USEPA-APPROVED
TOTAL MAXIMUM DAILY LOAD (TMDL)
FOR THE
Río PUERCO WATERSHED – PART 1

AUGUST 10, 2007

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COVER PHOTO: Downstream view of Rio Puerco channel and riparian vegetation below Village of Cuba SWCD gabions, July 17, 2003

LIST OF ABBREVIATIONS AND DEFINITIONS

AU	Assessment Unit
ADB	Assessment Database version 2
BLM	Bureau of Land Management
BMP	Best management practices- effective, practical, structural or nonstructural methods which prevent or reduce the movement of pollutants from the land to surface water.
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CGP	Construction general storm water permit
CWA	Clean Water Act
^{o}C	Degrees Celsius
^{o}F	Degrees Fahrenheit
Ecoregion	Ecological regions based on geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology.
EPT	Ephemeroptera/Plecoptera/Tricoptera
EQIP	Environmental Quality Incentive Program
GIS	Geographic Information Systems
HBI	Hilsenhoff's Biotic Index- tolerance index that represents relative sensitivity of benthic macroinvertebrates to perturbation.
HUC	Hydrologic unit code- a way of identifying all of the drainage basins in the United States in a catalogued arrangement from largest (Regions) to smallest (Cataloging Units).
km^2	Square kilometer
LA	Load allocation
mg/L	Milligrams per Liter
mi^2	Square miles
mL	Milliliters
mm	Millimeters
MOS	Margin of safety
MOU	Memoranda of Understanding
MS4	Municipal Separate Storm Sewer System
MSGP	Multi Sector General Storm Water Permit
NM	New Mexico
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System-as authorized by the Clean Water Act, permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.
%	Percent
QAPP	Quality Assurance Project Plan
RBP	Rapid bioassessment protocol- an evaluation of the condition of a waterbody using biological surveys and other direct measurements of the resident biota in surface waters.
RFP	Request for proposal
SBD	Stream bottom deposits

STORET	Storage and Retrieval Database- a repository for water quality, biological, and physical data and is used by state environmental agencies, EPA and other federal agencies, universities, private citizens, and others.
SWPPP	Storm Water Pollution Prevention Plan-a written document that describes the construction operator's activities to comply with the requirements in the construction general permit
SWQB	Surface Water Quality Bureau
TMDL	Total maximum daily load
TSS	Total suspended solids
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WLA	Waste load allocation
WQCC	Water Quality Control Commission- The commission is the state water pollution control agency for NM, and for all purposes of the federal Clean Water Act and the wellhead protection and sole source aquifer programs of the federal Safe Drinking Water Act.
WQS	Water quality standards (NMAC 20.6.4 as amended through October 11, 2002)
WRAS	Watershed Restoration Action Strategy
WWTP	Waste water treatment plant

EXECUTIVE SUMMARY

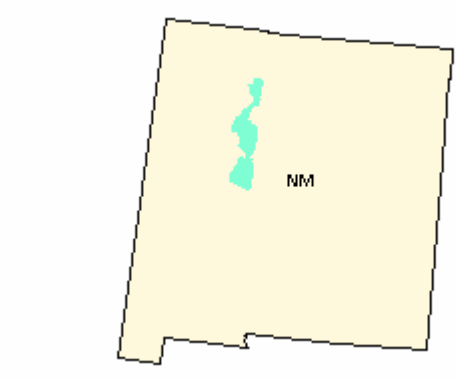
Section 303(d) of the Federal Clean Water Act requires states to develop Total Maximum Daily Load (TMDL) management plans for water bodies determined to be water quality limited. A TMDL documents the amount of a pollutant a water body can assimilate without violating a state's water quality standards. It also allocates the 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 (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources and background conditions, and includes a Margin of Safety (MOS).

The Río Puerco (from its confluence with the Río Grande), together with its tributaries and headwaters, define the Río Puerco Watershed. The Surface Water Quality Bureau (SWQB) held a pre-survey public meeting in Cuba, NM and conducted an intensive surface water quality survey of the Río Puerco watershed in 2004. Sampling stations were established along the river to evaluate the impact of tributary streams and to establish background conditions. As a result of assessing data generated during this monitoring effort impairment determinations of New Mexico water quality standards for sedimentation/siltation (i.e. stream bottom deposits) were documented in the Río Puerco (Arroyo Chijuilla to Northern Boundary Cuba) based on the current sedimentation assessment protocol. The SWQB is in the process of reviewing the sedimentation assessment protocol in order to improve it in the future, and will solicit input on revisions and improvements to this protocol. This TMDL document addresses the above noted impairment as summarized in the table below. The data used to develop this TMDL were collected during the 2004 survey.

The 2004 Río Puerco Watershed study also identified other potential water quality impairments in this watershed which are not addressed in this document. Additional data needs for verification of those impairments are being identified and data collection will follow. Subsequent TMDLs will be prepared in the near future in a separate TMDL document.

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 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 attainment category on the Clean Water Act Integrated §303(d)/§305(b) list of waters (NMED/SWQB 2004a).

TOTAL MAXIMUM DAILY LOAD FOR SEDIMENTATION/SILTATION
RÍO PUERCO (ARROYO CHIJUILLA TO NORTHERN BOUNDARY CUBA)



New Mexico Standards Segment	Río Grande Basin 20.6.4.99
Assessment Unit Identifier	Río Puerco (Arroyo Chijuilla to Northern Boundary Cuba), NM-2107.A_40 (formerly NM-MRG4-20000)
Assessment Unit Length	8.2 miles
Parameters of Concern	Sedimentation/Siltation
Designated Uses Affected	Marginal Warmwater Aquatic Life
Geographic Location	Río Puerco USGS Hydrologic Unit Code 13020204
Scope/size of Watershed	138 square miles
Land Type	Arizona/New Mexico Plateau Ecoregion (22)
Land Use/Cover	Forest (62%), Shrubland (21%), Grassland (12%), Agriculture (4.4%), Developed (0.14%), Barren (0.15%), Mining (0.04%), Water (0.01%)
Probable Sources	Highway/Road/Bridge Runoff (Non-construction related), Channelization, Rangeland Grazing, Loss of Riparian Habitat, Streambank Modification/destabilization, Natural Sources, Wildlife other than Waterfowl, Drought-related Impacts
Land Management	U.S. Forest Service (38%), Private (37%), Native (14%), BLM (10.5%), State (0.38%)
Priority Ranking	High
TMDL for: Sedimentation/Siltation	**WLA (0) + LA (16%) + MOS (4.0%) = 20%**

1.0 INTRODUCTION

Under Section 303 of the Clean Water Act (CWA), states establish water quality standards, which are submitted and subject to approval of the U.S. Environmental Protection Agency (USEPA). Under Section 303(d)(1) of the CWA, states are required to develop a list of waters within a state that are impaired and establish a total maximum daily load (TMDL) for each pollutant. A TMDL is defined as "*a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards including consideration of existing pollutant loads and reasonably foreseeable increases in pollutant loads*" (USEPA 1999). A TMDL documents the amount of a pollutant a waterbody 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. TMDLs are defined in 40 Code of Federal Regulations (CFR) Part 130 as the sum of the individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources and natural background conditions, and includes a margin of safety (MOS). This document provides TMDLs for assessment units within the Río Puerco watershed that are impaired based on a comparison of measured concentrations and conditions with water quality criteria and numeric translators for narrative standards.

This document is divided into several sections. Section 2.0 provides background information on the location and history of the Río Puerco watershed, provides applicable water quality standards for the assessment units addressed in this document, and briefly discusses the intensive water quality survey conducted in the Río Puerco watershed in 2004. Section 3.0 presents the TMDL developed for sedimentation/siltation (previously referred to as stream bottom deposits) in the Río Puerco watershed. Section 4.0 presents the rationale for delisting of other Río Puerco Consent Decree impairments. Pursuant to Section 106(e)(1) of the Federal CWA, Section 5.0 provides a monitoring plan in which methods, systems, and procedures for data collection and analysis are discussed. Section 6.0 discusses implementation of TMDLs (phase two) and the relationship between TMDLs and Watershed Restoration Action Strategies (WRAS). Section 7.0 discusses assurance, Section 8.0 public participation in the TMDL process, and Section 9.0 provides references.

2.0 RIO PUERCO WATERSHED BACKGROUND

2.1 Description and Land Ownership

The Río Puerco Watershed covers approximately 4,736 square miles (mi^2) in northwestern New Mexico (NM). The impaired reach covered by this TMDL, Río Puerco (Arroyo Chijuilla to northern boundary Cuba), drains approximately 138 mi^2. Land use for the watershed includes 62% forest, 21% shrubland, 12% grassland, 4% agriculture, and less than 1% developed, water, wetlands, bare rock, and mines/quarries (Figure 2.1). As presented in Figure 2.2, land ownership for the Río Puerco watershed is 38% U.S. Forest Service (USFS), 37% private, 10% Bureau of Land Management (BLM), 14% Native Lands, and <1% State.

The Río Puerco is the largest tributary to the middle Río Grande Basin and has headwaters located in the Nacimiento Mountains east of Cuba, NM. The mainstem of the Río Puerco begins in a wetland on the southwest side of San Pedro Peak. This mountain range is fully contained within the San Pedro Peak Wilderness area of the Santa Fe National Forest. From its 10,500-foot beginning, the stream flows to the southwest for almost 7 miles through high elevation forests then into a series of wet meadows to the edge of the wilderness area at 8,500-foot elevation.

From the forest boundary downstream approximately 6 miles to the Village of Cuba, domestic and wildlife grazing, road construction, and maintenance activities on private and public lands have impacted riparian vegetation and initiated discontinuous stream channel incision. In some local segments the stream bed is now five to ten feet below its original floodplain, while adjacent reaches remain relatively stable. At and below the Village of Cuba, flows from a series of small streams draining the west face of the Sierra Nacimiento Range on the Santa Fe National Forest combine with effluent from the Cuba WWTP to provide perennial flow in the Río Puerco downstream towards the confluence with Arroyo Chijuilla. This reach of the Río Puerco as well as the downstream reach flows through a complex mixture of private, State and Federal lands in a wide, deeply incised, vertical-walled canyon with banks up to 35 feet high. Erosional processes within this reach of the stream are extensive. Significant landscape and channel erosion, and channel incision are unfortunate realities throughout the majority of the Rio Puerco Watershed. When these conditions occur, soil is lost, the landscape is vulnerable to sheet attrition and rilling, vegetation vigor declines, streams and tributaries become sediment-filled, the availability of accessible water for irrigation diversions decreases or disappears, the river beds are lowered, the banks extended, riparian resources and related habitat is impacted, water quality deteriorates, and this process is inevitably accompanied by a drop in the local water table. None of these resulting conditions are conducive to healthy land productivity. Photos 2.1 and 2.2 provide a general visual overview of the area and show the extent to which portions of the watershed have experienced erosion and cut banks.

In the mid-1960s a segment of the reach between La Ventana and Cuba was diverted from its original meandering channel into a straight channel on the west side of the highway during the original construction of this valley segment of State Highway 44. This channelization has

resulted in an estimated 14.1 million cubic feet of sediment erosion of the local river bed and banks (Coleman, et al. 1998), has put the highway at risk, and has destroyed several County roads and bridges. In 1999, the multi-agency process of widening the highway to four lanes and transitioning it to federal Highway 550 also committed to restore the Río Puerco to its original channel and initiate riparian restoration efforts. These restoration activities, along with many other upstream and downstream projects, are ongoing and demonstrate favorable potential to improve water quality in the Río Puerco and Río Grande.

Photo 2.1 Historic photo of Río Puerco near Cabezòn (Bureau of Reclamation Collection)

Photo 2.2 Río Puerco above La Ventana, July 1999 (M. Coleman)

Water quality in the Río Puerco has long been of concern both within and outside of the State of NM. It has been known for over forty years that the Río Puerco contributes only a tiny fraction of the Río Grande's total water volume yet contributes well over half of the total sediment load entering Elephant Butte Reservoir (Happ 1948).

2.2 Geology and Fluvial Geomorphology

The Río Puerco Basin includes ten large subwatersheds draining portions of eight counties, west of the greater Río Grande Basin, in the northwest and west central portion of NM. Encompassing approximately 4,736 mi^2, it is by far the largest in-state tributary to the Río Grande.

The watershed lies along the east-southeast margin of the Colorado Plateau, along a transition zone with the Río Grande Rift (Basin and Range Province). Soft upper Paleozoic, Mesozoic, and lower Cenezoic sedimentary strata dominantly characterize the geologic setting of the area, displaying Permian through Tertiary age continental and marine sandstones, shales, mudstones, and carbonate rocks. Strata are generally flat lying, often faulted, and carved into broad valleys flanked by mesas and mountains. The mountainous areas along the margins of the northeast and west-central watershed are made up of intrusive igneous rocks (granitic plutonic rocks, gneiss, and schists). Younger Tertiary or Quaternary volcanic rocks intrude the sediments and occasionally cap high standing mesas. Tertiary and Quaternary valley fill, pediment gravels, talus, and alluvial deposits mantle the geologic section.

Numerous geomorphic elements combine to form the watershed's present structural, fluvial, and topographic settings. Existing landforms are an indication of the large amounts of surface

materials that have been removed from the region by wind and water. Elevations range from the 11,301 foot peak of Mt. Taylor, to the terrain at 10,500 feet in the Sierra Nacimiento - San Pedro Parks Wilderness headwaters area, to 9,120 feet along the Continental Divide in the Zuni Mountains, to less than 4,700 feet at the lower Río Puerco / Río Grande confluence at Bernardo north of Socorro. The change in elevation, a rather high regional surface gradient, and an excess of straight drainage channel segments combines with the region's climatic setting and vulnerable sedimentary lithologies to exacerbate the watershed's well-documented reputation for dramatic erosion.

Average rainfall in the basin varies annually between 12-20 inches, delivered mostly by late summer monsoon thunderstorms creating violent flash flood runoff that sweeps out of well-vegetated highlands across sparsely vegetated slopes and valley surfaces, carrying thin topsoil and weathered bedrock away. The large aerial extent of erosive geologic units provides the abundant source of available sediment, estimated as 40% from existing channels and banks, 30% from sediment-producing tributary drainages, and 30% from sheet, rill, and minor gully erosion of adjacent uplands (Gellis, 1992).

Soil loss contributing to sediment loading is such an extreme problem throughout the watershed that the basin has earned its status as one of the nation's most actively eroding watersheds. In fact, when compared with some of the world's great river systems, the Río Puerco Basin has been documented to transport one of the highest known average annual sediment concentrations. As the major source of suspended sediment entering the Río Grande above Elephant Butte Reservoir, the Río Puerco was determined to be contributing 83% of the total sediment load from 1948 to 1973 and 60% of the total load between 1974 and 1996. That decrease over time is evident in recent data from three active United States Geological Survey (USGS) gage stations in the lower half of the watershed. Investigators indicate that the decrease may be due to evolving changes in channel and planform geometry, combined with a decrease in peak flows out of the watershed, both favoring vegetation increases that positively influence channel roughness, sediment deposition, and overall stabilization. It is also believed that successful upland and in-channel erosion-control strategies implemented by private land owners prior to government-lead efforts, and by state and federal watershed restoration programs working with land management agencies and private landowners have contributed to this upward trend.

The distribution of soils and vegetation is also strongly influenced by topography and geology. Digitally processed satellite images show many parts of the basin are very responsive to seasonal variations in precipitation, while scattered riparian corridors in main stem and tributary drainages are recognized as increasingly stable and less prone to displaying significant vegetation changes given annual or seasonal precipitation variation. Natural vs. human controls on vegetation distribution aid in assessing impacts of grazing and other concentrated land use practices on erosion and sediment production.

The headwaters source area of the upper Río Puerco gathers snow melt and summer showers from forested terrain and meadows at the crest of the Nacimiento Uplift, approximately twelve miles above the Village of Cuba. Relatively low-discharge perennial tributaries coalesce and drop off the western face of the Nacimiento (one of the most prominent linear fault scarps in the southwest) as mostly straight and steep bedrock, boulder, or large cobble-lined channels. The

foothills areas north and northeast of Cuba are composed of erodable sedimentary units (clay and mudstones), so while stream incision becomes a component of this drainage system very close to its headwaters area, the downstream reach's sand-dominated setting and decreased gradient allows for some recovery of stable channel dimension, pattern, and profile.

The least incised, best vegetated, and most stable segment occurs one to three miles upstream of the Village of Cuba, below which deep incision and a broad meandering pattern becomes characteristic across the wide flat valleys, on to the distant confluence with the Río Grande. A few discontinuous bedrock zones or recent manmade grade control structures are occasionally observed controlling the incision.

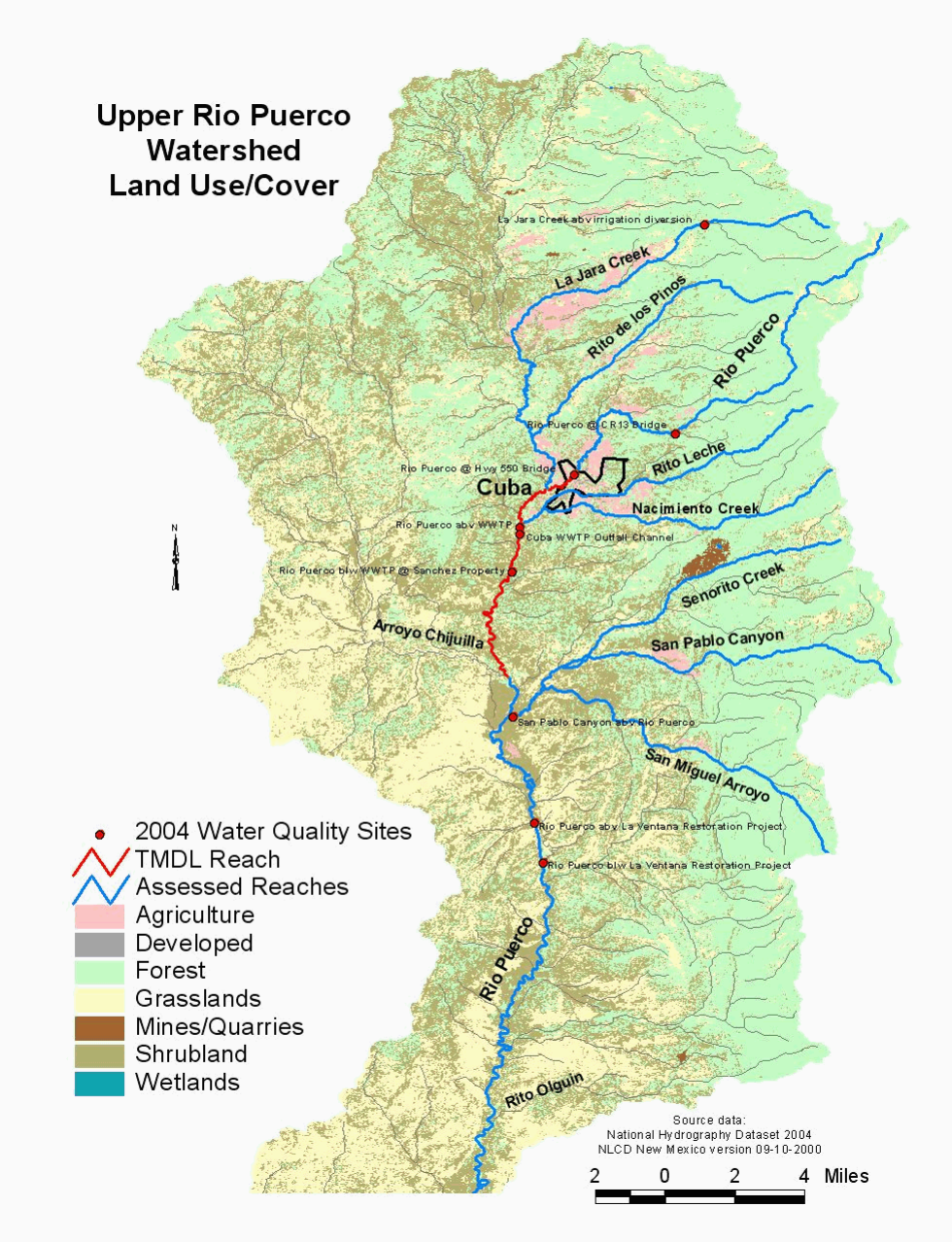


Figure 2.1 Río Puerco Watershed Land Use/Land Cover and Sampling Stations

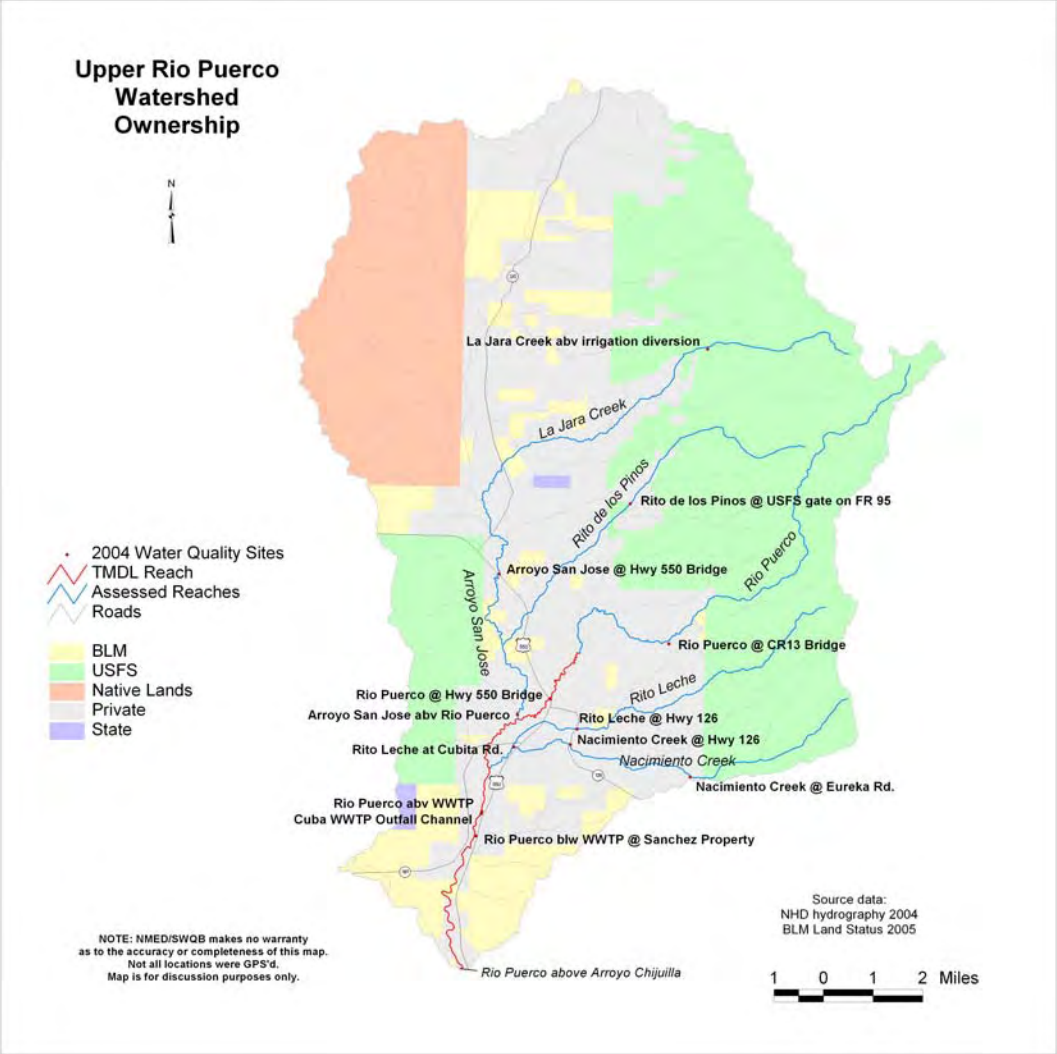


Figure 2.2 Río Puerco Watershed Land Ownership and Sampling Stations

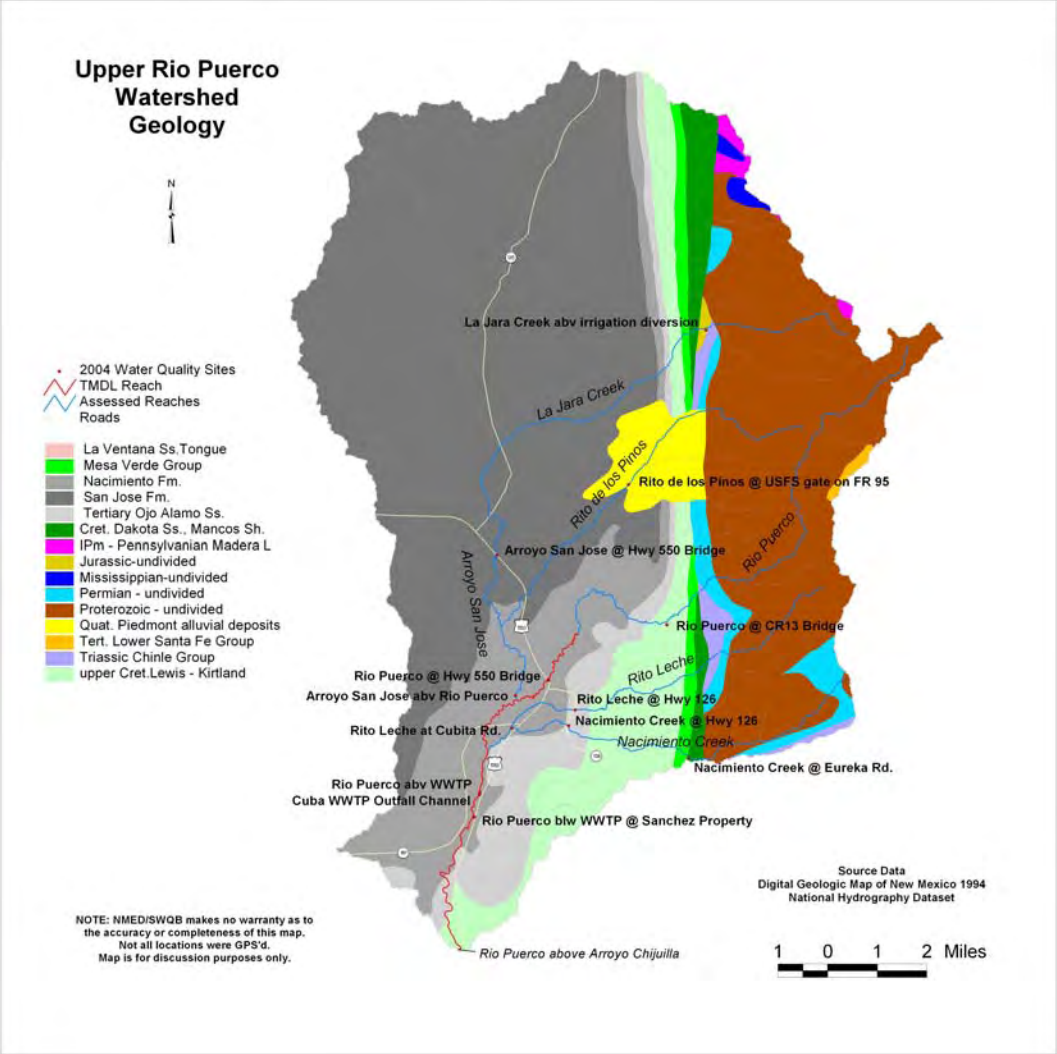


Figure 2.3 Río Puerco Watershed Geology

2.3 Water Quality Standards

Water quality standards (WQS) for the Río Puerco are set forth in the following sections of *New Mexico Standards for Interstate and Intrastate Surface Waters* (NM Administrative Code [NMAC] 20.6.4) (NMAC 2005):

20.6.4.105 RIO GRANDE BASIN – The main stem of the Río Grande from the headwaters of Elephant Butte reservoir upstream to Alameda Bridge (Corrales-bridge) and intermittent water below the perennial reaches of the Río Puerco that enters the main stem of the Río Grande.

A. Designated Uses: irrigation, marginal warmwater aquatic life, livestock watering, wildlife habitat, and secondary contact.

B. Criteria:

(1) In any single sample: pH within the range of 6.6 to 9.0 and temperature 32.2°C (90°F) or less. The use-specific criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less; single sample 410 cfu/100 mL or less (see Subsection B of 20.6.4.14 NMAC).

(3) At mean monthly flows above 100 cfs, the monthly average concentration for: TDS 1,500 mg/L or less, sulfate 500 mg/L or less and chloride 250 mg/L or less.

20.6.4.109 RIO GRANDE BASIN – Perennial reaches of Bluewater creek, Río Moquino, Seboyeta creek, Río Paguate, the Río Puerco above the village of Cuba and all other perennial reaches of tributaries to the Río Puerco including the Río San Jose in Cibola county from the USGS gaging station at Correo upstream to Horace springs.

A. Designated Uses: coldwater aquatic life, domestic water supply, fish culture, irrigation, livestock watering, wildlife habitat, and primary contact.

B. Criteria:

(1) In any single sample: pH shall be within the range of 6.6 to 8.8, temperature 20°C (68°F) or less and total phosphorus (as P) 0.1 mg/L. The use-specific criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less; single sample 235 cfu/100 mL or less (see Subsection B of 20.6.4.14 NMAC).

The assessment unit Río Puerco (Arroyo Chijuilla to northern boundary Cuba) does not fall into either of the specific Río Puerco standards listed above. This is a perennial reach of the Río Puerco within and below the Village of Cuba and therefore is not covered in 20.6.4.109 which only applies to perennial reaches of the Río Puerco above the Village of Cuba. In addition 20.6.4.105 does not apply because it relates to intermittent portions of the Río Puerco below perennial portions. Since neither of these standards apply to this particular reach of the Río Puerco, the general perennial waters standard (20.6.4.99) with an existing use of marginal

warmwater aquatic life will be the applicable standard for this TMDL document.

20.6.4.99 PERENNIAL WATERS – All perennial surface waters of the state that are not included in a classified water of the state in 20.6.4.101 through 20.6.4.899 NMAC.

A. Designated Uses: aquatic life, livestock watering, wildlife habitat, and secondary contact.

B. Criteria:

(1) Temperature shall not exceed 34°C (93.2°F). The use-specific criteria in 20.6.4.900 NMAC are applicable to the designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of E. coli bacteria shall not exceed 548 cfu/100 mL; no single sample shall exceed 2507 cfu/100 mL (see Subsection B of 20.6.4.14 NMAC).

NMAC 20.6.4.900 provides standards applicable to attainable or designated uses unless otherwise specified in 20.6.4.101 through 20.6.4.899. NMAC 20.6.4.13 lists general standards that apply to all surface waters of the state at all times, unless a specified standard is provided elsewhere in NMAC.

2.4 Intensive Water Quality Sampling

The Río Puerco watershed was intensively sampled by the SWQB in 2004. A brief summary of the survey and the hydrologic conditions during the intensive sample period is provided in the following subsections. A more detailed description of the Río Puerco intensive survey can be found in the *Water Quality Survey Summary for the Río Puerco and Tributaries* this document will be available online Fall 2006 at http://www.nmenv.state.nm.us/swqb/MAS/index.html (NMED/SWQB 2006a). Survey summary reports are also available via a phone call to SWQB.

2.4.1 Survey Design

Surface water quality samples were collected monthly between March and November during the 2004 intensive SWQB study. Surface water quality monitoring stations were selected to characterize water quality of various assessment units (i.e., stream reaches) throughout the watershed (Table 2.1, Figures 2.1 through 2.3). Stations were located to evaluate the impact of tributary streams and to determine ambient and background water quality conditions. Surface water grab samples were analyzed for a variety of chemical/physical parameters. Data from grab samples and field measurements are housed in the SWQB provisional water quality database and were uploaded to USEPA's Storage and Retrieval (STORET) database.

Table 2.1 SWQB 2004 Río Puerco Sampling Stations

Assessment Unit	STORET ID	Station Description
Bluewater Creek (Bluewater reservoir to headwaters)	36Bluewa018.9	Bluewater Creek above Bluewater Lake @ USGS Gage 8341300
Bluewater Creek (non-tribal Rio San Jose to Bluewater Rsrv)	36Bluewa003.5	Bluewater Creek @ mouth of Bluewater cayon
Rio Moquino (Laguna Pueblo to Seboyettia Creek)	36RMoqui00.6.4	Rito Moquino below confl of Seboyetitia Creek and Seboyeta Creek
Rio San Jose (Horrace Springs to Grants WWTP)	N/A	Rio San Jose blw Grants WWTF Discharge[1]
La Jara Creek (Perennial reaches abv Arroyo San Jose)	33LaJara009.7	La Jara Creek abv irrigation diversion
Arroyo San Jose (Rio Puerco to La Jara Creek)	33ASanJo006.5	Arroyo San Jose @ Hwy 550
Rito de los Pinos (Perennial reaches abv Arroyo San Jose)	33RPinos006.8	Rito de los Pinos @ USFS gate on FR 95
Rito Leche (Perennial reaches above Rio Puerco)	33RLeche002.6	Rito Leche @ Hwy 126
Rito Leche (Perennial reaches above Rio Puerco)	33RLeche001.3	Rito Leche @ Cubita Rd
Nacimiento Creek (Rio Puerco to USFS bnd)	33Nacimi008.0	Nacimiento Creek @ Eureka Rd
Nacimiento Creek (Rio Puerco to USFS bnd)	33 Nacimi003.4	Nacimiento Creek @ Hwy 126
Senorito Creek (Perennial Reaches above San Pablo Canyon)	33 Senori006.8	Senorito Creek blw Nacimiento Mine
San Miguel Arroyo (San Pablo Canyon to headwaters)	33SanMig005.7	San Miguel Arroyo @ old Hwy 44
San Pablo Canyon (Rio Puerco to headwaters)	33SPablo000.2	San Pablo Canyon abv Rio Puerco
Rio Puerco (northern bnd Cuba to headwaters)	33RPuerc256.0	Rio Puerco @ CR 13
Rio Puerco(Arroyo Chijuilla to northern bnd Cuba)	33RPuerc248.7	Rio Puerco @ Hwy 550
Rio Puerco(Arroyo Chijuilla to northern bnd Cuba)	33RPuerc244.0	Rio Puerco abv WWTP
Rio Puerco(Arroyo Chijuilla to northern bnd Cuba)	33RPuerc241.8	Rio Puerco blw WWTP @ Sanchez Property
Rio Puerco (non-pueblo Rio Grande to Arroyo Chijuilla)	33RPuerc224.8	Rio Puerco abv La Ventana Restoration Project
Rio Puerco (non-pueblo Rio Grande to Arroyo Chijuilla)	33RPuerc222.9	Rio Puerco blw La Ventana Restoration Project
Rio Puerco (non-pueblo Rio Grande to Arroyo Chijuilla)	33RPuerc198.4	Rio Puerco @ Hwy 279 Bridge near San Luis
Rio Puerco (non-pueblo Rio Grande to Arroyo Chijuilla)	33RPuerc004.6	Rio Puerco @ I-25

[1]No data collected, only photographs. Grants WWTP went to land application and channel now dry all year.

All sampling and assessment techniques used during the 2004 intensive SWQB survey are detailed in the *Quality Assurance Project Plan* (QAPP) (NMED/SWQB 2004b) and assessment

protocols (NMED/SWQB 2006b) both of which are available online or via a phone call to SWQB. As a result of the 2004 SWQB monitoring effort, several surface water impairments were verified. Accordingly, these impairments will remain and several new determined impairments will be added to the 2006-2008 Integrated CWA §303 (d)/305(b) list (NMED/SWQB 2006c in progress).

2.4.2 Hydrologic Conditions

There are no active real-time USGS gaging stations in the Río Puerco watershed associated with the reaches presented in this document. However, available flow data are included in Appendix D.

The 2004 SWQB intensive survey was performed over varying flow conditions from March to November. Flows during the 2004 survey year were below average based on the period of record. As stated in the Assessment Protocol (NMED/SWQB 2006b), data collected during all flow conditions, including low flow conditions (i.e., flows below the 4-day, 3-year low flow frequency [4Q3]), will be used to determine designated use attainment status during the assessment process. In terms of assessing designated use attainment in ambient surface waters, WQS apply at all times under all flow conditions.

3.0 SEDIMENTATION/SILTATION (STREAM BOTTOM DEPOSITS)

Based on sampling performed in the Fall of 2004, impairment due to excessive sedimentation/siltation (previously listed as impairment due to Stream Bottom Deposits [SBD]) was confirmed for Río Puerco (Arroyo Chijuilla to Northern boundary of Cuba). This assessment unit was originally listed on the 1996-1998 Integrated CWA §303(d)/§305(b) list for SBD (NMED/SWQB 1996) under the assessment unit name of Río Puerco (Rito Olguin to headwaters). This original assessment unit was later split based on the SWQB's knowledge of geologic conditions and stream characteristics of the Río Puerco.

3.1 Target Loading Capacity

Target values for this Sedimentation/Siltation TMDL will be determined based on 1) the presence of numeric criteria or appropriate numeric translator to a narrative standard, 2) the degree of experience in applying the indicator, and 3) the ability to easily monitor and produce quantifiable and reproducible results. This TMDL is also consistent with New Mexico's antidegradation policy.

The state of New Mexico has developed and adopted a narrative "bottom deposit" standard. The current general narrative standard for the deposition of material on the bottom of a stream channel is specifically found in Section 20.6.4.13(A) of the State of New Mexico Standards for Interstate and Intrastate Surface Waters (NMAC 2002):

> ***Bottom Deposits****: Surface waters of the State shall be free of water contaminants from other than natural causes that will settle and damage or impair the normal growth, function, or reproduction of aquatic life or significantly alter the physical or chemical properties of the bottom.*

Clean stream bottom substrates are essential for optimum habitat for many fish and aquatic insect communities. The impact of fine sediment deposits is well documented in the literature. Impairment occurs when critical habitat components, such as spawning gravels and cobble surfaces, are physically covered by fines thereby decreasing intergravel oxygen and reducing or eliminating the quality and quantity of habitat for fish, macroinvertebrates, and algae (Chapman and McLeod 1987, Lisle 1989, Waters 1995). An increased sediment load is often the most important adverse effect of activities on streams, according to a monitoring guidelines report (USEPA 1991). This impact is largely a mechanical action that severely reduces the available habitat for macroinvertebrates and fish species that utilize the streambed in various life stages. Minshall (1984) cited the importance of substratum size to aquatic insects and found that substratum is a primary factor influencing the abundance and distribution of insects. Aquatic detritivores also can be affected when their food supply either is buried under sediments or diluted by increased inorganic sediment load and by increasing search time for food (Relyea et al. 2000). In addition, sediment loads that exceed a river's sediment transport capacity often trigger changes in stream morphology (Leopold and Wolman 1964). Streams that become

overwhelmed with sediment often go through a period of accelerated channel widening and streambank erosion before returning to a stable form (Schumm 1977, Knighton 1984). These morphological changes tend to accelerate erosion, thereby reducing habitat diversity and placing additional stress on designated aquatic life uses.

The SWQB Sediment Workgroup evaluated a number of methods described in the literature that would provide information allowing a direct assessment of the impacts to the stream bottom substrate. In order to address the narrative criteria for bottom deposits, SWQB compiled techniques to measure the level of sedimentation of a stream bottom. These procedures are presented in Appendix D of the *State of New Mexico Procedures for Assessing Standards Attainment for the Integrated §303(d)/§305(b) Water Quality Monitoring and Assessment Report* (NMED/SWQB 2006b). The purpose of the protocol is to provide a reproducible quantification of the narrative criteria for bottom deposits in small wadeable streams. A final set of monitoring procedures was implemented at a wide variety of sites during the 2001 monitoring season. These procedures included conducting pebble counts (to determine percent fines), stream bottom cobble embeddedness, geomorphologic measurements, and the collection and enumeration of benthic macroinvertebrates. The SWQB is in the process of reviewing the sedimentation assessment protocol in order to improve it in the future, and will solicit input on revisions and improvements to this protocol.

The target levels involved the examination of developed relationships between percent fines and biological score as compared to a reference site. Using existing data from New Mexico, a relationship (r^2=0.75) was established between embeddedness and the biological scores using data collected in 1998 (NMED/SWQB 2006b). A correlation (r^2= 0.719) was also found when relating embeddedness to percent fines. Although these correlations were based on a limited data set, TMDL studies on other reaches, including those in the Cimarron Basin, the Jemez Basin, and the Río Guadalupe, have shown these relationships to be consistent. These relationships show that at the desired biological score of at least 79, the target embeddedness for fully supporting a designated use would be 45% and the target percent fines would be 20% (NMED/SWQB 2006b). Since this relationship is based on New Mexico streams, 20% was utilized for the target value for percent fines in previous TMDLs for small wadeable streams in New Mexico.

Rio Hondo above Rio Grande was chosen as the benthic macroinvertebrate reference station for the Río Puerco (Arroyo Chijuilla to Northern boundary of Cuba). Benthic macroinvertebrate samples and pebble counts were collected at both stations (Barbour et al. 1999, Wohlman 1954). Due to the extremely unique geomorphic characteristics and the level of impairment of the Río Puerco, it is difficult to identify an ideal benthic macroinvertebrate reference location for the Río Puerco. According to the SWQB assessment protocols (NMED/SWQB 2006b), a site can be used as a “best available” reference location if the reference and study site have similar attributes such as elevation, geology, and hydrology (precipitation, etc.). Both the Rio Puerco and Rio Hondo stations are in Omernik Ecoregion 22 and have similar geomorphic characteristics (Table 3.1).

Collection of benthic macroinvertebrates was performed using two devices, a kick net and a surber sampler. Use of the kick net involved the disturbance of approximately 0.5 of a square

meter of substrate for one minute. Three individual kick net samples were taken from a riffle at each sampling location and composited into a single sample. The second method involved using a Surber Sampler to collect three replicate samples from a riffle at each sampling location. In an area approximately 0.3 square meter, each substrate particle larger than 2 inches was scrubbed to remove macroinvertebrates and removed. The fines were then manually agitated to suspend any remaining macroinvertebrates. During both processes, the sampler was embedded in the substrate with the net opening facing upstream after which the substrate upstream of the sampler was disturbed. The macroinvertebrates dislodged during the disturbance are washed into a 500-micron mesh net. The rapid bioassessment protocol (RBP) metrics were applied to a 300-organism subsample of the composite sample at each site (Barbour et al. 1999). Selection of those metrics that are particularly suited to the delineation of sediment impacts highlights the degree of impairment. Ephemeroptera/Plecoptera/Tricoptera (EPT) taxa, the number of sediment adapted organisms, taxa richness, and Hilsenhoff's Biotic Index (HBI) all indicate some degree of impairment attributable to sedimentation (Table 3.1). Select results of the pebble count and benthic macroinvertebrate surveys are shown in Table 3.2.

Table 3.1 Characteristics of Benthic Macroinvertebrate Sampling Sites

Characteristics	Reference Site[(a)]	Study Site[(b)]
Omernik Level III Ecoregion	22	22
Aquatic Ecoregion*	2	2
Elevation	6453 ft (1967 m)	6900 ft (2103 m)
Watershed Area (square miles)	74	18

*Cowely *et al.* (1997) Aquatic Ecoregion 2 defines areas between 1675 m and 2135 m.

Table 3.2 Pebble Count and Benthic Macroinvertebrate Results

Results	Reference Site[(a)]	Study Site[(b)]	Percent of Reference
Pebble count			
% Fines (< 2 mm)	29%	68%	134%
D50	56 mm	0.6 mm	—
D84	325 mm	4 mm	—
Benthic metrics			
Ephemeroptera/ Plecoptera/ Tricoptera Taxa	12	4	—
Taxa Richness	33	31	—
Hilsenhoff's Biotic Index	4.7	6.78	—
Total Biologic Score (out of a possible 48)	44	18	41%
Total Habitat Score (out of a possible 200)	173	85	49%

Notes:
[(a)] Reference Site = Rio Hondo abv Rio Grande
[(b)] Study Site = Río Puerco @ Hwy 550 Bridge
mm = Millimeters — = Not applicable

3.2 Flow

No streamflow data are necessary because all loads are specified in percent fines.

3.3 Calculations

No calculations were necessary because all loads are specified in percent fines. The target loads for sedimentation are shown in Table 3.3.

Table 3.3 Calculation of Target Loads for Sedimentation/Siltation

Location	Sedimentation Standard[(a)] (% fines)	Sedimentation Target Load Capacity (% fines)
Río Puerco (Arroyo Chijuilla to Northern boundary of Cuba)	20	20

Notes:

(a) This value is based on a narrative standard. The background values for bottom deposits were taken from the Stream Bottom Deposit Assessment Protocol (NMED/SWQB 2006b).

The target load capacity of 20% fines is a statewide target that has been used in previous TMDLs for small wadeable streams in New Mexico. The target for the Rio Puerco and other parts of the state will be refined over time as the sedimentation assessment protocol is revised and improved. A 5 to 20% decrease in sediment in the assessment unit could be considered environmentally beneficial. It is important to remember that the TMDL itself is a value calculated at a defined critical condition, and is calculated as part of planning process designed to achieve WQSs. Since flows vary throughout the year in these systems, the actual load at any given time will vary based on the changing flow. Management of the load to improve stream water quality should be a goal to be attained.

Measured load was determined by a pebble count as described in the Stream Bottom Deposit Assessment Protocol (NMED/SWQB 2006b). Fines are defined as particles less than 2 millimeters (mm) in diameter. Results are displayed in Table 3.4.

Table 3.4 Calculation of Measured Loads for Sedimentation/Siltation

Location	Sedimentation/ Siltation Measured Load (% fines)
Río Puerco (Arroyo Chijuilla to Northern boundary of Cuba)	68

3.4 Waste Load Allocations and Load Allocations

3.4.1 Waste Load Allocation

The Village of Cuba Wastewater Treatment Plant (WWTP) (NM0024848) is located within the impaired Río Puerco AU and discharges directly to the Río Puerco. There is some debate regarding whether or not total suspended solids (TSS) from wastewater facilities has an impact on sedimentation. TSS sampling in ambient streams typically measures suspended sediment from erosional processes. Since TSS sampling in WWTP effluent typically measures biosolids, which are less inclined to settle on the stream bottom, USEPA contends that TSS from WWTPs have no impact on sedimentation.

There are no Municipal Separate Storm Sewer System (MS4) storm water permits in this AU. Sediment may be a component of some industrial and construction storm water discharges covered under General Permits, so these discharges should be addressed. In contrast to discharges from other industrial storm water and individual process wastewater permitted facilities, storm water discharges from construction activities are transient because they occur mainly during the construction itself, and then only during storm events. Coverage under the NPDES construction general storm water permit (CGP) for construction sites greater than one acre requires preparation of a Storm Water Pollution Prevention Plan (SWPPP) that includes identification and control of all pollutants associated with the construction activities to minimize impacts to water quality. In addition, the current CGP also includes state specific requirements to implement best management practices (BMPs) that are designed to prevent to the maximum extent practicable, an increase in sediment, or a parameter that addresses sediment (e.g., TSS, turbidity, siltation, SBDs, etc.) and water velocity during and after construction compared to pre-construction conditions. In this case, compliance with a SWPPP that meets the requirements of the CGP is generally assumed to be consistent with this TMDL.

Other industrial storm water facilities are generally covered under the current NPDES Multi Sector General Storm Water Permit (MSGP). This permit also requires preparation of an SWPPP that includes identification and control of all pollutants associated with the industrial activities to minimize impacts to water quality. In addition, the current MSGP also includes state specific requirements to further limit (or eliminate) pollutant loading to water quality impaired/water quality limited waters from facilities where there is a reasonable potential to contain pollutants for which the receiving water is impaired. In this case, compliance with a SWPPP that meets the requirements of the MSGP is generally assumed to be consistent with this TMDL.

Individual wasteload allocations for the General Permits were not possible to calculate at this time in this watershed using available tools. Loads that are in compliance with the General Permits from facilities covered are therefore currently calculated as part of the watershed load allocation.

3.4.2 Load Allocation

In order to calculate the LA, the WLA and MOS were subtracted from the target capacity TMDL following **Equation 1**:

$$WLA + LA + MOS = TMDL \quad \text{(Eq. 1)}$$

The MOS is estimated to be 20 percent of the target load calculated in Table 3.3. Results are presented in Table 3.5. Additional details on the MOS chosen are presented in Section 3.7.

Table 3.5 TMDL for Sedimentation/Siltation

Location	WLA (% fines)	LA (% fines)	MOS (20%) (% fines)	TMDL (% fines)
Río Puerco (Arroyo Chijuilla to Northern boundary of Cuba)	0	16	4.0	20

The extensive data collection and analyses necessary to determine background sedimentation loads for this AU was beyond the resources available for this study. It is acknowledged that the natural geology of the Rio Puerco watershed contributes to the sediment load in the impaired reach. Therefore, it is assumed that portions of both the load allocation and the measured load will necessarily include sediment contributed by natural background sources.

It is important to reiterate that TMDLs are planning documents that provide a framework for working towards the goal of achieving water quality standards or appropriate numeric translators. Management of the load to improve stream water quality is a goal to be attained, rather than a regulatory requirement.

3.5 Identification and Description of Pollutant Source(s)

Probable nonpoint sources that may be contributing to the observed load are displayed in Table 3.6:

Table 3.6 Pollutant source summary for Sedimentation/Siltation

Pollutant Sources	Magnitude[(a)]	Location	Probable Sources[(b)]
Point:			
None	0%	--------	0%
Nonpoint:			
Sedimentation	68%	Río Puerco (Arroyo Chijuilla to Northern boundary of Cuba)	100% Highway/Road/Bridge Runoff (non-construction related) Loss of Riparian Habitat Rangeland Grazing Streambank Modification/destabilization Channelization Natural Sources Wildlife other than Waterfowl Drought-related Impacts

Notes:
(a) Measured Load expressed as % fines.
(b) From the 2004-2006 Integrated CWA 303(d)/305(b) list (NMED/SWQB 2004a). This list of probable sources is based on staff observation and known land use activities in the watershed. These sources are not confirmed or quantified at this time.

Probable sources of sedimentation for this assessment unit will be evaluated, refined, and changed as necessary through the Watershed Restoration Action Strategy (WRAS) process.

3.6 Linkage of Water Quality and Pollutant Sources

SWQB fieldwork includes an assessment of the potential sources of impairment. The Pollutant Source(s) Documentation Summary included in Appendix A provides documentation of a visual analysis of probable sources along an impaired reach. Although this procedure is subjective, SWQB feels that it provides the best available information for the identification of potential sources of impairment in this watershed. Staff completing these forms identify probable sources of nonpoint source impairments along each reach as determined by field reconnaissance and assessment. It is important to consider not only the land directly adjacent to the stream, which is predominantly privately held, but also to consider upland and upstream areas in a more holistic watershed approach to implementing these TMDLs.

New Mexico's existing bottom deposits narrative WQS includes the phrase " *…from other than natural causes…*" Therefore, the degree to which sediment delivery and transport in this watershed is a natural phenomenon, has been exacerbated by human activities, or is the result of a combination of both should be considered. Even though the highly erodible soils of the Río Puerco Watershed are the primary source of sediment transport, the anthropogenic influence of the highway construction, channelization, land development, and historical rangeland grazing

practices are contributing to impairment in the Río Puerco. The geology in the watershed contributes to the amount of sediment available for transport.

3.7 Margin of Safety

TMDLs should reflect a MOS based on the uncertainty or variability in the data, the point and nonpoint source load estimates, and the modeling analysis. For this TMDL, there will be no MOS for point sources since none were accounted for in the TMDL calculation. However, the MOS is estimated to be 20% for sedimentation. This MOS is based on the uncertainty in the relationship between embeddedness and percent fines. In this case, the percent fines numeric target was determined to interpret the narrative standard. There are also potential errors in measurement of nonpoint source and background loads due to sampling technique, time of sampling, and other factors. Accordingly, a conservative MOS for sedimentation accounts for **20%** of the TMDL.

3.8 Consideration of Seasonal Variation

Data used in the calculation of this TMDL were collected during the fall, which is a biological index period; meaning fall is a critical time in the life cycle stages of aquatic biota. Fall is also generally the low-flow period of the mean annual hydrograph in New Mexico when bottom deposits are most likely to settle and cause impairment, after the summer monsoon season but before annual spring runoff. It is assumed that if critical conditions are met during this time, coverage of any potential seasonal variation will also be met.

3.9 Future Growth

Estimations of future growth are not anticipated to lead to a significant increase for sedimentation that cannot be controlled with BMP implementation in the watershed, continued improvement of road conditions, and proper land management.

4.0 REMOVAL OF CONSENT DECREE LISTINGS

The Río Puerco and San Pablo Canyon were identified as part of the Río Puerco Bundle in the *Forest Guardians and Southwest Environmental Center (Plaintiffs) v. Carol Browner, in her official capacity as Administrator, EPA (Defendant): Joint Motion for Entry of Consent Decree* (U.S. District Court for the District of New Mexico 1997). As part of this Consent Decree the Río Puerco Bundle TMDLs were required to be completed by December 31, 2006. The specific impairments listed on the 303(d) list approved by the USEPA on May 1, 1996 and therefore covered by the Consent Decree are identified in the following sections with an explanation on the actions the SWQB has taken for these waterbodies.

4.1 Río Puerco

The upper portion of the Río Puerco from Rito Olguin to the headwaters (later called Río Puerco [Rito Olguin to headwaters]) was originally listed on the 1996 CWA §303(d) list as impaired for temperature and sedimentation/siltation (previously referred to as "stream bottom deposits") and the lower portion Río Puerco from the mouth on the Río Grande to Rito Olguin (later called Río Puerco [non-pueblo lands Río Grande to Rito Olguin]) was listed for sedimentation/siltation. The sedimentation/siltation listing for Río Puerco (non-pueblo lands Río Grande to Rito Olguin) was removed in 1998 based on the intermittent status of this reach (NMED/SWQB 2004a). The listings for temperature and sedimentation/siltation for the Río Puerco (Rito Olguin to headwaters) have remained on subsequent CWA §303(d) lists based on the need for additional information to verify the impairments.

Before the 2004 Río Puerco study began, the original two assessment units were refined and renamed based on additional information gathered by the SWQB about the Río Puerco watershed. The new assessment units are Río Puerco (non-pueblo lands Río Grande to Arroyo Chijuilla), Río Puerco (Arroyo Chijuilla to Northern boundary Cuba), and Río Puerco (Northern boundary Cuba to headwaters). Arroyo Chijuilla is approximately 20 miles north of Rito Olguin (Figure 2.1) and the Rio Puerco reach in between these two tributaries is intermittent. Therefore, the lowest reach of the Río Puerco will continue to be listed as not impaired for sedimentation/siltation.

The 2004 Río Puerco study included several sampling stations on the Río Puerco (Figure 2.1 and Table 3.1). Based on information from these sampling stations, the reach Río Puerco (Arroyo Chijuilla to Northern boundary Cuba) has been determined to be a perennial reach with an existing use of marginal warmwater aquatic life (see Section 2.3).

A thermograph was deployed at the station Río Puerco @ Hwy 550 Bridge on June 16, 2004 and was retrieved on December 17, 2004. During this period, temperature readings never exceeded the marginal warmwater criteria of 32.2°C (20.6.4.900). The maximum temperature recorded was 28.14°C. Based on these new temperature data and the designated and existing uses in this reach, there are no water quality impairments for temperature on the reach Río Puerco (Arroyo Chijuilla to Northern boundary Cuba). As stated in the Consent Decree, waters removed from the CWA §303(d) list will not require development of a TMDL.

A biological and stream bed assessment was also performed at the station Río Puerco @ Hwy 550 Bridge which confirmed the sedimentation/siltation listing and is discussed in Section 3.0 of this TMDL document.

Between March and July 2004, SWQB staff conducted surveys to assess the physical and biological condition of Río Puerco (Northern boundary Cuba to headwaters) at the only established station in this assessment unit - Río Puerco @ CR13 Bridge. Subsequent visits to this site in August to November 2004 revealed that this station was not flowing and SWQB staff were unable to collect additional water quality samples or biological samples.

Based on the information gathered during the 2004 Río Puerco survey, the SWQB has determined that Río Puerco (Northern boundary Cuba to headwaters) is not perennial for the entire length of this assessment unit. SWQB has therefore determined that the applicable water quality standard segment for this intermittent reach is 20.6.4.98. There are no temperature criteria associated with 20.6.4.98. The general bottom deposit criteria found in 20.6.4.13.A NMAC and SWQB's sedimentation/siltation assessment protocol are not applicable to non perennial reaches. Therefore, there were no identified water quality impairments for either sedimentation/siltation or temperature at this station during the 2004 survey. As stated in the Consent Decree, waters removed from the CWA §303(d) list will not require development of a TMDL.

Photo 4.1 Río Puerco at County Road 13 Bridge (September 1, 2004)

Information supporting the recommendation for delistings for the Río Puerco is located in the SWQB administrative record file, which is open to public inspection upon appointment.

4.2 San Pablo Canyon

San Pablo Creek from the mouth on the Río Puerco to the headwaters (later changed to San Pablo Canyon [Río Puerco to headwaters]) was originally listed on the 1996 CWA §303(d) list as impaired for turbidity, nutrients, and sedimentation/siltation. The turbidity impairment was removed from the CWA §303(d) list in 1998 because the original listing was based on only one data point and according to the SWQB 1998 assessment protocols should have been identified as Full Support, Impacts Observed. The listings for nutrients and sedimentation/siltation have remained on subsequent CWA §303(d) lists based on the need for additional information to verify the lists. The 2004 Río Puerco study included a sampling station on San Pablo Creek (i.e. San Pablo Canyon above Río Puerco). On March 30, 2004 and April 15, 2004, SWQB staff conducted surveys to assess the physical and biological condition of San Pablo Canyon. Subsequent visits to this site in May 2004 to November 2004 found that San Pablo Canyon was not flowing and SWQB staff were unable to collect additional water quality samples or biological samples.

Based on the information gathered during the 2004 Río Puerco survey, the SWQB determined that San Pablo Canyon is not perennial at all points, and therefore does not fall under 20.6.4.109 NMAC. SWQB determined that the applicable water quality standard segment San Pablo Canyon is 20.6.4.98. The general bottom deposit and plant nutrient criteria found in 20.6.4.13 NMAC and SWQB's assessment protocols for these two items are not applicable to non perennial reaches. Therefore, there are no identified water quality impairments for either sedimentation/siltation or plant nutrients on this reach during the 2004 survey. As stated in the Consent Decree, waters removed from the CWA §303(d) list will not require development of a TMDL.

Photo 4.2 San Pablo Canyon above Highway 550 (June 30, 2004)

Information supporting the recommendation for delisting San Pablo Canyon from the mouth on the Río Puerco to the headwaters for sedimentation/siltation and plant nutrients is located in the SWQB administrative record file, which is open to public inspection upon appointment.

5.0 MONITORING PLAN

Pursuant to Section 106(e)(1) of the Federal CWA, the SWQB has established appropriate monitoring methods, systems and procedures in order to compile and analyze data on the quality of the surface waters of New Mexico. In accordance with the New Mexico Water Quality Act, the SWQB has developed and implemented a comprehensive water quality monitoring strategy for the surface waters of the State.

The monitoring strategy establishes methods for identifying and prioritizing water quality data needs, specifies procedures for acquiring and managing water quality data, and describes how these data are used to progress toward three basic monitoring objectives: to develop water quality-based controls, to evaluate the effectiveness of such controls, and to conduct water quality assessments.

The SWQB utilizes a rotating basin system approach to water quality monitoring. In this system, a select number of watersheds are intensively monitored each year with an established return frequency of approximately every eight years. The next scheduled monitoring date for the Río Puerco watershed is 2010. The SWQB maintains current quality assurance and quality control plans for the respective sample year to cover all monitoring activities. This document, called the QAPP, is updated and certified annually by USEPA Region 6. In addition, the SWQB identifies the data quality objectives required to provide information of sufficient quality to meet the established goals of the program. Current priorities for monitoring in the SWQB are driven by the CWA Section 303(d) list of streams requiring TMDLs. Short-term efforts will be directed toward those waters that are on the USEPA TMDL consent decree list (U.S. District Court for the District of New Mexico 1997).

Once assessment monitoring is completed, those reaches showing impacts and requiring a TMDL will be targeted for more intensive monitoring. The methods of data acquisition include fixed-station monitoring, intensive surveys of priority assessment units (including biological assessments), and compliance monitoring of industrial, federal, and municipal dischargers, as specified in the SWQB assessment protocols (NMED/SWQB 2006b).

Long-term monitoring for assessments will be accomplished through the establishment of sampling sites that are representative of the waterbody and which is revisited approximately every eight years. This information will provide time relevant information for use in CWA Section 303(d) listing and 305(b) report assessments and to support the need for developing TMDLs. The approach provides:

- a systematic, detailed review of water quality data which allows for a more efficient use of valuable monitoring resources;
- information at a scale where implementation of corrective activities is feasible;
- an established order of rotation and predictable sampling in each basin which allows for enhanced coordinated efforts with other programs; and
- program efficiency and improvements in the basis for management decisions.

SWQB recently developed a 10-year monitoring strategy submitted to USEPA on September 30, 2004. Once the 10-year monitoring plan is reviewed and approved by the USEPA, it will be available at the SWQB website: http://www.nmenv.state.nm.us/swqb/swqb.html. The strategy will detail both the extent of monitoring that can be accomplished with existing resources plus expanded monitoring strategies that could be implemented given additional resources. According to the draft proposed rotational cycle, which assumes the existing level of resources, the next time SWQB will intensively sample the Río Puerco watershed is during 2010.

It should be noted that a watershed would not be ignored during the years in between intensive sampling. The rotating basin program will be supplemented with other data collection efforts such as the funding of long-term USGS water quality gaging stations for long-term trend data, the Molycorp sampling, and on-going studies being performed by USGS and USEPA. Data will be analyzed and field studies will be conducted to further characterize acknowledged problems and TMDLs will be developed and implemented accordingly. Both long-term and intensive field studies can contribute to the State's Integrated §303(d)/§305(b) listing process for waters requiring TMDLs.

6.0 IMPLEMENTATION OF TMDLS

6.1 Coordination

Watershed public awareness and involvement will be crucial to the successful implementation of these plans to improve water quality. Staff from SWQB have worked with stakeholders to develop a WRAS for the Río Puerco Watershed (RPMC 2001). The WRAS is a written plan intended to provide a long-range vision for various activities and management of resources in a watershed. It details opportunities for private landowners and public agencies to reduce and prevent impacts to water quality. This long-range strategy will become instrumental in coordinating and achieving constituent levels consistent with New Mexico's WQS, and will be used to prevent water quality impacts in the watershed. The WRAS is essentially the Implementation Plan, or Phase Two of the TMDL process. The completion of the TMDLs and WRAS leads directly to the development of on-the-ground projects to address surface water impairments in the watershed.

SWQB staff will continue to assist with technical assistance such as selection and application of BMPs needed to meet WRAS goals. Stakeholder public outreach and involvement in the implementation of this TMDL will be ongoing. Stakeholders in this process will include SWQB and members of the Río Puerco Management Committee. SWQB will actively pursue engagement with land owners, ranchers and acequia associations as stakeholders in the implementation of this TMDL.

Implementation of BMPs within the watershed to reduce pollutant loading from nonpoint sources will be encouraged. Reductions from point sources will be addressed in revisions to NPDES discharge permits. SWQB will communicate to designated federal land management agencies the intent of the TMDL and desire that BMPs be developed through the above coordination process.

6.2 Time Line

The Río Puerco Management Committee (RPMC) was established in 1997 by direction from the Congress of the United States, under the *Río Puerco Watershed Act*, Section 401 of the *Omnibus Parks and Land Management Act of 1996*. Therefore watershed group formation was completed prior to the planning stages for the 2004 intensive survey, and thus prior to any impairment determinations/verifications or TMDL development. As a result, the WRAS was developed and finalized before preparation of these TMDLs. The modified general implementation timeline is detailed below (Table 6.1).

6.3 Clean Water Act §319(h) Funding Opportunities

The Watershed Protection Section of the SWQB provides USEPA §319(h) funding to assist in implementation of BMPs to address water quality problems on reaches listed as category 4 or 5 waters on the Integrated CWA §303(d)/§305(b) list. These monies are available to all private, for profit and nonprofit organizations that are authenticated legal entities, or governmental jurisdictions including: municipalities, counties, tribal entities, Federal agencies, or agencies of the State. Proposals are submitted by applicants at least once a year through a Request for Proposal (RFP) process and require a non-federal match of 40% of the total project cost consisting of funds and/or in-kind services. Funding is available for both watershed group formation (which includes WRAS development) and on-the-ground projects to improve surface water quality and associated habitat. Further information on funding from the CWA §319 (h) can be found at the SWQB website: http://www.nmenv.state.nm.us/swqb/.

Table 6.1 Proposed Implementation Timeline

Implementation Actions	Year 1 (1997)	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10 (2006)
Public Outreach and Involvement	X	X	X	X	X	X	X	X	X	X
Form watershed groups	X									
TMDL Development								X	X	X
WRAS Development				X	X					
Revise any NPDES permits as necessary (currently USEPA Region 6)				X					X	
Establish Performance Targets		X	X	X						
Secure Funding		X	X	X						
Implement Management Measures (BMPs)				X	X	X	X	X	X	X
Monitor BMPs					X	X	X	X	X	X
Determine BMP Effectiveness					X	X	X	X	X	X
Reevaluate Performance Targets						X	X	X	X	X

6.4 Other Funding Opportunities and Restoration Efforts in the Río Puerco Basin

Several other sources of funding existing to address impairments discussed in this TMDL document. NMED's Construction Programs Bureau assists communities in need of funding for WWTP upgrades and improvements to septic tank configurations (such as the design of cluster systems). They can also provide matching funds for appropriate CWA §319(h) projects using state revolving fund monies. The United States Department of Agriculture (USDA)

Environmental Quality Incentive Program (EQIP) program can provide assistance to private land owners in the basin. The USDA Forest Service aligns their mission to protect lands they manage with the TMDL process, and are another source of assistance. The BLM has several programs in place to provide assistance to improve unpaved roads and grazing allotments.

7.0 ASSURANCES

New Mexico's Water Quality Act (Act) does authorize the WQCC to "promulgate and publish regulation to prevent or abate water pollution in the state" and to require permits. The Act authorizes a constituent agency to take enforcement action against any person who violates a water quality standard. Several statutory provisions on nuisance law could also be applied to nonpoint source water pollution. The Water Quality Act also states in §74-6-12(a):

> *The Water Quality Act (this article) does not grant to the commission or to any other entity the power to take away or modify the property rights in water, nor is it the intention of the Water Quality Act to take away or modify such rights.*

In addition, the State of New Mexico Surface Water Quality Standards (see NMAC 20.6.4.11.C) (NMAC 2002) states:

> *These water quality standards do not grant the Commission or any other entity the power to create, take away or modify property rights in water.*

New Mexico policies are in accordance with the federal Clean Water Act §101(g):

> *It is the policy of Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by this Act. It is the further policy of Congress that nothing in this Act shall be construed to supersede or abrogate rights to quantities of water which have been established by any State.*
>
> *Federal agencies shall co-operate with State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources.*

New Mexico's 319 Program has been developed in a coordinated manner with the State's 303(d) process. All 319 watersheds that are targeted in the annual RFP process coincide with the State's biennial impaired waters list as approved by USEPA. The State has given a high priority for funding, assessment, and restoration activities to these watersheds.

As a constituent agency, NMED has the authority under Chapter 74, Article 6-10 NMSA 1978 to issue a compliance order or commence civil action in district court for appropriate relief if NMED determines that actions of a "person" (as defined in the Act) have resulted in a violation of a water quality standard including a violation caused by a nonpoint source. Proving causation by a nonpoint source of a violation of a water quality standard, especially proving causation of violation of the stream bottom deposit standard, would be very difficult, and to date NMED has not brought an enforcement action on this basis. Instead, the NMED nonpoint source water quality management program has historically strived for and will continue to promote voluntary compliance to nonpoint source water pollution concerns by utilizing a voluntary, cooperative approach. NMED believes this is the best and most effective approach to addressing impairment of streams as a result of sedimentation/stream bottom deposits. The State provides technical

support and grant monies for implementation of BMPs and other nonpoint source prevention mechanisms through §319 of the Clean Water Act. Since portions of this TMDL will be implemented through nonpoint source control mechanisms, the New Mexico Watershed Protection Program will target efforts to this and other watersheds with TMDLs.

In order to obtain reasonable assurances for implementation in watersheds with multiple landowners, including Federal, State and private land, NMED has previously established Memoranda of Understanding (MOUs) with various Federal agencies, in particular the USFS and the Bureau of Land Management. MOUs in the past have also been developed with other State agencies, such as the New Mexico State Highway and Transportation Department. These MOUs provide for coordination and consistency in dealing with nonpoint source issues.

The time required to attain standards for all reaches is estimated to be approximately 10-20 years. This estimate includes watershed projects that may not be starting immediately, and also contemplates response to earlier projects. This timeframe is intended to provide some measure of watershed response to projects but is not intended to be a fixed goal. Stakeholders in this process will include SWQB, and other members of the WRAS. The cooperation of watershed stakeholders will be pivotal in the implementation of these TMDLs as well.

8.0 PUBLIC PARTICIPATION

Public participation was solicited in development of this TMDL (see Appendix B). The draft TMDL was made available for a 30-day comment period on March 17, 2006. Response to Comments are included as Appendix C of this document. The draft document notice of availability was extensively advertised via newsletters, email distribution lists, webpage postings (http://www.nmenv.state.nm.us/), and press releases to area newspapers. A public meeting in the Río Puerco Watershed was held April 4, 2006 from 6-8 p.m. . There was a request for a public hearing on June 1, 2006. Responses to this hearing request are included in Appendix E. A second public meeting regarding the draft TMDL was held August 10, 2006, from 6-8 p.m. The public hearing was held on September 12 and October 10, 2006. All meetings and the hearing were held at the Village of Cuba Senior Center.

Once the TMDL is approved by the Water Quality Control Commission, the next step for public participation is revision of the Rio Puerco WRAS as described in Section 6.0, and participation in subsequent Clean Water Act Section 319(h) projects. The WRAS development process is open to any member of the public who wants to participate.

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APPENDIX A
SOURCE DOCUMENTATION SHEET AND SOURCES SUMMARY TABLE

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Río Puerco TMDL Probable Sources Summary

Reach	Parameter	Probable Sources (ADB v.2 terminology)
Río Puerco (Arroyo Chijuilla to Northern boundary of Cuba)	Sedimentation/ Siltation	Highway/Road/Bridge Runoff (non-construction related) Loss of Riparian Habitat Rangeland Grazing Streambank Modification/destabilization Channelization Natural Sources Wildlife other than Waterfowl Drought-related Impacts

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APPENDIX B
PUBLIC PARTICIPATION PROCESS FLOWCHART

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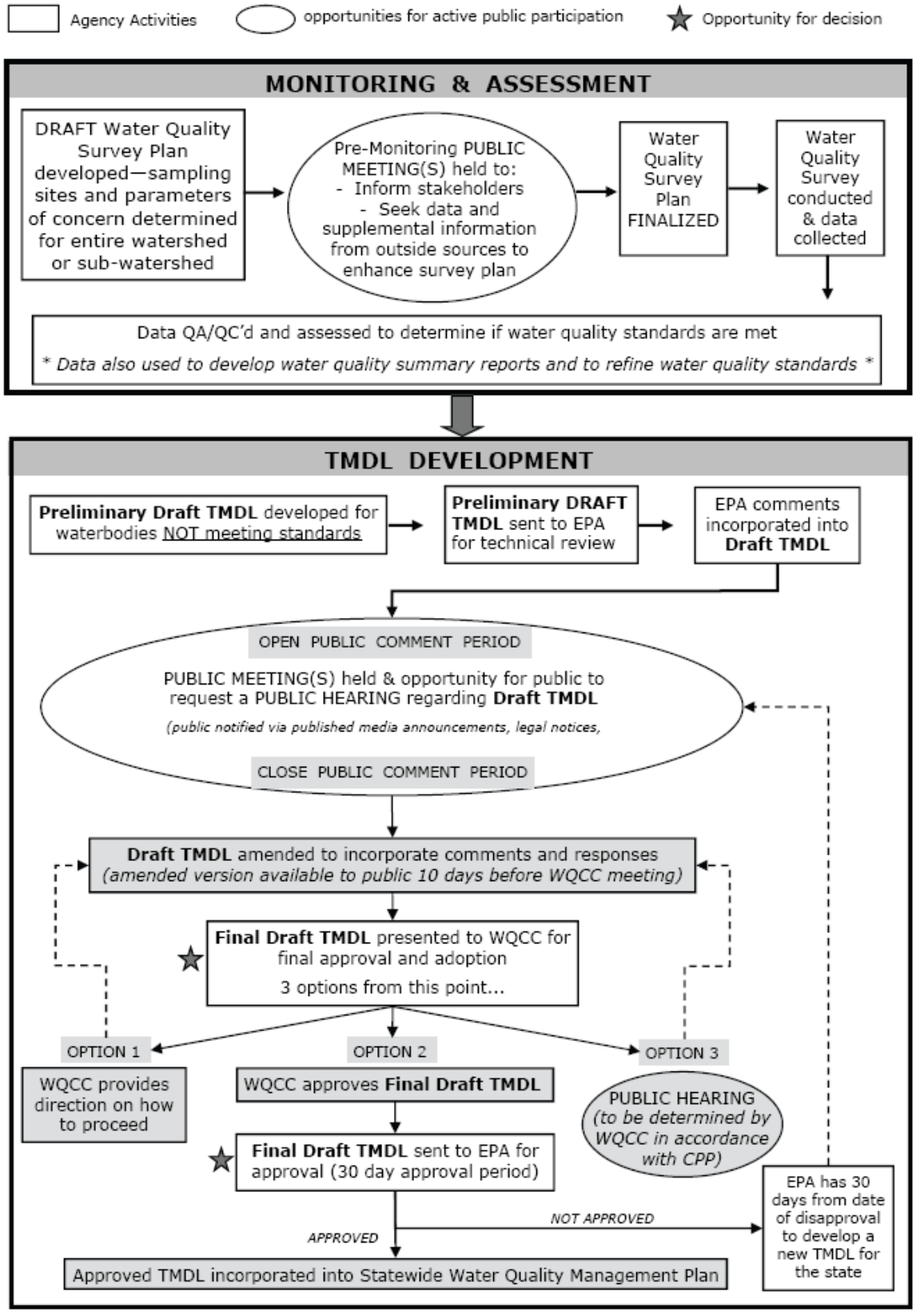
Monitoring, Assessment, & TMDL Development Process



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APPENDIX C
RESPONSES TO COMMENTS

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Comment Set A:

Surface Water Quality Bureau
New Mexico Environment Department
Harold Runnels Bldg. N2109
1190 ST. Francis Drive
P.O. Box 26110
Santa Fe New Mexico
87502
Attention: Jennifer Ickes

Reference: Water Quality meeting held in Cuba New Mexico on Tuesday, 04/04/2006

Dear Ms. Ickes:

Below are my comments as you have requested. Thank you for coming to Cuba and presenting to the group the slide show you prepared. I found it very educational and for the most part truthful or accurate.

1st. I spoke to my father who is nearly 80 years old. To my surprise he remembers catching fish here in Cuba as a boy. He told me they were from 6 inches to a foot in length.

2nd. Furthermore we have property about 10 miles above Cuba and he claims from there to the San Pedro Parks the Rio Puerco does have fish (Trout).

Along with what we spoke about all the way up the Rio Puerco; there are *"large pools"* of water fed from an under ground stream. Until you get up into the San Pedro Parks. Then no one can argue that at the head waters of the Rio Puerco it is a *"true Perennial Stream"*

Now down stream from the San Pedro Parks whether this it is a true *"Annual Stream"* or a *"Perennial Stream"* depends on your point of view and your established definitions of the above.

Response: Thank you very much for this information. This will help us to better characterize the Rio Puerco and provides much needed historical fishery information in this watershed. We agree that characterizing various segments of the Rio Puerco as either perennial or intermittent waterbodies is a difficult task. We need to make this distinction in order to apply the correct New Mexico water quality standards so we can determine whether or not associated designated or existing uses are being met.

To close it is my professional opinion as a Range Conservationist for the US Forest Service for over 20 years and having done work on our own private land. I believe if you were to do one thing and nothing else was done it would be to encourage the existence of Beavers in the water shed.

These critters do more good cheaper than all the man made engineering you and I could come up with. Our place is an example. Neighbors around us tend to try and destroy these animals out of ignorance. It's too bad, but many of the practices we are implementing on our private land don't tend to agree with my neighbors.

Response: The SWQB agrees with you that beavers and beaver dams are an integral part of any healthy watershed. Through our Watershed Protection Section and Outreach Program we have and will continue to educate the public about the importance allowing beaver to remain in watersheds.

Yours truly,

John Y. Hernandez

Comment Set B:

April 13, 2006

Jennifer Ickes
NMED SWQB Room N2109
P.O. Box 26110
Santa Fe, NM 87502

Dear Ms. Ickes:

I disagree with the New Mexico Environment Department, Surface Water Quality Bureau (NMED/SWQB) and its listing, defining and or labeling the Rio Puerco as a perennial stream/water. Clearly, such an action, without a doubt, demonstrates an absence of factual data regarding the nature and character of the Rio Puerco. It also casts doubt on the integrity of the Surface Water Quality Bureau's (SWQB) work Record Of Decision (ROD) either in part or as a whole body of investigation.

At the Cuba meeting held on April 4th, 2006, the insistence of the presenter, Jennifer Ickes of the Rio Puerco's perennial stream status is noted here and it should also be noted that **NO** copies of the ROD were available to the public at that April 4th, 2006 meeting. According to Ickes, she left copies of the ROD on her desk in Santa Fe.

A few days after the April 4th, 2006 Cuba meeting, I read the (ROD) Rio Puerco and the question from NMED/SWQB to USFW February 2, 1998 regarding, "Does siltation in and of itself with all other things being equal contribute to or directly cause impairment to the fishery use for LWWF and WWF?"

The response from US Fish and Wildlife Jennifer Fowler-Propst was, "There are many intermittent streams in New Mexico, including for example, the Rio Puerco and Rio Salado…The degree of siltation within intermittent streams and rivers and its effect on limited warm water fisheries is irrelevant since perennial waters are required for fish survival."

It is evident the SWQB is determined to create something that doesn't exist. The Rio Puerco "event" is an indicator of the agenda the state hopes to address at the expense of truthful science. This opportunity to comment on work of the SWQB is also a complaint regarding the lack of any oversight of the work/study and particularly questions the competence of those involved with this tax funded mission of the clean water act.

Ernest R. Torrez
P.O. Box 4
La Jara, NM 87027

CC: Joshua Madalena
Sandoval County Commissioner

CC: Debbie Rodella
NM State Representative

CC: Leonard Tsosie
NM State Senator

CC: Joe Carraro
NM State Senator

Response: Thank you for your comment. This comment actually refers to the Draft Rio Puerco Watershed TMDL and not to the Record of Decision (ROD), which is a different document prepared by the SWQB and unrelated to the Draft TMDL. The SWQB believes that its assessment of the Rio Puerco (Arroyo Chijuilla to northern boundary Cuba) as a perennial reach is correct. We agree that the entire Rio Puerco is not perennial and we have identified the other two reaches, Rio Puerco (non-pueblo Rio Grande to Arroyo Chijuilla) and Rio Puerco (Northern boundary Cuba to headwaters), as intermittent. The SWQB recently (7 March 2006) performed fish sampling on the Rio Puerco. Below the Cuba WWTP, we collected 46 fathead minnow (*Pimephales promelas*) in at least two age classes; immediately upstream of the U.S. 550 Bridge in Cuba, we collected 14 fathead minnow. There had been no recent storm events that could have flushed these short-lived fish down from upstream. This is a good indication that these particular sites are perennial. Historic records indicate that Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*) have been collected at the U.S. 550 Bridge in Cuba and approximately one mile further upstream in June and May (respectively) of 1956.

APPENDIX D
FLOW and FISH DATA

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Table D1: 2004 Flow Data in Rio Puerco (Arroyo Chijuilla to northern bnd Cuba) Assessment Unit

Site	Date	Flow (cfs)	Notes
Rio Puerco @ Hwy 550 Bridge 33RPuerc248.7	3/31/04	1.146	Estimated (fewer than 20 windows)
	4/14/04	6.60	Estimated (fewer than 20 windows)
	6/29/04	0.25	Visual estimation (no measurements)
	7/27/04	0.10	Visual estimation (no measurements)
	9/1/04	0.15	Visual estimation (no measurements)
	9/30/04	1.0	Visual estimation (no measurements)
	11/18/04	<1.0	Visual estimation (no measurements)
Rio Puerco abv WWTP 33RPuerc244.0	3/30/04	3.73	Estimated (fewer than 20 windows)
	4/14/04	27.97	Estimated (fewer than 20 windows)
	5/25/04	6.68	Estimated (fewer than 20 windows)
	6/29/04	1.00	Visual estimation (no measurements)
	9/1/04	0.05	Visual estimation (no measurements)
	9/21/04	<0.02 *	Visual estimation (no measurements)
	9/30/04	<1.0	Visual estimation (no measurements)
	11/18/04	<1.0	Visual estimation (no measurements)
Rio Puerco blw WWTP @ Sanchez Property 33RPuerc241.8	5/26/04	5.50	Visual estimation (no measurements)
	6/29/04	1.00	Visual estimation (no measurements)
	7/27/04	1.00	Visual estimation (no measurements)
	9/1/04	0.10	Visual estimation (no measurements)
	9/30/04	0.02	Visual estimation (no measurements)
	11/18/04	<1.0	Visual estimation (no measurements)

NOTES: *Sampling for SWQB-PSRS section, not part of intensive water quality survey.

Table D2: 2004 Effluent Discharge from Village of Cuba WWTP*

Month	30-day average (mgd)	30-day average (cfs)	7-day average (mgd)	7-day average (cfs)
January	0.036	0.056	0.066	0.102
February	0.035	0.054	0.038	0.059
March	0.034	0.053	0.046	0.071
April	0.0295	0.046	0.052	0.080
May	0.033	0.051	0.048	0.074
June	0.028	0.043	0.038	0.059
July	0.030	0.046	0.040	0.062
August	0.0298	0.046	0.042	0.065
September	0.0298	0.046	0.042	0.065
October	0.0287	0.044	0.042	0.065
November	0.0375	0.058	0.046	0.071
December	0.032	0.050	0.042	0.065

NOTE: *As of the NPDES permit (NM0024848) issued on October 31, 2005, the effluent limit is 0.144 mgd. The effluent limit was the same in 2004.

Figure D1: Annual Mean Discharge at USGS 08334000 (1925-2005)

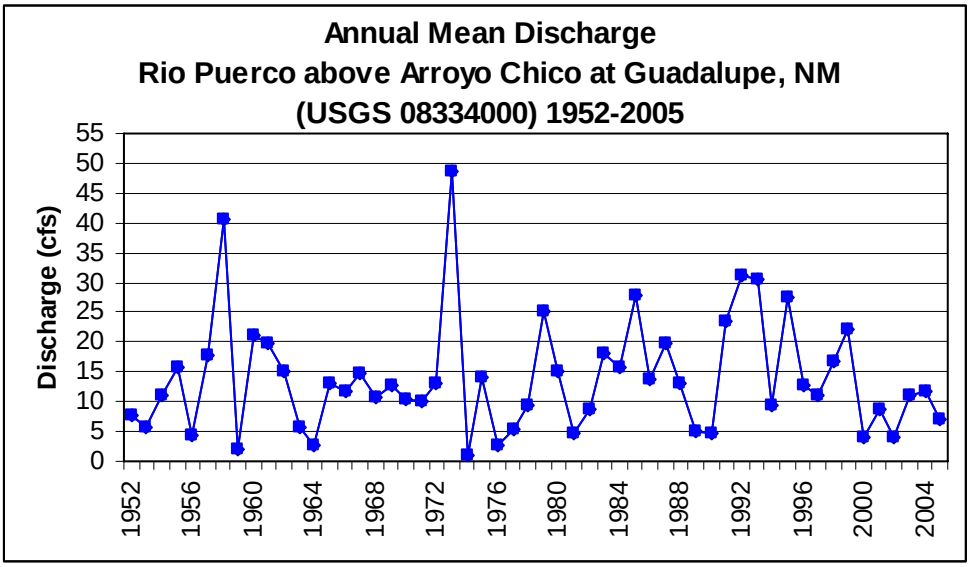

Table D3: Available Historic Fish Data*

Site	Date	Genus, Species	Species	Min SL (mm)	Max SL (mm)
Headwaters of Rio Puerco, east of Cuba	5/28/1956	*Oncorhynchus clarki*	11	82	135
Upper Rio Puerco, east of Cuba	6/20/1956	*Oncorhynchus clarki*	8	94	130
Rio Puerco, 3 miles north and 3 miles east of Cuba.	10/20/82	*Oncorhynchus clarki*	20	101	185
Rio Puerco, immediately below Cuba wastewater treatment plant outfall.	3/7/2006	*Pimephales promelas*	6	26	55
Rio Puerco, immediately upstream of NM State HWY 550 bridge in Cuba.	3/7/2006	*Pimephales promelas*	14	14	33

**obtained from the University of New Mexico Museum of Southwestern Biology, Division of Fishes*

Species = # of individuals in the collection for the given date
SL = Standard length in millimeters

Sightings of fishes upstream of the Cuba WWTF

July 16, 2001: Members of the Rio Puerco Management Committee, Cuba SWCD, and EPA Region 6 participated in a site cleanup project on the Rio Puerco within the Village of Cuba (behind the local Hardware Store). A total of 600 tire carcasses were removed from the channel, immediately below a rock and wire gabion grade control structure, in an area where a former attempt at stream stabilization utilizing tire bales is in the process of failing. Cleanup crews could not help but disturb and scatter dozens of small fish as the tires were extricated from the channel, banks, and bars. (Guesses as to species were verbalized: 'one of several kinds of minnows?' 'chubs?' - nobody in the group is actually a fish biologist).

A 319 implementation project (FY03-I) was developed at the same site after the 2001 tire removal event. Minor numbers of generally small fish have continued to be observed in the project reach, in the stable and very well vegetated stream segment immediately upstream of the project site (on 7/25/01 small schools of fish were seen moving between pooled areas under very low flow conditions during longitudinal and cross-sectional laser surveys of the river); and downstream of the project,
during a reconnaissance walk/wade to assess channel characteristics (natural dimensions and meandering pattern) of the river downstream of where the restoration project will be implemented (9/30/03).

Crews contracted to install a 20' square rock mattress at the toe of the gabion on the FY03-I project gathered local fist-size cobble and broken clasts of concrete that already occupied the channel bottom, for inclusion in the rock mattresses they were building. The SWQB Project Officer assisted in this effort and made note in his field notebook (6/15/04), noting that "I wish I knew what kind (species) of macroinvertebrate insect casts and tubes we were seeing on the bottoms and sides of some of the rocks we were gathering".

The report from a SWQB Water Quality Survey dated 6/20/89, documents the presence of fathead minnows at stations above the Cuba WWTP outfall in the Rio Puerco.

The Thermograph Deployment and Retrieval Field Sheet (for # 604216), dated 6/15/2004, notes an impressive quantity (>25) of small (minnow ?) fish were occupying a large pool area immediately below the Hwy. 550 bridge over the Rio Puerco, at the time the thermograph was installed along the river's left (east) bank. The fish scattered into the pooled area and dissipated upstream. (This site is upstream of the previously described Implementation Project site.)

Fish sightings downstream of CWWTF

(From field notes during NMED's 8/14/96 response to complaints regarding the Cuba Wastewater Treatment Plant: Ann Young, Peter Monahan, Mike Coleman). During the course of our conversation with Louie Wiese, local rancher, he expressed concern that there has been a decline in the presence of sizable fish - recently he is seeing only schools of much smaller fish. We observed several instances of these small (0.5 to1.5"+) fish as we walked along the Rio Puerco on his property south of Cuba.

Section 319 FY98-I Implementation Project site visit and inspection of vegetation plantings on Forest Guardian's New Mexico State Lease sections, in June, 1999: Traversing the project with John Horning, Project Manager, we scattered several groups of small minnow-like fish. Horning commented that the presence of any fish at all further validates the need for their work in protecting and improving local ecology.

The report from a SWQB Water Quality Survey dated 6/20/89, documents the presence of fathead minnows at stations below the Cuba WWTP outfall in the Rio Puerco.

APPENDIX E
RESPONSE TO HEARING REQUEST

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June 1, 2006

Mr. Ron Curry, Chairman
New Mexico Water Quality Control Commission &
Secretary, New Mexico Environment Department
1190 S. St. Francis Dr.
Santa Fe, New Mexico 87502

attn: Joyce Medina
WQCC Administrator

COPY

RE: PETITION FOR HEARING / Rio Puerco Watershed TMDL

Dear Chairman & Secretary Curry:

Pursuant to **20.1.6 Rulemaking Procedures – Water Quality Control Commission** (WQCC), we the undersigned do hereby petition the Water Quality Control Commission (WQCC) for a hearing in the matter of the Rio Puerco Watershed TMDL (total maximum daily load).

We request this hearing to allow all interested participants a reasonable opportunity to submit data, views, and arguments on the Rio Puerco Watershed TMDL (see *FINAL DRAFT Total Maximum Daily Load [TMDL] for the Rio Puerco Watershed – Part 1, Rio Grande to Headwaters, April 21, 2006* / Attachment A).

Statement of Reasons:

- *There are no definitions.* The stakeholders who will be impacted by this document are largely unfamiliar with the processes and terminology utilized. Without definitions, it is difficult if not impossible for those stakeholders to grasp the implications of documents and decisions related to its' adoption and implementation. It is worth noting that it is highly likely that at least some of the impacted stake holders do not read or speak English.

  A definitions section should be added defining numerous terms key to the document and the action.

1. There is a List of Abbreviations section on pages ii and iii. SWQB has expanded this list to included definitions where necessary.

- *The Surface Water Quality Bureau (SWQB) conducted an intensive surface water survey of the Rio Puerco Watershed in 2004. (page 1, Executive Summary).* The document fails to note that a public meeting was held in Cuba in 2004 at which time stakeholders were invited to participate in this survey process. However, although some signed up to participate, they were never again contacted by SWQB until the public meeting on the draft document in March 2006. Why weren't local stakeholders included in this survey?

  Interested stakeholders must be included in surveying processes that will affect them if they indicate the desire to participate.

2. SWQB has added information to the Executive Summary regarding the pre-survey meeting. The purpose of these pre-survey meetings is to discuss the draft sampling plan and to solicit stakeholders input. Survey design is not a consensus process because we have limited resources and specific mandates to accomplish Clean Water Act goals for the state. We generally only have the resources for one station per assessment unit, and strive to establish this station at the bottom of the assessment unit because the data from that station are to represent the condition of that reach (assessment unit). SWQB does not imply at these meetings that we will be able to sample on all interested persons' property. We work with individual land owners if we propose sampling location on his/her

property. SWQB's policy is to add any interested stakeholders to our mailing lists at their request.

- *The 2004 … Study also identified other potential water quality impairments… which are not addressed in this document. Subsequent TMDLs will be prepared in the near future in a separate TMDL document. (page 1, Executive Summary).* How can stakeholders or the WQCC evaluate the impacts and whether or not there is undue economic burden on regulated entities of this TMDL designation without knowledge of what is planned for the future in regard to TMDLs?

  If additional information is available and additional TMDLs are to be presented, they should be all contained in a single document to effectively evaluate the impacts of the action.

3. Since 2002, SWQB has strived to include all TMDLs related to a particular watershed in one document. Prior to that time, separate documents were written for each impairment / waterbody pair. There is no obligation for SWQB to present all TMDLs for a particular area in one TMDL document. The Rio Puerco TMDLs were broken into two based on suggestion from EPA Region 6 to complete TMDLs on consent decree listings as soon as possible. Historic impairment listings on New Mexico's *1996 Clean Water Act Section 303(d) List of Impaired Waters* in the Rio Puerco watershed are part of the consent decree. According to the consent decree,

> "5. The parties agree…for the State of New Mexico to establish TMDLs for the Water Quality Limited Segments ("WQLSs") identified on the Clean Water Act Section 303(d) list approved by EPA on May 1, 1996…
> 6. In fulfilling its obligations under this Consent Decree, EPA is under no obligation to establish TMDLs for any water quality limited segments which are determined not to need TMDLs consistent with Section 303(d) of the Clean Water Act…or are removed from New Mexico's Section 303(d) list consistent with the provisions of the Clean Water Act and its implementing regulations."

- *From the forest boundary downstream… to the Village of Cuba, overgrazing, road construction and maintenance activities … have impacted… (page 4, 2.0 Background)* This is a broad statement with unsupported assumptions. Where is the data to back up this statement?

  Data supporting these statements must be included in the document. When was their overgrazing? Have grazing practices changed? If so, have there been changes in impact? A massive road project was recently completed in the area. Was there any mitigation to water quality in that project? What maintenance activities? What is being maintained?

4. Qualitative assessment of land use impacts and past or present conditions, not quantitative data, characterizes the recognized or perceived ground conditions in the region. Residents, various agency staffs, and the landowners themselves - people living or working in the area, including Tribal interests - have been the source of information via a multitude of personal communications and accounts, initial assessments and descriptions have been shared during any variety of public meetings, listening sessions, Watershed Group meetings, and field visits. These parties' participation in conservation and restoration grant and award programs is customarily accompanied by written descriptions of the wide range of problems and conditions they themselves wish to see improved, including some of those presented in the draft TMDL text.

The Probable Sources list is intended to include any and all activities that could be contributing to the identified impairment. It is not intended to single out any particular land owner or single land management activity, and has therefore been labeled "Probable" and generally includes several items. USEPA through guidance documents strongly encourages states to include a list of Probable Sources for each listed impairment. According to the 1998 305(b) report guidance, "…, states must always provide aggregate source category totals…" in the biennial submittal that fulfills CWA section 305(b)(1)(C) through (E) (USEPA 1997). "Sources" are defined as activities that may contribute pollutants or stressors to a water body (USEPA 1997).

References: USEPA. 1997. Guidelines for preparation of the comprehensive state water quality assessments (305(b) reports) and electronic uptakes. EPA-841-B-97-002A. Washington, D.C.

- *At and below the Village of Cuba, flows… combine with effluent from the Cuba WWTP to provide perennial flow… (page 4, 2.0 Background)* There is no data to support this statement. What are the flows? When were they measured? How much is attributable to the effluent? Does the Cuba WWTP keep track of its' releases? How does a stretch between two (2) intermittent segments become perennial?

  At the May 9, 2006 WQCC it was reported that there was monitoring data available. If it is available it should be made a part of this document. If it is not available, it should be obtained.

5. SWQB did not include flow data in the draft TMDL because flow is not a part of the Sedimentation/Siltation TMDL calculation. We have added available stream flow data, Cuba WWTP effluent discharge data, and observational field notes to Appendix D.

- *Erosional processes within this reach of the stream are extensive… Consequently, lands that had been historically very productive irrigated farms have dried up. (page 4, 2.0 background)* Where is the data to support this statement?

  Data should be provided to support this statement or it should be removed from the document.

6. SWQB has added additional information regarding erosional processes on page 4 in this reach based on field observation and measurements taking during on-going watershed restoration efforts in the area.

- **Photo 2.1 and 2.2 (page 5)** The historic photo is not dated. Was it taken after a heavy rain storm? What was the rainfall the year it was taken? Additionally the photos are not taken from the same photo point. What is the comparative value of the two photos?

  Misleading photos of this nature should be removed from the document.

7. SWQB has added text to the draft TMDL explaining the intent of including these photos on page 4. They were included to provide a general visual overview of the area and to show the extent to which portions of the watershed have experienced erosion and cut banks.

- *Water Quality Survey Summary… (page 12, 2.4 Intensive Water Quality Sampling)* The document states that this summary is available on a website. First, there is an assumption that most stakeholders have computer access. That is not necessarily true. Second, the summary is not on the website (see Attachment B - printout of screen on 5.31.06)

  The summary should be made an appendix to the document so that it is available for stakeholders and the WQCC to review prior to decision-making.

8. The TMDL states,

> "A more detailed description of the Rio Puerco intensive survey can be found in the *Water Quality Survey Summary for the Rio Puerco and Tributaries* this document will be available online…" [emphasis added].

SWQB added an estimate posting date and a sentence (page 12) to clarify that summary reports can also be requested through a phone call to the Bureau. The Rio Puerco survey summary is expected to be completed Fall 2006. It is not necessary to include survey summaries in TMDL documents as an appendix because all the pertinent information is integrated directly into the TMDL.

- *All sampling and assessment techniques used… are detailed in the Quality Assurance Project Plan… (page 13, Survey Design)* Again, this document is not readily available to the impacted public.

  The Project Plan should be made an appendix to the document.

9. The Quality Assurance Project Plan (QAPP) that covers sampling activities for the entire bureau on a yearly basis is over 100 pages and not appropriate as an appendix in TMDL documents. It is readily available on the web, or through a phone call to the bureau. Clarification was added on page 13 regarding requesting the document by phone.

- *The 2004… survey was performed over varying flow conditions… (page 14, 2.4.2 Hydrologic Conditions)* Why were the follow conditions detailed in the document?

  Flow data should be contained in the document.

10. *Secion 2.4.2 Hydrologic Conditions* is generally the section in a TMDL document where SWQB presents pertinent USGS gage data. There is no USGS gage in the Rio Puerco (Arroyo Chijuilla to Northern boundary Cuba) assessment unit. The nearest USGS gage is at Rio Puerco above Arroyo Chico at Guadalupe, NM (08334000) which is 43 stream miles south/southwest of Cuba. The watershed size at the gage is 420 square miles whereas the watershed area at the bottom of the Rio Puerco (Arroyo Chijuilla to Northern boundary Cuba) assessment unit is 138 square miles. It is not appropriate to include the flow data in the TMDL document given the difference in watershed areas. However, the discharge data available during the development of the TMDL is included in Appendix D for informational purposes.

- *Target values… will be determined… (page 15, 3.1 Target Load Capacity)* This determination is questionable due the use of the reference site of La Jara Creek (page 16) being of substantially greater diversity in elevation, geology and hydrology.

  A more comparable site should be used as a reference point.

11. The target load capacity of 20% fines (Table 3.3) is independent of the reference site selection. The determination of this target value, based on New Mexico streams, is explained in the second full paragraph on page 16, beginning:

    > "The target levels involved in the examination of developed relationships between percent fines and biological score as compared to a reference site…"

    Based on this comment, SWQB looked further into the choice of the La Jara Creek above Irrigation Diversion site and determined that there was a better reference site available. Further information regarding the Rio Hondo above Rio Grande reference site is available on pages 16-17.

- *La Jara Creek… was chosen as the… reference station… (page 16, 3.1 Target Loading Capacity)* How was La Jara Creek chosen? Are there not areas closer in elevation, geology and hydrology to the Rio Puerco than La Jara? What is an ecoregion?

Comparative data should be included in the document to justify this as the "best available" reference location.

12. Comparative characteristics between the reference site and study site are now included as Table 3.1 on page 17. SWQB has added the definition of "ecoregion" to the List of Abbreviations/Definitions section in the Table of Contents and included additional listings in the References section.

- *No streamflow data are necessary… (page 17, 3.2 Flow)* There is serious question as to whether or not this stream segment is really a perennial stream. There is no flow data to support the New Mexico Environment Department (NMED) conclusion that this stream segment is perennial.

  Flow data should be supplied within the document to support the conclusion.

13. SWQB did not include flow data in the draft TMDL because flow is not a part of the Sedimentation/Siltation TMDL calculation. Available flow data has been included in Appendix D. However, as far as the perennial nature of the Rio Puerco (Arroyo Chijuilla to Northern boundary Cuba), the amount of water has been fully capable of continually supporting aquatic life (as in the various macroinvertebrate and fish samples collected by SWQB) and is supporting an existing, thriving, and expanding riparian plant community.

- *Data used in the calculation of this TMDL were collected in the fall… (page 21, 3.8 Consideration of Seasonal Variation).* This statement presents two (2) problems. First, on page 17, 3.3 Calculations, the document states: *"No calculations were necessary…"* Second on page 12, 2.4.1 Survey Design, the document states: *"Surface water quality samples were collected monthly between March and November during the 2004 intensive SWQB study."* Were calculations necessary? Were the samples taken early than the fall of 2004 not considered?

  These statements need to be clarified in the document.

14. First, the statement regarding calculations in Section 3.3 is in reference to calculations involving flow. Calculations for the determination of WLA, LA, MOS, and the TMDL were performed as discussed in Tables 3.2, 3.3, 3.4, and 3.5. Second, there were no earlier pebble counts and benthic macroinvertebrate samples to consider. Benthic macroinvertebrate and pebble count data are collected once per intensive survey, typically in the fall during the benthic macroinvertebrate index period.

- *Estimations of future growth are not anticipated… that cannot be controlled with BMP implementation… and proper land management. (page 22, 3.9 Future Growth).* What is "proper land management?" Who makes that determination? Is that affected by the social and economic value of the sources of water contaminants?

  This statement should be explained in the document or be removed.

15. ~~SWQB has extended the statement regarding "proper land management" on page 23.~~ TMDLs must include a section on Future Growth.

- *Based on information from these sampling stations… the reach… has been determined to be a perennial reach… (page 23, 4.1 Rio Puerco)* What was the information? How reliable is it?

  The sampling information that led to the determination should be included in the document.

16. The issue of the perennial nature of this reach is discussed in response #5, 10, and 13.

The next scheduled monitoring date for the Rio Puerco watershed is 2010. (page 27, 5.0 Monitoring Plan) It is understandable that staffing and financial resources are at a premium, however, when impacting stakeholders and regulated entities, monitoring every six (6) to eight (8) years, with dramatic differing precipitation from year to year does not appear to be adequate.

More frequent monitoring should be prescribed.

17. SWQB agrees more frequent monitoring is desired. Unfortunately, SWQB currently has the financial and staff resources to perform intensive watershed surveys on a rotational basis every 8 years because we are charged with monitoring the entire state. We have several initiatives in progress, such as the development of improved bioassessment tools and biocriteria that will hopefully help us shorten this rotational time frame to 5 years in the future.

- *Staff from the SWQB have worked with stakeholders to develop a WRAS for the Rio Puerco… The WRAS is essentially the Implementation Plan… of the TMDL Process. (page 29, 6.1 Coordination)* While with some diligent searching the Rio Puerco WRAS is available on the web (Attachment C), if it is the implementation plan, why isn't it included as an appendix to the document so that all involved stakeholders and regulated entities can determine implementation impacts? Additionally who were the stakeholders and how many of them were included in the development of the WRAS? According to the cover page of the WRAS, not a single member of the WRAS Subcommittee of the Rio Puerco Management Committee is a resident of the Cuba area. Finally, if the "*WRAS was finalized prior to the preparation of these TMDLs,"* what assurance is there that the WRAS addressed the necessary elements? Finally, according to *Table 6.1 Proposed Implementation Timeline, "implementation management measures"* have been being applied for six (6) years. How has that impacted water quality?

  The WRAS should be added to the document as an appendix. Prior to any implementation of the WRAS as part of the TMDL program, it should be reviewed and possibly amended by additional stakeholders who reside in the area.

18. In general, a well constructed WRAS will identify, among many other elements, the specific proposals, recommendations, plans, and possible funding sources to address the impairment(s) identified by a TMDL. A Clean Water Act Section 319 Project Workplan further pinpoints the active cooperators, calculates associated costs, determines a schedule, generates a monitoring component, and activates an actual TMDL Implementation Plan. SWQB does not include WRAS' as part of the TMDL because EPA does not approve TMDL implementation plans. SWQB found it focusing to have one single document that is only half approved, so we removed TMDL implementation information from TMDL documents and started referring stakeholders to the WRAS for implementation information. The Rio Puerco watershed is a unique case. Generally, WRAS development follows TMDL development, but watershed restoration efforts in the Rio Puerco started many years ago due to the Rio Puerco's notoriety as one of the nation's most actively eroding watersheds. Stakeholder involvement in WRAS development is voluntary. The 2001 Rio Puerco WRAS is slated for updating in the future, as select pollutant loading elements of the WRAS will rely on calculations made available once the TMDLs are complete. This updating is being undertaken by the Rio Puerco Management Committee, with input being received from broad segments of the public

- *Appendix C: Responses to Comments / Comment Set B* The response indicates that there were fishes collected in March 2006, which is well after all the data for this document was collected according to early references. Additionally, there was no reference in the document anywhere to specific fishes. What data is available regarding the collection of fishes? Why isn't that data included in the document? Was there any consideration given to the fact that these fishes might be coming from area stock ponds? Finally, the statement in the response that says that two age classes of fishes were present seems to be in conflict with the statement that there are "short-lived fish."

  If fish data is available, it should be included in the document, along with potential scenarios of the generation of those fish.

19. As you stated, the March 2006 fish data were not available at the time the draft TMDL was prepared so it was not included and the data were referenced in the Response to Comments. Now that the data are available, SWQB has included the available fish data in Appendix D in the TMDL to provide additional information regarding the perennial nature of the reach where collections were performed.

A review of the Administrative Record as well as other documents pertaining to this issue may reveal additional areas of concern.

Pursuant to **20.1.6.305 Location of Hearing** which states *"The commission may hold hearings on proposed regulatory changes of local application within the area substantially affected by the proposal,"* we request that this hearing be held in Cuba, New Mexico so that all interested parties have that reasonable opportunity to participate. Traveling to Santa Fe for a hearing may be out of reach for the multi-cultural residents of the Cuba area who could be substantially affected by the adoption of the Rio Puerco Watershed TMDL.

Finally, while we are not requesting a verbatim transcript of the proceeds due to the cost, we are requesting that the hearing proceeding be tape recorded. Pursuant to **20.1.6.404 Transcript of Proceedings**, the commission may specify actions regarding a transcript.

Thank you in advance for your attention to this petition for hearing.

Sincerely,

Ernest Torres
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PETITION FOR HEARING / RIO PUERCO WATERSHED TMDL

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PETITION FOR HEARING / RIO PUERCO WATERSHED TMDL

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