



NEW MEXICO ENVIRONMENT DEPARTMENT

Surface Water Quality Bureau



**Lower Pecos River
2014**

Amended

FIELD SAMPLING PLAN

Prepared by
New Mexico Environment Department SWQB

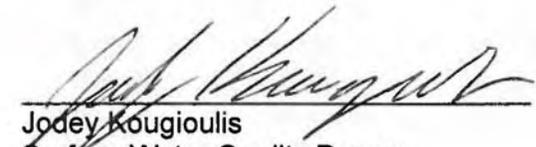
Approvals



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3/10/2014

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1. Introduction

This document is intended to serve as a companion to the 2013 Lower Pecos River (LPR) field sampling plan (FSP). It was written to document planned sampling and field work for the 2014 field season, made necessary by data gaps that resulted from heavy rains and subsequent flooding and scouring that occurred in September 2013. Background information on the survey area, sampling locations, and sampling frequency is documented in the 2013 FSP (<http://www.nmenv.state.nm.us/swqb/documents/swqbdocs/MAS/Sampling/FieldSamplingPlan-LowerPecos2013.pdf>).

The tables that appear below show the samples necessary to complete the survey that was planned in 2012. Because of requirements made by the Surface Water Quality Bureau's Assessment Protocol (AP), a complete suite of nutrient parameters is required to make impairment conclusions. The nutrient parameters are divided into causal variables (total nitrogen, total phosphorus), and response variables (pH and dissolved oxygen measured via sonde deployment, and chlorophyll *a* as a surrogate for algal biomass). Most of the causal variables were collected as planned in 2013, but due to the extreme flooding and scouring in September 2013, there were no sonde deployments or chlorophyll *a* collection during the 2013 campaign. For 2014 revisits, sites that had indications of nutrient enrichment in 2013, have a current nutrient or dissolved oxygen listing, contain a NPDES discharge in the assessment unit (AU), or require additional data to complete a TMDL, will receive two additional total nitrogen/total phosphorus samples, a sonde or DO logger deployment, and chlorophyll *a* collection. A full suite of nutrient variables will also be collected on most main stem Pecos River AUs. This will inform development of large river nutrient assessment protocols. *E. coli* samples will be collected at each site receiving nutrient collection, due to the high variability of results in 2013 and relatively inexpensive costs. Chemistry sampling is outlined in Table 1. Biological, sonde deployment, and chlorophyll *a* collection plans are outlined in Table 2.

Apart from sampling necessary to complete nutrient assessments, the majority of the remainder of the work outlined in this amendment is to complete sampling and habitat monitoring that was precluded by the heavy rains and subsequent flooding in all segments of the Lower Pecos River survey in September 2013.

The collection of full suite nutrient variables will be conducted within the growing season from June through July 2014 in two site visits. During the first visit, staff will collect nutrient and chlorophyll *a* samples, and deploy a sonde or DO logger. The second visit will be scheduled at least three weeks after the first visit to retrieve the sonde or DO logger. At this time, staff will collect additional nutrient and *E. coli* samples.

Table 1. Water Chemistry 2014 supplement

#	Station Name	Assessment Unit	Nutrients (low P) ¹	E. coli	Comments
5	Pecos River below 6 Mile Draw	Pecos River (Salt Creek to Sumner Dam)	2	2	Nutrient Data Gap
6	Pecos River at Bitter Lake NWR, North Unit	Pecos River (Salt Creek to Sumner Dam)	2	2	Nutrient Data Gap
13	Rio Hondo at 380 Bridge	Rio Hondo (Pecos River to North Spring River)	2	2	Nutrient Data Gap
15	Pecos River @ Wichita Rd. near Dexter	Pecos River (Rio Felix to Salt Creek)	2	2	Nutrient Data Gap
19	Pecos River above Rio Penasco	Pecos River (Brantley headwaters to Rio Felix)	2	2	Nutrient Data Gap
20	Pecos River below Brantley Dam	Pecos River (Avalon Reservoir to Brantley Reservoir)	2	2	Nutrient Data Gap
25	Pecos River above Black River	Pecos River (Black River to Lower Tansil Dam)	2	2	Nutrient Data Gap
27	Black River above Rattlesnake Spring	Black River (Blue Spring to headwaters)	2	2	Nutrient Data Gap
33	Black River blw RR Xing	Black River (Pecos River to Blue Spring)	2	2	Nutrient Data Gap
34	Delaware River at US 285	Delaware River (Pecos River to TX border)	2	2	Nutrient Data Gap
36	Pecos River near Red Bluff	Pecos River (TX border to Black River)	2	2	Nutrient Data Gap
	QC	Field, equipment, reagent and bacterial blanks collected per QAPP.	2	2	
Totals			24	24	

¹ Suite includes total Kjeldahl nitrogen, nitrate+nitrite, ammonia and total phosphorus.

Table 2. Biological Sampling 2014 supplement

#	Station Name	Assessment Unit	Sonde Deployment ¹	Chlorophyll a ²	Periphyton - diatoms ³	Physical Habitat ⁴	Macro- invertebrates	Nutrient Priority ⁵
5	Pecos River at USGS gauge below 6 Mile Draw	Pecos River (Salt Creek to Sumner Dam)	1	1	1	1	1	L
6	Pecos River at Bitter Lake NWR, North Unit	Pecos River (Salt Creek to Sumner Dam)	1	1	1	1	1	M
13	Rio Hondo at 380 bridge	Rio Hondo (Pecos River to North Spring River)	1	1		1		H
15	Pecos River @ Wichita Rd. near Dexter	Pecos River (Rio Felix to Salt Creek)	1	1	1	1	1	M
19	Pecos River above Rio Penasco	Pecos River (Brantley headwaters to Rio Felix)	1	1	1	1	1	M
20	Pecos River below Brantley Dam	Pecos River (Avalon Reservoir to Brantley Reservoir)				1	1	L
25	Pecos River above Black River	Pecos River (Black River to Lower Tansil Dam)	1	1	1	1	1	M
27	Black River above Rattlesnake Spring	Black River (Blue Spring to headwaters)	1	1		1	1	M
33	Black River blw RR tracks	Black River (Pecos River to Blue Spring)	1	1		1	1	H
34	Delaware River at US 285	Delaware River (Pecos River to TX border)	1	1		1	1	H
35	Sitting Bull Creek below recreation area	Sitting Bull Creek (Last Chance Canyon to Sitting Bull Spring)				1	1	L
36	Pecos River near Red Bluff	Pecos River (TX border to Black River)	1	1	1	1	1	M
	QC	Quality Control samples collected per QAPP	-	-	-	1	1	
	Totals		10	10	6	13	12	

¹ Sondes are deployed at sites that indicate elevated turbidity or nutrient enrichment or have been previously listed for turbidity or nutrients.

² Chlorophyll a samples are collected at sites that indicate nutrient enrichment or have been previously listed for nutrients. Additional stations may be added as indicated by the preliminary nutrient assessments.

³ Periphyton community composition samples are only collected at “non-wadeable” river sites that indicate nutrient enrichment or have been previously listed for nutrients.

⁴ If sedimentation data (pebble counts) exceed the threshold value for percent sand and fines at a site, more extensive habitat data are collected.

⁵ Nutrient Data Gap priorities. H=high, M=medium, L=low. Final decisions will be made as resources allow.

2. Resources

Most resources required to complete work in 2014 are carried over from 2013 budgets, since heavy rains and subsequent flooding precluded collection of periphyton, macroinvertebrates, and sonde deployments in 2013. Two additional nutrient samples will be collected beyond the original field sampling plan. An outline of estimated expenses, chemistry analysis allotment (WTU), per diem, and staff requirements are found in Tables 3-6.

Table 3. Biological and Chemical Cost Summary

Analyte	Total # Samples	Cost per Sample (WTU or \$)	Total Expenditure (WTU or \$)
<i>E. coli</i>	24	\$5	\$122
Nutrients, low phosphorus	24	100	2,400
Chlorophyll a (contract)	10	\$50	\$500
Periphyton - Diatoms	6	\$425	\$2,550
Macroinvertebrates	12	\$200	\$2,400
TOTALS		WTU	2,400
		DOLLAR \$	\$5,450

Table 4. Vehicle Costs

Month	Approximate Miles	Estimated MPG	Estimated Cost of Gasoline per Gallon	Total Fuel Costs
June	900	13	\$3.50	\$242.31
July	900	13	\$3.50	\$242.31
October	900	13	\$3.50	\$242.31
TOTAL				\$726.92

Table 5. Per Diem Costs

Expense	Water Chemistry Surveys	Biological and Habitat Surveys	Total
Per Diem (number of nights out)	\$364	\$2,184	\$2,548
Salary Days	6	32	38

Table 6. Total Cost Estimates

WTUs	Bio Sample \$	Fuel \$	Per Diem \$	Staff Field Days
2400	\$5,450	\$727	\$2,548	38