SECTION 5

The Clean Water Act:
§319 and TMDLs on the Gila Watershed

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THE FEDERAL CLEAN WATER ACT: TMDLS

Section (d)303 of the CWA requires the states to prioritize their listed waters for development of total maximum daily loads (TMDLs). The TMDL of a pollutant is the greatest loading or amount of the pollutant that may be introduced into a stream reach from all sources without resulting in a violation of water quality standards. A TMDL sets an "allowable budget" by determining the amount of pollutants that can be assimilated without causing a waterbody to exceed water quality standards set to protect its designated uses (e.g., fishery, irrigation, etc.). Once this capacity is determined, sources of the pollutants are considered (NM Water Quality Control Commission [WQCC], 2003).

Both point and nonpoint sources must be included. A "point source" is simply described as a discrete discharge of pollutants as through a pipe or similar conveyance (e.g., a ditch). All other pollutant inputs—sheet flow from pastures or sediment runoff from steep forest slopes, for example—are defined as "nonpoint sources." Once all sources are accounted for, the pollutants are then allocated, or budgeted, among the sources in a manner which will describe the limit (the total maximum load, or TMDL) that can be discharged into the river without causing the stream standard, or budget, to be exceeded (NM WQCC, 2003).

On stream segments for which TMDLs are developed for nonpoint contaminants, water quality does not meet or is not expected to meet applicable water quality standards even after point source discharges achieve the effluent limitations required by §301 and §306 of the CWA. TMDLs are established for these segments on a pollutant-by-pollutant basis (taking into account seasonal variability). Identification of a watercourse segment as water quality limited and still requiring TMDLs means that the state is to:

- Calculate a TMDL for the segment;
- Develop more stringent effluent limitations and wasteload allocations (WLAs), if necessary, for point sources on the segment;
- Identify nonpoint sources of pollution and if possible quantify and assign load allocations (LAs) to them; and
- Identify management practices (MPs), where appropriate, to mitigate nonpoint source pollution. Improvement practices are defined as schedules of activities based on approved or proven actions or stratagems, including design and selection that exhibits efficiency and effectiveness towards decreasing a measured resource problem that ultimately achieves control of sources of water pollutants.

Normally, the bulk of the work is done by NMED and submitted to the State's WQCC for their consideration. WQCC in turn compiles the identified water quality limited segments in the §303(d) list and submits them to EPA on April 1st of each even-numbered year. If the State does not set TMDLs to the EPA's satisfaction, then EPA is required to do so (see CWA §303(d)). Public notice is issued and there is opportunity for public comment on proposed lists (NM WQCC, 1998, 2004).

The §303(d) list for 2004–2006 as approved by EPA was used in development of the *WIPS*. TMDLs have been developed for 13 water-quality impaired stream segments on the Gila watershed in New Mexico, as listed in Table 6. (The complete §305(b)/§303(d) listing appears in Table 5,

Section 4.) Figure 35 shows the number of stream segments affected by each identified contaminant within the Upper Gila/Gila-Mangas and San Francisco HUCs.

Table 6. Current water-quality impaired reaches on the 2004–2006 303(d) list for the Gila and San Francisco watersheds (from New Mexico WQCC, 2004).

Assessment unit	Reach length (mi.)	TMDL parameter	Impairment category	Non-supported uses
HUC 15040001 (Gila mainstem and tributaries at and upstream of the confluence with Mogollon Creek)				
Black Canyon Cr. (EF Gila River to headwaters)	25.2	Temperature	4A	HiQ coldwater
Canyon Cr. (MF Gila River to headwaters)	14.2	Nutrients	4A	HiQ coldwater
ditto		Turbidity		
Gila River (EF)	26.2	Al chronic	4A	HiQ coldwater
Mogollon Cr. (Perennial reaches abv USGS gage)	12.6	Al chronic	4A	HiQ coldwater
Sapillo Cr. (Gila River to Lake Roberts)	11.9	Turbidity	4A	HiQ coldwater
Taylor Cr. (Beaver Cr. to Wall Lake)	2.6	Al chronic	5/5A	HiQ coldwater
ditto		Temperature		
HUC 15040002 (Gila mainstem and tributaries from the AZ–NM line upstream to the confluence with Mogollon Cr.)				
Mangas Cr. (Gila River to Mangas Springs)	6.2	Nutrients	4A	Marginal coldwater
HUC 15040004 (San Francisco and tributaries)				
Centerfire Cr. (San Fran. R. to headwaters)	16.1	Conduct.	5/5A	HiQ coldwater
ditto		Nutrients		
Negrito Cr. (South Fork)	14.5	Temperature	4A	HiQ coldwater
San Fran. R. (Centerfire Cr. to AZ border)	14.9	Nutrients	4A	Coldwater
ditto		Temperature		
Tularosa River (San Fran. R. to Apache Cr.)	22.0	Conduct.	4A	HiQ coldwater
Whitewater Cr. (San Fran. R. to Whitewater Campgrd)	6.9	Turbidity	4A	HiQ coldwater
Whitewater Cr. (Whitewater Campgrd to headwaters)	14.2	Al chronic	4A	HiQ coldwater

EF: East Fork; MF: Middle Fork; San Fran.: San Francisco; Nutrients: plant nutrients; Conduct.: conductivity. Chronic: at levels that create "a stimulus that lingers or continues for a relatively long period relative to the life span of an organism. Chronic effects include, but are not limited to, lethality, growth impairment, behavioral modifications, disease and reduced reproduction" (from New Mexico WQCC, 2005).
8-digit HUC: Hydrologic Unit Code assigned by USGS. TMDL parameter: exceeded pollutant value. Al: aluminum. Impairment categories: 4A: Impaired for one or more designated uses, but all necessary TMDLs have been developed that once implemented are expected to result in full attainment of the standard. 5/5A: Impaired for one or more designated uses and a TMDL is underway or scheduled.
All non-supported uses in the Gila watershed are as habitat for aquatic life; HiQ: High quality.

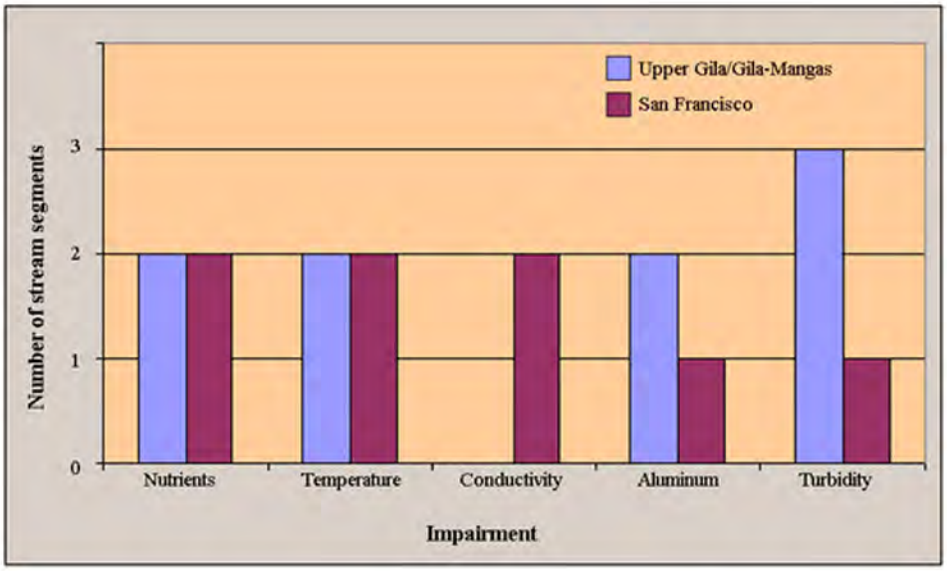

Figure 35. Number and type of NPS water-quality impaired stream segments for which NMED SWQB has developed TMDLs on the Upper Gila/Gila–Mangas and San Francisco HUCs in New Mexico.

All of the completed TMDLs for the Gila watershed were prepared by NMED and accepted by EPA as of August 2002. In general, re-assessment or development of TMDLs for a particular watershed is scheduled on an 8-year cycle. Assessments for potential TMDL development of many surface waters not listed in Table 6 have been scheduled or re-scheduled for future years. Refer to Section 4 for more information on these stream segments.

TMDL SUBWATERSHEDS

Impaired surface waters for which TMDLs have been developed are grouped by HUC: 15040001 (Upper Gila); 15040002 (Upper Gila-Mangas); and 15040004 (San Francisco). Reach descriptions within each HUC are in downstream-to-upstream order. The map for each HUC shows listed stream reaches and the contributing subwatershed area for the reach (the TMDL drainage area). The maps within this section are best viewed digitally. All data used to construct the maps are available through the watershed information coordinator. All NMED SWQB sampling locations are shown; non-listed stream segments with sampling sites are identified on the maps in Section 4.

Since designated uses reflect the particular attributes of each drainage basin, each reach description includes a link to the WQCC *Standards* (2006) and identifies the pertinent section within the *Standards* that describes its assigned water quality standards. Links are also included to the original TMDL documents, which describe potential contaminant sources and derivation of the TMDL in greater detail. Potential management strategies to reduce NPS contaminant loads are outlined with a links to the original TMDL documents (NMED, 2001) for each listed subwatershed. Management practices are described in Section 6; financial and technical resources are listed in Section 7.

Ideally, watershed planning is a holistic, adaptive, and iterative process integrated with other planning efforts and geographically defined by watershed divides rather than legal boundaries. The interim results of remediation practices should result in quantifiable positive trends in water quality or its likely indicators: e.g., arrested gully development or improved ground cover (EPA, 2005). On a watershed of the geographic scale of the Gila River, the best results from improvement practices will be achieved at the subwatershed level, when multiple, complementary projects are designed and implemented in an integrated fashion. (This approach can have corollary benefits in leveraging funding support from varied sources, as well.) Achieving this sort of integration is dependent on the landowners, management agencies, and watershed groups who are working on or can be engaged in watershed planning and implementation of improvement practices.

Table 7. General schedule for identification, planning, and implementation of remediation projects on the Gila watershed.

Implementation Actions	Year 1	Year 2	Year 3	Year 4
Public outreach and initial data collection	X	X	X	X
Establish milestones		X	X	X
Secure/leverage funding		X	X	X
Implement Management Practices (MPs)		X	X	X
Data collection (monitoring)		X	X	X
Evaluate effectiveness of MPs				X
Begin new cycle				

Table 7 is a general schedule for the steps involved in planning and implementing on-the-ground projects. Additional planning, including data collection or documentation of contaminant sources, is still needed for many subbasins. The implementation schedules provided for each subwatershed are guidelines that will be adjusted over time depending on 1) engagement among management agencies, advisory groups (e.g., SWCDs), and private landowners to identify contaminant sources within the watershed; 2) prioritization of the effectiveness and efficacy of management strategies; 3) completion and funding of work plans to put strategies into on-the-ground practice, 4) effectiveness monitoring within a landscape-model approach, and 5) adaptation and implementation of additional measures.