WLA (0) + LA (59.3) + MOS (6.59) = 65.9 j/m²/sec/day

**TOTAL MAXIMUM DAILY LOAD FOR TEMPERATURE
RIO GRANDE (RED RIVER TO NEW MEXICO-COLORADO BORDER)**



New Mexico Standards Segment	Rio Grande 20.6.4.122
Waterbody Identifier	Rio Grande (Red River to New Mexico-Colorado Border) NM-2119_05 (formerly NM-URG1-20000 [split])
Segment Length	27.75 miles
Parameters of Concern	Temperature
Uses Affected	Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	5,660 mi ²
Land Type	Southern Rockies Ecoregion (22)
Land Use/Cover	Rangeland (42%), Forest (46%), Agriculture (11%), Barren/Tundra (1%), Built-up/Water (<1%)
Identified Sources	Watershed runoff following forest fire; removal of riparian vegetation; recreation and tourism activities (other than boating); hydromodification; habitat modification (other than hydromodification); flow regulation/modification
Land Management	State land (10%), U.S. Forest Service (28%), Bureau of Land Management (30%), Private (32%)
Priority Ranking	2
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (82.0) + MOS (9.11) = 91.1 j/m²/sec/day

**TOTAL MAXIMUM DAILY LOAD FOR SPECIFIC CONDUCTANCE
RIO GRANDE DEL RANCHO (RIO PUEBLO DE TAOS TO HIGHWAY 518)**



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Rio Grande del Rancho (Rio Pueblo de Taos to Hwy 518) NM-2120.A_501 (formerly NM-URG1-20110)
Segment Length	11.5 miles
Parameters of Concern	Specific Conductance
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	142 mi ²
Land Type	Southern Rockies Ecoregion (21/22)
Land Use/Cover	Rangeland (4%), Forest (92%), Agriculture (2%), Built-up/Water (2%)
Identified Sources	Range grazing (riparian and/or upland); natural sources; land disposal; hydromodification; highway/road/bridge construction; highway maintenance and runoff; habitat modification (other than hydromodification); flow regulation/modification; construction; channelization; bank or shoreline modification/destabilization
Land Management	U.S. Forest Service (93%), Private (7%)
Priority Ranking	4
Threatened and Endangered Species	None
TMDL for: Specific Conductance	WLA (0) + LA (3,743) + MOS (660) = 4,403 lbs/day

**TOTAL MAXIMUM DAILY LOAD FOR TEMPERATURE
RIO HONDO (RIO GRANDE TO U.S. FOREST SERVICE BOUNDARY)**



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Rio Hondo (Rio Grande to US Forest Service Boundary) NM-2120.A_600 (formerly NM-URG1-20300)
Segment Length	8.5 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	72 mi ²
Land Type	Southern Rockies Ecoregion (22)
Land Use/Cover	Rangeland (7%), Forest (78%), Agriculture (10%), Built-up/Water (3%), Barren/Tundra (2%)
Identified Sources	Removal of riparian vegetation; pasture grazing (riparian and/or upland); irrigated crop production; highway maintenance and runoff; habitat modification (other than hydromodification); crop-related sources; bank or shoreline modification/destabilization
Land Management	Tribal lands (1%), U.S. Forest Service (61%), Private (38%)
Priority Ranking	4
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (91.7) + MOS (10.2) = 101.9 j/m²/sec/day

**TOTAL MAXIMUM DAILY LOAD FOR TEMPERATURE
RIO PUEBLO DE TAOS (RIO GRANDE TO ARROYO DEL ALAMO)**



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Rio Pueblo de Taos (Rio Grande to Arroyo del Alamo) NM-2119_20 (formerly NM-URG1-20100 [split])
Segment Length	6.4 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	418 mi ²
Land Type	Southern Rockies Ecoregion (22)
Land Use/Cover	Rangeland (15%), Forest (76%), Agriculture (5%), Built-up/Water (3%), Barren/Tundra (1%)
Identified Sources	Recreation and tourism activities (other than boating); range grazing (riparian and/or upland); pasture grazing (riparian and/or upland); irrigated crop production; hydromodification; highway maintenance and runoff; habitat modification (other than hydromodification); grazing related sources; flow regulation/modification; crop-related sources; bank or shoreline modification/destabilization
Land Management	Tribal land (32%), U.S. Forest Service (47%), Private (21%)
Priority Ranking	2
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (23.1) + MOS (2.57) = 25.7 j/m²/sec/day

**TOTAL MAXIMUM DAILY LOADS FOR TEMPERATURE
AND STREAM BOTTOM DEPOSITS
RIO PUEBLO DE TAOS (ARROYO DEL ALAMO TO RIO GRANDE DEL RANCHO)**



New Mexico Standards Segment	Rio Grande 20.6.4.122
Waterbody Identifier	Rio Pueblo de Taos (Arroyo del Alamo to Rio Grande del Rancho) NM-2119_30 (formerly NM-URG1-20100 [split])
Segment Length	1.2 miles
Parameters of Concern	Temperature, Stream bottom deposits (sedimentation/siltation)
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	401 mi ²
Land Type	Southern Rockies Ecoregion (22)
Land Use/Cover	Rangeland (14%), Forest (77%), Agriculture (5%), Built-up/Water (3%), Barren/Tundra (1%)
Identified Sources	Range grazing (riparian and/or upland); onsite wastewater systems (septic tanks); municipal point sources; land disposal; highway/road/bridge construction; highway maintenance and runoff; grazing related sources; crop-related sources; construction; agriculture
Land Management	Tribal land (33%), U.S. Forest Service (48%), Private (19%)
Priority Ranking	2
Threatened and Endangered Species	None
TMDL for:	
Temperature	WLA (0) + LA (10.7) + MOS (1.19) = 11.9 j/m²/sec/day
Stream bottom deposits	WLA (0) + LA (15) + MOS (5) = 20 percent fines

**TOTAL MAXIMUM DAILY LOADS FOR TEMPERATURE
RIO PUEBLO DE TAOS (RIO GRANDE DEL RANCHO TO TAOS PUEBLO BOUNDARY)**



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Rio Pueblo de Taos (Rio Grande del Rancho to Taos Pueblo bdy) NM-2120.A_511 (formerly NM-URG1-20200)
Segment Length	2.8 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	214 mi ²
Land Type	Southern Rockies Ecoregion (22)
Land Use/Cover	Rangeland (7%), Forest (78%), Agriculture (9%), Built-up/Water (5%), Barren/Tundra (1%)
Identified Sources	Removal of riparian vegetation; pasture grazing (riparian and/or upland); irrigated crop production; habitat modification (other than hydromodification); grazing related sources; crop-related sources; bank or shoreline modification/destabilization; agriculture
Land Management	Tribal lands (56%), U.S. Forest Service (30%), Private (14%)
Priority Ranking	4
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (64.7) + MOS (7.19) = 71.9 j/m²/sec/day

**TOTAL MAXIMUM DAILY LOAD FOR TEMPERATURE
RIO SAN ANTONIO (MONTROYA CANYON TO HEADWATERS)**



New Mexico Standards Segment	Rio Grande 20.6.4.123
Waterbody Identifier	Rio San Antonio (Montoya Canyon to headwaters) NM-2120.A_901 (formerly NM-URG1-50100)
Segment Length	12.9 miles
Parameters of Concern	Temperature
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13010005
Scope/size of Watershed	125 mi ²
Land Type	Southern Rockies Ecoregion (21/22)
Land Use/Cover	Rangeland (63%), Forest (37%), Agriculture (<1%), Built-up/Water (<1%)
Identified Sources	Range grazing, removal of riparian vegetation, streambank modification or destabilization, natural, unknown
Land Management	U.S. Forest Service (86%), Bureau of Land Management (12%), State Land (1%), Private (1%)
Priority Ranking	3
Threatened and Endangered Species	None
TMDL for: Temperature	WLA (0) + LA (147.48) + MOS (16.4) = 163.88 j/m²/sec/day