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Water-Quality and Ancillary Data Collected From the Arroyo Colorado Near Rio Hondo, Texas, 2006

Data Series 255

U.S. Department of the Interior
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Cover. Arroyo Colorado downstream from Rio Hondo lift bridge, June 2005 (photograph courtesy of Roger Miranda, Texas Commission on Environmental Quality).

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U.S. Geological Survey, Reston, Virginia: 2007

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Suggested citation:

Roussel, M.C., Canova, M.G., Asquith, W.H., and Kiesling, R.L., 2007, Water-quality and ancillary data collected from the Arroyo Colorado near Rio Hondo, Texas, 2006: U.S. Geological Survey Data Series 255, 46 p.

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Abstract

The Arroyo Colorado is in the lower Rio Grande Valley of southern Texas and extends from near Mission, Texas, eastward to the Laguna Madre estuarine and coastal marine system, which separates Padre Island from the Texas mainland. Streamflow in the Arroyo Colorado primarily is sustained by effluent from municipal wastewater-treatment plants along the stream banks. Since 1986, the tidal segment of the Arroyo Colorado from the port of Harlingen to the Laguna Madre has been designated by the State of Texas as an impaired water body because of low dissolved oxygen concentrations. Efforts to develop predictive water-quality models for the tidal segment of the Arroyo Colorado have been hampered by a lack of physical, biological, and biochemical data. Specifically, data on primary algal productivity, nutrient cycling, sediment deposition rates, and the relations between these processes and dissolved oxygen dynamics in the stream have been inadequate to support water-quality modeling efforts. The U.S. Geological Survey, in cooperation with the Texas Commission on Environmental Quality, did a study in 2006 to collect data associated with primary algal productivity, nutrient cycling, and dissolved oxygen dynamics in the tidal segment (2201) of the Arroyo Colorado near Rio Hondo. Specific objectives of the study were to (1) characterize water quality by measuring basic properties; (2) characterize the concentrations of carbon and nutrients, biochemical oxygen demand, total organic carbon, total suspended solids, and volatile suspended solids; (3) measure the seasonal differences of nutrient-dependent algal growth and algal production in the water column; (4) measure oxygen respiration or production rates; and (5) measure rates of sediment deposition.

Introduction

The Arroyo Colorado is in the lower Rio Grande Valley of southern Texas and extends from near Mission, Tex., eastward to the Laguna Madre estuarine and coastal marine system, which separates South Padre Island from the Texas mainland (fig. 1). Streamflow in the Arroyo Colorado primarily is sustained by effluent from municipal wastewater-treatment plants along the stream banks. Additional streamflow is contributed by irrigation return flow, storm runoff, and other sources. The Arroyo Colorado is used as a floodway; an inland waterway; and a recreational area for boating, fishing, and swimming; and is an important nursery and foraging area for crab, shrimp, and several types of marine fish (Raines and Miranda, 2002).

The Texas Commission on Environmental Quality (TCEQ) has classified two distinct stream sections (fig. 1) of the Arroyo Colorado (Texas Natural Resource Conservation Commission, 1997) on the basis of the physical characteristics of the stream. Segment 2201 extends downstream from the port of Harlingen to the Laguna Madre at the border of Cameron and Willacy Counties, is tidally influenced, provides habitat to a diverse range of aquatic organisms, and has contact-recreational and high aquatic life designated uses. Segment 2202 extends upstream from the port of Harlingen to Perezville in Hidalgo County, is nontidal, is the shallower and narrower of the two segments, and also has contact-recreational and intermediate aquatic life designated uses. Segment 2202 is not considered further in this report.

Since 1986, the tidal segment of the Arroyo Colorado has been designated by the State of Texas as an impaired water body because of low dissolved oxygen (DO) concentrations (R.M. Miranda, Texas Commission on Environmental Quality, oral commun., 2005). Efforts to develop predictive water-quality models for the Arroyo Colorado have been hampered by a lack of physical, biological, and biochemical data. These data are necessary to provide information on primary algal productivity, nutrient cycling, sediment deposition rates, and the relations between these processes and DO dynamics used to support many types of water-quality models. The catalyst for the investigation described here was the need for more data to increase the reliability of predictive models.

The U.S. Geological Survey (USGS), in cooperation with the TCEQ, did a study in 2006 to collect data associated with primary algal productivity, nutrient cycling and DO dynamics in the tidal segment (2201) of the Arroyo Colorado near Rio Hondo. Specific objectives of the study were to (1) characterize

water quality by measuring 15-minute values of DO, pH, specific conductance, and temperature at two depths (near bottom and near surface) for each of four sites in the tidal segment over a 24-hour or longer period during one data-collection period in February 2006 and one in May 2006; (2) characterize the concentrations of carbon and nutrients (including pertinent nitrogen and phosphorus species), biochemical oxygen demand (BOD), total organic carbon (TOC), total suspended solids (TSS), and volatile suspended solids (VSS) during the two periods; (3) measure the seasonal (as provided by data from the two collection periods) differences of nutrient-dependent algal growth and algal productivity in the water column; (4) measure oxygen respiration or production rates; and (5) measure rates of sediment deposition during each of the two data-collection periods.

Purpose and Scope

The purpose of this report is to describe the methods for data sampling and analysis and to present the water-quality and ancillary data collected in the tidal segment (2201) of the Arroyo Colorado near Rio Hondo, Tex., during two data-collection periods, one in February and one in May 2006.

Site selection, sampling/monitoring and analysis, and post-collection data treatment, including quality assurance/quality control (QA/QC), are described. The data (in tabular format) are presented in two appendixes, one containing the data collected at near-bottom and near-surface depths and one containing the data collected along vertical profiles.

Description of Study Area

The study area is in southern Texas in the lower Rio Grande Valley (fig. 1). The Arroyo Colorado flows about 90 miles from west to east and has a contributing drainage area (basin) of about 700 square miles. The study area is in the neotropical Southern Coastal Plain physiographic province (National Oceanic and Atmospheric Administration, 1996) and is characterized by long, hot summers and short, mild winters. The mean annual temperature is about 73 degrees Fahrenheit (°F), and mean monthly temperatures range from 58 °F (January) to 84 °F (July). Mean annual evaporation in the study area is about 58 inches. Mean annual rainfall is about 21 inches at the western limit and 27 inches at the eastern limit of the study area.

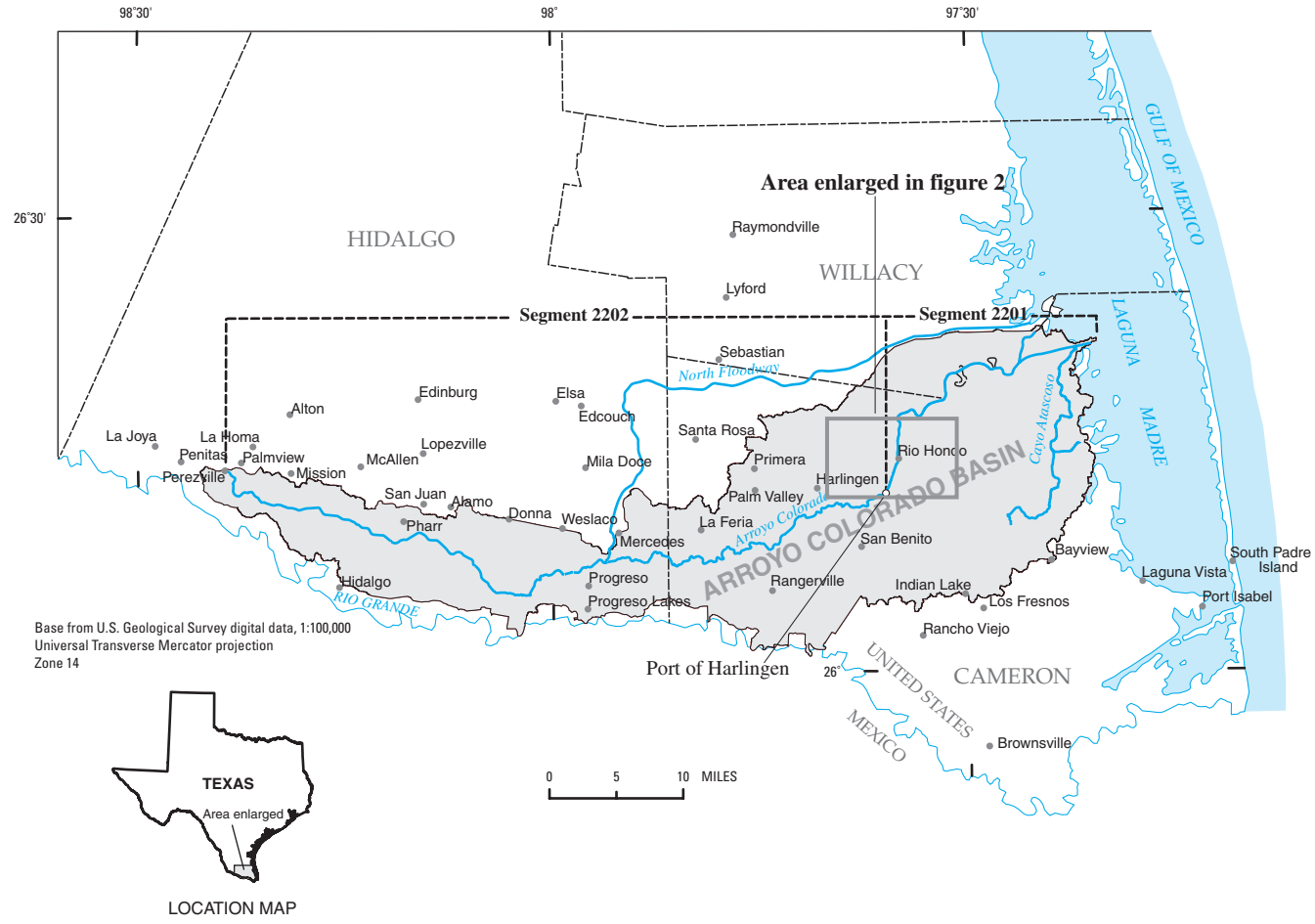

Figure 1. Arroyo Colorado Basin, Texas (modified from Raines and Miranda, 2002, fig. 1).

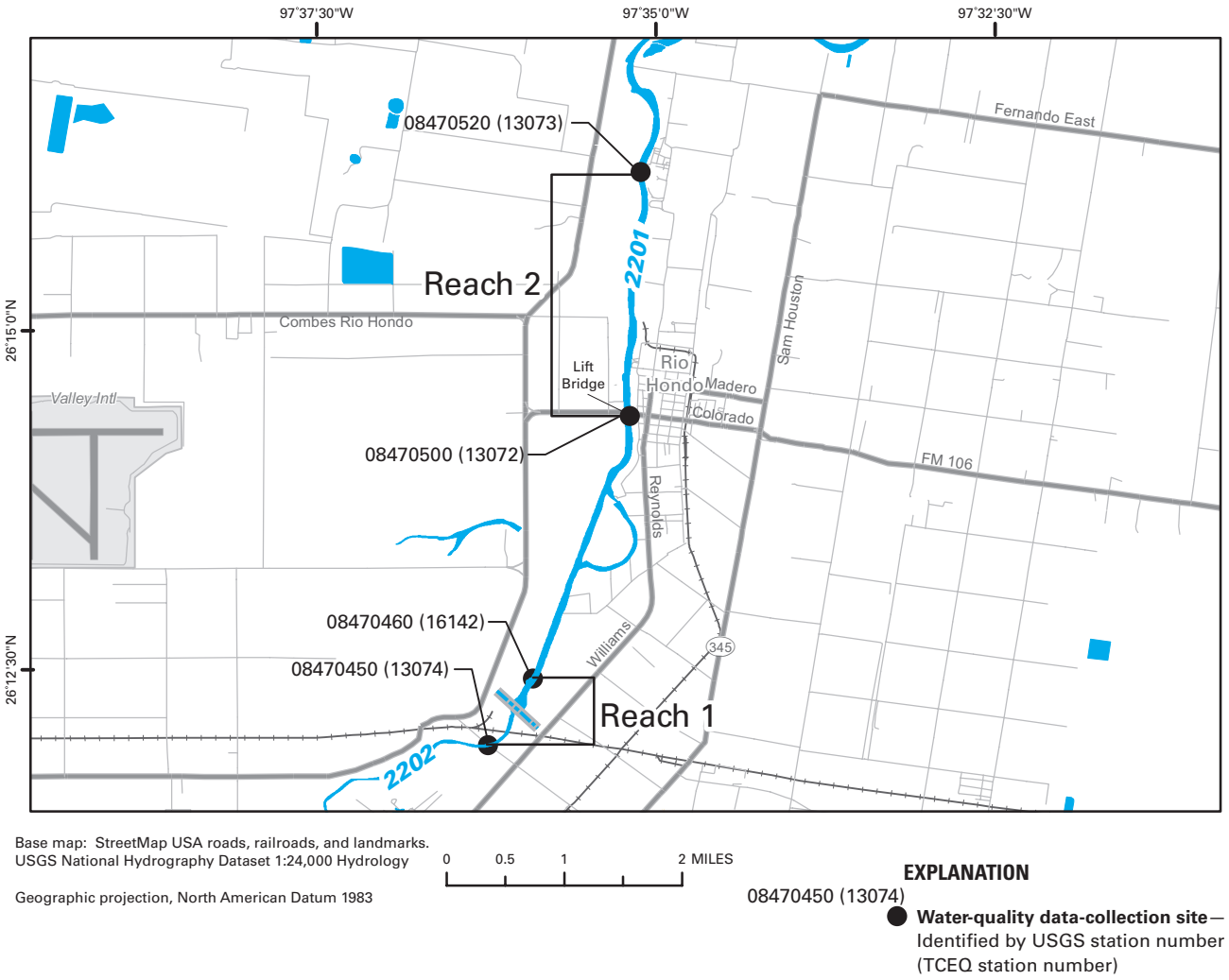

Figure 2. Water-quality data-collection sites on the tidal segment (2201) of the Arroyo Colorado, Texas, February and May 2006.

The lower Rio Grande Valley has flat terrain and is extensively cultivated and irrigated for agriculture. Water for irrigation is transported from the Rio Grande through canals to the fields by operators of numerous irrigation districts. The irrigation districts provide water for irrigation of citrus, sugar cane, and several row crops that include corn, grain sorghum, and cotton. Irrigation practices generally consist of periodic field flooding during periods of insufficient rainfall to produce economically viable crop yields. Urban development is extensive in many areas adjacent to the Arroyo Colorado, particularly in the western and central parts of the drainage area.

There are 21 permitted dischargers in the Arroyo Colorado Basin: 16 are municipal wastewater-treatment plants, three are industrial, and two are shrimp farm operations. The limits of the municipal discharge permits range from 0.4 to 10 million gallons per day (Raines and Miranda, 2002).

Acknowledgments

The authors recognize the contributions of Roger Miranda, TCEQ Total Maximum Daily Load (TMDL) Project Manager, and Faith Hambleton, TCEQ TMDL Program Manager.

Methods of Investigation

Site Selection

Two reaches, each of which is bounded by two sampling sites within segment 2201, were specified by TCEQ as areas of particular interest (fig. 2; table 1). Site selection was based on the requirements of the TCEQ TMDL program (R.M. Miranda, Texas Commission on Environmental Quality, oral commun.,

2005). The first reach is between USGS stations 08470450 and 08470460, near the boundary between the tidal and nontidal segments of the Arroyo Colorado, and the second reach is between USGS stations 08470500 and 08470520, downstream of the lift bridge on FM 106 in Rio Hondo, where summer fish kills are common (R.M. Miranda, Texas Commission on Environmental Quality, oral commun., 2005). The sites provide potential calibration points for modeling and other assessments.

Table 1. Water-quality data-collection sites on the tidal segment (2201) of the Arroyo Colorado, Texas, February and May 2006.

[USGS, U.S. Geological Survey; TCEQ, Texas Commission on Environmental Quality]

USGS station no.	TCEQ station no.	Station name	Latitude (decimal degrees)	Longitude (decimal degrees)
08470450	13074	Arroyo Colorado above Rio Hondo, Texas	26.195	97.602
08470460	16142	Arroyo Colorado at the port of Harlingen, Rio Hondo, Texas	26.203	97.596
08470500	13072	Arroyo Colorado at FM 106 at Rio Hondo, Texas	26.235	97.584
08470520	13073	Arroyo Colorado at Camp Perry near Rio Hondo, Texas	26.265	97.583

Sampling/Monitoring and Analysis

Because of the tidal nature of the segment, two depths (near bottom and near surface) at each of the four selected sites were designated for sampling. A schematic diagram of water-quality sampling for each data-collection period, one in February 2006 and one in May 2006, is shown in figure 3. For near-bottom depths at each site, algal productivity measurements were taken (using light-dark bottle experiments), multiparameter water-quality monitors were deployed, sediment traps (to measure sedimentation rates) were deployed, and discrete environmental samples were collected. For near-surface depths at each site, algal productivity measurements were taken, multiparameter water-quality monitors were deployed, water samples for bioassay analysis were collected, water samples for phytoplankton and zooplankton analysis were collected, and discrete environmental samples were collected. Also at each site, vertical profiles of water-quality characteristics and photosynthetically active radiation (PAR) were conducted as well as a variety of field measurements. QA/QC samples were collected at selected sites. Physical characteristics (from field measurements) and respective measurement methods specified by TCEQ are listed in table 2, and analytes (from environmental samples) and respective measurement methods specified by TCEQ are listed in table 3. All other data collected were analyzed using standard USGS methods.

Table 2. Physical characteristics with measurement methods specified by Texas Commission on Environmental Quality.

[TCEQ SOP, Texas Commission on Environmental Quality (2003) Standard Operating Procedure; EPA, U.S. Environmental Protection Agency (1983); mg/L, milligrams per liter; µS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; µE/m^2/sec, microEinsteins per square meter per second; ppt, parts per thousand; SM, Standard Method (American Public Health Association, 1998); ft/sec, feet per second; FNMU, formazin nephelometric units]

Physical characteristic	Units	Method
Depth	feet	TCEQ SOP
pH	pH units	EPA 150.1 and TCEQ SOP
Dissolved oxygen	mg/L	EPA 150.1 and TCEQ SOP
Specific conductance	µS/cm	EPA 150.1 and TCEQ SOP
Temperature	°C	EPA 150.1 and TCEQ SOP
Secchi depth	feet	TCEQ SOP
Light	µE/m^2/sec	Wetzel and Likens (1979)
Days since significant rainfall	days	TCEQ SOP
Salinity	ppt	SM 2520 and TCEQ SOP
Velocity	ft/sec	TCEQ SOP
Air temperature	°C	TCEQ SOP
Turbidity	FNMU	EPA 160.1

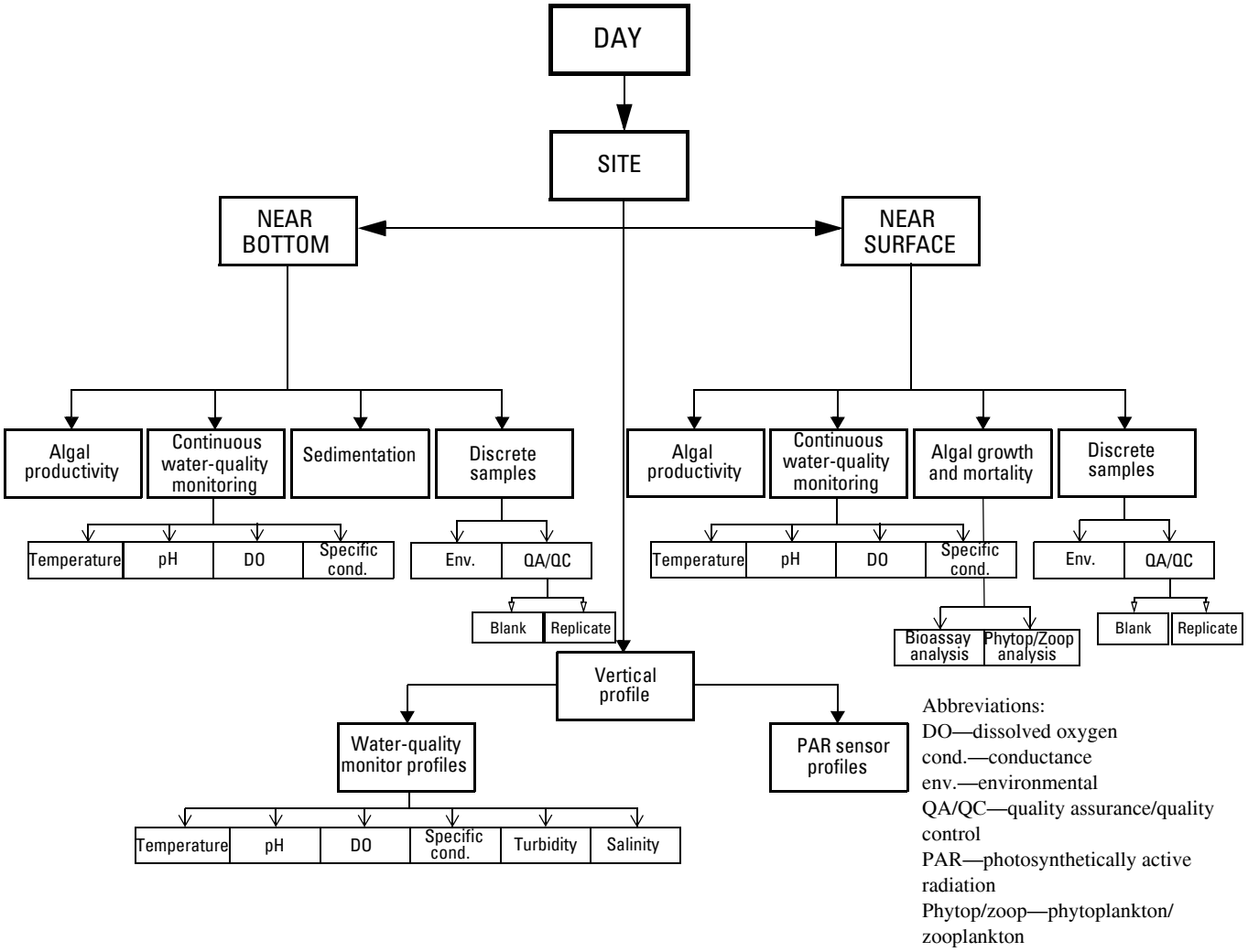

Figure 3. Schematic diagram of water-quality data collection in the tidal segment of the Arroyo Colorado, Texas, February and May 2006.

Water samples collected at the four sites during each of the two data-collection periods were analyzed for a suite of water-quality constituents that included 5-day BOD, chloride and sulfate, chlorophyll *a* and pheophytin *a*, nutrients, particulate carbon and particulate nitrogen, and TSS and VSS. In addition, bioassay analyses, sediment flux measurements, and standing light-dark bottle productivity measurements were made. Field measurements consisted of air temperature, barometric pressure, Secchi depth, wind speed, and vertical profile data that comprised DO, PAR, pH, salinity, specific conductance, turbidity, and water temperature. The scope of work did not include measurements of streamflow.

Algal Productivity

Algal productivity measurements, which describe water-column primary productivity and are determined by changes in DO concentrations using light-dark bottle methods, were taken at one site per reach (two sites total) at near-surface (about 1 foot below the water surface) and near-bottom (about 5 feet below the water surface) depths. DO and temperature profiles were measured in-situ at each site. These measurements were used as initial conditions with which to compare the final values obtained from the light-dark bottle experiments. A replicate set (two each) of clear and dark plastic-coated bottles were filled with water collected at the two specified depths and sealed with standard ground-glass stoppers to prevent gas exchange with the surrounding water column. Care was taken to shade the bottles during the filling process. Once all the bottles were filled, they were secured to a bottle rack (as shown in fig. 4) and suspended at the depth from which the water was collected. After a minimum of 4 hours of deployment, the light-dark bottles were removed from the water column, and DO and temperature measurements were made. Reaeration was kept to a minimum during final DO and temperature measurements. Start and end times for the instream incubations were recorded, as were DO and temperature measurements.

Table 3. Analytes with measurement methods specified by Texas Commission on Environmental Quality.

[mg/L, milligrams per liter; EPA, U.S. Environmental Protection Agency (1983); N, nitrogen; P, phosphorus; µg/L, micrograms per liter; SM, Standard Method (American Public Health Association, 1998); cells/mL, cells per milliliter; ind./mL, individuals per milliliter]

Analyte	Units	Method
Total suspended solids	mg/L	EPA 160.2
Total organic carbon	mg/L	EPA 415.1
Dissolved organic carbon	mg/L	EPA 415.2
Total dissolved solids	mg/L	EPA 160.1
Sulfate	mg/L	EPA 300.0
Chloride	mg/L	EPA 300.0
Ammonia-nitrogen, total	mg/L as N	EPA 350.1
Orthophosphate, dissolved	mg/L as P	EPA 365.1
Total reactive phosphate	mg/L	EPA 365.1
Total phosphorus wet method	mg/L as P	EPA 365.1
Nitrate/nitrite-nitrogen, total	mg/L as N	EPA 353.2
Total kjeldahl nitrogen	mg/L as N	EPA 351.2
Total nitrogen	mg/L as N	Computation
Chlorophyll *a*	µg/L	SM 10200 H
Pheophytin *a*	µg/L	SM 10200 H
Phytoplankton	cells/mL	SM 10200 F
Zooplankton	ind./mL	SM 10200 G
Particulate carbon	mg/L	EPA 440.0
Particulate nitrogen	mg/L	EPA 440.0
5-day biochemical oxygen demand	mg/L	SM 5210
Volatile suspended solids	mg/L	EPA 160.4
Algal productivity	mg/L	SM 10300D2
Algal growth	day^{-1}	Lehman and Sandgren (1985)
Algal mortality	day^{-1}	Lehman and Sandgren (1985)

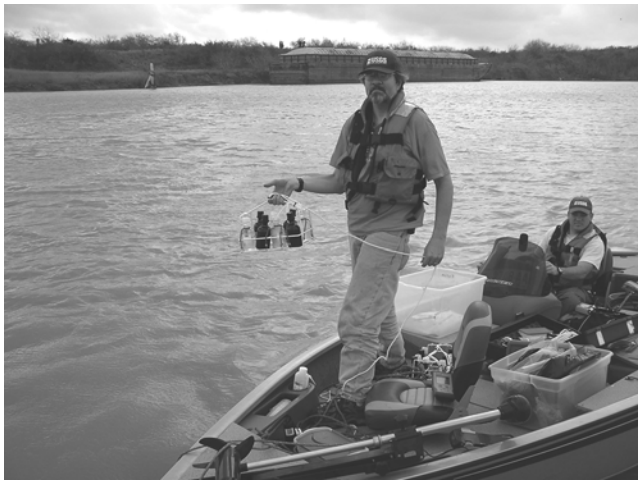

Figure 4. Light-dark bottle experiment being deployed in the Arroyo Colorado near Rio Hondo, Texas.

Standard light-dark bottle computational methods were used to determine gross primary productivity (GPP) and net primary productivity (NPP) or gross respiration and net respiration, where respiration is signified by a negative value, for each site at each of the two depths (American Public Health Association, 1998). GPP is computed by subtracting the final DO concentration in the dark bottle (DB) from the final DO concentration in the light bottle (LB) and then dividing by the incubation period (Δt) and a conversion factor to convert liters to cubic meters (milligrams of oxygen/cubic meter/day). The equation for GPP is as follows:

$$GPP = \frac{(LB - DB)}{\Delta t} \times 1000 . \quad (1)$$

NPP (summation of all metabolic processes) is computed by subtracting the initial light bottle DO concentration (ILB) from the final DO concentration in the light bottle (LB) and then dividing by the incubation period (Δt) and a conversion factor to convert liters to cubic meters. The equation for NPP is as follows:

$$NPP = \frac{(LB - ILB)}{\Delta t} \times 1000 . \quad (2)$$

In this method, changes in the mass of oxygen in the closed bottles during the incubation period are used to estimate rates of primary productivity. In this study, one replicate in addition to the environmental sample at each depth allowed for an averaging of the computed rates. Procedures follow those outlined in method 10300D2 of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association, 1998).

Continuous Water-Quality Monitoring

Multiparameter water-quality monitors were deployed at the near-surface and near-bottom depths at all four sites to collect 15-minute DO, pH, specific conductance, and temperature data. The instruments were deployed for a minimum of 24 hours during concurrent collection of other data. The monitor configuration and deployment procedure are shown in figure 5. Procedures for 24-hour continuous multiparameter field data collection follow standard protocols (Texas Commission on Environmental Quality, 2003; U.S. Geological Survey, 2006).

Sedimentation

Sedimentation is the vertical deposition of mass per unit time per unit area (mass flux) in the water column. Sedimentation is of critical importance to estimates of sediment movement and algal mortality within the context of water-quality models. Sedimentation represents the transport of particulate chemical species vertically through the water column with the explicit assumption that the chemical species reach the sediments. Sediment traps are used to measure the deposition of particulates over a specified period of time by integrating particle deposition

Figure 5. Continuous multiparameter water-quality monitor configuration and deployment in the Arroyo Colorado near Rio Hondo, Texas.

through time in a collection cylinder. The traps are cylindrical collectors closed at the bottom and open at the top that catch mineral particles, plant debris, refractory organic material, dead phytoplankton and zooplankton, the feces of zooplankton and fish, and other detritus. The traps are attached to a line with floats on the surface and a weight at the bottom to keep the trap vertical.

At each site, 4-inch-diameter traps were deployed in pairs (fig. 6). After a specified period of time, approximately 48 hours for this study, the traps were recovered. The exact time of deployment and retrieval were noted for each trap to allow for the computation of a flux. For retrieval, traps were pulled to the surface, ensuring the cylindrical collectors remained vertical; the cylinders then were emptied into 9-liter carboys. The collected material was weighed and analyzed for TSS and VSS and, during the February data-collection period, particulate carbon and nitrogen. The mass of collected material divided by the collection area and the deployment time of the traps yields the sedimentation flux. Sediment traps were deployed during each of the two data-collection periods at all four sites.

Discrete Samples

The USGS collected water samples in the tidal segment of the Arroyo Colorado during each of the two data-collection periods to identify seasonal differences in water quality. Samples were collected on 2 consecutive days at near-surface and near-bottom depths at the four sites. Near-surface samples were collected by the grab-sample method—direct filling of sample bottles from a boat. Near-bottom water samples were collected using a Kemmerer sampler as shown in figure 7. The Kemmerer sampler consists of a hollow cylinder with remotely activated stoppers at each end activated by a weighted messenger. Samples requiring field filtration were filtered in environmental chambers, made up of clear polyethylene bags supported by plastic frames, to minimize the potential for contamination. Equipment that came into contact with the sample was rinsed three times with deionized water between use at each sampling site. The different sampling methods used for sampling near-surface (grab sample) and near-bottom (Kemmerer sampler) water prevented contamination between samples at each site.

Figure 6. Sediment trap deployment in the Arroyo Colorado near Rio Hondo, Texas.

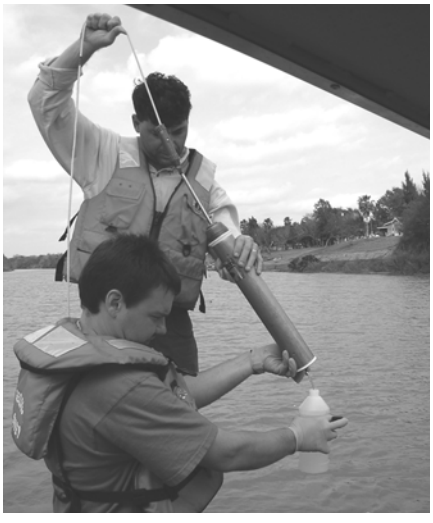

Figure 7. Near-bottom water being collected using the Kemmerer sampler in the Arroyo Colorado near Rio Hondo, Texas.

Algal Growth and Mortality

Bioassay Analysis

Algal population growth was determined using standard nutrient-addition bioassays (Lehman and Sandgren, 1985). Bioassay analyses were conducted in the laboratory under ambient temperature and light conditions on water samples collected at each of the four sites at near-surface depths. Water was transported to the laboratory and allocated to one of four treatment groups: control, phosphate (PO_4) addition, nitrate (NO_3) addition, or combined PO_4+NO_3 addition. Each treatment consisted of four cultures that were monitored for growth every other day for 10 days. Zooplankton were removed from the bioassay water using a 153-micrometer-mesh sieve. Changes in algal biomass were measured using an acclimated growth-rate method where algal populations are measured using in-vivo fluorescence (IVF). An exponential growth model was fit to the IVF data for each culture, providing four estimates of algal population growth rate per treatment per site. Growth rates were used to determine where nutrient additions appreciably enhanced algal growth. Nutrient addition and dilution bioassays were used to simultaneously estimate algal growth rates and grazing mortality rates following the methods of Lehman and Sandgren (1985).

Algal mortality rates were determined using experimental grazer density gradients. Zooplankton were collected from the Arroyo Colorado at each site and were used to increase animal density to ambient levels observed in the field. Micro-grazers also were manipulated through the use of dilution of ambient water using particle-free Arroyo Colorado water. Any observed negative changes in algal growth rates were attributed to the density of grazers in the experimental treatments. Algal mortality rates were assumed to be equal to these negative growth rates.

Phytoplankton and Zooplankton Analysis

Preserved phytoplankton samples and preserved zooplankton samples were used to estimate ambient population densities at all four sites. Phytoplankton cell counts and zooplankton animal counts were determined for each water sample during the two data-collection periods and were identified to the lowest possible taxonomic level.

Vertical Profiles

At the same time samples were collected at near-bottom and near-surface depths, vertical profiles of DO, pH, salinity, specific conductance, turbidity, and water temperature were measured at intervals of 1 foot with a multiparameter water-quality monitor. In addition, PAR-sensor profiles, a measure of upwelling and downwelling radiation in a water column between wavelengths of 400 and 700 nanometers, were done in conjunction with the light-dark bottle experiments. Measurements were taken in the air, just above the water surface, at the surface of the water with the sensors just under the water, and then at 1-meter intervals down through the water column. PAR-sensor measurements in the air were taken to provide an idea of ambient light conditions. The PAR-sensor profiles provide a measurement of sunlight intensity at a specified point in the water column looking toward the water surface (downwelling) and looking toward the streambed (upwelling). Sunlight intensity influences biota in the water column that rely on photosynthesis for growth.

Data Treatment

Severn Trent Labs (STL) in Denver, Colo., analyzed most of the constituents, except for chlorophyll *a* and pheophytin *a,* which were analyzed by STL in Westfield, Mass., and particulate carbon and particulate nitrogen, which were analyzed by an STL subcontractor, Nutrient Analytical Services Laboratory, Chesapeake Biological Laboratory in Solomons, Md. Biological analyses were done by USGS laboratory staff, except for phytoplankton analyses, which were done by the Department of Biology and Center for Subtropical Studies, University of Texas–Pan American, Edinburg, Tex.

Environmental sample data were subject to two reviews. Data were initially reviewed by the Contracting Officer's Representative for the USGS analytical-services contract with STL. The focus of this review was to determine the completeness of the samples analyzed, if holding times were met, if dilution factors were applied, and if QA/QC samples were within acceptance criteria. The final data review was done by a designated USGS Data Manager before data were entered into the USGS National Water Information System (NWIS) (U.S. Geological Survey, 2001). The focus of the review was to verify the accuracy and completeness of the laboratory data, to determine if laboratory QA/QC data had any effect on the results, and to determine whether samples were handled appropriately in the field and the laboratory.

Field measurements, such as DO, pH, specific conductance, temperature, and turbidity were reviewed by verifying that the standards used for calibration were adequate, the post-calibration checks were within calibration criteria, and the results were consistent between multiple measurements of the same constituent. The field measured physical characteristics were measured multiple times during instantaneous measurements, vertical profile measurements, and 24-hour continuous monitoring.

Field analyses consisted of BOD determinations and water-column primary productivity measurements (light-dark bottle experiment) (U.S. Geological Survey, 2006). Replicate sample analysis was used to determine the variability of the results. BOD data were qualified in accordance with standard USGS methods (U.S. Geological Survey, 2006).

The field QA/QC samples collected were field blanks and field replicates (two each). Field blanks were used to check for sample contamination in the field by analyzing inorganics-free water that was exposed to the field-sampling equipment used to

collect and process environmental samples. Field replicates were used to assess the variability of sample handling, preservation, and storage. QA/QC sample results are in appendix 1, table 1–3.

Data were combined into sample sets organized by site, date, and time following the review process described above. The sample sets were entered into the USGS NWIS, and chemical verification checks were done and used to evaluate each sample set. Chemical verification checks are these: Total constituents concentration must be greater than dissolved constituents concentration, mass ion-balance ratios must be within specified limits of ±5.49 percent difference, and the ratio of the sum of constituents to specific conductance must be within specified limits of 0.55 to 0.81. The final sample sets were checked for transcription and typographical errors.

Finally, data were qualified using "value qualifier codes." Value qualifier codes are used to describe a sample result that does not meet QA/QC criteria or to give additional information about how the sample was treated or the analysis was done. The following codes are used: sample diluted (d), value verified by rerun same method (r), sample received warm (*), holding time exceeded (@), and analyte detected in laboratory blank (v). The potential effect of the assignment of the value qualifier code was judged by the USGS Data Manager, and subsequently, a "remark code" was assigned. Samples were assigned a remark code of "less than" (<) if the results were below the laboratory reporting limit. Samples were assigned a remark code of "estimated" (E) if the data values are uncertain because of the deficiencies noted by the value qualifier code(s). For this report, remark codes only are included in the data tables. The value qualifier codes are available in the NWIS database.

Water-Quality and Ancillary Data

Data are grouped into two appendixes at the end of this report: (1) data collected at the near-surface and near-bottom depths of the Arroyo Colorado and (2) vertical profile data collected in the Arroyo Colorado. Data collected at near-bottom depth of the Arroyo Colorado are listed in the following order (appendixes 1–1.1 through 1–1.4): algal productivity measurements, continuous water-quality monitor measurements, sedimentation measurements, and discrete sample results. Data collected at near-surface depth of the Arroyo Colorado are listed in the following order (appendixes 1–2.1 through 1–2.4): algal productivity measurements, continuous water-quality monitor measurements, algal growth and mortality analyses (bioassay analysis, phytoplankton analysis, zooplankton analysis), and discrete sample results. Discrete sample results (appendixes 1–1.4 and 1–2.4) are categorized by data-collection period. Data collected for QA/QC purposes are listed in appendix 1–3. Water-quality vertical profile data are listed in appendix 2–1, and the PAR sensor vertical profile data are listed in appendix 2–2.

Water-quality data shown in this report allow specific comparisons between the two depths for each of the four sites sampled in the tidal segment of the Arroyo Colorado during the February and May 2006 data-collection periods. Finally, the water-quality data facilitate general analyses of the productivity, biochemical oxygen dynamics, and nutrient cycling in the tidal segment of the Arroyo Colorado, Texas.

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Appendix 1—Data Collected at Near-Bottom and Near-Surface Depths of the Arroyo Colorado Near Rio Hondo, Texas

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Appendix 1–1.1. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using algal productivity methods (5 feet below water surface).

[mg O_2/m^3/day, milligrams of oxygen per cubic meter per day; negative value signifies deficit of oxygen and positive value signifies accumulation of oxygen]

USGS station no.	Date	Data-collection period	Gross primary productivity (mg O_2/m^3/day)	Net primary productivity (mg O_2/m^3/day)	Respiration (mg O_2/m^3/day)
08470460	02/22/2006	February	568	-2,309	2,878
08470460	05/23/2006	May	2,626	-5,082	7,708
08470500	02/22/2006	February	51	-5,788	5,839
08470500	05/23/2006	May	11,560	9,560	2,400

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors.

[°C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter. Dissolved oxygen values less than 2.0 mg/L reported here to show resolution in a low dissolved oxygen environment, rather than set all values to <2.0 mg/L; zero values should be interpreted as <0.1 mg/L]

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470450 February data-collection period					
08470450	02/22/2006 10:30	17.8	3,500	7.6	7.5
08470450	02/22/2006 10:45	17.8	3,510	7.7	7.6
08470450	02/22/2006 11:00	18.1	3,440	7.8	7.6
08470450	02/22/2006 11:15	18.1	3,470	7.7	7.6
08470450	02/22/2006 11:30	18.1	3,480	7.8	7.6
08470450	02/22/2006 11:45	18.2	3,460	7.8	7.6
08470450	02/22/2006 12:00	18.2	3,490	7.8	7.6
08470450	02/22/2006 12:15	18.3	3,500	7.9	7.6
08470450	02/22/2006 12:30	18.4	3,490	7.8	7.6
08470450	02/22/2006 12:45	18.4	3,510	7.8	7.6
08470450	02/22/2006 13:00	18.6	3,500	7.9	7.6
08470450	02/22/2006 13:15	18.6	3,510	8.0	7.6
08470450	02/22/2006 13:30	18.7	3,510	8.0	7.6
08470450	02/22/2006 13:45	18.7	3,520	8.0	7.6
08470450	02/22/2006 14:00	18.8	3,510	8.1	7.6
08470450	02/22/2006 14:15	19.0	3,500	8.0	7.7
08470450	02/22/2006 14:30	19.0	3,520	8.0	7.6
08470450	02/22/2006 14:45	19.0	3,530	8.1	7.7
08470450	02/22/2006 15:00	19.5	3,460	8.1	7.7
08470450	02/22/2006 15:15	19.4	3,490	8.0	7.7
08470450	02/22/2006 15:30	19.5	3,500	8.0	7.7
08470450	02/22/2006 15:45	19.4	3,530	8.0	7.7
08470450	02/22/2006 16:00	19.5	3,530	8.1	7.7
08470450	02/22/2006 16:15	19.6	3,520	8.1	7.7
08470450	02/22/2006 16:30	19.6	3,540	8.0	7.7
08470450	02/22/2006 16:45	19.6	3,900	8.0	7.7
08470450	02/22/2006 17:00	19.2	3,620	8.1	7.7
08470450	02/22/2006 17:15	19.3	3,620	8.2	7.7
08470450	02/22/2006 17:30	19.3	3,630	8.1	7.7
08470450	02/22/2006 17:45	19.3	3,630	8.1	7.7
08470450	02/22/2006 18:00	19.2	4,420	7.4	7.6
08470450	02/22/2006 18:15	19.0	7,600	6.2	7.6
08470450	02/22/2006 18:30	18.9	8,500	6.2	7.6
08470450	02/22/2006 18:45	18.8	10,600	6.2	7.6
08470450	02/22/2006 19:00	18.8	9,380	5.5	7.7
08470450	02/22/2006 19:15	19.0	8,610	5.7	7.7
08470450	02/22/2006 19:30	19.0	9,450	6.1	7.6
08470450	02/22/2006 19:45	19.0	10,100	6.2	7.6
08470450	02/22/2006 20:00	19.0	9,980	6.1	7.7
08470450	02/22/2006 20:15	19.0	11,200	5.9	7.7
08470450	02/22/2006 20:30	19.0	10,400	6.4	7.7
08470450	02/22/2006 20:45	19.1	8,400	6.7	7.7
08470450	02/22/2006 21:00	19.1	8,830	6.8	7.6
08470450	02/22/2006 21:15	19.2	8,070	7.0	7.6
08470450	02/22/2006 21:30	19.2	7,550	7.2	7.6
08470450	02/22/2006 21:45	19.3	6,200	7.2	7.7
08470450	02/22/2006 22:00	19.3	6,050	7.2	7.6
08470450	02/22/2006 22:15	19.4	5,420	7.3	7.7
08470450	02/22/2006 22:30	19.4	4,690	7.5	7.7
08470450	02/22/2006 22:45	19.5	3,880	7.6	7.7
08470450	02/22/2006 23:00	19.5	3,730	7.6	7.7
08470450	02/22/2006 23:15	19.5	3,730	7.5	7.7
08470450	02/22/2006 23:30	19.6	3,730	7.5	7.7
08470450	02/22/2006 23:45	19.6	3,730	7.5	7.7
08470450	02/23/2006 00:00	19.6	3,730	7.4	7.7
08470450	02/23/2006 00:15	19.7	3,740	7.5	7.7
08470450	02/23/2006 00:30	19.7	3,740	7.4	7.7
08470450	02/23/2006 00:45	19.8	3,740	7.3	7.7
08470450	02/23/2006 01:00	19.8	3,750	7.3	7.6
08470450	02/23/2006 01:15	19.8	3,740	7.3	7.7
08470450	02/23/2006 01:30	19.9	3,750	7.3	7.6
08470450	02/23/2006 01:45	19.9	3,750	7.3	7.6
08470450	02/23/2006 02:00	19.9	3,750	7.3	7.6
08470450	02/23/2006 02:15	20.0	3,750	7.2	7.6
08470450	02/23/2006 02:30	20.0	3,750	7.2	7.6
08470450	02/23/2006 02:45	20.1	3,740	7.1	7.6
08470450	02/23/2006 03:00	20.1	3,740	7.1	7.6
08470450	02/23/2006 03:15	20.1	3,740	7.2	7.6
08470450	02/23/2006 03:30	20.2	3,730	7.2	7.6
08470450	02/23/2006 03:45	20.2	3,730	7.1	7.6
08470450	02/23/2006 04:00	20.2	3,730	7.0	7.6
08470450	02/23/2006 04:15	20.2	3,720	7.1	7.6
08470450	02/23/2006 04:30	20.3	3,720	7.1	7.6
08470450	02/23/2006 04:45	20.3	3,720	7.0	7.6
08470450	02/23/2006 05:00	20.3	3,710	7.0	7.6
08470450	02/23/2006 05:15	20.3	3,710	7.0	7.6

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470450 February data-collection period—Continued					
08470450	02/23/2006 05:30	20.4	3,720	6.9	7.6
08470450	02/23/2006 05:45	20.4	3,720	7.0	7.6
08470450	02/23/2006 06:00	20.4	3,720	7.0	7.6
08470450	02/23/2006 06:15	20.4	3,720	6.9	7.6
08470450	02/23/2006 06:30	20.4	3,720	6.8	7.6
08470450	02/23/2006 06:45	20.4	3,720	6.9	7.6
08470450	02/23/2006 07:00	20.4	3,730	6.9	7.6
08470450	02/23/2006 07:15	20.4	3,730	6.8	7.6
08470450	02/23/2006 07:30	20.4	3,740	6.8	7.6
08470450	02/23/2006 07:45	20.4	3,740	6.8	7.6
08470450	02/23/2006 08:00	20.5	3,740	6.7	7.6
08470450	02/23/2006 08:15	20.5	3,740	6.7	7.6
08470450	02/23/2006 08:30	20.5	3,750	6.7	7.6
08470450	02/23/2006 08:45	20.5	3,760	6.8	7.6
08470450	02/23/2006 09:00	20.5	3,760	6.7	7.6
08470450	02/23/2006 09:15	20.6	3,760	6.8	7.6
08470450	02/23/2006 09:30	20.6	3,770	6.8	7.6
08470450	02/23/2006 09:45	20.6	3,770	6.7	7.6
08470450	02/23/2006 10:00	20.6	3,770	6.8	7.6
08470450	02/23/2006 10:15	20.6	3,780	6.7	7.6
08470450	02/23/2006 10:30	20.6	3,780	6.7	7.6
08470450	02/23/2006 10:45	20.6	3,780	6.7	7.6
08470450	02/23/2006 11:00	20.6	3,780	6.7	7.6
08470450	02/23/2006 11:15	20.5	3,790	6.7	7.6
08470450	02/23/2006 11:30	20.5	3,790	6.8	7.6
08470450	02/23/2006 11:45	20.5	3,790	6.8	7.6
08470450	02/23/2006 12:00	20.4	3,790	6.8	7.6
08470450	02/23/2006 12:15	20.4	3,800	6.8	7.6
08470450	02/23/2006 12:30	20.4	3,800	6.8	7.6
08470450	02/23/2006 12:45	20.4	3,800	6.9	7.6
08470450	02/23/2006 13:00	20.4	3,800	7.0	7.6
Station 08470450 May data-collection period					
08470450	05/23/2006 11:45	28.2	4,330	5.3	7.7
08470450	05/23/2006 12:00	28.2	4,330	5.1	7.7
08470450	05/23/2006 12:15	28.3	4,330	5.4	7.7
08470450	05/23/2006 12:30	28.3	4,330	5.4	7.7
08470450	05/23/2006 12:45	28.3	4,340	5.4	7.7
08470450	05/23/2006 13:00	28.4	4,340	5.5	7.7
08470450	05/23/2006 13:15	28.4	4,340	4.3	7.7
08470450	05/23/2006 13:30	28.4	4,340	4.3	7.7
08470450	05/23/2006 13:45	28.5	4,340	4.4	7.7
08470450	05/23/2006 14:00	28.5	4,350	4.5	7.7
08470450	05/23/2006 14:15	28.6	4,350	4.7	7.7
08470450	05/23/2006 14:30	28.6	4,350	5.9	7.7
08470450	05/23/2006 14:45	28.6	4,350	5.9	7.7
08470450	05/23/2006 15:00	28.7	4,350	6.0	7.7
08470450	05/23/2006 15:15	28.8	4,360	6.1	7.7
08470450	05/23/2006 15:30	28.9	4,350	6.2	7.8
08470450	05/23/2006 15:45	29.0	4,350	6.2	7.8
08470450	05/23/2006 16:00	29.1	4,340	6.4	7.8
08470450	05/23/2006 16:15	29.1	4,340	6.3	7.8
08470450	05/23/2006 16:30	29.2	4,340	6.4	7.8
08470450	05/23/2006 16:45	29.2	4,340	6.4	7.8
08470450	05/23/2006 17:00	29.2	4,340	6.4	7.8
08470450	05/23/2006 17:15	29.2	4,340	6.4	7.8
08470450	05/23/2006 17:30	29.3	4,350	6.5	7.8
08470450	05/23/2006 17:45	29.4	4,350	6.6	7.8
08470450	05/23/2006 18:00	29.4	4,350	6.6	7.8
08470450	05/23/2006 18:15	29.5	4,350	6.7	7.8
08470450	05/23/2006 18:30	29.5	4,350	6.7	7.8
08470450	05/23/2006 18:45	29.6	4,350	6.8	7.8
08470450	05/23/2006 19:00	29.6	4,350	6.9	7.8
08470450	05/23/2006 19:15	29.6	4,350	6.9	7.8
08470450	05/23/2006 19:30	29.6	4,360	7.0	7.8
08470450	05/23/2006 19:45	29.5	4,350	7.0	7.8
08470450	05/23/2006 20:00	29.5	4,350	7.0	7.8
08470450	05/23/2006 20:15	29.4	4,350	6.9	7.8
08470450	05/23/2006 20:30	29.4	4,340	6.9	7.8
08470450	05/23/2006 20:45	29.3	4,350	6.8	7.8
08470450	05/23/2006 21:00	29.2	4,340	6.8	7.8
08470450	05/23/2006 21:15	29.2	4,340	6.8	7.8
08470450	05/23/2006 21:30	29.1	4,330	6.6	7.8
08470450	05/23/2006 21:45	29.1	4,320	6.6	7.8
08470450	05/23/2006 22:00	29.0	4,310	6.5	7.8
08470450	05/23/2006 22:15	29.0	4,300	6.6	7.8
08470450	05/23/2006 22:30	29.0	4,290	6.5	7.8
08470450	05/23/2006 22:45	29.0	4,290	6.6	7.8
08470450	05/23/2006 23:00	29.0	4,280	6.2	7.8
08470450	05/23/2006 23:15	28.9	4,280	6.0	7.8
08470450	05/23/2006 23:30	28.9	4,280	5.2	7.8
08470450	05/23/2006 23:45	28.8	4,270	4.8	7.8
08470450	05/24/2006 00:00	28.8	4,270	4.8	7.7
08470450	05/24/2006 00:15	28.8	4,270	4.7	7.8
08470450	05/24/2006 00:30	28.7	4,270	4.5	7.8
08470450	05/24/2006 00:45	28.7	4,270	4.6	7.7
08470450	05/24/2006 01:00	28.6	4,260	4.5	7.7
08470450	05/24/2006 01:15	28.6	4,260	4.4	7.7
08470450	05/24/2006 01:30	28.6	4,260	4.4	7.7
08470450	05/24/2006 01:45	28.5	4,260	6.1	7.7
08470450	05/24/2006 02:00	28.5	4,260	6.1	7.7
08470450	05/24/2006 02:15	28.5	4,260	6.0	7.7
08470450	05/24/2006 02:30	28.5	4,260	5.9	7.7
08470450	05/24/2006 02:45	28.5	4,260	5.8	7.7
08470450	05/24/2006 03:00	28.5	4,260	5.8	7.7
08470450	05/24/2006 03:15	28.5	4,260	5.7	7.7
08470450	05/24/2006 03:30	28.5	4,270	5.6	7.7
08470450	05/24/2006 03:45	28.5	4,270	5.5	7.7
08470450	05/24/2006 04:00	28.5	4,280	5.5	7.7
08470450	05/24/2006 04:15	28.5	4,290	5.5	7.7
08470450	05/24/2006 04:30	28.4	4,300	5.3	7.7
08470450	05/24/2006 04:45	28.4	4,300	5.3	7.7
08470450	05/24/2006 05:00	28.4	4,320	5.2	7.7
08470450	05/24/2006 05:15	28.4	4,320	5.1	7.7
08470450	05/24/2006 05:30	28.4	4,330	5.0	7.7
08470450	05/24/2006 05:45	28.4	4,340	4.9	7.7
08470450	05/24/2006 06:00	28.4	4,350	4.9	7.7
08470450	05/24/2006 06:15	28.4	4,360	4.9	7.7
08470450	05/24/2006 06:30	28.4	4,360	4.9	7.7
08470450	05/24/2006 06:45	28.4	4,370	4.9	7.7
08470450	05/24/2006 07:00	28.4	4,380	4.9	7.7

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470450 May data-collection period—Continued					
08470450	05/24/2006 07:15	28.4	4,380	4.9	7.7
08470450	05/24/2006 07:30	28.3	4,380	4.9	7.7
08470450	05/24/2006 07:45	28.3	4,380	4.8	7.7
08470450	05/24/2006 08:00	28.3	4,390	4.8	7.7
08470450	05/24/2006 08:15	28.2	4,390	4.8	7.7
08470450	05/24/2006 08:30	28.2	4,400	4.7	7.7
08470450	05/24/2006 08:45	28.2	4,400	4.7	7.7
08470450	05/24/2006 09:00	28.2	4,410	4.7	7.7
08470450	05/24/2006 09:15	28.1	4,420	4.7	7.7
08470450	05/24/2006 09:30	28.1	4,420	4.6	7.7
08470450	05/24/2006 09:45	28.1	4,420	4.6	7.7
08470450	05/24/2006 10:00	28.1	4,420	4.7	7.7
08470450	05/24/2006 10:15	28.1	4,420	4.7	7.7
08470450	05/24/2006 10:30	28.1	4,410	4.8	7.7
08470450	05/24/2006 10:45	28.1	4,410	4.8	7.7
08470450	05/24/2006 11:00	28.1	4,410	4.8	7.7
08470450	05/24/2006 11:15	28.1	4,400	4.9	7.7
08470450	05/24/2006 11:30	28.2	4,390	5.0	7.7
08470450	05/24/2006 11:45	28.2	4,390	5.0	7.7
08470450	05/24/2006 12:00	28.3	4,380	5.0	7.7
08470450	05/24/2006 12:15	28.4	4,380	5.1	7.7
08470450	05/24/2006 12:30	28.4	4,380	5.2	7.7
08470450	05/24/2006 12:45	28.5	4,370	5.3	7.7
Station 08470460 February data-collection period					
08470460	02/22/2006 09:45	16.1	51,100	1.0	7.9
08470460	02/22/2006 10:00	16.0	51,000	.9	7.9
08470460	02/22/2006 10:15	16.0	51,100	1.1	7.9
08470460	02/22/2006 10:30	16.0	51,000	1.1	8.0
08470460	02/22/2006 10:45	16.0	51,100	.9	8.0
08470460	02/22/2006 11:00	16.1	51,100	.5	7.9
08470460	02/22/2006 11:15	16.1	51,100	.5	8.0
08470460	02/22/2006 11:30	16.1	51,100	.3	8.0
08470460	02/22/2006 11:45	16.1	51,100	.3	8.0
08470460	02/22/2006 12:00	16.1	51,200	.3	8.0
08470460	02/22/2006 12:15	16.1	51,200	.2	8.0
08470460	02/22/2006 12:30	16.1	51,200	.3	8.0
08470460	02/22/2006 12:45	16.1	51,300	.2	8.0
08470460	02/22/2006 13:00	16.1	51,200	.2	8.0
08470460	02/22/2006 13:15	16.1	51,300	.2	8.0
08470460	02/22/2006 13:30	16.1	51,400	.2	8.0
08470460	02/22/2006 13:45	16.1	51,300	.2	8.0
08470460	02/22/2006 14:00	16.1	51,400	.2	8.0
08470460	02/22/2006 14:15	16.1	51,500	.3	8.0
08470460	02/22/2006 14:30	16.1	51,500	.4	8.0
08470460	02/22/2006 14:45	16.1	51,400	.2	8.0
08470460	02/22/2006 15:00	16.1	51,500	.4	8.0
08470460	02/22/2006 15:15	16.1	51,500	.5	8.0
08470460	02/22/2006 15:30	16.1	51,400	.3	8.0
08470460	02/22/2006 15:45	16.0	51,500	.7	8.0
08470460	02/22/2006 16:00	16.0	51,500	.8	8.0
08470460	02/22/2006 16:15	16.0	51,500	.9	8.0
08470460	02/22/2006 16:30	16.0	51,600	.6	8.0
08470460	02/22/2006 16:45	16.1	51,600	.6	8.0
08470460	02/22/2006 17:00	16.0	51,600	.8	8.0
08470460	02/22/2006 17:15	16.0	51,600	.7	8.0
08470460	02/22/2006 17:30	16.0	51,600	0.9	8.0
08470460	02/22/2006 17:45	16.0	51,600	1.0	8.0
08470460	02/22/2006 18:00	16.1	51,600	.7	8.0
08470460	02/22/2006 18:15	16.1	51,700	.7	8.0
08470460	02/22/2006 18:30	16.1	51,700	.7	8.0
08470460	02/22/2006 18:45	16.0	51,700	.9	8.0
08470460	02/22/2006 19:00	16.0	51,700	.9	8.0
08470460	02/22/2006 19:15	16.0	51,700	.8	8.0
08470460	02/22/2006 19:30	16.1	51,800	.7	8.0
08470460	02/22/2006 19:45	16.0	51,700	.9	8.0
08470460	02/22/2006 20:00	16.1	51,800	.8	8.0
08470460	02/22/2006 20:15	16.0	51,800	.8	8.0
08470460	02/22/2006 20:30	16.1	51,800	.8	8.0
08470460	02/22/2006 20:45	16.1	51,800	.7	8.0
08470460	02/22/2006 21:00	16.1	51,800	.7	8.0
08470460	02/22/2006 21:15	16.1	51,800	.9	8.0
08470460	02/22/2006 21:30	16.0	51,800	.8	8.0
08470460	02/22/2006 21:45	16.0	51,800	.9	8.0
08470460	02/22/2006 22:00	16.0	51,700	.9	8.0
08470460	02/22/2006 22:15	16.1	51,800	.9	8.0
08470460	02/22/2006 22:30	16.0	51,700	.9	8.0
08470460	02/22/2006 22:45	16.1	51,700	.9	8.0
08470460	02/22/2006 23:00	16.1	51,800	.8	8.0
08470460	02/22/2006 23:15	16.1	51,600	.8	8.0
08470460	02/22/2006 23:30	16.1	51,700	.8	8.0
08470460	02/22/2006 23:45	16.1	51,800	.8	8.0
08470460	02/23/2006 00:00	16.1	51,800	.8	8.0
08470460	02/23/2006 00:15	16.1	51,800	.8	8.0
08470460	02/23/2006 00:30	16.1	51,800	.8	8.0
08470460	02/23/2006 00:45	16.0	51,800	.9	8.0
08470460	02/23/2006 01:00	16.0	51,800	.8	8.0
08470460	02/23/2006 01:15	16.1	51,700	.8	8.0
08470460	02/23/2006 01:30	16.1	51,700	.8	8.0
08470460	02/23/2006 01:45	16.1	51,800	.8	8.0
08470460	02/23/2006 02:00	16.0	51,800	.8	8.0
08470460	02/23/2006 02:15	16.1	51,800	.8	8.0
08470460	02/23/2006 02:30	16.1	51,800	.7	8.0
08470460	02/23/2006 02:45	16.1	51,700	.7	8.0
08470460	02/23/2006 03:00	16.1	51,700	.7	8.0
08470460	02/23/2006 03:15	16.1	51,700	.7	8.0
08470460	02/23/2006 03:30	16.1	51,700	.7	8.0
08470460	02/23/2006 03:45	16.1	51,700	.7	8.0
08470460	02/23/2006 04:00	16.1	51,700	.7	8.0
08470460	02/23/2006 04:15	16.1	51,600	.8	8.0
08470460	02/23/2006 04:30	16.1	51,600	.6	8.0
08470460	02/23/2006 04:45	16.1	51,600	.7	8.0
08470460	02/23/2006 05:00	16.1	51,600	.6	8.0
08470460	02/23/2006 05:15	16.1	51,600	.6	8.0
08470460	02/23/2006 05:30	16.1	51,600	.6	8.0
08470460	02/23/2006 05:45	16.1	51,600	.6	8.0
08470460	02/23/2006 06:00	16.2	51,600	.5	8.0
08470460	02/23/2006 06:15	16.2	51,600	.5	8.0
08470460	02/23/2006 06:30	16.1	51,600	.6	8.0
08470460	02/23/2006 06:45	16.1	51,600	.6	8.0
08470460	02/23/2006 07:00	16.1	51,500	.7	8.0

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470460 February data-collection period—Continued					
08470460	02/23/2006 07:15	16.1	51,500	0.6	8.0
08470460	02/23/2006 07:30	16.1	51,600	.7	8.0
08470460	02/23/2006 07:45	16.1	51,500	.6	8.0
08470460	02/23/2006 08:00	16.1	51,500	.6	8.0
08470460	02/23/2006 08:15	16.1	51,600	.6	8.0
08470460	02/23/2006 08:30	16.1	51,600	.6	8.0
08470460	02/23/2006 08:45	16.1	51,600	.6	8.0
08470460	02/23/2006 09:00	16.1	51,600	.6	8.0
08470460	02/23/2006 09:15	16.1	51,600	.5	8.0
08470460	02/23/2006 09:30	16.1	51,600	.5	8.0
08470460	02/23/2006 09:45	16.1	51,700	.5	8.0
08470460	02/23/2006 10:00	16.1	51,700	.5	8.0
08470460	02/23/2006 10:15	16.1	51,600	.5	8.0
08470460	02/23/2006 10:30	16.2	51,600	.5	8.0
08470460	02/23/2006 10:45	16.2	51,500	.5	8.0
08470460	02/23/2006 11:00	16.2	51,400	.5	8.0
08470460	02/23/2006 11:15	16.2	51,300	.4	8.0
08470460	02/23/2006 11:30	16.2	51,100	.4	8.0
08470460	02/23/2006 11:45	16.2	51,100	.5	8.0
08470460	02/23/2006 12:00	16.2	50,700	.4	8.0
08470460	02/23/2006 12:15	16.3	50,600	.4	8.0
08470460	02/23/2006 12:30	16.2	51,100	.4	8.0
08470460	02/23/2006 12:45	16.3	50,600	.5	8.0
08470460	02/23/2006 13:00	16.3	50,900	.4	8.0
08470460	02/23/2006 13:15	16.3	50,600	.4	8.0
08470460	02/23/2006 13:30	16.3	50,500	.6	8.0
08470460	02/23/2006 13:45	16.3	48,700	.6	7.9
Station 08470460 May data-collection period					
08470460	05/23/2006 11:15	26.6	24,300	.2	6.9
08470460	05/23/2006 11:30	26.6	23,900	.1	6.9
08470460	05/23/2006 11:45	26.6	23,900	.1	6.9
08470460	05/23/2006 12:00	26.6	23,900	.1	6.9
08470460	05/23/2006 12:15	26.6	23,800	.1	6.9
08470460	05/23/2006 12:30	26.6	23,800	.1	6.9
08470460	05/23/2006 12:45	26.6	23,800	.1	6.9
08470460	05/23/2006 13:00	26.6	23,800	.1	6.9
08470460	05/23/2006 13:15	26.6	23,800	.1	6.9
08470460	05/23/2006 13:30	26.6	23,800	.1	6.9
08470460	05/23/2006 13:45	26.6	23,800	.1	6.9
08470460	05/23/2006 14:00	26.6	23,800	.1	6.9
08470460	05/23/2006 14:15	26.6	23,900	.1	6.9
08470460	05/23/2006 14:30	26.6	23,800	.1	6.9
08470460	05/23/2006 14:45	26.6	23,800	.1	6.9
08470460	05/23/2006 15:00	26.6	23,800	.1	6.9
08470460	05/23/2006 15:15	26.6	23,700	.1	6.9
08470460	05/23/2006 15:30	26.6	23,700	.1	6.9
08470460	05/23/2006 15:45	26.6	23,700	.1	6.9
08470460	05/23/2006 16:00	27.0	23,500	.1	6.9
08470460	05/23/2006 16:15	27.0	23,700	.1	6.9
08470460	05/23/2006 16:30	27.1	23,600	.1	6.9
08470460	05/23/2006 16:45	27.1	23,500	.1	6.9
08470460	05/23/2006 17:00	27.4	23,500	.1	6.9
08470460	05/23/2006 17:15	26.8	23,500	.1	6.9
08470460	05/23/2006 17:30	26.8	23,400	.1	6.9
08470460	05/23/2006 17:45	27.0	23,400	.1	6.9
08470460	05/23/2006 18:00	27.0	23,300	0.1	6.9
08470460	05/23/2006 18:15	26.9	23,300	.1	6.9
08470460	05/23/2006 18:30	26.9	23,200	.1	6.9
08470460	05/23/2006 18:45	26.9	23,200	.1	6.9
08470460	05/23/2006 19:00	26.9	23,200	.1	6.9
08470460	05/23/2006 19:15	26.9	23,200	.1	6.9
08470460	05/23/2006 19:30	26.9	23,100	.1	6.9
08470460	05/23/2006 19:45	26.9	23,100	.1	6.9
08470460	05/23/2006 20:00	26.9	23,100	.1	6.9
08470460	05/23/2006 20:15	26.9	23,100	.1	6.9
08470460	05/23/2006 20:30	26.9	23,100	.1	6.9
08470460	05/23/2006 20:45	26.9	23,100	.1	6.9
08470460	05/23/2006 21:00	26.9	23,100	.1	6.9
08470460	05/23/2006 21:15	26.8	23,100	.1	6.9
08470460	05/23/2006 21:30	26.8	23,100	.1	6.9
08470460	05/23/2006 21:45	26.8	23,100	.1	6.9
08470460	05/23/2006 22:00	26.8	23,100	.1	6.9
08470460	05/23/2006 22:15	26.8	23,100	.1	6.9
08470460	05/23/2006 22:30	26.8	23,100	.1	6.9
08470460	05/23/2006 22:45	26.8	23,100	.1	6.9
08470460	05/23/2006 23:00	26.8	23,100	.1	6.9
08470460	05/23/2006 23:15	26.8	23,100	.1	6.9
08470460	05/23/2006 23:30	26.8	23,100	.1	6.9
08470460	05/23/2006 23:45	26.8	23,100	.1	6.9
08470460	05/24/2006 00:00	26.8	23,100	.1	6.9
08470460	05/24/2006 00:15	26.8	23,100	.1	6.9
08470460	05/24/2006 00:30	26.8	23,100	.1	6.9
08470460	05/24/2006 00:45	26.8	23,100	.1	6.9
08470460	05/24/2006 01:00	26.8	23,100	0	6.9
08470460	05/24/2006 01:15	26.8	23,100	.1	6.9
08470460	05/24/2006 01:30	26.8	23,100	.1	6.9
08470460	05/24/2006 01:45	26.8	23,100	.1	6.9
08470460	05/24/2006 02:00	26.8	23,100	.1	6.9
08470460	05/24/2006 02:15	26.8	23,100	.1	6.9
08470460	05/24/2006 02:30	26.8	23,100	.1	6.9
08470460	05/24/2006 02:45	26.8	23,100	.1	6.9
08470460	05/24/2006 03:00	26.8	23,100	.1	6.9
08470460	05/24/2006 03:15	26.8	23,100	0	6.9
08470460	05/24/2006 03:30	26.8	23,100	.1	6.9
08470460	05/24/2006 03:45	26.8	23,100	0	6.9
08470460	05/24/2006 04:00	26.8	23,100	0	6.9
08470460	05/24/2006 04:15	26.8	23,100	0	6.9
08470460	05/24/2006 04:30	26.8	23,200	0	6.9
08470460	05/24/2006 04:45	26.8	23,100	.1	6.9
08470460	05/24/2006 05:00	26.8	23,100	.1	6.9
08470460	05/24/2006 05:15	26.8	23,100	0	6.9
08470460	05/24/2006 05:30	26.8	23,100	.1	6.9
08470460	05/24/2006 05:45	26.8	23,100	0	6.9
08470460	05/24/2006 06:00	26.8	23,100	.1	6.9
08470460	05/24/2006 06:15	26.8	23,100	0	6.9
08470460	05/24/2006 06:30	26.8	23,100	.1	6.9
08470460	05/24/2006 06:45	26.8	23,100	.1	6.9
08470460	05/24/2006 07:00	26.8	23,100	.1	6.9
08470460	05/24/2006 07:15	26.7	23,200	.1	6.9
08470460	05/24/2006 07:30	26.7	23,100	0	6.9

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470460 May data-collection period—Continued					
08470460	05/24/2006 07:45	26.7	23,100	0.1	6.9
08470460	05/24/2006 08:00	26.7	23,100	0	6.9
08470460	05/24/2006 08:15	26.8	23,100	.1	6.9
08470460	05/24/2006 08:30	26.8	23,100	.1	6.9
08470460	05/24/2006 08:45	26.8	23,100	0	6.9
08470460	05/24/2006 09:00	26.8	23,100	.1	6.9
08470460	05/24/2006 09:15	26.8	23,100	0	6.9
08470460	05/24/2006 09:30	26.8	23,100	.1	6.9
08470460	05/24/2006 09:45	26.8	23,100	0	6.9
08470460	05/24/2006 10:00	26.8	23,100	0	6.9
08470460	05/24/2006 10:15	26.8	23,100	0	6.9
08470460	05/24/2006 10:30	26.8	23,100	.1	6.9
08470460	05/24/2006 10:45	26.8	23,100	0	6.9
08470460	05/24/2006 11:00	26.8	23,100	.1	6.9
08470460	05/24/2006 11:15	26.8	23,100	.1	6.9
08470460	05/24/2006 11:30	26.8	23,100	.1	6.9
08470460	05/24/2006 11:45	26.8	23,100	0	6.9
08470460	05/24/2006 12:00	26.8	23,100	0	6.9
08470460	05/24/2006 12:15	26.8	23,100	0	6.9
08470460	05/24/2006 12:30	26.8	23,100	0	6.9
08470460	05/24/2006 12:45	26.8	23,100	.1	6.9
08470460	05/24/2006 13:00	26.8	23,100	0	6.9
Station 08470500 February data-collection period					
08470500	02/22/2006 11:10	16.2	53,000	1.4	8.0
08470500	02/22/2006 11:25	16.2	52,100	1.4	8.0
08470500	02/22/2006 11:40	16.3	51,300	1.4	8.0
08470500	02/22/2006 11:55	16.3	52,400	1.3	8.0
08470500	02/22/2006 12:10	16.3	52,800	1.3	8.0
08470500	02/22/2006 12:25	16.3	52,400	1.3	8.0
08470500	02/22/2006 12:40	16.4	53,000	1.2	8.0
08470500	02/22/2006 12:55	16.4	53,000	1.1	8.0
08470500	02/22/2006 13:10	16.4	52,300	1.2	8.0
08470500	02/22/2006 13:25	16.4	52,900	1.1	8.0
08470500	02/22/2006 13:40	16.4	52,800	1.2	8.0
08470500	02/22/2006 13:55	16.4	52,600	1.3	8.0
08470500	02/22/2006 14:10	16.5	53,200	1.1	8.1
08470500	02/22/2006 14:25	16.5	53,500	1.0	8.1
08470500	02/22/2006 14:40	16.6	53,800	.9	8.1
08470500	02/22/2006 14:55	16.6	53,600	1.0	8.1
08470500	02/22/2006 15:10	16.5	53,200	1.0	8.1
08470500	02/22/2006 15:25	16.6	53,500	1.1	8.1
08470500	02/22/2006 15:40	16.6	53,600	.9	8.1
08470500	02/22/2006 15:55	16.6	53,800	1.0	8.1
08470500	02/22/2006 16:10	16.6	53,900	.9	8.1
08470500	02/22/2006 16:25	16.6	53,800	1.0	8.1
08470500	02/22/2006 16:40	16.7	53,800	.9	8.1
08470500	02/22/2006 16:55	16.7	54,000	.9	8.1
08470500	02/22/2006 17:10	16.7	54,100	.9	8.1
08470500	02/22/2006 17:25	16.7	54,000	.9	8.1
08470500	02/22/2006 17:40	16.7	53,900	.9	8.1
08470500	02/22/2006 17:55	16.7	53,900	.9	8.1
08470500	02/22/2006 18:10	16.7	54,100	.9	8.1
08470500	02/22/2006 18:25	16.7	54,000	.8	8.1
08470500	02/22/2006 18:40	16.7	54,000	.9	8.1
08470500	02/22/2006 18:55	16.7	54,000	.8	8.1
08470500	02/22/2006 19:10	16.7	54,100	0.9	8.1
08470500	02/22/2006 19:25	16.7	54,000	.9	8.1
08470500	02/22/2006 19:40	16.7	54,100	.8	8.1
08470500	02/22/2006 19:55	16.7	54,100	.8	8.1
08470500	02/22/2006 20:10	16.7	54,100	.8	8.1
08470500	02/22/2006 20:25	16.7	54,100	.9	8.1
08470500	02/22/2006 20:40	16.7	53,900	.9	8.1
08470500	02/22/2006 20:55	16.7	53,900	.8	8.1
08470500	02/22/2006 21:10	16.7	53,800	.9	8.1
08470500	02/22/2006 21:25	16.7	53,800	.9	8.1
08470500	02/22/2006 21:40	16.7	54,000	.9	8.1
08470500	02/22/2006 21:55	16.6	53,800	.9	8.1
08470500	02/22/2006 22:10	16.7	53,900	.9	8.1
08470500	02/22/2006 22:25	16.7	53,900	.8	8.1
08470500	02/22/2006 22:40	16.7	53,800	.9	8.1
08470500	02/22/2006 22:55	16.7	53,800	.8	8.1
08470500	02/22/2006 23:10	16.7	53,700	.9	8.1
08470500	02/22/2006 23:25	16.6	53,600	.9	8.1
08470500	02/22/2006 23:40	16.6	53,800	.8	8.1
08470500	02/22/2006 23:55	16.6	53,700	.9	8.1
08470500	02/23/2006 00:10	16.6	53,600	.9	8.1
08470500	02/23/2006 00:25	16.6	53,500	.9	8.1
08470500	02/23/2006 00:40	16.6	53,300	.9	8.1
08470500	02/23/2006 00:55	16.5	53,200	.9	8.1
08470500	02/23/2006 01:10	16.5	52,900	.9	8.1
08470500	02/23/2006 01:25	16.5	52,400	1.1	8.0
08470500	02/23/2006 01:40	16.5	52,500	1.1	8.1
08470500	02/23/2006 01:55	16.4	52,500	1.1	8.1
08470500	02/23/2006 02:10	16.4	52,500	1.0	8.1
08470500	02/23/2006 02:25	16.4	52,400	1.2	8.1
08470500	02/23/2006 02:40	16.4	52,600	1.1	8.1
08470500	02/23/2006 02:55	16.4	52,500	1.1	8.1
08470500	02/23/2006 03:10	16.4	52,900	1.1	8.1
08470500	02/23/2006 03:25	16.4	52,100	1.1	8.1
08470500	02/23/2006 03:40	16.4	52,600	1.1	8.1
08470500	02/23/2006 03:55	16.4	52,600	1.1	8.1
08470500	02/23/2006 04:10	16.4	53,000	1.0	8.1
08470500	02/23/2006 04:25	16.4	52,900	.9	8.1
08470500	02/23/2006 04:40	16.4	53,100	1.0	8.1
08470500	02/23/2006 04:55	16.4	52,800	1.0	8.1
08470500	02/23/2006 05:10	16.4	52,900	1.0	8.1
08470500	02/23/2006 05:25	16.4	53,300	.9	8.1
08470500	02/23/2006 05:40	16.4	53,000	1.1	8.1
08470500	02/23/2006 05:55	16.4	52,900	1.0	8.1
08470500	02/23/2006 06:10	16.4	53,000	1.0	8.1
08470500	02/23/2006 06:25	16.4	53,000	1.1	8.1
08470500	02/23/2006 06:40	16.2	52,800	1.2	8.1
08470500	02/23/2006 06:55	16.2	52,900	1.1	8.1
08470500	02/23/2006 07:10	16.2	52,600	1.2	8.1
08470500	02/23/2006 07:25	16.2	52,000	1.3	8.1
08470500	02/23/2006 07:40	16.4	53,000	1.0	8.1
08470500	02/23/2006 07:55	16.3	53,000	1.0	8.1
08470500	02/23/2006 08:10	16.3	52,900	1.0	8.1
08470500	02/23/2006 08:25	16.2	53,000	1.1	8.1
08470500	02/23/2006 08:40	16.2	52,500	1.1	8.1

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470500 February data-collection period—Continued					
08470500	02/23/2006 08:55	16.1	52,300	1.2	8.1
08470500	02/23/2006 09:10	16.2	52,500	1.1	8.1
08470500	02/23/2006 09:25	16.1	51,700	1.3	8.0
08470500	02/23/2006 09:40	16.1	51,800	1.2	8.0
08470500	02/23/2006 09:55	16.0	51,600	1.4	8.0
08470500	02/23/2006 10:10	15.9	51,600	1.6	8.0
08470500	02/23/2006 10:25	16.0	51,500	1.5	8.0
08470500	02/23/2006 10:40	16.0	51,100	1.6	8.0
08470500	02/23/2006 10:55	16.1	51,700	1.4	8.0
08470500	02/23/2006 11:10	15.9	51,000	1.6	8.0
08470500	02/23/2006 11:25	16.0	50,900	1.3	8.0
08470500	02/23/2006 11:40	16.0	51,600	1.3	8.0
08470500	02/23/2006 11:55	16.1	51,300	1.3	8.0
08470500	02/23/2006 12:10	16.1	51,200	1.3	8.0
08470500	02/23/2006 12:25	16.1	51,900	1.1	8.0
08470500	02/23/2006 12:40	16.1	50,800	1.1	8.0
08470500	02/23/2006 12:55	16.2	50,800	1.1	8.0
08470500	02/23/2006 13:10	16.3	50,300	1.0	8.0
08470500	02/23/2006 13:25	16.3	50,400	1.0	8.0
08470500	02/23/2006 13:40	16.4	49,700	1.0	8.0
08470500	02/23/2006 13:55	16.6	49,200	.9	8.0
08470500	02/23/2006 14:10	16.5	49,600	.9	8.0
08470500	02/23/2006 14:25	16.4	50,000	.9	8.0
Station 08470500 May data-collection period					
08470500	05/23/2006 10:45	26.7	34,200	.2	7.6
08470500	05/23/2006 11:00	26.7	33,900	.2	7.6
08470500	05/23/2006 11:15	26.7	34,100	.2	7.6
08470500	05/23/2006 11:30	26.7	34,100	.2	7.6
08470500	05/23/2006 11:45	26.7	33,900	.1	7.6
08470500	05/23/2006 12:00	26.7	33,900	.2	7.6
08470500	05/23/2006 12:15	26.7	33,600	.1	7.6
08470500	05/23/2006 12:30	26.7	33,100	.2	7.6
08470500	05/23/2006 12:45	26.7	34,300	.1	7.6
08470500	05/23/2006 13:00	26.7	33,400	.1	7.6
08470500	05/23/2006 13:15	26.7	33,700	.1	7.6
08470500	05/23/2006 13:30	26.7	33,600	.1	7.6
08470500	05/23/2006 13:45	26.7	33,300	.1	7.6
08470500	05/23/2006 14:00	26.7	33,000	.1	7.6
08470500	05/23/2006 14:15	26.7	32,700	.1	7.6
08470500	05/23/2006 14:30	26.7	33,100	.2	7.6
08470500	05/23/2006 14:45	26.7	33,300	.2	7.6
08470500	05/23/2006 15:00	26.7	33,300	.1	7.6
08470500	05/23/2006 15:15	26.7	33,400	.1	7.3
08470500	05/23/2006 15:30	26.7	33,100	.1	7.6
08470500	05/23/2006 15:45	26.7	33,100	.1	7.6
08470500	05/23/2006 16:00	26.7	33,000	.1	7.6
08470500	05/23/2006 16:15	26.7	33,800	.1	7.6
08470500	05/23/2006 16:30	26.7	33,900	.1	7.6
08470500	05/23/2006 16:45	26.7	33,200	.1	7.6
08470500	05/23/2006 17:00	26.7	33,500	.1	7.6
08470500	05/23/2006 17:15	26.7	34,000	.1	7.6
08470500	05/23/2006 17:30	26.7	34,000	.1	7.6
08470500	05/23/2006 17:45	26.7	33,800	.1	7.6
08470500	05/23/2006 18:00	26.7	33,800	.1	7.6
08470500	05/23/2006 18:15	26.7	33,600	.1	7.6
08470500	05/23/2006 18:30	26.7	34,300	0.1	7.6
08470500	05/23/2006 18:45	26.7	33,700	.1	7.6
08470500	05/23/2006 19:00	26.7	33,600	.1	7.6
08470500	05/23/2006 19:15	26.7	33,700	.1	7.6
08470500	05/23/2006 19:30	26.6	34,400	.1	7.6
08470500	05/23/2006 19:45	26.7	34,000	.1	7.6
08470500	05/23/2006 20:00	26.7	33,700	.1	7.6
08470500	05/23/2006 20:15	26.7	33,800	.1	7.6
08470500	05/23/2006 20:30	26.7	33,300	.1	7.6
08470500	05/23/2006 20:45	26.7	33,200	.1	7.6
08470500	05/23/2006 21:00	26.8	30,400	.1	7.6
08470500	05/23/2006 21:15	26.7	31,100	.1	7.6
08470500	05/23/2006 21:30	26.8	29,300	.1	7.6
08470500	05/23/2006 21:45	26.8	30,800	.1	7.6
08470500	05/23/2006 22:00	26.8	31,400	.1	7.6
08470500	05/23/2006 22:15	26.8	30,300	.1	7.6
08470500	05/23/2006 22:30	26.8	30,300	.1	7.6
08470500	05/23/2006 22:45	26.8	30,100	.1	7.6
08470500	05/23/2006 23:00	27.0	27,700	.1	7.6
08470500	05/23/2006 23:15	27.1	26,100	.1	7.6
08470500	05/23/2006 23:30	27.0	26,900	.1	7.6
08470500	05/23/2006 23:45	27.2	24,700	.1	7.5
08470500	05/24/2006 00:00	27.2	24,700	.1	7.5
08470500	05/24/2006 00:15	27.2	24,700	.1	7.5
08470500	05/24/2006 00:30	27.1	26,000	.1	7.5
08470500	05/24/2006 00:45	27.2	24,800	.1	7.5
08470500	05/24/2006 01:00	27.1	26,200	.1	7.5
08470500	05/24/2006 01:15	27.1	26,900	.1	7.6
08470500	05/24/2006 01:30	26.9	29,700	.1	7.6
08470500	05/24/2006 01:45	26.9	29,800	.1	7.6
08470500	05/24/2006 02:00	26.8	31,100	.1	7.6
08470500	05/24/2006 02:15	26.8	31,900	.1	7.6
08470500	05/24/2006 02:30	26.7	32,700	.1	7.6
08470500	05/24/2006 02:45	26.7	32,300	.1	7.6
08470500	05/24/2006 03:00	26.8	32,200	.1	7.6
08470500	05/24/2006 03:15	26.7	32,400	.1	7.6
08470500	05/24/2006 03:30	26.7	32,700	.1	7.6
08470500	05/24/2006 03:45	26.7	32,500	.1	7.6
08470500	05/24/2006 04:00	26.7	34,200	.1	7.6
08470500	05/24/2006 04:15	26.7	32,400	.1	7.6
08470500	05/24/2006 04:30	26.7	33,600	.1	7.6
08470500	05/24/2006 04:45	26.7	33,200	.1	7.6
08470500	05/24/2006 05:00	26.6	34,300	.1	7.6
08470500	05/24/2006 05:15	26.7	32,900	.1	7.6
08470500	05/24/2006 05:30	26.8	30,400	.1	7.6
08470500	05/24/2006 05:45	26.9	30,200	.1	7.6
08470500	05/24/2006 06:00	27.0	29,200	.1	7.6
08470500	05/24/2006 06:15	26.9	29,800	.1	7.6
08470500	05/24/2006 06:30	26.8	31,800	.1	7.6
08470500	05/24/2006 06:45	26.8	31,900	.1	7.6
08470500	05/24/2006 07:00	26.8	31,500	.1	7.6
08470500	05/24/2006 07:15	26.8	31,900	.1	7.6
08470500	05/24/2006 07:30	26.8	31,300	.1	7.6
08470500	05/24/2006 07:45	26.8	31,300	.1	7.6
08470500	05/24/2006 08:00	26.7	31,800	.1	7.5

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470500 May data-collection period—Continued					
08470500	05/24/2006 08:15	26.7	32,100	0.1	7.6
08470500	05/24/2006 08:30	26.8	31,400	.1	7.6
08470500	05/24/2006 08:45	27.2	25,000	.7	7.6
08470500	05/24/2006 09:00	27.0	27,900	.3	7.6
08470500	05/24/2006 09:15	26.9	29,600	.2	7.6
08470500	05/24/2006 09:30	27.0	28,400	.1	7.6
08470500	05/24/2006 09:45	27.1	27,000	.1	7.6
08470500	05/24/2006 10:00	27.1	27,100	.1	7.6
08470500	05/24/2006 10:15	27.0	28,400	.1	7.6
08470500	05/24/2006 10:30	27.0	28,800	.1	7.4
08470500	05/24/2006 10:45	26.9	29,700	.1	7.4
08470500	05/24/2006 11:00	26.9	29,300	.1	7.5
08470500	05/24/2006 11:15	27.0	28,600	.1	7.5
08470500	05/24/2006 11:30	27.0	28,900	.1	7.5
08470500	05/24/2006 11:45	27.0	28,400	.1	7.6
08470500	05/24/2006 12:00	27.0	28,300	.1	7.6
08470500	05/24/2006 12:15	27.1	26,900	.1	7.6
08470500	05/24/2006 12:30	27.0	28,100	.1	7.6
08470500	05/24/2006 12:45	27.0	27,300	.1	7.5
08470500	05/24/2006 13:00	27.1	26,300	.1	7.6
08470500	05/24/2006 13:15	27.0	28,300	.1	7.6
Station 08470520 February data-collection period					
08470520	02/22/2006 12:00	17.2	55,000	.8	8.0
08470520	02/22/2006 12:15	17.2	55,000	.8	8.0
08470520	02/22/2006 12:30	17.2	55,000	.8	8.1
08470520	02/22/2006 12:45	17.1	55,000	.8	8.1
08470520	02/22/2006 13:00	17.2	55,000	.8	8.1
08470520	02/22/2006 13:15	17.2	55,100	.8	8.1
08470520	02/22/2006 13:30	17.2	55,100	.8	8.1
08470520	02/22/2006 13:45	17.2	55,100	.7	8.1
08470520	02/22/2006 14:00	17.2	55,100	.8	8.1
08470520	02/22/2006 14:15	17.2	55,100	.8	8.1
08470520	02/22/2006 14:30	17.2	55,100	.7	8.1
08470520	02/22/2006 14:45	17.2	55,100	.7	8.1
08470520	02/22/2006 15:00	17.3	55,100	.7	8.1
08470520	02/22/2006 15:15	17.3	55,100	.7	8.1
08470520	02/22/2006 15:30	17.3	55,100	.7	8.1
08470520	02/22/2006 15:45	17.3	55,200	.7	8.1
08470520	02/22/2006 16:00	17.3	55,200	.6	8.1
08470520	02/22/2006 16:15	17.4	55,200	.6	8.1
08470520	02/22/2006 16:30	17.4	55,300	.6	8.1
08470520	02/22/2006 16:45	17.4	55,300	.6	8.1
08470520	02/22/2006 17:00	17.4	55,300	.6	8.1
08470520	02/22/2006 17:15	17.4	55,300	.6	8.1
08470520	02/22/2006 17:30	17.4	55,300	.5	8.1
08470520	02/22/2006 17:45	17.4	55,300	.5	8.1
08470520	02/22/2006 18:00	17.4	55,300	.6	8.1
08470520	02/22/2006 18:15	17.4	55,300	.5	8.1
08470520	02/22/2006 18:30	17.4	55,300	.5	8.1
08470520	02/22/2006 18:45	17.4	55,300	.5	8.1
08470520	02/22/2006 19:00	17.4	55,300	.5	8.1
08470520	02/22/2006 19:15	17.4	55,300	.6	8.1
08470520	02/22/2006 19:30	17.4	55,300	.5	8.1
08470520	02/22/2006 19:45	17.4	55,300	.5	8.1
08470520	02/22/2006 20:00	17.4	55,300	.5	8.1
08470520	02/22/2006 20:15	17.4	55,300	0.5	8.1
08470520	02/22/2006 20:30	17.4	55,300	.4	8.1
08470520	02/22/2006 20:45	17.4	55,300	.5	8.1
08470520	02/22/2006 21:00	17.4	55,300	.5	8.1
08470520	02/22/2006 21:15	17.4	55,300	.4	8.1
08470520	02/22/2006 21:30	17.4	55,300	.5	8.1
08470520	02/22/2006 21:45	17.4	55,300	.5	8.1
08470520	02/22/2006 22:00	17.4	55,200	.4	8.1
08470520	02/22/2006 22:15	17.4	55,200	.4	8.1
08470520	02/22/2006 22:30	17.4	55,200	.4	8.1
08470520	02/22/2006 22:45	17.4	55,200	.5	8.1
08470520	02/22/2006 23:00	17.4	55,200	.5	8.1
08470520	02/22/2006 23:15	17.4	55,200	.5	8.1
08470520	02/22/2006 23:30	17.3	55,100	.5	8.1
08470520	02/22/2006 23:45	17.3	55,100	.5	8.1
08470520	02/23/2006 00:00	17.3	55,100	.5	8.1
08470520	02/23/2006 00:15	17.3	55,000	.5	8.1
08470520	02/23/2006 00:30	17.3	55,000	.5	8.1
08470520	02/23/2006 00:45	17.3	55,000	.5	8.1
08470520	02/23/2006 01:00	17.2	55,000	.5	8.1
08470520	02/23/2006 01:15	17.2	55,000	.5	8.1
08470520	02/23/2006 01:30	17.2	55,000	.6	8.1
08470520	02/23/2006 01:45	17.2	55,000	.5	8.1
08470520	02/23/2006 02:00	17.2	54,900	.5	8.1
08470520	02/23/2006 02:15	17.2	54,900	.6	8.1
08470520	02/23/2006 02:30	17.2	54,900	.5	8.1
08470520	02/23/2006 02:45	17.1	54,900	.6	8.1
08470520	02/23/2006 03:00	17.1	54,900	.6	8.1
08470520	02/23/2006 03:15	17.1	54,900	.5	8.1
08470520	02/23/2006 03:30	17.1	54,900	.6	8.1
08470520	02/23/2006 03:45	17.1	54,900	.6	8.1
08470520	02/23/2006 04:00	17.2	54,900	.5	8.1
08470520	02/23/2006 04:15	17.2	54,900	.6	8.1
08470520	02/23/2006 04:30	17.2	54,900	.5	8.1
08470520	02/23/2006 04:45	17.1	54,800	.5	8.1
08470520	02/23/2006 05:00	17.1	54,800	.6	8.1
08470520	02/23/2006 05:15	17.2	54,900	.5	8.1
08470520	02/23/2006 05:30	17.2	54,800	.5	8.1
08470520	02/23/2006 05:45	17.1	54,800	.5	8.1
08470520	02/23/2006 06:00	17.2	54,800	.5	8.1
08470520	02/23/2006 06:15	17.1	54,900	.5	8.1
08470520	02/23/2006 06:30	17.2	54,900	.5	8.1
08470520	02/23/2006 06:45	17.2	54,900	.5	8.1
08470520	02/23/2006 07:00	17.2	54,900	.5	8.1
08470520	02/23/2006 07:15	17.2	54,900	.4	8.1
08470520	02/23/2006 07:30	17.2	54,900	.4	8.1
08470520	02/23/2006 07:45	17.1	54,800	.5	8.1
08470520	02/23/2006 08:00	17.2	54,900	.4	8.1
08470520	02/23/2006 08:15	17.2	54,900	.5	8.1
08470520	02/23/2006 08:30	17.2	54,900	.5	8.1
08470520	02/23/2006 08:45	17.2	55,000	.3	8.1
08470520	02/23/2006 09:00	17.3	55,000	.3	8.1
08470520	02/23/2006 09:15	17.2	54,900	.4	8.1
08470520	02/23/2006 09:30	17.2	54,900	.3	8.1
08470520	02/23/2006 09:45	17.2	54,900	.4	8.1

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470520 February data-collection period—Continued					
08470520	02/23/2006 10:00	17.2	54,900	0.4	8.1
08470520	02/23/2006 10:15	17.2	54,900	.4	8.1
08470520	02/23/2006 10:30	17.2	54,900	.3	8.1
08470520	02/23/2006 10:45	17.2	54,900	.4	8.1
08470520	02/23/2006 11:00	17.2	54,900	.4	8.1
08470520	02/23/2006 11:15	17.2	54,800	.4	8.1
08470520	02/23/2006 11:30	17.2	54,900	.4	8.1
08470520	02/23/2006 11:45	17.1	54,900	.4	8.1
08470520	02/23/2006 12:00	17.1	54,800	.4	8.1
08470520	02/23/2006 12:15	17.2	54,800	.4	8.1
08470520	02/23/2006 12:30	17.2	54,900	.3	8.1
08470520	02/23/2006 12:45	17.2	54,900	.4	8.1
08470520	02/23/2006 13:00	17.2	54,800	.4	8.1
08470520	02/23/2006 13:15	17.2	54,800	.3	8.1
08470520	02/23/2006 13:30	17.2	54,900	.3	8.1
08470520	02/23/2006 13:45	17.2	54,900	.2	8.1
08470520	02/23/2006 14:00	17.2	54,900	.2	8.1
08470520	02/23/2006 14:15	17.2	54,800	.2	8.1
08470520	02/23/2006 14:30	17.1	54,700	.3	8.1
08470520	02/23/2006 14:45	17.1	54,800	.3	8.1
Station 08470520 May data-collection period					
08470520	05/23/2006 10:15	26.8	31,700	.2	7.5
08470520	05/23/2006 10:30	26.8	31,800	.2	7.5
08470520	05/23/2006 10:45	26.8	32,600	.1	7.5
08470520	05/23/2006 11:00	26.8	31,900	.1	7.5
08470520	05/23/2006 11:15	26.8	32,100	.1	7.5
08470520	05/23/2006 11:30	26.8	31,200	.1	7.5
08470520	05/23/2006 11:45	26.8	31,500	.1	7.5
08470520	05/23/2006 12:00	26.8	31,200	.1	7.5
08470520	05/23/2006 12:15	26.8	31,100	.1	7.6
08470520	05/23/2006 12:30	26.8	30,900	.1	7.6
08470520	05/23/2006 12:45	26.8	31,000	.1	7.6
08470520	05/23/2006 13:00	26.8	30,400	.1	7.6
08470520	05/23/2006 13:15	26.8	30,400	.1	7.6
08470520	05/23/2006 13:30	26.8	30,500	.1	7.6
08470520	05/23/2006 13:45	26.8	30,100	.1	7.6
08470520	05/23/2006 14:00	26.8	30,200	.1	7.6
08470520	05/23/2006 14:15	26.8	30,400	.1	7.6
08470520	05/23/2006 14:30	26.8	30,300	.1	7.6
08470520	05/23/2006 14:45	26.8	30,400	.1	7.6
08470520	05/23/2006 15:00	26.8	30,300	.1	7.6
08470520	05/23/2006 15:15	26.8	29,500	.1	7.5
08470520	05/23/2006 15:30	26.8	30,800	.1	7.6
08470520	05/23/2006 15:45	26.8	30,800	.1	7.6
08470520	05/23/2006 16:00	26.8	30,900	.1	7.6
08470520	05/23/2006 16:15	26.8	30,700	.1	7.6
08470520	05/23/2006 16:30	26.7	32,500	.1	7.5
08470520	05/23/2006 16:45	26.7	32,300	.1	7.5
08470520	05/23/2006 17:00	26.7	32,700	.1	7.5
08470520	05/23/2006 17:15	26.7	32,200	.1	7.5
08470520	05/23/2006 17:30	26.7	33,300	.1	7.5
08470520	05/23/2006 17:45	26.7	33,500	.1	7.5
08470520	05/23/2006 18:00	26.7	32,400	.1	7.5
08470520	05/23/2006 18:15	26.7	32,000	.1	7.5
08470520	05/23/2006 18:30	26.7	32,800	.1	7.5
08470520	05/23/2006 18:45	26.8	31,800	0.1	7.5
08470520	05/23/2006 19:00	26.7	32,500	.1	7.5
08470520	05/23/2006 19:15	26.7	32,800	.1	7.5
08470520	05/23/2006 19:30	26.7	31,900	.1	7.5
08470520	05/23/2006 19:45	26.7	32,400	.1	7.5
08470520	05/23/2006 20:00	26.7	33,600	.1	7.5
08470520	05/23/2006 20:15	26.7	33,300	.1	7.5
08470520	05/23/2006 20:30	26.8	32,100	.1	7.5
08470520	05/23/2006 20:45	26.8	32,100	.1	7.5
08470520	05/23/2006 21:00	26.7	32,200	.1	7.5
08470520	05/23/2006 21:15	26.8	31,800	.1	7.6
08470520	05/23/2006 21:30	26.7	32,100	.1	7.6
08470520	05/23/2006 21:45	26.7	32,300	.1	7.5
08470520	05/23/2006 22:00	26.7	32,300	.1	7.5
08470520	05/23/2006 22:15	26.7	32,700	.1	7.5
08470520	05/23/2006 22:30	26.7	33,500	.1	7.5
08470520	05/23/2006 22:45	26.7	33,500	.1	7.5
08470520	05/23/2006 23:00	26.6	34,200	.1	7.5
08470520	05/23/2006 23:15	26.6	34,400	.1	7.5
08470520	05/23/2006 23:30	26.6	34,600	.1	7.5
08470520	05/23/2006 23:45	26.6	34,700	.1	7.5
08470520	05/24/2006 00:00	26.6	35,900	.1	7.5
08470520	05/24/2006 00:15	26.6	35,400	.1	7.5
08470520	05/24/2006 00:30	26.6	36,000	.1	7.5
08470520	05/24/2006 00:45	26.6	36,100	.1	7.5
08470520	05/24/2006 01:00	26.7	32,700	.1	7.6
08470520	05/24/2006 01:15	26.7	32,000	.1	7.6
08470520	05/24/2006 01:30	26.7	31,100	.1	7.6
08470520	05/24/2006 01:45	26.7	32,200	.1	7.6
08470520	05/24/2006 02:00	26.7	32,500	.1	7.6
08470520	05/24/2006 02:15	26.7	32,300	.1	7.6
08470520	05/24/2006 02:30	26.7	32,500	.1	7.6
08470520	05/24/2006 02:45	26.7	32,100	.1	7.6
08470520	05/24/2006 03:00	26.6	32,300	.1	7.6
08470520	05/24/2006 03:15	26.7	32,200	.1	7.6
08470520	05/24/2006 03:30	26.7	32,100	.1	7.6
08470520	05/24/2006 03:45	26.6	32,500	.1	7.6
08470520	05/24/2006 04:00	26.7	31,600	.1	7.6
08470520	05/24/2006 04:15	26.7	32,700	.1	7.6
08470520	05/24/2006 04:30	26.7	32,600	.1	7.6
08470520	05/24/2006 04:45	26.7	32,800	.1	7.6
08470520	05/24/2006 05:00	26.6	33,600	.1	7.6
08470520	05/24/2006 05:15	26.6	34,400	.1	7.6
08470520	05/24/2006 05:30	26.5	35,800	.1	7.5
08470520	05/24/2006 05:45	26.4	38,400	.1	7.5
08470520	05/24/2006 06:00	26.5	36,000	.1	7.5
08470520	05/24/2006 06:15	26.4	37,300	.1	7.5
08470520	05/24/2006 06:30	26.4	37,600	.1	7.5
08470520	05/24/2006 06:45	26.3	40,300	0	7.5
08470520	05/24/2006 07:00	26.3	40,100	.1	7.5
08470520	05/24/2006 07:15	26.3	40,300	.1	7.5
08470520	05/24/2006 07:30	26.2	41,600	.1	7.5
08470520	05/24/2006 07:45	26.2	41,800	.1	7.6
08470520	05/24/2006 08:00	26.2	41,800	.1	7.5
08470520	05/24/2006 08:15	26.2	41,900	.1	7.6

Appendix 1–1.2. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470520 May data-collection period—Continued					
08470520	05/24/2006 08:30	26.2	41,700	0.1	7.6
08470520	05/24/2006 08:45	26.2	41,700	.1	7.6
08470520	05/24/2006 09:00	26.3	40,500	.1	7.6
08470520	05/24/2006 09:15	27.0	27,900	1.8	7.8
08470520	05/24/2006 09:30	26.9	29,400	1.2	7.8
08470520	05/24/2006 09:45	26.8	29,500	.6	7.8
08470520	05/24/2006 10:00	26.7	30,800	.1	7.8
08470520	05/24/2006 10:15	27.0	27,700	.5	7.8
08470520	05/24/2006 10:30	26.9	28,300	.3	7.8
08470520	05/24/2006 10:45	26.8	29,600	.1	7.8
08470520	05/24/2006 11:00	26.9	29,200	.1	7.8
08470520	05/24/2006 11:15	26.8	30,100	0.1	7.8
08470520	05/24/2006 11:30	26.9	28,600	.1	7.7
08470520	05/24/2006 11:45	26.9	28,400	.1	7.7
08470520	05/24/2006 12:00	26.9	28,700	.1	7.7
08470520	05/24/2006 12:15	26.9	28,400	.1	7.7
08470520	05/24/2006 12:30	26.9	28,500	.1	7.7
08470520	05/24/2006 12:45	26.9	28,500	.1	7.7
08470520	05/24/2006 13:00	27.0	27,800	.1	7.7
08470520	05/24/2006 13:15	27.0	27,000	.1	7.7
08470520	05/24/2006 13:30	27.1	26,400	.1	7.7

Appendix 1–1.3. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using sediment traps.

[$mg/m^2/hr$, milligrams per square meter per hour; --, not sampled; values manually rounded]

USGS station no.	Date and time	Total nonfilterable residue ($mg/m^2/hr$)	Ignition loss from nonfilterable residue ($mg/m^2/hr$)	Total carbon suspended sediment ($mg/m^2/hr$)	Particulate nitrogen suspended in water ($mg/m^2/hr$)
08470450	02/24/2006 14:00	34,690	5,900	571.0	30.0
08470450	02/24/2006 14:05	32,610	5,190	--	--
08470460	02/24/2006 13:00	6,682	1,170	59.9	4.0
08470460	02/24/2006 13:05	8,368	1,810	--	--
08470460	05/24/2006 08:00	25,050	4,320	--	--
08470460	05/24/2006 08:05	23,750	4,530	--	--
08470500	02/24/2006 12:00	1,521	266	30.8	2.0
08470500	02/24/2006 12:05	1,285	270	--	--
08470520	02/24/2006 11:00	1,237	169	187.0	10.0
08470520	02/24/2006 11:05	1,442	308	--	--
08470520	05/24/2006 07:00	2,525	498	--	--
08470520	05/24/2006 07:05	2,555	477	--	--

Appendix 1–1.4a. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using environmental discrete-sample analysis, February 2006.

[ft, feet; FNMU, formazin nephelometric units; mmHg, millimeters of mercury; mg/L, milligrams per liter; --, not sampled; E, estimated; PSU, practical salinity units; µS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; $CaCO_3$, calcium carbonate; N, nitrogen; NH_4, ammonia; NO_3, nitrate; P, phosphorus; µg/L, micrograms per liter; <, less than]

Constituent	08470450		08470460		08470500		08470520	
	02/22/2006 17:00	02/23/2006 11:00	02/22/2006 16:00	02/23/2006 10:00	02/22/2006 15:00	02/23/2006 09:00	02/22/2006 14:30	02/23/2006 08:00
Sampling depth (ft)	4	4	14	14	14	14	14	14
Turbidity (FNMU)	210.0	120.0	22.0	15.0	8.0	9.4	6.2	6.4
Barometric pressure (mmHg)	762	762	761	762	760	760	762	762
Carbon dioxide (mg/L)	--	--	--	--	--	--	--	--
Dissolved oxygen (mg/L)	8.1	6.7	E.8	E.5	E1.0	E1.2	E.7	E.4
Dissolved oxygen (percent of saturation)	89	76	E10	E6	E13	E15	E9	E5
pH (standard units)	7.7	7.6	8.0	8.0	8.1	8.1	8.1	8.1
Salinity (PSU)	2	2	34	34	35	34	36	36
Specific conductance (µS/cm)	3,620	3,780	51,500	51,700	53,600	52,300	55,100	54,900
Temperature, air (°C)	E23.0	E21.0	E23.0	E21.0	E23.0	E21.0	E23.0	E21.0
Temperature, water (°C)	19.2	20.6	16.0	16.1	16.6	16.1	17.0	17.2
Acid neutralizing capacity (mg/L as $CaCO_3$)	--	--	--	--	--	--	--	--
Chloride (mg/L)	660	640	16,000	19,000	18,000	19,000	20,000	16,000
Sulfate (mg/L)	640	630	2,600	2,800	2,600	2,700	2,700	2,600
Residue on evaporation dried at 180 °C (mg/L)	2,300	2,400	33,000	34,000	33,000	34,000	36,000	36,000
Fixed nonfilterable residue (mg/L)	74	79	14	10	10	7	8	5
Total nonfilterable residue (mg/L)	100	100	22	14	16	11	12	10
Ignition loss from nonfilterable residue (mg/L)	26.0	21.0	8.4	4.4	5.6	4.4	4.4	4.8
Ammonia plus organic nitrogen (mg/L as N)	1.10	.90	.97	1.20	1.30	.85	.62	.67
Ammonia (mg/L as NH_4)	.32	.35	.88	.89	.93	.80	.71	.70
Ammonia (mg/L as N)	.25	.27	.68	.69	.72	.62	.55	.54
Nitrite plus nitrate (mg/L as N)	5.20	5.10	.26	.48	.86	.36	.46	.27
Organic nitrogen (mg/L)	.85	.63	.29	.51	.58	.23	.07	.13
Particulate nitrogen (mg/L)	.45	.48	.25	.30	.20	.25	.22	.31
Total nitrogen (mg/L)	6.3	6.0	1.2	1.7	2.2	1.2	1.1	.9
Total nitrogen (mg/L as NO_3)	27.9	26.6	5.4	7.4	9.6	5.4	4.8	4.2
Orthophosphate (mg/L)	.399	1.660	.043	.227	.399	.399	.175	.267
Orthophosphate (mg/L as P)	.130	.540	.014	.074	.130	.130	.057	.087
Phosphate (mg/L)	.560	.550	.094	.088	.120	.150	.088	.088
Phosphorus (mg/L)	E.34	E.39	E.20	E.24	E.24	E.24	E.18	E.16
Carbon (inorganic plus organic) suspended sediment (mg/L)	6.0	5.5	1.8	1.6	1.1	1.1	1.0	1.1
Organic carbon, filtered (mg/L)	3.4	E3.2	5.7	E5.3	5.6	E5.5	5.4	E4.1
Organic carbon, unfiltered (mg/L)	3.9	4.0	5.7	6.2	5.6	5.6	5.6	5.6
Biochemical oxygen demand (mg/L)	2.9	2.9	<2.0	<2.0	2.2	<2.0	<2.0	<2.0
Chlorophyll *a* (µg/L)	E19.0	E18.0	<5.00	--	<5.00	<5.00	<5.00	<5.00
Pheophytin *a* (µg/L)	E6.00	<5.00	<5.00	--	<5.00	<5.00	<5.00	<5.00

Appendix 1–1.4b. Data collected at near-bottom depth of the Arroyo Colorado near Rio Hondo, Texas, using environmental discrete-sample analysis, May 2006.

[ft, feet; FNMU, formazin nephelometric units; mmHg, millimeters of mercury; mg/L, milligrams per liter; --, not sampled; E, estimated; PSU, practical salinity units; µS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; $CaCO_3$, calcium carbonate; N, nitrogen; NH_4, ammonia; NO_3, nitrate; P, phosphorus; µg/l, micrograms per liter; <, less than]

Constituent	08470450		08470460		08470500		08470520	
	05/23/2006 11:00	05/24/2006 11:00	05/23/2006 12:00	05/24/2006 10:00	05/23/2006 13:00	05/24/2006 09:00	05/23/2006 14:00	05/24/2006 07:00
Sampling depth (ft)	4	4	10	10	10	10	10	10
Turbidity (FNMU)	110	140	38	36	12	52	8.4	17
Barometric pressure (mmHg)	760	760	760	762	761	762	760	760
Carbon dioxide (mg/L)	4.5	3.9	1.5	.7	2.5	1.3	8.7	--
Dissolved oxygen (mg/L)	5.3	4.8	E.6	E.1	E.8	E.1	E.3	E.1
Dissolved oxygen (percent of saturation)	69	63	--	--	--	--	--	--
pH (standard units)	8.0	8.0	8.4	8.7	8.1	8.4	7.5	9.5
Salinity (PSU)	2	2	20	22	26	19	15	29
Specific conductance (µS/cm)	4,310	4,350	31,900	35,300	41,100	29,900	24,600	45,000
Temperature, air (°C)	32.8	31.1	33.9	28.9	33.9	28.9	33.9	23.9
Temperature, water (°C)	28.1	28.2	26.9	26.7	26.3	26.9	27.0	25.5
Acid neutralizing capacity (mg/L as $CaCO_3$)	210	210	180	180	170	170	160	--
Chloride (mg/L)	830	860	13,000	10,000	11,000	11,000	13,000	12,000
Sulfate (mg/L)	870	920	2,100	1,900	1,900	1,900	2,100	2,100
Residue on evaporation dried at 180 °C (mg/L)	2,700	2,800	22,000	20,000	19,000	18,000	18,000	21,000
Fixed nonfilterable residue (mg/L)	81	82	10	18	6	15	4	12
Total nonfilterable residue (mg/L)	E100	E110	E18	E27	E16	E28	E13	E26
Ignition loss from nonfilterable residue (mg/L)	E19.0	E28.0	E7.6	E8.8	E10.0	E13.0	E8.8	E14.0
Ammonia plus organic nitrogen (mg/L as N)	1.10	1.20	1.70	2.20	1.50	1.80	1.60	1.40
Ammonia (mg/L as NH_4)	.22	.15	1.80	1.67	1.16	1.15	1.24	.91
Ammonia (mg/L as N)	.17	.12	1.40	1.30	.90	.89	.96	.71
Nitrite plus nitrate (mg/L as N)	4.10	1.80	.22	.10	.44	.65	.02	1.70
Organic nitrogen (mg/L)	.93	1.10	.30	.90	.60	.91	.64	.69
Particulate nitrogen (mg/L)	--	--	--	--	--	--	--	--
Total nitrogen (mg/L)	5.2	3.0	1.9	2.3	1.9	2.4	1.6	3.1
Total nitrogen (mg/L as NO_3)	23.0	13.3	8.5	10.2	8.6	10.8	7.2	13.7
Orthophosphate (mg/L)	1.870	1.870	1.130	1.200	.221	1.070	1.320	.705
Orthophosphate (mg/L as P)	.610	.610	.370	.390	.072	.350	.430	.230
Phosphate (mg/L)	--	--	--	--	--	--	--	--
Phosphorus (mg/L)	.64	.56	.54	.54	.37	.45	.36	.40
Carbon (inorganic plus organic) suspended sediment (mg/L)	--	--	--	--	--	--	--	--
Organic carbon, filtered (mg/L)	4.4	4.3	5.0	4.7	4.8	5.6	5.3	6.4
Organic carbon, unfiltered (mg/L)	4.7	4.6	5.5	5.4	5.5	6.2	9.2	7.7
Biochemical oxygen demand (mg/L)	3.3	3.2	5.0	4.5	2.4	E8.8	E8.0	E8.6
Chlorophyll *a* (µg/L)	E42.0	E35.0	E13.0	E5.70	E16.0	E57.0	E140	E93.0
Pheophytin *a* (µg/L)	E18.0	E19.0	E3.30	E5.30	<3.00	<3.00	E6.90	E16.0

Appendix 1–2.1. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using algal productivity methods.

[mg O_2/m^3/day, milligrams of oxygen per cubic meter per day; negative value signifies a deficit of oxygen and positive value signifies accumulation of oxygen; values manually rounded.]

USGS station no.	Date	Data-collection period	Gross primary productivity (mg O_2/m^3/day)	Net primary productivity (mg O_2/m^3/day)	Respiration (mg O_2/m^3/day)
08470460	02/22/2006	February	9,068	6,547	2,521
08470460	05/23/2006	May	16,452	12,875	3,576
08470500	02/22/2006	February	8,243	4,529	3,714
08470500	05/23/2006	May	35,660	31,820	3,840

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors.

[°C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter. Dissolved oxygen values less than 2.0 mg/L reported here to show resolution in a low dissolved oxygen environment, rather than set all values to <2.0 mg/L; zero values should be interpreted as <0.1 mg/L]

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470450 February data-collection period					
08470450	02/22/2006 10:30	17.8	3,540	7.8	7.6
08470450	02/22/2006 10:45	17.9	3,540	7.8	7.6
08470450	02/22/2006 11:00	18.1	3,480	7.9	7.7
08470450	02/22/2006 11:15	18.1	3,510	7.9	7.7
08470450	02/22/2006 11:30	18.1	3,540	7.8	7.7
08470450	02/22/2006 11:45	18.3	3,480	7.8	7.7
08470450	02/22/2006 12:00	18.2	3,530	7.9	7.7
08470450	02/22/2006 12:15	18.3	3,540	7.9	7.7
08470450	02/22/2006 12:30	18.4	3,540	7.9	7.7
08470450	02/22/2006 12:45	18.4	3,540	8.0	7.7
08470450	02/22/2006 13:00	18.6	3,540	8.0	7.7
08470450	02/22/2006 13:15	18.6	3,540	8.0	7.7
08470450	02/22/2006 13:30	18.7	3,540	8.0	7.7
08470450	02/22/2006 13:45	18.7	3,560	8.1	7.7
08470450	02/22/2006 14:00	18.8	3,540	8.0	7.7
08470450	02/22/2006 14:15	19.0	3,540	8.1	7.7
08470450	02/22/2006 14:30	19.0	3,560	8.1	7.7
08470450	02/22/2006 14:45	19.1	3,560	8.1	7.7
08470450	02/22/2006 15:00	19.4	3,500	8.2	7.7
08470450	02/22/2006 15:15	19.5	3,520	8.1	7.7
08470450	02/22/2006 15:30	19.6	3,500	8.2	7.8
08470450	02/22/2006 15:45	19.5	3,540	8.2	7.7
08470450	02/22/2006 16:00	19.7	3,520	8.2	7.8
08470450	02/22/2006 16:15	19.7	3,540	8.2	7.8
08470450	02/22/2006 16:30	19.8	3,570	8.2	7.7
08470450	02/22/2006 16:45	19.8	3,550	8.5	7.8
08470450	02/22/2006 17:00	19.5	3,640	8.2	7.7
08470450	02/22/2006 17:15	19.5	3,640	8.2	7.7
08470450	02/22/2006 17:30	19.5	3,640	8.1	7.7
08470450	02/22/2006 17:45	19.6	3,650	8.1	7.7
08470450	02/22/2006 18:00	19.6	3,650	8.1	7.7
08470450	02/22/2006 18:15	19.6	3,660	8.1	7.7
08470450	02/22/2006 18:30	19.6	3,670	8.1	7.7
08470450	02/22/2006 18:45	19.6	3,710	8.1	7.7
08470450	02/22/2006 19:00	19.6	3,690	8.0	7.7
08470450	02/22/2006 19:15	19.6	3,810	8.0	7.7
08470450	02/22/2006 19:30	19.6	3,790	8.0	7.7
08470450	02/22/2006 19:45	19.6	3,800	8.0	7.7
08470450	02/22/2006 20:00	19.6	3,800	7.9	7.7
08470450	02/22/2006 20:15	19.6	3,750	7.9	7.7
08470450	02/22/2006 20:30	19.6	3,750	7.9	7.7
08470450	02/22/2006 20:45	19.7	3,760	7.8	7.7
08470450	02/22/2006 21:00	19.7	3,820	7.8	7.7
08470450	02/22/2006 21:15	19.7	3,760	7.8	7.7
08470450	02/22/2006 21:30	19.7	3,740	7.7	7.7
08470450	02/22/2006 21:45	19.7	3,750	7.7	7.7
08470450	02/22/2006 22:00	19.7	3,790	7.7	7.7
08470450	02/22/2006 22:15	19.8	3,820	7.6	7.7
08470450	02/22/2006 22:30	19.8	3,770	7.6	7.7
08470450	02/22/2006 22:45	19.8	3,740	7.6	7.7
08470450	02/22/2006 23:00	19.8	3,740	7.5	7.7
08470450	02/22/2006 23:15	19.8	3,740	7.5	7.7
08470450	02/22/2006 23:30	19.9	3,740	7.4	7.7
08470450	02/22/2006 23:45	19.9	3,740	7.4	7.7
08470450	02/23/2006 00:00	20.0	3,750	7.4	7.7
08470450	02/23/2006 00:15	20.0	3,750	7.3	7.7
08470450	02/23/2006 00:30	20.0	3,750	7.3	7.7
08470450	02/23/2006 00:45	20.1	3,760	7.2	7.7
08470450	02/23/2006 01:00	20.1	3,760	7.2	7.7
08470450	02/23/2006 01:15	20.2	3,760	7.2	7.7
08470450	02/23/2006 01:30	20.2	3,760	7.2	7.7
08470450	02/23/2006 01:45	20.3	3,760	7.1	7.7
08470450	02/23/2006 02:00	20.3	3,760	7.1	7.7
08470450	02/23/2006 02:15	20.4	3,760	7.1	7.7
08470450	02/23/2006 02:30	20.4	3,760	7.0	7.7
08470450	02/23/2006 02:45	20.4	3,760	7.0	7.7
08470450	02/23/2006 03:00	20.5	3,750	7.0	7.7
08470450	02/23/2006 03:15	20.5	3,750	7.0	7.7
08470450	02/23/2006 03:30	20.6	3,740	7.0	7.7
08470450	02/23/2006 03:45	20.6	3,740	7.0	7.7
08470450	02/23/2006 04:00	20.6	3,740	6.9	7.7
08470450	02/23/2006 04:15	20.7	3,730	6.9	7.7
08470450	02/23/2006 04:30	20.7	3,730	6.9	7.7
08470450	02/23/2006 04:45	20.7	3,730	6.9	7.7
08470450	02/23/2006 05:00	20.7	3,720	6.9	7.7
08470450	02/23/2006 05:15	20.7	3,720	6.8	7.7
08470450	02/23/2006 05:30	20.8	3,720	6.8	7.7
08470450	02/23/2006 05:45	20.8	3,720	6.8	7.7

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470450 February data-collection period—Continued					
08470450	02/23/2006 06:00	20.8	3,730	6.8	7.7
08470450	02/23/2006 06:15	20.8	3,730	6.8	7.7
08470450	02/23/2006 06:30	20.8	3,730	6.8	7.7
08470450	02/23/2006 06:45	20.8	3,740	6.8	7.7
08470450	02/23/2006 07:00	20.8	3,740	6.7	7.7
08470450	02/23/2006 07:15	20.9	3,740	6.7	7.7
08470450	02/23/2006 07:30	20.9	3,740	6.6	7.7
08470450	02/23/2006 07:45	20.9	3,750	6.7	7.7
08470450	02/23/2006 08:00	20.9	3,750	6.6	7.7
08470450	02/23/2006 08:15	20.9	3,750	6.6	7.7
08470450	02/23/2006 08:30	20.9	3,760	6.6	7.7
08470450	02/23/2006 08:45	21.0	3,760	6.6	7.7
08470450	02/23/2006 09:00	21.0	3,760	6.6	7.7
08470450	02/23/2006 09:15	21.0	3,770	6.6	7.7
08470450	02/23/2006 09:30	21.0	3,770	6.6	7.7
08470450	02/23/2006 09:45	21.0	3,780	6.6	7.7
08470450	02/23/2006 10:00	21.1	3,780	6.7	7.7
08470450	02/23/2006 10:15	21.0	3,780	6.6	7.7
08470450	02/23/2006 10:30	21.0	3,790	6.7	7.7
08470450	02/23/2006 10:45	21.0	3,790	6.7	7.7
08470450	02/23/2006 11:00	21.0	3,790	6.6	7.7
08470450	02/23/2006 11:15	21.0	3,790	6.7	7.7
08470450	02/23/2006 11:30	21.0	3,790	6.7	7.7
08470450	02/23/2006 11:45	20.9	3,800	6.8	7.7
08470450	02/23/2006 12:00	20.9	3,800	6.7	7.7
08470450	02/23/2006 12:15	20.9	3,800	6.8	7.7
08470450	02/23/2006 12:30	20.9	3,800	6.8	7.7
08470450	02/23/2006 12:45	20.9	3,800	6.8	7.7
08470450	02/23/2006 13:00	20.9	3,810	6.8	7.7
Station 08470450 May data-collection period					
08470450	05/23/2006 11:45	28.2	4,300	5.3	7.7
08470450	05/23/2006 12:00	28.2	4,300	5.3	7.7
08470450	05/23/2006 12:15	28.3	4,300	5.5	7.7
08470450	05/23/2006 12:30	28.3	4,300	5.5	7.7
08470450	05/23/2006 12:45	28.4	4,310	5.4	7.6
08470450	05/23/2006 13:00	28.4	4,310	5.5	7.6
08470450	05/23/2006 13:15	28.4	4,310	5.5	7.7
08470450	05/23/2006 13:30	28.4	4,310	5.6	7.7
08470450	05/23/2006 13:45	28.5	4,310	5.7	7.7
08470450	05/23/2006 14:00	28.5	4,320	5.7	7.7
08470450	05/23/2006 14:15	28.6	4,320	5.9	7.7
08470450	05/23/2006 14:30	28.7	4,320	6.0	7.7
08470450	05/23/2006 14:45	28.7	4,320	6.0	7.7
08470450	05/23/2006 15:00	28.8	4,320	6.1	7.7
08470450	05/23/2006 15:15	28.9	4,320	6.2	7.7
08470450	05/23/2006 15:30	28.9	4,320	6.2	7.7
08470450	05/23/2006 15:45	29.0	4,320	6.3	7.7
08470450	05/23/2006 16:00	29.1	4,320	6.4	7.7
08470450	05/23/2006 16:15	29.2	4,310	6.4	7.7
08470450	05/23/2006 16:30	29.2	4,310	6.4	7.7
08470450	05/23/2006 16:45	29.2	4,310	6.4	7.7
08470450	05/23/2006 17:00	29.2	4,310	6.4	7.7
08470450	05/23/2006 17:15	29.3	4,320	6.5	7.8
08470450	05/23/2006 17:30	29.3	4,320	6.5	7.8
08470450	05/23/2006 17:45	29.4	4,320	6.6	7.8
08470450	05/23/2006 18:00	29.4	4,320	6.7	7.8
08470450	05/23/2006 18:15	29.5	4,320	6.7	7.8
08470450	05/23/2006 18:30	29.6	4,320	6.8	7.8
08470450	05/23/2006 18:45	29.6	4,320	6.8	7.8
08470450	05/23/2006 19:00	29.6	4,320	6.8	7.8
08470450	05/23/2006 19:15	29.6	4,320	6.9	7.8
08470450	05/23/2006 19:30	29.6	4,320	6.9	7.8
08470450	05/23/2006 19:45	29.5	4,320	6.9	7.8
08470450	05/23/2006 20:00	29.5	4,320	6.9	7.8
08470450	05/23/2006 20:15	29.4	4,320	6.8	7.8
08470450	05/23/2006 20:30	29.4	4,320	6.8	7.8
08470450	05/23/2006 20:45	29.3	4,320	6.7	7.8
08470450	05/23/2006 21:00	29.2	4,310	6.7	7.8
08470450	05/23/2006 21:15	29.2	4,310	6.7	7.8
08470450	05/23/2006 21:30	29.1	4,300	6.6	7.8
08470450	05/23/2006 21:45	29.1	4,290	6.5	7.8
08470450	05/23/2006 22:00	29.0	4,280	6.5	7.7
08470450	05/23/2006 22:15	29.0	4,270	6.5	7.7
08470450	05/23/2006 22:30	29.0	4,270	6.4	7.7
08470450	05/23/2006 22:45	29.0	4,260	6.4	7.7
08470450	05/23/2006 23:00	29.0	4,260	6.4	7.7
08470450	05/23/2006 23:15	28.9	4,250	6.4	7.7
08470450	05/23/2006 23:30	28.9	4,250	6.3	7.7
08470450	05/23/2006 23:45	28.9	4,240	6.3	7.7
08470450	05/24/2006 00:00	28.8	4,240	6.2	7.7
08470450	05/24/2006 00:15	28.8	4,240	6.2	7.7
08470450	05/24/2006 00:30	28.7	4,240	6.2	7.7
08470450	05/24/2006 00:45	28.7	4,240	6.2	7.7
08470450	05/24/2006 01:00	28.6	4,240	6.2	7.7
08470450	05/24/2006 01:15	28.6	4,240	6.1	7.7
08470450	05/24/2006 01:30	28.6	4,230	6.1	7.7
08470450	05/24/2006 01:45	28.5	4,230	6.2	7.7
08470450	05/24/2006 02:00	28.5	4,230	6.1	7.7
08470450	05/24/2006 02:15	28.5	4,230	6.0	7.7
08470450	05/24/2006 02:30	28.5	4,230	6.0	7.7
08470450	05/24/2006 02:45	28.5	4,230	5.9	7.7
08470450	05/24/2006 03:00	28.5	4,230	5.8	7.7
08470450	05/24/2006 03:15	28.5	4,240	5.8	7.7
08470450	05/24/2006 03:30	28.5	4,240	5.7	7.7
08470450	05/24/2006 03:45	28.5	4,240	5.6	7.7
08470450	05/24/2006 04:00	28.5	4,250	5.6	7.7
08470450	05/24/2006 04:15	28.5	4,260	5.5	7.7
08470450	05/24/2006 04:30	28.4	4,270	5.4	7.7
08470450	05/24/2006 04:45	28.4	4,280	5.3	7.7
08470450	05/24/2006 05:00	28.4	4,290	5.2	7.7
08470450	05/24/2006 05:15	28.4	4,290	5.2	7.7
08470450	05/24/2006 05:30	28.4	4,300	5.1	7.7
08470450	05/24/2006 05:45	28.4	4,310	5.0	7.7
08470450	05/24/2006 06:00	28.4	4,320	5.0	7.7
08470450	05/24/2006 06:15	28.4	4,330	4.9	7.7
08470450	05/24/2006 06:30	28.4	4,340	4.9	7.7
08470450	05/24/2006 06:45	28.4	4,340	4.9	7.7
08470450	05/24/2006 07:00	28.4	4,350	4.9	7.7
08470450	05/24/2006 07:15	28.4	4,350	4.9	7.7
08470450	05/24/2006 07:30	28.3	4,350	4.9	7.7

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470450 May data-collection period—Continued					
08470450	05/24/2006 07:45	28.3	4,360	4.9	7.7
08470450	05/24/2006 08:00	28.3	4,360	4.9	7.7
08470450	05/24/2006 08:15	28.2	4,360	4.8	7.7
08470450	05/24/2006 08:30	28.2	4,370	4.7	7.7
08470450	05/24/2006 08:45	28.2	4,370	4.7	7.7
08470450	05/24/2006 09:00	28.2	4,380	4.8	7.7
08470450	05/24/2006 09:15	28.1	4,380	4.8	7.7
08470450	05/24/2006 09:30	28.1	4,390	4.8	7.7
08470450	05/24/2006 09:45	28.1	4,390	4.8	7.7
08470450	05/24/2006 10:00	28.1	4,390	4.8	7.7
08470450	05/24/2006 10:15	28.1	4,390	4.8	7.7
08470450	05/24/2006 10:30	28.1	4,380	4.8	7.7
08470450	05/24/2006 10:45	28.1	4,380	4.8	7.7
08470450	05/24/2006 11:00	28.1	4,370	4.9	7.7
08470450	05/24/2006 11:15	28.1	4,370	5.0	7.7
08470450	05/24/2006 11:30	28.2	4,360	5.0	7.7
08470450	05/24/2006 11:45	28.2	4,360	5.1	7.7
08470450	05/24/2006 12:00	28.4	4,360	5.2	7.7
08470450	05/24/2006 12:15	28.4	4,350	5.2	7.7
08470450	05/24/2006 12:30	28.5	4,340	5.3	7.7
08470450	05/24/2006 12:45	28.5	4,340	5.4	7.7
Station 08470460 February data-collection period					
08470460	02/22/2006 09:45	17.6	4,380	8.2	7.6
08470460	02/22/2006 10:00	17.7	4,400	8.2	7.7
08470460	02/22/2006 10:15	17.8	4,440	8.2	7.7
08470460	02/22/2006 10:30	17.9	4,590	8.1	7.7
08470460	02/22/2006 10:45	18.0	4,680	8.1	7.7
08470460	02/22/2006 11:00	18.1	4,850	8.2	7.7
08470460	02/22/2006 11:15	18.2	5,080	8.1	7.7
08470460	02/22/2006 11:30	18.3	5,310	8.2	7.7
08470460	02/22/2006 11:45	18.4	5,430	8.2	7.7
08470460	02/22/2006 12:00	18.4	5,860	8.2	7.7
08470460	02/22/2006 12:15	18.6	6,240	8.2	7.7
08470460	02/22/2006 12:30	18.7	6,930	8.1	7.7
08470460	02/22/2006 12:45	19.0	7,690	8.0	7.7
08470460	02/22/2006 13:00	18.6	11,500	7.6	7.7
08470460	02/22/2006 13:15	18.6	13,000	7.3	7.7
08470460	02/22/2006 13:30	18.6	16,000	7.0	7.6
08470460	02/22/2006 13:45	18.1	22,000	6.1	7.6
08470460	02/22/2006 14:00	18.1	22,900	5.7	7.6
08470460	02/22/2006 14:15	18.6	21,800	6.2	7.7
08470460	02/22/2006 14:30	18.4	24,100	5.3	7.7
08470460	02/22/2006 14:45	18.1	25,400	5.2	7.7
08470460	02/22/2006 15:00	18.2	29,000	5.3	7.7
08470460	02/22/2006 15:15	18.7	26,500	5.7	7.7
08470460	02/22/2006 15:30	18.2	28,600	5.5	7.7
08470460	02/22/2006 15:45	19.2	25,200	5.8	7.7
08470460	02/22/2006 16:00	18.4	27,600	5.8	7.7
08470460	02/22/2006 16:15	19.0	26,300	5.8	7.7
08470460	02/22/2006 16:30	18.6	27,300	5.1	7.7
08470460	02/22/2006 16:45	19.2	25,400	5.9	7.7
08470460	02/22/2006 17:00	19.3	25,500	6.0	7.8
08470460	02/22/2006 17:15	18.6	24,200	6.1	7.7
08470460	02/22/2006 17:30	19.1	21,800	6.2	7.8
08470460	02/22/2006 17:45	18.6	23,900	5.6	7.7
08470460	02/22/2006 18:00	18.7	22,600	6.2	7.8
08470460	02/22/2006 18:15	18.6	22,600	6.0	7.7
08470460	02/22/2006 18:30	18.8	21,900	5.8	7.7
08470460	02/22/2006 18:45	18.9	20,300	6.2	7.8
08470460	02/22/2006 19:00	19.0	18,900	6.3	7.8
08470460	02/22/2006 19:15	19.0	18,700	6.2	7.7
08470460	02/22/2006 19:30	19.0	19,000	6.1	7.7
08470460	02/22/2006 19:45	19.0	19,400	6.2	7.7
08470460	02/22/2006 20:00	19.0	18,500	6.2	7.7
08470460	02/22/2006 20:15	19.1	17,700	6.2	7.7
08470460	02/22/2006 20:30	19.1	16,900	6.3	7.7
08470460	02/22/2006 20:45	19.1	16,100	6.3	7.7
08470460	02/22/2006 21:00	19.2	15,000	6.5	7.7
08470460	02/22/2006 21:15	19.3	13,600	6.6	7.7
08470460	02/22/2006 21:30	19.3	12,900	6.6	7.7
08470460	02/22/2006 21:45	19.4	12,900	6.6	7.7
08470460	02/22/2006 22:00	19.4	11,900	6.7	7.7
08470460	02/22/2006 22:15	19.4	11,200	6.7	7.7
08470460	02/22/2006 22:30	19.4	10,900	6.8	7.7
08470460	02/22/2006 22:45	19.4	11,200	6.8	7.7
08470460	02/22/2006 23:00	19.5	10,100	6.9	7.7
08470460	02/22/2006 23:15	19.5	10,200	6.8	7.7
08470460	02/22/2006 23:30	19.5	10,700	6.7	7.7
08470460	02/22/2006 23:45	19.6	9,660	6.8	7.7
08470460	02/23/2006 00:00	19.7	8,720	6.8	7.7
08470460	02/23/2006 00:15	19.7	8,560	6.9	7.7
08470460	02/23/2006 00:30	19.7	8,740	6.9	7.7
08470460	02/23/2006 00:45	19.7	8,410	6.9	7.7
08470460	02/23/2006 01:00	19.8	8,160	6.8	7.7
08470460	02/23/2006 01:15	19.8	7,840	6.8	7.7
08470460	02/23/2006 01:30	19.8	7,780	6.9	7.7
08470460	02/23/2006 01:45	19.8	7,960	6.8	7.7
08470460	02/23/2006 02:00	19.8	7,430	6.8	7.7
08470460	02/23/2006 02:15	19.9	7,280	6.9	7.7
08470460	02/23/2006 02:30	19.9	6,990	6.8	7.7
08470460	02/23/2006 02:45	20.0	6,750	6.8	7.7
08470460	02/23/2006 03:00	20.0	6,620	6.8	7.7
08470460	02/23/2006 03:15	20.0	6,600	6.8	7.7
08470460	02/23/2006 03:30	20.1	6,520	6.8	7.7
08470460	02/23/2006 03:45	20.1	6,390	6.7	7.7
08470460	02/23/2006 04:00	20.1	6,300	6.7	7.7
08470460	02/23/2006 04:15	20.2	6,210	6.7	7.7
08470460	02/23/2006 04:30	20.2	6,050	6.7	7.7
08470460	02/23/2006 04:45	20.2	5,880	6.7	7.7
08470460	02/23/2006 05:00	20.2	5,790	6.6	7.7
08470460	02/23/2006 05:15	20.2	5,750	6.7	7.7
08470460	02/23/2006 05:30	20.3	5,660	6.7	7.7
08470460	02/23/2006 05:45	20.3	5,480	6.7	7.7
08470460	02/23/2006 06:00	20.4	5,390	6.6	7.7
08470460	02/23/2006 06:15	20.4	5,150	6.7	7.7
08470460	02/23/2006 06:30	20.4	5,290	6.6	7.7
08470460	02/23/2006 06:45	20.5	5,190	6.6	7.7
08470460	02/23/2006 07:00	20.5	4,990	6.6	7.7
08470460	02/23/2006 07:15	20.6	4,780	6.6	7.7
08470460	02/23/2006 07:30	20.6	4,640	6.7	7.7

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470460 February data-collection period—Continued					
08470460	02/23/2006 07:45	20.6	4,630	6.6	7.7
08470460	02/23/2006 08:00	20.6	4,780	6.6	7.7
08470460	02/23/2006 08:15	20.6	4,900	6.6	7.7
08470460	02/23/2006 08:30	20.6	5,000	6.7	7.7
08470460	02/23/2006 08:45	20.6	4,880	6.6	7.7
08470460	02/23/2006 09:00	20.5	5,220	6.7	7.7
08470460	02/23/2006 09:15	20.8	4,810	6.8	7.7
08470460	02/23/2006 09:30	20.7	5,010	6.7	7.7
08470460	02/23/2006 09:45	20.8	4,960	6.7	7.7
08470460	02/23/2006 10:00	20.9	4,630	6.8	7.7
08470460	02/23/2006 10:15	20.9	4,310	6.7	7.7
08470460	02/23/2006 10:30	20.8	4,780	6.8	7.7
08470460	02/23/2006 10:45	20.8	4,800	6.8	7.7
08470460	02/23/2006 11:00	20.7	5,000	6.9	7.7
08470460	02/23/2006 11:15	20.8	4,490	6.9	7.7
08470460	02/23/2006 11:30	20.8	4,320	6.9	7.7
08470460	02/23/2006 11:45	20.8	4,190	6.9	7.7
08470460	02/23/2006 12:00	20.8	4,250	7.0	7.7
08470460	02/23/2006 12:15	20.8	4,510	7.1	7.7
08470460	02/23/2006 12:30	20.7	4,790	7.1	7.7
08470460	02/23/2006 12:45	20.8	4,450	7.1	7.7
08470460	02/23/2006 13:00	20.8	4,350	7.2	7.7
08470460	02/23/2006 13:15	20.8	4,410	7.3	7.7
08470460	02/23/2006 13:30	20.8	4,230	7.2	7.7
08470460	02/23/2006 13:45	17.6	4,380	8.2	7.6
Station 08470460 May data-collection period					
08470460	05/23/2006 11:15	27.9	5,170	5.6	7.7
08470460	05/23/2006 11:30	27.9	5,270	5.7	7.7
08470460	05/23/2006 11:45	28.0	5,250	5.7	7.7
08470460	05/23/2006 12:00	28.1	5,160	6.0	7.7
08470460	05/23/2006 12:15	28.2	5,260	5.8	7.7
08470460	05/23/2006 12:30	28.2	5,310	5.8	7.7
08470460	05/23/2006 12:45	28.2	5,310	5.9	7.7
08470460	05/23/2006 13:00	28.3	5,350	5.7	7.7
08470460	05/23/2006 13:15	28.4	5,350	5.9	7.7
08470460	05/23/2006 13:30	28.7	5,400	6.2	7.7
08470460	05/23/2006 13:45	28.8	5,380	6.2	7.8
08470460	05/23/2006 14:00	28.7	5,440	6.2	7.7
08470460	05/23/2006 14:15	29.0	5,360	6.4	7.8
08470460	05/23/2006 14:30	28.9	5,510	6.3	7.7
08470460	05/23/2006 14:45	28.8	5,560	6.1	7.7
08470460	05/23/2006 15:00	29.4	5,630	6.6	7.8
08470460	05/23/2006 15:15	28.9	8,210	5.1	7.7
08470460	05/23/2006 15:30	29.0	8,550	5.3	7.7
08470460	05/23/2006 15:45	28.9	9,220	5.3	7.7
08470460	05/23/2006 16:00	28.6	15,000	3.6	7.6
08470460	05/23/2006 16:15	28.8	12,000	4.0	7.6
08470460	05/23/2006 16:30	29.0	12,100	4.4	7.7
08470460	05/23/2006 16:45	28.9	12,000	4.5	7.7
08470460	05/23/2006 17:00	28.7	12,500	4.0	7.6
08470460	05/23/2006 17:15	28.7	14,000	4.1	7.6
08470460	05/23/2006 17:30	29.1	10,800	5.2	7.7
08470460	05/23/2006 17:45	29.1	11,000	5.0	7.7
08470460	05/23/2006 18:00	29.1	10,600	5.4	7.7
08470460	05/23/2006 18:15	29.1	11,800	4.9	7.7
08470460	05/23/2006 18:30	29.1	11,700	5.0	7.7
08470460	05/23/2006 18:45	29.2	11,200	5.3	7.7
08470460	05/23/2006 19:00	29.3	10,800	5.3	7.7
08470460	05/23/2006 19:15	29.8	8,690	6.1	7.8
08470460	05/23/2006 19:30	29.8	8,060	6.3	7.8
08470460	05/23/2006 19:45	29.6	7,170	6.4	7.8
08470460	05/23/2006 20:00	29.6	6,480	6.2	7.8
08470460	05/23/2006 20:15	29.5	6,110	6.4	7.8
08470460	05/23/2006 20:30	29.5	5,940	6.2	7.8
08470460	05/23/2006 20:45	29.4	5,400	6.3	7.8
08470460	05/23/2006 21:00	29.3	5,320	6.2	7.8
08470460	05/23/2006 21:15	29.3	4,860	6.2	7.8
08470460	05/23/2006 21:30	29.3	5,150	6.0	7.8
08470460	05/23/2006 21:45	29.2	5,050	6.0	7.8
08470460	05/23/2006 22:00	29.2	5,180	6.0	7.8
08470460	05/23/2006 22:15	29.1	5,180	6.1	7.8
08470460	05/23/2006 22:30	29.0	5,110	6.1	7.8
08470460	05/23/2006 22:45	29.2	5,620	6.1	7.7
08470460	05/23/2006 23:00	29.2	5,870	6.0	7.7
08470460	05/23/2006 23:15	28.9	5,320	5.9	7.8
08470460	05/23/2006 23:30	29.0	5,950	5.8	7.8
08470460	05/23/2006 23:45	28.9	6,170	5.6	7.7
08470460	05/24/2006 00:00	28.9	5,770	5.6	7.7
08470460	05/24/2006 00:15	28.9	7,930	5.3	7.7
08470460	05/24/2006 00:30	28.9	6,760	5.4	7.7
08470460	05/24/2006 00:45	28.8	7,030	5.3	7.7
08470460	05/24/2006 01:00	28.8	9,080	4.8	7.7
08470460	05/24/2006 01:15	28.6	6,270	5.3	7.7
08470460	05/24/2006 01:30	28.6	6,180	5.3	7.7
08470460	05/24/2006 01:45	28.6	6,180	5.5	7.7
08470460	05/24/2006 02:00	28.5	5,940	5.5	7.7
08470460	05/24/2006 02:15	28.5	6,290	5.4	7.7
08470460	05/24/2006 02:30	28.5	6,180	5.4	7.7
08470460	05/24/2006 02:45	28.4	5,890	5.4	7.7
08470460	05/24/2006 03:00	28.4	5,990	5.3	7.7
08470460	05/24/2006 03:15	28.4	5,970	5.4	7.7
08470460	05/24/2006 03:30	28.4	5,680	5.4	7.7
08470460	05/24/2006 03:45	28.3	5,580	5.3	7.7
08470460	05/24/2006 04:00	28.2	5,480	5.3	7.7
08470460	05/24/2006 04:15	28.2	5,410	5.3	7.7
08470460	05/24/2006 04:30	28.2	5,380	5.3	7.7
08470460	05/24/2006 04:45	28.4	5,610	5.2	7.7
08470460	05/24/2006 05:00	28.2	5,390	5.2	7.7
08470460	05/24/2006 05:15	28.2	5,320	5.2	7.7
08470460	05/24/2006 05:30	28.3	5,350	5.1	7.7
08470460	05/24/2006 05:45	28.2	5,320	5.2	7.7
08470460	05/24/2006 06:00	28.2	5,270	5.1	7.7
08470460	05/24/2006 06:15	28.2	5,280	5.0	7.7
08470460	05/24/2006 06:30	28.0	5,160	5.0	7.7
08470460	05/24/2006 06:45	28.1	5,120	5.0	7.7
08470460	05/24/2006 07:00	28.0	5,170	5.0	7.7
08470460	05/24/2006 07:15	28.0	4,330	4.9	7.7
08470460	05/24/2006 07:30	28.0	5,120	4.8	7.7
08470460	05/24/2006 07:45	28.0	5,430	4.7	7.7
08470460	05/24/2006 08:00	28.2	14,800	2.5	7.5

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470460 May data-collection period—Continued					
08470460	05/24/2006 08:15	28.0	7,960	4.1	7.6
08470460	05/24/2006 08:30	28.1	7,220	4.1	7.6
08470460	05/24/2006 08:45	27.9	5,850	4.5	7.7
08470460	05/24/2006 09:00	27.9	6,040	4.3	7.6
08470460	05/24/2006 09:15	28.0	6,450	4.2	7.6
08470460	05/24/2006 09:30	28.0	5,920	4.4	7.6
08470460	05/24/2006 09:45	28.0	5,860	4.3	7.6
08470460	05/24/2006 10:00	28.0	5,880	4.5	7.7
08470460	05/24/2006 10:15	28.0	5,950	4.3	7.6
08470460	05/24/2006 10:30	28.1	6,540	4.4	7.6
08470460	05/24/2006 10:45	28.2	6,380	4.8	7.7
08470460	05/24/2006 11:00	28.2	6,260	4.8	7.7
08470460	05/24/2006 11:15	28.2	6,280	4.9	7.7
08470460	05/24/2006 11:30	28.3	6,280	4.9	7.7
08470460	05/24/2006 11:45	28.3	6,700	4.7	7.7
08470460	05/24/2006 12:00	28.3	6,990	4.7	7.7
08470460	05/24/2006 12:15	28.4	6,680	5.2	7.7
08470460	05/24/2006 12:30	28.4	6,820	4.9	7.7
08470460	05/24/2006 12:45	28.4	6,750	5.2	7.7
08470460	05/24/2006 13:00	28.5	6,580	5.5	7.7
Station 08470500 February data-collection period					
08470500	02/22/2006 11:10	17.5	8,500	7.8	7.7
08470500	02/22/2006 11:25	17.6	7,870	7.6	7.8
08470500	02/22/2006 11:40	17.6	10,200	7.3	7.8
08470500	02/22/2006 11:55	17.7	10,200	7.2	7.8
08470500	02/22/2006 12:10	17.8	11,900	7.0	7.8
08470500	02/22/2006 12:25	17.9	12,900	7.0	7.8
08470500	02/22/2006 12:40	18.1	12,700	7.0	7.8
08470500	02/22/2006 12:55	18.2	10,800	7.0	7.8
08470500	02/22/2006 13:10	18.2	10,600	7.0	7.8
08470500	02/22/2006 13:25	18.5	12,000	7.0	7.8
08470500	02/22/2006 13:40	18.5	13,800	6.8	7.8
08470500	02/22/2006 13:55	18.6	13,800	6.9	7.8
08470500	02/22/2006 14:10	18.6	14,800	6.6	7.8
08470500	02/22/2006 14:25	18.8	13,900	6.7	7.9
08470500	02/22/2006 14:40	18.8	14,000	6.5	7.8
08470500	02/22/2006 14:55	18.9	15,500	6.6	7.9
08470500	02/22/2006 15:10	19.1	15,100	6.6	7.9
08470500	02/22/2006 15:25	19.1	16,200	6.4	7.9
08470500	02/22/2006 15:40	19.2	15,400	6.6	7.9
08470500	02/22/2006 15:55	19.1	15,400	6.5	7.9
08470500	02/22/2006 16:10	19.3	16,300	6.5	7.9
08470500	02/22/2006 16:25	19.2	17,000	6.3	7.8
08470500	02/22/2006 16:40	19.4	15,200	6.6	7.9
08470500	02/22/2006 16:55	19.5	14,100	6.5	7.9
08470500	02/22/2006 17:10	19.5	15,000	6.5	7.9
08470500	02/22/2006 17:25	19.5	16,200	6.4	7.8
08470500	02/22/2006 17:40	19.5	16,600	6.3	7.8
08470500	02/22/2006 17:55	19.5	16,400	6.3	7.8
08470500	02/22/2006 18:10	19.5	17,800	6.2	7.8
08470500	02/22/2006 18:25	19.5	17,700	6.0	7.8
08470500	02/22/2006 18:40	19.6	18,000	6.0	7.8
08470500	02/22/2006 18:55	19.5	18,100	6.0	7.8
08470500	02/22/2006 19:10	19.5	18,100	6.0	7.8
08470500	02/22/2006 19:25	19.5	18,300	5.9	7.8
08470500	02/22/2006 19:40	19.4	18,800	5.7	7.8
08470500	02/22/2006 19:55	19.6	19,000	5.7	7.8
08470500	02/22/2006 20:10	19.4	19,000	5.6	7.8
08470500	02/22/2006 20:25	19.5	19,200	5.7	7.8
08470500	02/22/2006 20:40	19.4	18,900	5.6	7.8
08470500	02/22/2006 20:55	19.4	19,200	5.7	7.8
08470500	02/22/2006 21:10	19.4	19,200	5.5	7.8
08470500	02/22/2006 21:25	19.4	18,900	5.5	7.8
08470500	02/22/2006 21:40	19.6	19,000	5.9	7.8
08470500	02/22/2006 21:55	19.6	19,300	5.8	7.8
08470500	02/22/2006 22:10	19.3	19,200	5.3	7.8
08470500	02/22/2006 22:25	19.4	18,800	5.4	7.8
08470500	02/22/2006 22:40	19.6	18,900	6.0	7.8
08470500	02/22/2006 22:55	19.5	19,000	5.7	7.8
08470500	02/22/2006 23:10	19.6	18,500	6.0	7.8
08470500	02/22/2006 23:25	19.5	18,200	5.8	7.8
08470500	02/22/2006 23:40	19.6	18,300	5.8	7.8
08470500	02/22/2006 23:55	19.5	18,300	5.8	7.8
08470500	02/23/2006 00:10	19.5	18,000	6.0	7.8
08470500	02/23/2006 00:25	19.5	17,700	6.0	7.8
08470500	02/23/2006 00:40	19.5	17,300	5.9	7.8
08470500	02/23/2006 00:55	19.6	17,200	6.0	7.8
08470500	02/23/2006 01:10	19.6	16,800	6.1	7.8
08470500	02/23/2006 01:25	19.6	16,600	6.1	7.8
08470500	02/23/2006 01:40	19.6	16,600	6.1	7.8
08470500	02/23/2006 01:55	19.6	16,500	6.1	7.8
08470500	02/23/2006 02:10	19.6	16,300	6.1	7.8
08470500	02/23/2006 02:25	19.6	16,000	6.2	7.8
08470500	02/23/2006 02:40	19.6	16,100	6.0	7.8
08470500	02/23/2006 02:55	19.6	15,800	6.0	7.8
08470500	02/23/2006 03:10	19.6	15,800	6.1	7.8
08470500	02/23/2006 03:25	19.6	15,700	6.3	7.8
08470500	02/23/2006 03:40	19.6	15,600	6.2	7.8
08470500	02/23/2006 03:55	19.5	15,600	6.3	7.8
08470500	02/23/2006 04:10	19.5	15,400	6.3	7.8
08470500	02/23/2006 04:25	19.6	15,300	6.3	7.8
08470500	02/23/2006 04:40	19.6	15,200	6.3	7.8
08470500	02/23/2006 04:55	19.5	14,400	6.2	7.8
08470500	02/23/2006 05:10	19.5	14,400	6.1	7.8
08470500	02/23/2006 05:25	19.5	13,700	5.9	7.8
08470500	02/23/2006 05:40	19.5	13,600	6.0	7.8
08470500	02/23/2006 05:55	19.5	12,700	6.0	7.8
08470500	02/23/2006 06:10	19.5	12,600	6.0	7.8
08470500	02/23/2006 06:25	19.5	11,300	6.0	7.8
08470500	02/23/2006 06:40	19.5	12,300	6.0	7.8
08470500	02/23/2006 06:55	19.5	11,700	6.0	7.8
08470500	02/23/2006 07:10	19.5	12,300	6.0	7.8
08470500	02/23/2006 07:25	19.4	12,500	5.9	7.8
08470500	02/23/2006 07:40	19.6	9,620	6.0	7.8
08470500	02/23/2006 07:55	19.6	10,500	6.0	7.8
08470500	02/23/2006 08:10	19.7	9,790	6.0	7.8
08470500	02/23/2006 08:25	19.7	9,150	6.1	7.8
08470500	02/23/2006 08:40	19.7	10,200	6.0	7.8
08470500	02/23/2006 08:55	19.7	9,790	6.1	7.8
08470500	02/23/2006 09:10	19.7	10,200	6.1	7.8

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470500 February data-collection period—Continued					
08470500	02/23/2006 09:25	19.8	9,340	6.2	7.8
08470500	02/23/2006 09:40	19.8	10,500	6.2	7.8
08470500	02/23/2006 09:55	19.8	8,750	6.4	7.8
08470500	02/23/2006 10:10	19.8	8,720	6.5	7.8
08470500	02/23/2006 10:25	19.9	8,650	6.6	7.8
08470500	02/23/2006 10:40	19.9	8,800	6.7	7.8
08470500	02/23/2006 10:55	19.8	9,320	6.6	7.8
08470500	02/23/2006 11:10	19.7	10,100	6.6	7.8
08470500	02/23/2006 11:25	19.7	10,800	6.7	7.8
08470500	02/23/2006 11:40	19.7	11,300	6.7	7.8
08470500	02/23/2006 11:55	19.7	12,300	6.7	7.8
08470500	02/23/2006 12:10	19.7	13,200	6.6	7.8
08470500	02/23/2006 12:25	19.7	13,900	6.8	7.9
08470500	02/23/2006 12:40	19.7	13,900	7.0	7.9
08470500	02/23/2006 12:55	19.7	14,100	6.8	7.9
08470500	02/23/2006 13:10	19.7	14,200	6.9	7.9
08470500	02/23/2006 13:25	19.7	14,400	7.0	7.9
08470500	02/23/2006 13:40	19.7	14,400	7.1	7.9
08470500	02/23/2006 13:55	19.7	14,400	7.1	7.9
08470500	02/23/2006 14:10	19.7	14,300	7.0	7.9
08470500	02/23/2006 14:25	19.7	14,500	7.0	7.9
Station 08470500 May data-collection period					
08470500	05/23/2006 10:45	27.5	8,970	4.3	7.6
08470500	05/23/2006 11:00	27.3	8,550	4.7	7.7
08470500	05/23/2006 11:15	27.2	8,370	4.6	7.6
08470500	05/23/2006 11:30	27.3	8,320	4.3	7.6
08470500	05/23/2006 11:45	27.4	8,210	4.7	7.6
08470500	05/23/2006 12:00	27.5	8,060	4.9	7.7
08470500	05/23/2006 12:15	27.6	8,090	5.0	7.7
08470500	05/23/2006 12:30	27.6	8,000	5.0	7.7
08470500	05/23/2006 12:45	27.7	7,930	5.3	7.7
08470500	05/23/2006 13:00	27.9	7,950	5.5	7.7
08470500	05/23/2006 13:15	28.1	7,960	5.4	7.7
08470500	05/23/2006 13:30	28.2	8,060	5.4	7.7
08470500	05/23/2006 13:45	28.6	7,930	5.8	7.7
08470500	05/23/2006 14:00	28.7	7,900	5.9	7.7
08470500	05/23/2006 14:15	28.9	7,810	5.9	7.7
08470500	05/23/2006 14:30	29.1	7,680	6.4	7.8
08470500	05/23/2006 14:45	29.2	7,670	6.9	7.8
08470500	05/23/2006 15:00	29.3	7,530	6.9	7.8
08470500	05/23/2006 15:15	29.4	7,420	7.1	7.8
08470500	05/23/2006 15:30	29.6	7,400	6.8	7.8
08470500	05/23/2006 15:45	29.7	7,280	6.8	7.8
08470500	05/23/2006 16:00	29.9	7,120	7.0	7.8
08470500	05/23/2006 16:15	29.8	7,100	7.2	7.8
08470500	05/23/2006 16:30	29.8	6,880	7.8	7.9
08470500	05/23/2006 16:45	30.0	6,870	7.9	7.9
08470500	05/23/2006 17:00	30.3	6,650	8.3	7.9
08470500	05/23/2006 17:15	30.2	6,780	8.2	7.9
08470500	05/23/2006 17:30	30.4	6,700	8.2	7.9
08470500	05/23/2006 17:45	30.4	6,720	8.2	7.9
08470500	05/23/2006 18:00	30.5	6,650	8.4	7.9
08470500	05/23/2006 18:15	30.6	6,510	8.7	8.0
08470500	05/23/2006 18:30	30.6	6,550	8.6	8.0
08470500	05/23/2006 18:45	30.4	6,710	8.6	7.9
08470500	05/23/2006 19:00	30.2	6,810	9.0	8.0
08470500	05/23/2006 19:15	30.3	6,830	9.4	8.0
08470500	05/23/2006 19:30	30.3	6,680	9.6	8.0
08470500	05/23/2006 19:45	30.2	6,730	9.4	8.0
08470500	05/23/2006 20:00	30.0	6,750	9.6	8.0
08470500	05/23/2006 20:15	29.9	6,880	9.4	8.0
08470500	05/23/2006 20:30	29.9	6,870	9.3	8.0
08470500	05/23/2006 20:45	29.8	6,880	9.2	8.0
08470500	05/23/2006 21:00	29.6	6,860	9.2	8.0
08470500	05/23/2006 21:15	29.6	6,860	9.0	8.0
08470500	05/23/2006 21:30	29.4	6,930	8.7	8.0
08470500	05/23/2006 21:45	29.4	6,880	8.7	8.0
08470500	05/23/2006 22:00	29.3	6,960	8.4	7.9
08470500	05/23/2006 22:15	29.2	7,040	8.3	7.9
08470500	05/23/2006 22:30	29.1	7,000	8.4	8.0
08470500	05/23/2006 22:45	29	6,990	8.2	7.9
08470500	05/23/2006 23:00	29	7,290	7.8	7.9
08470500	05/23/2006 23:15	28.8	7,050	7.7	7.9
08470500	05/23/2006 23:30	29	7,600	7.1	7.8
08470500	05/23/2006 23:45	28.8	7,370	7.4	7.9
08470500	05/24/2006 00:00	28.7	7,250	7.6	7.9
08470500	05/24/2006 00:15	28.7	7,360	7.3	7.9
08470500	05/24/2006 00:30	28.7	7,360	7.3	7.9
08470500	05/24/2006 00:45	28.7	7,540	6.6	7.8
08470500	05/24/2006 01:00	28.7	7,480	6.5	7.8
08470500	05/24/2006 01:15	28.5	7,450	6.6	7.8
08470500	05/24/2006 01:30	28.5	7,540	6.4	7.8
08470500	05/24/2006 01:45	28.3	7,450	6.6	7.8
08470500	05/24/2006 02:00	28.3	7,490	6.4	7.8
08470500	05/24/2006 02:15	28.3	7,380	6.2	7.8
08470500	05/24/2006 02:30	28.3	7,350	5.9	7.8
08470500	05/24/2006 02:45	28.3	7,260	5.8	7.8
08470500	05/24/2006 03:00	28.3	7,290	5.8	7.8
08470500	05/24/2006 03:15	28.3	7,280	5.7	7.8
08470500	05/24/2006 03:30	28.2	7,220	5.7	7.8
08470500	05/24/2006 03:45	28.2	7,280	5.6	7.8
08470500	05/24/2006 04:00	28.2	7,250	5.5	7.8
08470500	05/24/2006 04:15	28.2	7,250	5.2	7.7
08470500	05/24/2006 04:30	28.1	7,350	5.1	7.7
08470500	05/24/2006 04:45	28.1	7,330	5.1	7.7
08470500	05/24/2006 05:00	28.1	7,300	5.1	7.7
08470500	05/24/2006 05:15	28.1	7,470	4.8	7.7
08470500	05/24/2006 05:30	28.0	7,580	4.7	7.7
08470500	05/24/2006 05:45	28.0	7,590	4.6	7.7
08470500	05/24/2006 06:00	28.0	7,500	4.7	7.7
08470500	05/24/2006 06:15	27.9	7,440	4.5	7.7
08470500	05/24/2006 06:30	27.9	7,380	4.5	7.7
08470500	05/24/2006 06:45	27.9	7,370	4.3	7.7
08470500	05/24/2006 07:00	27.8	7,400	4.2	7.7
08470500	05/24/2006 07:15	27.8	7,390	4.2	7.7
08470500	05/24/2006 07:30	27.8	7,390	4.0	7.7
08470500	05/24/2006 07:45	27.8	7,390	4.0	7.7
08470500	05/24/2006 08:00	27.8	7,520	3.9	7.6
08470500	05/24/2006 08:15	27.7	7,400	4.0	7.7
08470500	05/24/2006 08:30	27.7	7,470	3.9	7.7

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470500 May data-collection period—Continued					
08470500	05/24/2006 08:45	27.7	12,000	2.4	7.5
08470500	05/24/2006 09:00	27.7	11,200	3.1	7.6
08470500	05/24/2006 09:15	27.7	10,900	2.9	7.6
08470500	05/24/2006 09:30	27.7	10,700	3.1	7.6
08470500	05/24/2006 09:45	27.7	10,800	3.2	7.6
08470500	05/24/2006 10:00	27.7	10,800	3.4	7.6
08470500	05/24/2006 10:15	27.8	10,500	3.8	7.7
08470500	05/24/2006 10:30	27.9	11,500	3.8	7.7
08470500	05/24/2006 10:45	28.0	10,700	4.6	7.7
08470500	05/24/2006 11:00	28.0	10,800	4.4	7.7
08470500	05/24/2006 11:15	28.1	10,700	5.6	7.8
08470500	05/24/2006 11:30	28.1	10,700	5.5	7.8
08470500	05/24/2006 11:45	28.3	10,300	6.2	7.8
08470500	05/24/2006 12:00	28.5	10,600	7.7	7.9
08470500	05/24/2006 12:15	28.7	10,500	9.0	8.0
08470500	05/24/2006 12:30	29.0	9,740	11.4	8.2
08470500	05/24/2006 12:45	29.1	9,950	12.9	8.3
08470500	05/24/2006 13:00	29.2	10,100	13	8.3
08470500	05/24/2006 13:15	29.3	10,000	13	8.3
Station 08470520 February data-collection period					
08470520	02/22/2006 12:00	19.3	13,000	7.4	7.8
08470520	02/22/2006 12:15	19.3	12,900	7.4	7.8
08470520	02/22/2006 12:30	19.3	13,200	7.3	7.8
08470520	02/22/2006 12:45	19.3	13,100	7.3	7.8
08470520	02/22/2006 13:00	19.3	13,000	7.4	7.8
08470520	02/22/2006 13:15	19.4	12,900	7.5	7.8
08470520	02/22/2006 13:30	19.4	12,800	7.6	7.8
08470520	02/22/2006 13:45	19.5	12,700	7.7	7.8
08470520	02/22/2006 14:00	19.5	12,600	7.9	7.8
08470520	02/22/2006 14:15	19.4	12,700	7.8	7.8
08470520	02/22/2006 14:30	19.4	12,700	7.8	7.8
08470520	02/22/2006 14:45	19.4	13,100	7.7	7.8
08470520	02/22/2006 15:00	19.4	12,900	7.7	7.8
08470520	02/22/2006 15:15	19.4	12,700	7.8	7.8
08470520	02/22/2006 15:30	19.4	12,400	7.9	7.8
08470520	02/22/2006 15:45	19.4	12,300	8.0	7.8
08470520	02/22/2006 16:00	19.4	12,600	8.0	7.8
08470520	02/22/2006 16:15	19.4	12,400	8.1	7.8
08470520	02/22/2006 16:30	19.4	12,400	8.2	7.8
08470520	02/22/2006 16:45	19.4	12,700	8.2	7.8
08470520	02/22/2006 17:00	19.4	12,600	8.3	7.8
08470520	02/22/2006 17:15	19.4	12,600	8.3	7.8
08470520	02/22/2006 17:30	19.4	12,300	8.4	7.9
08470520	02/22/2006 17:45	19.4	12,600	8.4	7.8
08470520	02/22/2006 18:00	19.4	12,600	8.5	7.9
08470520	02/22/2006 18:15	19.4	12,500	8.7	7.9
08470520	02/22/2006 18:30	19.4	12,400	8.7	7.9
08470520	02/22/2006 18:45	19.4	12,500	8.8	7.9
08470520	02/22/2006 19:00	19.4	12,700	8.7	7.9
08470520	02/22/2006 19:15	19.3	13,000	7.4	7.8
08470520	02/22/2006 19:30	19.3	12,900	7.4	7.8
08470520	02/22/2006 19:45	19.3	13,200	7.3	7.8
08470520	02/22/2006 20:00	19.3	13,100	7.3	7.8
08470520	02/22/2006 20:15	19.3	13,000	7.4	7.8
08470520	02/22/2006 20:30	19.4	12,900	7.5	7.8
08470520	02/22/2006 20:45	19.4	12,800	7.6	7.8
08470520	02/22/2006 21:00	19.5	12,700	7.7	7.8
08470520	02/22/2006 21:15	19.5	12,600	7.9	7.8
08470520	02/22/2006 21:30	19.4	12,700	7.8	7.8
08470520	02/22/2006 21:45	19.4	12,700	7.8	7.8
08470520	02/22/2006 22:00	19.4	13,100	7.7	7.8
08470520	02/22/2006 22:15	19.4	12,900	7.7	7.8
08470520	02/22/2006 22:30	19.4	12,700	7.8	7.8
08470520	02/22/2006 22:45	19.4	12,400	7.9	7.8
08470520	02/22/2006 23:00	19.4	12,300	8.0	7.8
08470520	02/22/2006 23:15	19.4	12,600	8.0	7.8
08470520	02/22/2006 23:30	19.4	12,400	8.1	7.8
08470520	02/22/2006 23:45	19.4	12,400	8.2	7.8
08470520	02/23/2006 00:00	19.4	12,700	8.2	7.8
08470520	02/23/2006 00:15	19.4	12,600	8.3	7.8
08470520	02/23/2006 00:30	19.4	12,600	8.3	7.8
08470520	02/23/2006 00:45	19.4	12,300	8.4	7.9
08470520	02/23/2006 01:00	19.4	12,600	8.4	7.8
08470520	02/23/2006 01:15	19.4	12,600	8.5	7.9
08470520	02/23/2006 01:30	19.4	12,500	8.7	7.9
08470520	02/23/2006 01:45	19.4	12,400	8.7	7.9
08470520	02/23/2006 02:00	19.4	12,500	8.8	7.9
08470520	02/23/2006 02:15	19.4	12,700	8.7	7.9
08470520	02/23/2006 02:30	19.3	13,000	7.4	7.8
08470520	02/23/2006 02:45	19.3	12,900	7.4	7.8
08470520	02/23/2006 03:00	19.3	13,200	7.3	7.8
08470520	02/23/2006 03:15	19.3	13,100	7.3	7.8
08470520	02/23/2006 03:30	19.3	13,000	7.4	7.8
08470520	02/23/2006 03:45	19.4	12,900	7.5	7.8
08470520	02/23/2006 04:00	19.4	12,800	7.6	7.8
08470520	02/23/2006 04:15	19.5	12,700	7.7	7.8
08470520	02/23/2006 04:30	19.5	12,600	7.9	7.8
08470520	02/23/2006 04:45	19.4	12,700	7.8	7.8
08470520	02/23/2006 05:00	19.4	12,700	7.8	7.8
08470520	02/23/2006 05:15	19.4	13,100	7.7	7.8
08470520	02/23/2006 05:30	19.4	12,900	7.7	7.8
08470520	02/23/2006 05:45	19.4	12,700	7.8	7.8
08470520	02/23/2006 06:00	19.4	12,400	7.9	7.8
08470520	02/23/2006 06:15	19.4	12,300	8.0	7.8
08470520	02/23/2006 06:30	19.4	12,600	8.0	7.8
08470520	02/23/2006 06:45	19.4	12,400	8.1	7.8
08470520	02/23/2006 07:00	19.4	12,400	8.2	7.8
08470520	02/23/2006 07:15	19.4	12,700	8.2	7.8
08470520	02/23/2006 07:30	19.4	12,600	8.3	7.8
08470520	02/23/2006 07:45	19.4	12,600	8.3	7.8
08470520	02/23/2006 08:00	19.4	12,300	8.4	7.9
08470520	02/23/2006 08:15	19.4	12,600	8.4	7.8
08470520	02/23/2006 08:30	19.4	12,600	8.5	7.9
08470520	02/23/2006 08:45	19.4	12,500	8.7	7.9
08470520	02/23/2006 09:00	19.4	12,400	8.7	7.9
08470520	02/23/2006 09:15	19.4	12,500	8.8	7.9
08470520	02/23/2006 09:30	19.4	12,700	8.7	7.9
08470520	02/23/2006 09:45	19.3	13,000	7.4	7.8
08470520	02/23/2006 10:00	19.3	12,900	7.4	7.8
08470520	02/23/2006 10:15	19.3	13,200	7.3	7.8

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470520 February data-collection period—Continued					
08470520	02/23/2006 10:30	19.3	13,100	7.3	7.8
08470520	02/23/2006 10:45	19.3	13,000	7.4	7.8
08470520	02/23/2006 11:00	19.4	12,900	7.5	7.8
08470520	02/23/2006 11:15	19.4	12,800	7.6	7.8
08470520	02/23/2006 11:30	19.5	12,700	7.7	7.8
08470520	02/23/2006 11:45	19.5	12,600	7.9	7.8
08470520	02/23/2006 12:00	19.4	12,700	7.8	7.8
08470520	02/23/2006 12:15	19.4	12,700	7.8	7.8
08470520	02/23/2006 12:30	19.4	13,100	7.7	7.8
08470520	02/23/2006 12:45	19.4	12,900	7.7	7.8
08470520	02/23/2006 13:00	19.4	12,700	7.8	7.8
08470520	02/23/2006 13:15	19.4	12,400	7.9	7.8
08470520	02/23/2006 13:30	19.4	12,300	8.0	7.8
08470520	02/23/2006 13:45	19.4	12,600	8.0	7.8
08470520	02/23/2006 14:00	19.4	12,400	8.1	7.8
08470520	02/23/2006 14:15	19.4	12,400	8.2	7.8
08470520	02/23/2006 14:30	19.4	12,700	8.2	7.8
08470520	02/23/2006 14:45	19.4	12,600	8.3	7.8
Station 08470520 May data-collection period					
08470520	05/23/2006 10:15	27.2	7,220	7.9	7.9
08470520	05/23/2006 10:30	27.3	7,560	9.3	8.0
08470520	05/23/2006 10:45	27.5	7,980	8.8	8.0
08470520	05/23/2006 11:00	27.8	8,320	8.3	7.9
08470520	05/23/2006 11:15	28.0	8,590	8.6	8.0
08470520	05/23/2006 11:30	28.1	8,580	10.4	8.1
08470520	05/23/2006 11:45	28.1	8,610	10.7	8.1
08470520	05/23/2006 12:00	28.2	8,750	11.6	8.2
08470520	05/23/2006 12:15	28.3	8,630	13.8	8.4
08470520	05/23/2006 12:30	28.4	8,720	13.8	8.3
08470520	05/23/2006 12:45	28.4	8,760	13.7	8.3
08470520	05/23/2006 13:00	28.5	8,690	14.6	8.4
08470520	05/23/2006 13:15	28.5	8,620	14.9	8.4
08470520	05/23/2006 13:30	28.6	8,570	15.5	8.4
08470520	05/23/2006 13:45	28.7	8,520	16.1	8.5
08470520	05/23/2006 14:00	28.8	8,480	17.1	8.5
08470520	05/23/2006 14:15	29.1	8,460	18.3	8.6
08470520	05/23/2006 14:30	29.4	8,400	18.9	8.6
08470520	05/23/2006 14:45	29.5	8,400	19.6	8.7
08470520	05/23/2006 15:00	29.5	8,460	19.5	8.7
08470520	05/23/2006 15:15	30.1	8,360	19.3	8.7
08470520	05/23/2006 15:30	29.8	8,470	19.1	8.6
08470520	05/23/2006 15:45	29.4	8,510	13.7	8.3
08470520	05/23/2006 16:00	29.5	8,530	15.7	8.4
08470520	05/23/2006 16:15	29.9	8,580	15.5	8.5
08470520	05/23/2006 16:30	30.0	8,560	16.3	8.5
08470520	05/23/2006 16:45	30.2	8,590	17.1	8.5
08470520	05/23/2006 17:00	30.4	8,600	19.5	8.6
08470520	05/23/2006 17:15	30.5	8,720	18.5	8.6
08470520	05/23/2006 17:30	30.8	8,640	21.6	8.7
08470520	05/23/2006 17:45	30.6	8,660	19.8	8.6
08470520	05/23/2006 18:00	31.0	8,220	18.8	8.6
08470520	05/23/2006 18:15	31.1	8,190	20.5	8.7
08470520	05/23/2006 18:30	31.5	7,970	20.2	8.6
08470520	05/23/2006 18:45	31.0	8,440	21.3	8.7
08470520	05/23/2006 19:00	31.6	8,180	21.7	8.7
08470520	05/23/2006 19:15	31.2	7,990	19.1	8.6
08470520	05/23/2006 19:30	31.3	8,360	21.7	8.7
08470520	05/23/2006 19:45	31.1	8,420	20.7	8.7
08470520	05/23/2006 20:00	31.0	8,270	19.9	8.6
08470520	05/23/2006 20:15	31.3	8,200	21.6	8.7
08470520	05/23/2006 20:30	31.0	8,350	19.9	8.6
08470520	05/23/2006 20:45	30.4	8,460	17.8	8.5
08470520	05/23/2006 21:00	30.5	8,180	18.5	8.5
08470520	05/23/2006 21:15	30.4	8,260	17.7	8.5
08470520	05/23/2006 21:30	30.0	8,120	14.8	8.4
08470520	05/23/2006 21:45	30.1	8,200	14.9	8.4
08470520	05/23/2006 22:00	29.8	8,240	13.8	8.3
08470520	05/23/2006 22:15	29.7	8,460	13.8	8.3
08470520	05/23/2006 22:30	29.6	8,340	13.0	8.3
08470520	05/23/2006 22:45	29.6	8,400	12.9	8.3
08470520	05/23/2006 23:00	29.5	8,500	12.5	8.2
08470520	05/23/2006 23:15	29.4	8,500	12.1	8.2
08470520	05/23/2006 23:30	29.4	8,540	11.8	8.2
08470520	05/23/2006 23:45	29.4	8,520	12.0	8.2
08470520	05/24/2006 00:00	29.5	8,560	12.3	8.2
08470520	05/24/2006 00:15	29.3	8,480	11.8	8.2
08470520	05/24/2006 00:30	29.3	8,520	11.6	8.2
08470520	05/24/2006 00:45	29.3	8,500	11.3	8.2
08470520	05/24/2006 01:00	29.2	8,470	11.3	8.2
08470520	05/24/2006 01:15	29.2	8,410	11.0	8.2
08470520	05/24/2006 01:30	29.2	8,460	11.0	8.2
08470520	05/24/2006 01:45	29.1	8,470	11.1	8.2
08470520	05/24/2006 02:00	29.1	8,440	11.2	8.2
08470520	05/24/2006 02:15	29.1	8,440	11.0	8.2
08470520	05/24/2006 02:30	29.1	8,470	10.9	8.2
08470520	05/24/2006 02:45	29.0	8,450	10.9	8.2
08470520	05/24/2006 03:00	29.0	8,400	10.7	8.1
08470520	05/24/2006 03:15	29.0	8,430	10.7	8.1
08470520	05/24/2006 03:30	28.9	8,410	10.5	8.1
08470520	05/24/2006 03:45	28.8	8,350	10.3	8.1
08470520	05/24/2006 04:00	28.8	8,360	10.2	8.1
08470520	05/24/2006 04:15	28.9	8,420	10.2	8.1
08470520	05/24/2006 04:30	28.8	8,430	10.2	8.1
08470520	05/24/2006 04:45	28.8	8,370	10.2	8.1
08470520	05/24/2006 05:00	28.7	8,380	10.2	8.1
08470520	05/24/2006 05:15	28.7	8,410	10.1	8.1
08470520	05/24/2006 05:30	28.6	8,400	9.9	8.1
08470520	05/24/2006 05:45	28.6	8,340	9.8	8.1
08470520	05/24/2006 06:00	28.5	8,320	9.6	8.1
08470520	05/24/2006 06:15	28.4	8,200	9.5	8.1
08470520	05/24/2006 06:30	28.4	8,240	9.3	8.0
08470520	05/24/2006 06:45	28.4	8,230	9.0	8.0
08470520	05/24/2006 07:00	28.3	8,150	8.7	8.0
08470520	05/24/2006 07:15	28.2	8,080	8.4	8.0
08470520	05/24/2006 07:30	28.0	7,960	8.0	8.0
08470520	05/24/2006 07:45	28.0	8,020	8.0	8.0
08470520	05/24/2006 08:00	28.0	8,110	8.1	7.9
08470520	05/24/2006 08:15	28.3	8,320	7.9	7.9
08470520	05/24/2006 08:30	28.1	8,170	7.8	7.9
08470520	05/24/2006 08:45	28.1	8,250	7.7	7.9

Appendix 1–2.2. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using multiparameter continuous water-quality monitors—Continued.

USGS station no.	Date and time	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)
Station 08470520 May data-collection period—Continued					
08470520	05/24/2006 09:00	28.1	8,220	8.0	7.9
08470520	05/24/2006 09:15	28.3	8,770	7.9	7.9
08470520	05/24/2006 09:30	28.2	10,800	6.6	7.8
08470520	05/24/2006 09:45	27.8	11,300	6.4	7.8
08470520	05/24/2006 10:00	27.8	10,900	6.6	7.8
08470520	05/24/2006 10:15	27.8	10,400	6.4	7.8
08470520	05/24/2006 10:30	28.0	10,600	6.7	7.8
08470520	05/24/2006 10:45	28.1	10,800	7.0	7.8
08470520	05/24/2006 11:00	28.2	11,500	7.2	7.9
08470520	05/24/2006 11:15	28.3	11,700	7.7	7.9
08470520	05/24/2006 11:30	28.4	11,400	7.3	7.9
08470520	05/24/2006 11:45	28.4	11,400	7.6	7.9
08470520	05/24/2006 12:00	28.7	10,900	9.5	8.0
08470520	05/24/2006 12:15	28.7	10,900	10.9	8.1
08470520	05/24/2006 12:30	28.8	10,900	10.4	8.1
08470520	05/24/2006 12:45	28.8	10,800	13.1	8.2
08470520	05/24/2006 13:00	29.0	10,700	14.2	8.3
08470520	05/24/2006 13:15	29.1	11,200	11.7	8.2
08470520	05/24/2006 13:30	29.1	11,000	14.6	8.3

Appendix 1–2.3.a. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using algal growth and mortality analyses/bioassay analysis.

[+N, nitrogen addition; +NP, nitrogen and phosphorus addition; +P, phosphorus addition; control, no addition. R^2, statistical measure of the degree to which two different things are related. An R^2 of 1.00 indicates perfect correlation; an R^2 of 0 indicates no correlation. A negative growth rate indicates that phytoplankton are being consumed by zooplankton and is an algal mortality rate]

USGS station no.	Date and time	Sample type	Average R^2	Average growth rate
08470450	02/22/2006 17:30	+N	0.95	0.556
08470450	02/23/2006 17:30	+NP	.96	.430
08470450	02/24/2006 17:30	+P	.98	.422
08470450	02/25/2006 17:30	control	.96	.556
08470450	05/23/2006 11:30	+N	.74	-.285
08470450	05/24/2006 11:30	+NP	.18	.166
08470450	05/25/2006 11:30	+P	.89	-.470
08470450	05/26/2006 11:30	control	.78	-.398
08470460	02/22/2006 16:30	+N	.90	.315
08470460	02/23/2006 16:30	+NP	.91	.415
08470460	02/24/2006 16:30	+P	.90	.315
08470460	02/25/2006 16:30	control	.92	.553
08470460	05/23/2006 12:30	+N	.77	.519
08470460	05/24/2006 12:30	+NP	.32	.195
08470460	05/25/2006 12:30	+P	.39	.220
08470460	05/26/2006 12:30	control	.76	.493
08470520	02/25/2006 13:30	control	0.86	0.511
08470500	02/22/2006 15:30	+N	.86	.512
08470500	02/23/2006 15:30	+NP	.82	.398
08470500	02/24/2006 15:30	+P	.82	.353
08470500	02/25/2006 15:30	control	.65	.325
08470500	05/23/2006 13:30	+N	.92	-.255
08470500	05/24/2006 13:30	+NP	.54	-.193
08470500	05/25/2006 13:30	+P	.78	-.235
08470500	05/26/2006 13:30	control	.86	-.209
08470520	02/22/2006 13:30	+N	.86	.498
08470520	02/23/2006 13:30	+NP	.87	.440
08470520	02/24/2006 13:30	+P	.85	.455
08470520	05/23/2006 14:30	+N	.94	-.290
08470520	05/24/2006 14:30	+NP	.57	-.189
08470520	05/25/2006 14:30	+P	.95	-.332
08470520	05/26/2006 14:30	control	.93	-.377

Appendix 1–2.3.b. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using algal growth and mortality analyses/phytoplankton analysis.

[Division, type of phytoplankton; Taxa, a classification or group of organisms (for example, kingdom, phylum, class, order, family, genus, species—becomes more specific with increasing number; cells/mL, cells per milliliter of sample; sp, unknown species; --, not applicable; <, less than; mm, millimeter; >, more than]

USGS station no.	Date and time	Division	Taxa1	Taxa2	Count (cells/mL)	Sample total (cells/mL)
Station 08470450 February data-collection period						3,969
08470450	02/22/2006 17:30	Bacillariophyceae	Surirella	sp	142	
08470450	02/22/2006 17:30	Bacillariophyceae	Pennate	--	142	
08470450	02/22/2006 17:30	Bacteria	spirillum	--	142	
08470450	02/22/2006 17:30	Chlorophyta	Closterium	sp	142	
08470450	02/22/2006 17:30	Chlorophyta	Crucigenia	sp	2,267	
08470450	02/22/2006 17:30	Chlorophyta	Monoraphidium	sp	283	
08470450	02/22/2006 17:30	Cyanobacteria	coccoid	<5 mm	709	
08470450	02/22/2006 17:30	Indeterminate	coccoid	>5 mm	142	
Station 08470450 May data-collection period						23,241
08470450	05/23/2006 11:30	Bacillariophyceae	centric	small	992	
08470450	05/23/2006 11:30	Bacillariophyceae	centric	large	142	
08470450	05/23/2006 11:30	Bacillariophyceae	pennate	small	1,417	
08470450	05/23/2006 11:30	Bacillariophyceae	Placoneis	sp	142	
08470450	05/23/2006 11:30	Chlorophyta	coccoid	<5 mm	567	
08470450	05/23/2006 11:30	Chlorophyta	coccoid	>5 mm	142	
08470450	05/23/2006 11:30	Chlorophyta	ovoid	--	142	
08470450	05/23/2006 11:30	Chlorophyta	Euglena	sp	283	
08470450	05/23/2006 11:30	Chlorophyta	Kirchneriella	sp	142	
08470450	05/23/2006 11:30	Chlorophyta	Monoraphidium	sp	425	
08470450	05/23/2006 11:30	Chlorophyta	Oocystis	sp	567	
08470450	05/23/2006 11:30	Chlorophyta	Scenedesmus	quadricauda	1,700	
08470450	05/23/2006 11:30	Chlorophyta	Scenedesmus	sp	8,502	
08470450	05/23/2006 11:30	Chlorophyta	Tetraedron	sp	142	
08470450	05/23/2006 11:30	Chlorophyta	Trachelomonas	sp	142	
08470450	05/23/2006 11:30	Cyanobacteria	coccoid	<5 mm	709	
08470450	05/23/2006 11:30	Cyanobacteria	colony	--	2,267	
08470450	05/23/2006 11:30	Cyanobacteria	spirillum	--	425	
08470450	05/23/2006 11:30	Cyanobacteria	lunate	--	1,417	
08470450	05/23/2006 11:30	Cyanobacteria	Gloeocapsa	punctata	283	
08470450	05/23/2006 11:30	Indeterminate	coccoid	small	142	
08470450	05/23/2006 11:30	Indeterminate	coccoid	large	2,409	
08470450	05/23/2006 11:30	Indeterminate	ovate	--	142	
Station 08470460 February data-collection period						1,134
08470460	02/22/2006 16:30	Cyanobacteria	coccoid	<5 mm	1,134	
Station 08470460 May data-collection period						13,604
08470460	05/23/2006 12:30	Bacillariophyceae	pennate	--	142	
08470460	05/23/2006 12:30	Bacteria	spirillum	--	709	
08470460	05/23/2006 12:30	Chlorophyta	Ankistrodesmus	sp	142	
08470460	05/23/2006 12:30	Chlorophyta	Kirchneriella	sp	283	
08470460	05/23/2006 12:30	Chlorophyta	Monoraphidium	sp	142	
08470460	05/23/2006 12:30	Chlorophyta	Scenedesmus	acuminatus	1,134	
08470460	05/23/2006 12:30	Chlorophyta	Scenedesmus	sp	3,401	
08470460	05/23/2006 12:30	Chlorophyta	coccoid	<5 mm	283	
08470460	05/23/2006 12:30	Cryptophyceae	cryptomonad	--	142	
08470460	05/23/2006 12:30	Cyanobacteria	coccoid	<5 mm	3,826	
08470460	05/23/2006 12:30	Cyanobacteria	coccoid	>5 mm	142	
08470460	05/23/2006 12:30	Cyanobacteria	spirillum	--	1,134	
08470460	05/23/2006 12:30	Cyanobacteria	short rod	--	283	
08470460	05/23/2006 12:30	Cyanobacteria	lunate	--	1,275	
08470460	05/23/2006 12:30	Cyanobacteria	filament	filament	283	
08470460	05/23/2006 12:30	Indeterminate	coccoid	>5 mm	283	

Appendix 1–2.3.b. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using algal growth and mortality analyses/phytoplankton analysis—Continued.

USGS station no.	Date and time	Division	Taxa1	Taxa2	Count (cells/mL)	Sample total (cells/mL)
Station 08470500 February data-collection period						2,056
08470500	02/22/2006 15:30	Chlorophyta	Kirchneriella	sp	142	
08470500	02/22/2006 15:30	Cyanobacteria	coccoid	<5 mm	567	
08470500	02/22/2006 15:30	Cyanobacteria	filament	1 mm dia	709	
08470500	02/22/2006 15:30	Cyanobacteria	lunate	--	71	
08470500	02/22/2006 15:30	Cyanobacteria	Oscillatoria	sp	567	
Station 08470500 May data-collection period						171,180
08470500	05/23/2006 13:30	Bacillariophyceae	centric	small	3,684	
08470500	05/23/2006 13:30	Bacillariophyceae	centric	large	283	
08470500	05/23/2006 13:30	Bacillariophyceae	Nitzschia	sp	283	
08470500	05/23/2006 13:30	Bacteria	filament	--	4,251	
08470500	05/23/2006 13:30	Bacteria	spirillum	--	1,700	
08470500	05/23/2006 13:30	Chlorophyta	ovate	small	2,834	
08470500	05/23/2006 13:30	Chlorophyta	ovate	large	1,134	
08470500	05/23/2006 13:30	Chlorophyta	ovoid	--	283	
08470500	05/23/2006 13:30	Chlorophyta	paired cells	--	2,267	
08470500	05/23/2006 13:30	Chlorophyta	Ankistrodesmus	sp	1,134	
08470500	05/23/2006 13:30	Chlorophyta	Kirchneriella	sp	850	
08470500	05/23/2006 13:30	Chlorophyta	Scenedesmus	sp	1,134	
08470500	05/23/2006 13:30	Cryptophyceae	cryptomonad	--	567	
08470500	05/23/2006 13:30	Cyanobacteria	coccoid	<5 mm	4,251	
08470500	05/23/2006 13:30	Cyanobacteria	short rod	--	1,417	
08470500	05/23/2006 13:30	Cyanobacteria	spirillum	--	1,134	
08470500	05/23/2006 13:30	Cyanobacteria	lunate	--	283	
08470500	05/23/2006 13:30	Cyanobacteria	filament	--	1,417	
08470500	05/23/2006 13:30	Cyanobacteria	Merismopedia	sp	99,762	
08470500	05/23/2006 13:30	Indeterminate	coccoid	small	40,812	
08470500	05/23/2006 13:30	Indeterminate	ovate	large	283	
08470500	05/23/2006 13:30	Pyrrophyta	dinoflagellate	--	1,417	
Station 08470520 February data-collection period						1,843
08470520	02/22/2006 13:30	Bacillariophyceae	pennate	--	71	
08470520	02/22/2006 13:30	Chlorophyta	Kirchneriella	sp	425	
08470520	02/22/2006 13:30	Chlorophyta	Monoraphidium	sp	142	
08470520	02/22/2006 13:30	Cyanobacteria	coccoid	<5 mm	638	
08470520	02/22/2006 13:30	Cyanobacteria	short rod	--	142	
08470520	02/22/2006 13:30	Indeterminate	coccoid	>5 mm	354	
08470520	02/22/2006 13:30	Indeterminate	ovate	--	71	
Station 08470520 May data-collection period						264,143
08470520	05/23/2006 14:30	Bacillariophyceae	pennate	small	567	
08470520	05/23/2006 14:30	Bacillariophyceae	centric	small	3,401	
08470520	05/23/2006 14:30	Bacillariophyceae	centric	large	567	
08470520	05/23/2006 14:30	Cyanobacteria	coccoid	<5 mm	1,700	
08470520	05/23/2006 14:30	Cyanobacteria	lunate	--	567	
08470520	05/23/2006 14:30	Indeterminate	ovate	<5 mm	1,134	
08470520	05/23/2006 14:30	Indeterminate	ovate	>5 mm	567	
08470520	05/23/2006 14:30	Pyrrophyta	dinoflagellate	--	255,640	

Appendix 1–2.3.c. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using algal growth and mortality analyses/zooplankton analysis.

[ind./m^3, number of individuals per cubic meter; total organisms, micro plus macrozooplankton]

USGS station no.	Date and time	Macro-zooplankton (ind./m^3)	Total organisms (ind./m^3)
08470450	02/22/2006 17:30	122,000	734,000
08470460	02/22/2006 16:30	4,070	7,830
08470500	02/22/2006 15:30	1,610	2,030
08470520	02/22/2006 13:30	464	618
08470450	05/24/2006 11:30	279,000	929,000
08470460	05/24/2006 12:30	0	45,700,000
08470500	05/24/2006 13:30	0	15,800,000
08470520	05/24/2006 14:30	446,000	1,110,000

Appendix 1–2.4.a. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using environmental discrete-sample analysis, February 2006.

[ft, feet; FNMU, formazin nephelometric units; mmHg, millimeters of mercury; mg/L, milligrams per liter; --, not sampled; PSU, practical salinity units; µS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; E, estimated; $CaCO_3$, calcium carbonate; N, nitrogen; NH_4, ammonia; NO_3, nitrate; P, phosphorus; <, less than; µg/L, micrograms per liter]

Constituent	08470450		08470460		08470500		08470520	
	02/22/2006 17:30	02/23/2006 11:30	02/22/2006 16:30	02/23/2006 10:30	02/22/2006 15:30	02/23/2006 09:30	02/22/2006 13:30	02/23/2006 08:30
Sampling depth (ft)	1	1	1	1	1	1	1	1
Turbidity (FNMU)	190	110	55	55	28	18	34	12
Barometric pressure (mmHg)	762	762	761	762	760	760	762	762
Carbon dioxide (mg/L)	--	--	--	--	--	--	--	--
Dissolved oxygen (mg/L)	8.1	6.7	5.1	6.8	6.4	6.2	8.1	7.7
Dissolved oxygen (percent of saturation)	90	76	54	76	74	70	91	88
pH (standard units)	7.7	7.7	7.7	7.7	7.9	7.8	7.8	7.8
Salinity (PSU)	2	2	17	3	10	5	7	8
Specific conductance (µS/cm)	3,640	3,790	27,300	4,780	16,200	9,340	12,400	13,100
Temperature, air (°C)	E23.0	E21.0	E23.0	E21.0	E23.0	E21.0	E23.0	E21.0
Temperature, water (°C)	19.5	21.0	18.6	20.8	19.1	19.8	19.0	19.4
Acid neutralizing capacity (mg/L as $CaCO_3$)	212	--	219	--	209	--	209	--
Bicarbonate (mg/L)	256	--	263	--	250	--	250	--
Carbonate (mg/L)	1	--	2	--	2	--	2	--
Hydroxide (mg/L)	<1	--	<1	--	<1	--	<1	--
Chloride (mg/L)	650	650	3,900	1,100	3,500	2,000	2,200	3,000
Sulfate (mg/L)	630	640	980	680	890	850	860	840
Residue on evaporation dried at 180 °C (mg/L)	2,200	2,400	13,000	2,900	6,600	5,300	5,000	7,100
Fixed nonfilterable residue (mg/L)	67	87	53	52	25	10	14	4
Total nonfilterable residue (mg/L)	91	110	68	66	32	16	20	11
Ignition loss from nonfilterable residue (mg/L)	24.0	23.0	15.0	14.0	7.2	6.4	6.0	7.2
Ammonia plus organic nitrogen (mg/L as N)	.87	.96	.68	.98	.83	.53	1.00	.56
Ammonia (mg/L as NH_4)	.32	.33	.40	.32	.42	.33	.40	.31
Ammonia (mg/L as N)	.25	.26	.31	.25	.33	.26	.31	.24
Nitrite plus nitrate (mg/L as N)	5.3	4.8	4.3	4.4	4.0	4.6	4.0	3.4
Organic nitrogen (mg/L)	.62	.70	.37	.73	.50	.27	.69	.32
Particulate nitrogen (mg/L)	.43	.49	.37	.40	.24	.23	.61	.22
Total nitrogen (mg/L)	6.2	5.8	5.0	5.4	4.8	5.1	5.0	4.0
Total nitrogen (mg/L as NO_3)	27.3	25.5	22.0	23.8	21.4	22.7	22.1	17.5
Orthophosphate (mg/L)	.981	1.630	1.070	1.230	1.230	.981	2.330	.052
Orthophosphate (mg/L as P)	.32	.53	.35	.40	.40	.32	.76	.02
Phosphate (mg/L)	.47	.46	.39	.49	.38	.39	.39	.24
Phosphorus (mg/L)	E.41	E.41	E.58	E.44	E.50	E.51	E.50	E.36
Carbon (inorganic plus organic) suspended sediment (mg/L)	4.7	5.3	4.1	4.3	1.9	1.5	4.8	1.3
Organic carbon, filtered (mg/L)	4.2	E4.8	4.3	E4.5	4.8	E3.3	4.7	E4.6
Organic carbon, unfiltered (mg/L)	4.0	3.9	4.3	4.2	4.6	4.2	4.5	3.9
Biochemical oxygen demand (mg/L)	3.2	<2.0	2.4	2.5	2.6	<2.0	2.2	<2.0
Chlorophyll *a* (µg/L)	<5.0	E14.0	E15.0	--	E10.0	E9.0	E10.0	E9.0
Pheophytin *a* (µg/L)	<5.0	<5.0	<5.0	--	<5.0	<5.0	<5.0	<5.0

Appendix 1–2.4.b. Data collected at near-surface depth of the Arroyo Colorado near Rio Hondo, Texas, using environmental discrete-sample analysis, May 2006.

[ft, feet; FNMU, formazin nephelometric units; mmHg, millimeters of mercury; mg/L, milligrams per liter; --, not sampled; PSU, practical salinity units; µS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; $CaCO_3$, calcium carbonate; E, estimated; N, nitrogen; NH_4, ammonia; NO_3, nitrate; P, phosphorus; µg/L, micrograms per liter; <, less than]

Constituent	08470450		08470460		08470500		08470520	
	05/23/2006 11:30	05/24/2006 11:30	05/23/2006 12:30	05/24/2006 10:30	05/23/2006 13:30	05/24/2006 09:30	05/23/2006 14:30	05/24/2006 07:30
Sampling depth (ft)	1	1	1	1	1	1	1	1
Turbidity (FNMU)	92	100	50	28	16	15	11	17
Barometric pressure (mmHg)	760	760	760	762	761	762	760	760
Carbon dioxide (mg/L)	4.8	4.0	4.5	4.0	3.7	4.4	.6	--
Dissolved oxygen (mg/L)	6.2	5.0	6.8	3.9	8.9	4.0	16.8	6.7
Dissolved oxygen (percent of saturation)	80	66	90	64	120	53	229	88
pH (standard units)	7.9	8.0	8.0	8.0	8.0	7.9	8.8	8.0
Salinity (PSU)	2	2	3	3	4	6	5	4
Specific conductance (µS/cm)	4,310	4,350	5,240	6,190	6,880	10,300	8,380	7,920
Temperature, air (°C)	32.8	31.1	33.9	28.9	33.9	27.8	33.9	23.9
Temperature, water (°C)	28.1	28.3	28.8	28.3	29.4	27.8	30.3	27.8
Acid neutralizing capacity (mg/L as $CaCO_3$)	210	220	210	210	190	190	180	--
Bicarbonate (mg/L)	--	--	--	--	--	--	--	--
Carbonate (mg/L)	--	--	--	--	--	--	--	--
Hydroxide (mg/L)	--	--	--	--	--	--	--	--
Chloride (mg/L)	830	840	1,100	1,500	1,700	3,100	2,200	2,100
Sulfate (mg/L)	880	890	860	950	940	1,100	910	960
Residue on evaporation dried at 180°C (mg/L)	2,800	2,800	3,200	3,800	4,200	6,000	5,000	4,800
Fixed nonfilterable residue (mg/L)	52	67	33	34	5	8	3	--
Total nonfilterable residue (mg/L)	E69	E89	E43	E44	E10	E15	E28	E12
Ignition loss from nonfilterable residue (mg/L)	E17.0	E22.0	E10.0	E10.0	E5.2	E7.2	E25.0	<4.0
Ammonia plus organic nitrogen (mg/L as N)	.73	.77	.61	.66	.62	.72	2.20	<.500
Ammonia (mg/L as NH_4)	.11	.14	.15	.24	.23	.37	.12	.12
Ammonia (mg/L as N)	.089	.110	.120	.190	.180	.290	.092	.091
Nitrite plus nitrate (mg/L as N)	3.7	3.5	1.8	3.5	3.0	2.8	1.3	2.8
Organic nitrogen (mg/L)	.64	.66	.49	.47	.44	.43	2.10	--
Particulate nitrogen (mg/L)	--	--	--	--	--	--	--	--
Total nitrogen (mg/L)	4.4	4.3	2.4	4.2	3.6	3.5	3.5	3.3
Total nitrogen (mg/L as NO_3)	19.6	18.9	10.7	18.4	16.0	15.6	15.5	--
Orthophosphate (mg/L)	1.930	1.410	1.690	1.720	1.690	1.530	1.230	1.230
Orthophosphate (mg/L as P)	.63	.46	.55	.56	.55	.50	.40	.40
Phosphate (mg/L)	--	--	--	--	--	--	--	--
Phosphorus (mg/L)	.58	.54	.59	.59	.53	.47	.54	.40
Carbon (inorganic plus organic) suspended sediment (mg/L)	--	--	--	--	--	--	--	--
Organic carbon, filtered (mg/L)	4.4	4.5	4.6	7.0	4.9	5.0	5.2	4.4
Organic carbon, unfiltered (mg/L)	4.7	4.7	5.0	8.0	5.2	5.2	11.0	5.0
Biochemical oxygen demand (mg/L)	3.3	3.2	3.6	7.3	2.6	7.7	E8.6	2.5
Chlorophyll *a* (µg/L)	<3.0	E34.0	E25.0	E29.0	E21.0	E83.0	E240	E43.0
Pheophytin *a* (µg/L)	E110	E12.0	<3.0	<3.0	<3.0	<3.0	E24.0	<3.0

Appendix 1–3. Data collected for quality assurance/quality control from the Arroyo Colorado near Rio Hondo, Texas.

[mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; --, not sampled; <, less than; °C, degrees Celsius; N, nitrogen; NH_4, ammonia; NO_3, nitrate; P, phosphorus; µg/L, micrograms per liter; E, estimated]

Constituent	08470520		08470450		08470450		08470520	
	02/22/2006 13:05	02/22/2006 13:32	02/23/2006 11:02	02/23/2006 11:05	05/23/2006 11:02	05/23/2006 11:05	05/24/2006 07:02	05/24/2006 07:05
Sample type	Blank	Replicate	Replicate	Blank	Replicate	Blank	Blank	Replicate
Acid neutralizing capacity (mg/L as $CaCO_3$)	--	--	--	--	--	--	<5	210
Chloride (mg/L)	<3	2,400	630	<3	810	<3	4	2,000
Sulfate (mg/L)	<5	820	620	<5	860	<5	<5	980
Residue on evaporation dried at 180 °C (mg/L)	<10	5,400	2,400	<10	2,800	14	<10	4,900
Fixed nonfilterable residue (mg/L)	--	15	96	--	47	--	--	5
Total nonfilterable residue (mg/L)	<4	22	120	<4	62	<4	<4	11
Ignition loss from nonfilterable residue (mg/L)	<4.0	6.8	24.0	<4.0	15.0	<4.0	<4.0	5.6
Ammonia plus organic nitrogen (mg/L as N)	<.50	.89	1.00	<.50	1.10	<.50	<.50	<.50
Ammonia (mg/L as NH_4)	--	.41	.36	--	.11	.06	.04	.10
Ammonia (mg/L as N)	<.100	.320	.280	<.100	.085	.047	.031	.081
Nitrite plus nitrate (mg/L as N)	<.002	4.200	5.200	<.002	2.600	.007	.007	2.500
Organic nitrogen (mg/L)	--	.57	.72	--	1.00	--	--	--
Particulate nitrogen (mg/L)	.05	.27	.54	<.01	.56	.01	.04	.39
Total nitrogen (mg/L)	<.5	5.1	6.2	<.5	3.7	<.5	<.5	2.9
Total nitrogen (mg/L as NO_3)	--	22.5	27.4	--	16.4	--	--	--
Orthophosphate (mg/L)	--	.92	1.63	--	1.81	--	--	1.07
Orthophosphate (mg/L as P)	<.002	.300	.530	<.002	.590	<.002	<.002	.350
Phosphate (mg/L)	<.05	.44	.55	<.05	--	--	--	--
Phosphorus (mg/L)	.002	.510	.420	.002	.530	.002	.002	.380
Carbon (inorganic plus organic) suspended sediment (mg/L)	.30	2.10	6.30	<.05	5.10	.10	.10	2.00
Organic carbon, filtered (mg/L)	<1.0	4.6	4.2	<1.0	4.6	<1.0	<1.0	4.6
Organic carbon, unfiltered (mg/L)	<1.0	4.5	4.0	<1.0	4.7	<1.0	<1.0	4.8
Chlorophyll *a* (µg/L)	<5	E12	E26	<5	E33	<3	<3	E21
Pheophytin *a* (µg/L)	<5.0	<5.0	E6.0	<5.0	E11.0	E16.0	E5.3	<3.0

Appendix 2—Vertical Profile Data Collected From the Arroyo Colorado Near Rio Hondo, Texas

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Appendix 2–1. Water-quality monitor vertical profile data collected from the Arroyo Colorado near Rio Hondo, Texas.

[ft, feet; °C, degrees Celsius; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; PSU, practical salinity units; FNMU, formazin nephelometric units; E, estimated]

USGS station no.	Date and time	Sample depth (ft)	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)	Salinity (PSU)	Turbidity (FNMU)
Station 08470450 February data-collection period day 1								
08470450	02/22/2006 10:01	1	17.7	3,480	7.7	7.8	2	190
08470450	02/22/2006 10:02	2	17.7	3,480	7.3	7.8	2	190
08470450	02/22/2006 10:03	3	17.7	3,490	7.4	7.8	2	210
08470450	02/22/2006 10:04	4	17.7	3,490	7.2	7.9	2	180
Station 08470450 February data-collection period day 2								
08470450	02/23/2006 13:05	1	20.9	3,740	6.5	7.6	2	110
08470450	02/23/2006 13:06	2	20.9	3,740	6.6	7.7	2	120
08470450	02/23/2006 13:07	3	20.9	3,740	6.5	7.7	2	120
08470450	02/23/2006 13:08	4	20.9	3,740	6.5	7.7	2	120
08470450	02/23/2006 13:09	5	20.9	3,710	6.5	7.7	2	160
Station 08470450 May data-collection period day 1								
08470450	05/23/2006 10:22	1	28.1	4,310	6.2	7.9	2	92
08470450	05/23/2006 10:23	2	28.1	4,310	5.5	8.0	2	93
08470450	05/23/2006 10:24	3	28.1	4,310	5.8	8.0	2	100
08470450	05/23/2006 10:25	4	28.1	4,310	5.3	8.0	2	110
Station 08470450 May data-collection period day 2								
08470450	05/24/2006 10:49	1	28.3	4,350	5.0	8.0	2	100
08470450	05/24/2006 10:50	2	28.2	4,430	5.0	8.0	2	120
08470450	05/24/2006 10:51	3	28.2	4,350	4.9	8.0	2	120
08470450	05/24/2006 10:52	4	28.2	4,350	4.8	8.0	2	140
08470450	05/24/2006 10:53	5	28.2	4,350	4.8	8.0	2	140
Station 08470460 February data-collection period day 1								
08470460	02/22/2006 08:55	1	17.6	4,280	7.8	7.8	2	56
08470460	02/22/2006 08:56	2	17.6	5,200	7.8	7.7	3	55
08470460	02/22/2006 08:57	3	17.5	8,130	7.0	7.7	4	53
08470460	02/22/2006 08:58	4	17.1	18,700	5.9	7.6	11	45
08470460	02/22/2006 08:59	5	16.4	47,700	1.8	7.9	31	20
08470460	02/22/2006 09:00	6	16.2	49,200	1.0	8.0	32	17
08470460	02/22/2006 09:01	7	16.1	49,800	1.1	8.1	33	18
08470460	02/22/2006 09:02	8	16.0	50,400	1.3	8.2	33	15
08470460	02/22/2006 09:03	9	15.9	50,700	1.5	8.2	33	17
08470460	02/22/2006 09:04	10	15.9	51,000	1.6	8.2	33	18
08470460	02/22/2006 09:05	11	15.8	51,200	1.6	8.2	34	15
08470460	02/22/2006 09:06	12	15.8	51,800	1.6	8.3	34	15
Station 08470460 February data-collection period day 2								
08470460	02/23/2006 13:31	1	20.8	4,300	7.0	7.8	2	120
08470460	02/23/2006 13:32	2	20.7	4,360	7.0	7.8	2	70
08470460	02/23/2006 13:33	3	20.8	4,290	7.0	7.8	2	74
08470460	02/23/2006 13:34	4	20.8	4,180	7.0	7.8	2	76
08470460	02/23/2006 13:35	5	20.6	5,090	6.8	7.7	3	66
08470460	02/23/2006 13:36	6	20.6	5,830	6.7	7.7	3	65
08470460	02/23/2006 13:37	7	20.6	5,960	6.6	7.7	3	62
08470460	02/23/2006 13:38	8	20.0	14,000	5.2	7.6	8	45
08470460	02/23/2006 13:39	9	19.7	35,000	.9	7.7	22	27
08470460	02/23/2006 13:40	10	16.0	50,400	1.1	7.9	33	18
08470460	02/23/2006 13:41	11	15.9	51,500	1.1	7.9	34	19
08470460	02/23/2006 13:42	12	15.9	52,000	.8	8.0	34	20
08470460	02/23/2006 13:43	13	15.9	52,400	.8	8.0	34	22
08470460	02/23/2006 13:44	14	15.9	52,400	E.5	8.0	35	22

Appendix 2–1. Water-quality monitor vertical profile data collected from the Arroyo Colorado near Rio Hondo, Texas—Continued.

USGS station no.	Date and time	Sample depth (ft)	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)	Salinity (PSU)	Turbidity (FNMU)
Station 08470460 May data-collection period day 1								
08470460	05/23/2006 09:57	1	27.8	4,980	5.6	8.0	3	36
08470460	05/23/2006 09:58	2	27.8	5,560	5.1	7.9	3	50
08470460	05/23/2006 09:59	3	27.8	6,470	4.2	7.9	4	40
08470460	05/23/2006 10:00	4	27.8	9,620	4.1	7.9	5	43
08470460	05/23/2006 10:01	5	27.6	17,400	1.2	7.7	10	18
08470460	05/23/2006 10:02	6	27.6	18,800	E.5	7.7	11	20
08470460	05/23/2006 10:03	7	27.3	23,700	E.2	7.6	14	34
08470460	05/23/2006 10:04	8	27.2	26,800	E.1	7.8	16	28
08470460	05/23/2006 10:05	9	27.0	29,700	E.1	8.4	18	57
08470460	05/23/2006 10:06	10	26.9	32,800	E.1	8.6	21	38
08470460	05/23/2006 10:07	11	26.7	34,800	E.1	8.6	22	33
08470460	05/23/2006 10:08	12	26.6	36,300	E.1	8.5	23	27
Station 08470460 May data-collection period day 2								
08470460	05/24/2006 10:07	1	28.3	6,190	3.9	8.0	3	28
08470460	05/24/2006 10:08	2	28.3	6,330	4.6	8.0	3	48
08470460	05/24/2006 10:09	3	28.0	9,620	3.0	7.9	5	31
08470460	05/24/2006 10:10	4	27.9	16,200	1.9	7.8	9	25
08470460	05/24/2006 10:11	5	27.8	18,400	.9	7.7	11	29
08470460	05/24/2006 10:12	6	27.7	20,300	E.5	7.7	12	35
08470460	05/24/2006 10:13	7	27.6	22,900	E.1	7.7	14	48
08470460	05/24/2006 10:14	8	27.4	26,300	E.1	7.8	16	57
08470460	05/24/2006 10:15	9	27.3	28,000	E.1	8.1	17	57
08470460	05/24/2006 10:16	10	27.2	29,500	E.1	8.4	18	65
08470460	05/24/2006 10:17	11	27.0	31,700	E.1	8.7	20	59
08470460	05/24/2006 10:18	12	26.8	33,900	E.1	8.7	21	48
08470460	05/24/2006 10:19	13	26.7	35,300	E.1	8.7	22	36
08470460	05/24/2006 10:20	14	26.6	37,100	E.1	8.6	23	29
Station 08470500 February data-collection period day 1								
08470500	02/22/2006 10:55	1	17.4	5,310	8.5	7.7	3	28
08470500	02/22/2006 10:56	2	17.4	5,270	8.2	7.7	3	28
08470500	02/22/2006 10:57	3	17.3	5,530	8.0	7.7	3	28
08470500	02/22/2006 10:58	4	17.3	5,930	6.9	7.5	3	21
08470500	02/22/2006 10:59	5	16.4	48,600	1.9	7.8	32	13
08470500	02/22/2006 11:00	6	16.4	48,700	1.1	7.9	32	11
08470500	02/22/2006 11:01	7	15.9	50,300	1.6	8.0	33	9.8
08470500	02/22/2006 11:02	8	16.0	51,400	1.6	8.1	34	12
08470500	02/22/2006 11:03	9	16.0	53,200	1.5	8.1	35	7.7
08470500	02/22/2006 11:04	10	16.1	53,300	1.4	8.2	35	8.0
08470500	02/22/2006 11:05	11	16.3	54,000	1.1	8.2	36	6.5
08470500	02/22/2006 11:06	12	16.4	54,000	1.1	8.2	36	7.2
08470500	02/22/2006 11:07	13	16.4	54,000	1.0	8.2	36	6.8
Station 08470500 February data-collection period day 2								
08470500	02/23/2006 14:05	1	19.7	14,300	7.4	7.8	8	18
08470500	02/23/2006 14:06	2	19.6	14,600	7.3	7.8	8	18
08470500	02/23/2006 14:07	3	19.6	14,800	7.2	7.8	9	19
08470500	02/23/2006 14:08	4	19.6	15,000	7.0	7.8	9	21
08470500	02/23/2006 14:09	5	19.6	15,200	6.9	7.8	9	12
08470500	02/23/2006 14:10	6	19.2	19,500	5.6	7.7	12	20
08470500	02/23/2006 14:11	7	18.7	26,400	4.4	7.7	16	18
08470500	02/23/2006 14:12	8	17.8	38,100	1.7	7.7	24	16
08470500	02/23/2006 14:13	9	16.9	48,000	.8	7.8	31	8.4
08470500	02/23/2006 14:14	10	16.5	50,300	.9	7.8	33	13

Appendix 2–1. Water-quality monitor vertical profile data collected from the Arroyo Colorado near Rio Hondo, Texas—Continued.

USGS station no.	Date and time	Sample depth (ft)	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)	Salinity (PSU)	Turbidity (FNMU)
Station 08470500 February data-collection period day 2—Continued								
08470500	02/23/2006 14:15	11	16.1	52,300	0.9	7.9	34	12
08470500	02/23/2006 14:16	12	16.1	52,400	.9	8.0	34	9.1
08470500	02/23/2006 14:17	13	16.1	52,700	.9	8.0	35	9.4
08470500	02/23/2006 14:18	14	16.4	53,600	.7	8.0	35	7.6
Station 08470500 May data-collection period day 1								
08470500	05/23/2006 09:36	1	25.5	8,970	5.1	7.9	5	11
08470500	05/23/2006 09:37	2	27.5	9,000	4.6	7.9	5	12
08470500	05/23/2006 09:38	3	27.5	9,130	3.9	7.9	5	9.9
08470500	05/23/2006 09:39	4	27.6	9,410	3.4	7.8	5	9.6
08470500	05/23/2006 09:40	5	28.0	10,600	2.6	7.8	6	11
08470500	05/23/2006 09:41	6	28.2	13,000	1.4	7.7	7	15
08470500	05/23/2006 09:42	7	27.4	21,700	E.3	7.7	13	11
08470500	05/23/2006 09:43	8	27.1	23,600	E.3	7.8	14	14
08470500	05/23/2006 09:44	9	26.8	29,600	E.2	8.5	18	18
08470500	05/23/2006 09:45	10	26.6	35,400	E.2	8.6	22	16
Station 08470500 May data-collection period day 2								
08470500	05/24/2006 09:26	1	27.8	10,300	4.0	7.9	6	15
08470500	05/24/2006 09:27	2	27.9	11,100	4.0	7.9	6	19
08470500	05/24/2006 09:28	3	27.8	12,600	3.1	7.9	7	19
08470500	05/24/2006 09:29	4	27.7	16,400	1.4	7.8	10	23
08470500	05/24/2006 09:31	5	27.5	19,500	.7	7.8	12	30
08470500	05/24/2006 09:32	6	27.4	21,400	E.5	7.8	13	30
08470500	05/24/2006 09:33	7	27.3	23,400	E.2	7.8	14	39
08470500	05/24/2006 09:34	8	27.2	25,300	E.1	7.8	15	50
08470500	05/24/2006 09:35	9	27.1	27,400	E.1	7.9	17	54
08470500	05/24/2006 09:36	10	26.9	29,900	E.1	8.4	19	52
08470500	05/24/2006 09:37	11	26.2	31,000	E.1	8.7	19	48
Station 08470520 February data-collection period day 1								
08470520	02/22/2006 11:16	1	17.7	6,330	8.7	7.8	3	34
08470520	02/22/2006 11:17	2	17.7	6,410	8.3	7.8	3	24
08470520	02/22/2006 11:18	3	17.6	6,400	7.7	7.8	3	26
08470520	02/22/2006 11:19	4	17.5	10,800	7.3	7.7	6	21
08470520	02/22/2006 11:20	5	17.0	12,200	6.0	7.8	7	22
08470520	02/22/2006 11:21	6	16.8	46,600	2.3	7.8	30	7.6
08470520	02/22/2006 11:22	7	16.6	52,700	1.1	8.0	35	6.1
08470520	02/22/2006 11:23	8	17.1	52,100	1.1	7.9	34	6.1
08470520	02/22/2006 11:24	9	17.0	54,700	.9	8.2	36	7.7
08470520	02/22/2006 11:25	10	16.9	54,600	.9	8.2	36	6.2
08470520	02/22/2006 11:26	11	16.9	55,100	.9	8.2	36	5.0
08470520	02/22/2006 11:27	12	17.1	55,000	.7	8.2	36	5.3
08470520	02/22/2006 11:28	13	17.1	55,200	.6	8.3	37	4.5
08470520	02/22/2006 11:29	14	17.1	55,200	.7	8.3	37	5.1
Station 08470520 February data-collection period day 2								
08470520	02/23/2006 14:46	1	19.4	12,400	8.5	7.9	7	12
08470520	02/23/2006 14:47	2	19.3	12,400	8.5	7.9	7	15
08470520	02/23/2006 14:48	3	19.3	12,600	8.5	8.0	7	15
08470520	02/23/2006 14:49	4	19.3	12,900	8.1	7.9	7	16
08470520	02/23/2006 14:50	5	19.2	16,100	7.7	7.9	9	15
08470520	02/23/2006 14:51	6	18.7	34,100	5.0	7.8	21	12
08470520	02/23/2006 14:52	7	16.0	50,400	2.0	7.8	33	5.9
08470520	02/23/2006 14:53	8	16.1	50,700	1.4	7.9	33	8.3
08470520	02/23/2006 14:54	9	16.0	51,400	1.4	7.9	34	5.6

Appendix 2–1. Water-quality monitor vertical profile data collected from the Arroyo Colorado near Rio Hondo, Texas—Continued.

USGS station no.	Date and time	Sample depth (ft)	Temperature (°C)	Specific conductance (µS/cm)	Dissolved oxygen (mg/L)	pH (standard units)	Salinity (PSU)	Turbidity (FNMU)
Station 08470520 February data-collection period day 2—Continued								
08470520	02/23/2006 14:55	10	16.1	52,500	1.3	8.0	35	6.4
08470520	02/23/2006 14:56	11	16.4	53,200	1.0	8.0	35	7.5
08470520	02/23/2006 14:57	12	16.8	54,400	E.5	8.1	36	6.6
08470520	02/23/2006 14:58	13	16.9	54,600	E.4	8.1	36	6.4
08470520	02/23/2006 14:59	14	17.0	54,700	E.4	8.1	36	6.5
08470520	02/23/2006 15:00	15	17.0	54,800	E.4	8.1	36	6.4
Station 08470520 May data-collection period day 1								
08470520	05/23/2006 09:10	1	27.5	8,040	7.5	7.9	4	24
08470520	05/23/2006 09:11	2	27.5	8,510	6.6	7.8	5	18
08470520	05/23/2006 09:12	3	27.7	8,430	5.3	7.8	5	17
08470520	05/23/2006 09:13	4	27.8	10,500	3.2	7.5	6	14
08470520	05/23/2006 09:14	5	28.0	12,200	.9	7.5	7	13
08470520	05/23/2006 09:15	6	27.9	17,000	E.4	7.4	10	11
08470520	05/23/2006 09:16	7	27.5	22,000	E.3	7.4	13	7.4
08470520	05/23/2006 09:17	8	26.7	29,200	E.2	8.5	18	14
08470520	05/23/2006 09:18	9	26.7	31,500	E.2	8.6	20	13
08470520	05/23/2006 09:19	10	26.4	35,500	E.2	8.7	22	11
08470520	05/23/2006 09:20	11	25.9	43,100	E.2	9.0	28	16
08470520	05/23/2006 09:21	12	25.9	43,300	E.2	9.1	28	15
08470520	05/23/2006 09:22	13	25.7	43,900	E.2	9.1	28	16
08470520	05/23/2006 09:23	14	25.7	44,000	E.2	9.1	28	14
08470520	05/23/2006 09:24	15	25.7	44,100	E.1	9.1	28	16
Station 08470520 May data-collection period day 2								
08470520	05/24/2006 07:40	1	27.8	7,920	6.7	8.0	4	17
08470520	05/24/2006 07:41	2	28.1	8,240	6.2	8.0	5	15
08470520	05/24/2006 07:42	3	28.3	8,740	6.0	8.0	5	13
08470520	05/24/2006 07:43	4	28.4	9,350	4.7	7.9	5	12
08470520	05/24/2006 07:44	5	28.4	11,800	3.0	7.7	7	9.9
08470520	05/24/2006 07:45	6	28.1	15,500	E.4	7.5	9	8.4
08470520	05/24/2006 07:46	7	27.8	18,400	E.2	7.5	11	17
08470520	05/24/2006 07:47	8	27.4	24,200	E.2	7.5	15	17
08470520	05/24/2006 07:48	9	26.5	36,500	E.2	8.7	23	12
08470520	05/24/2006 07:49	10	25.7	44,500	E.1	9.4	29	16
08470520	05/24/2006 07:50	11	25.5	44,900	E.1	9.4	29	15
08470520	05/24/2006 07:51	12	25.5	45,000	E.1	9.5	29	18
08470520	05/24/2006 07:52	13	25.5	45,000	E.1	9.5	29	16
08470520	05/24/2006 07:53	14	25.5	45,000	E.1	9.5	29	17
08470520	05/24/2006 07:54	15	25.5	45,100	E.1	9.5	29	16

Appendix 2–2. PAR sensor vertical profile data collected from the Arroyo Colorado near Rio Hondo, Texas.

[PAR, photosynthetically active radiation; m, meters; μE/m^2/s, microEinsteins per square meter per second]

USGS station no.	Date and time	Sample depth (m)	Remark	Downwelling light (μE/m^2/sec)	Upwelling light (μE/m^2/sec)
Station 08470450 February data-collection period					
08470450	02/22/2006 14:20	0	Air	1,774.00	152.00
08470450	02/22/2006 14:21	0	Surface	644.00	29.00
08470450	02/22/2006 14:22	1	Water	11.00	.60
08470450	02/22/2006 14:23	2	Water	.01	.00
Station 08470450 May data-collection period					
08470450	05/23/2006 14:20	0	Air	2,430.00	109.10
08470450	05/23/2006 14:21	0	Surface	1,274.00	38.01
08470450	05/23/2006 14:22	1	Water	2.30	.20
08470450	05/23/2006 14:23	2	Water	.00	.00
Station 08470460 February data-collection period					
08470460	02/22/2006 10:22	0	Air	207.00	22.00
08470460	02/22/2006 10:23	0	Surface	82.00	12.00
08470460	02/22/2006 10:24	1	Water	25.00	3.00
08470460	02/22/2006 10:25	2	Water	3.00	.03
08470460	02/22/2006 10:26	3	Water	1.00	.20
08470460	02/22/2006 10:27	4	Water	.30	.04
08470460	02/22/2006 14:32	0	Air	837.00	126.00
08470460	02/22/2006 14:33	0	Surface	399.00	19.00
08470460	02/22/2006 14:34	1	Water	41.00	4.00
08470460	02/22/2006 14:35	2	Water	4.70	.60
08470460	02/22/2006 14:36	3	Water	.80	.10
08470460	02/22/2006 14:37	4	Water	.40	.06
08470460	02/22/2006 16:08	0	Air	940.00	182.00
08470460	02/22/2006 16:09	0	Surface	544.00	51.00
08470460	02/22/2006 16:10	1	Water	83.00	7.00
08470460	02/22/2006 16:11	2	Water	13.00	1.40
08470460	02/22/2006 16:12	3	Water	2.80	.30
08470460	02/22/2006 16:13	4	Water	.40	.06
Station 08470460 May data-collection period					
08470460	05/23/2006 10:22	0	Air	1,820.00	137.00
08470460	05/23/2006 10:23	0	Surface	275.00	48.00
08470460	05/23/2006 10:24	1	Water	7.20	1.60
08470460	05/23/2006 10:25	2	Water	.43	.09
08470460	05/23/2006 10:26	3	Water	.02	.00
08470460	05/23/2006 10:27	4	Water	.00	.00
Station 08470500 February data-collection period					
08470500	02/22/2006 10:48	0	Air	856.00	85.00
08470500	02/22/2006 10:49	0	Surface	425.00	43.00
08470500	02/22/2006 10:50	1	Water	114.00	12.00
08470500	02/22/2006 10:51	2	Water	13.00	1.10
08470500	02/22/2006 10:52	3	Water	3.60	.40
08470500	02/22/2006 10:53	4	Water	1.40	.10

Appendix 2–2. PAR sensor vertical profile data collected from the Arroyo Colorado near Rio Hondo, Texas—Continued.

USGS station no.	Date and time	Sample depth (m)	Remark	Downwelling light ($\mu E/m^2/sec$)	Upwelling light ($\mu E/m^2/sec$)
Station 08470500 February data-collection period—Continued					
08470500	02/22/2006 14:02	0	Air	1,127.00	142.00
08470500	02/22/2006 14:03	0	Surface	544.00	53.00
08470500	02/22/2006 14:04	1	Water	132.00	14.00
08470500	02/22/2006 14:05	2	Water	8.00	.90
08470500	02/22/2006 14:06	3	Water	2.20	.20
08470500	02/22/2006 14:07	4	Water	.70	.09
08470500	02/22/2006 16:28	0	Air	814.00	139.00
08470500	02/22/2006 16:29	0	Surface	441.00	47.00
08470500	02/22/2006 16:30	1	Water	115.00	9.00
08470500	02/22/2006 16:31	2	Water	16.00	1.00
08470500	02/22/2006 16:32	3	Water	3.80	.30
Station 08470500 May data-collection period					
08470500	05/23/2006 10:48	0	Air	477.00	69.00
08470500	05/23/2006 10:49	0	Surface	276.00	53.00
08470500	05/23/2006 10:50	1	Water	36.00	8.90
08470500	05/23/2006 10:51	2	Water	15.00	2.30
08470500	05/23/2006 10:52	3	Water	2.80	.35
08470500	05/23/2006 10:53	4	Water	.58	.05
Station 08470520 February data-collection period					
08470520	02/22/2006 13:30	0	Air	1,633.00	174.00
08470520	02/22/2006 13:31	0	Surface	938.00	91.00
08470520	02/22/2006 13:32	1	Water	217.00	26.00
08470520	02/22/2006 13:33	2	Water	23.00	2.80
08470520	02/22/2006 13:34	3	Water	4.10	.40
08470520	02/22/2006 13:35	4	Water	1.40	.10
Station 08470520 May data-collection period					
08470520	05/23/2006 13:30	0	Air	1,737.00	26.07
08470520	05/23/2006 13:31	0	Surface	148.10	3.20
08470520	05/23/2006 13:32	1	Water	3.46	.51
08470520	05/23/2006 13:33	2	Water	.36	.04
08470520	05/23/2006 13:34	3	Water	.08	.01

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