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Scientific Investigations Report 2013–5015

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**U.S. Department of the Interior
U.S. Geological Survey**

U.S. Department of the Interior

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U.S. Geological Survey, Reston, Virginia: 2013

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Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
Length		
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
Area		
acre	4,047	square meter (m ²)
acre	0.4047	hectare (ha)
acre	0.4047	square hectometer (hm ²)
acre	0.004047	square kilometer (km ²)
square foot (ft ²)	929.0	square centimeter (cm ²)
square foot (ft ²)	0.09290	square meter (m ²)
square mile (mi ²)	259.0	hectare (ha)
square mile (mi ²)	2.590	square kilometer (km ²)
Volume		
cubic foot (ft ³)	28.32	cubic decimeter (dm ³)
cubic foot (ft ³)	0.02832	cubic meter (m ³)
acre-foot (acre-ft)	1,233	cubic meter (m ³)
acre-foot (acre-ft)	0.001233	cubic hectometer (hm ³)
Flow rate		
foot per second (ft/s)	0.3048	meter per second (m/s)
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second (m ³ /s)
cubic foot per day (ft ³ /d)	0.02832	cubic meter per day (m ³ /d)
gallon per minute (gal/min)	0.06309	liter per second (L/s)
Mass		
tons per day	0.9072	metric ton per day
tons per year (ton/yr)	0.9072	metric ton per day

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:
 $^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Elevation, as used in this report, refers to distance above the vertical datum.

Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L) or micrograms per liter (µg/L).

Abbreviations Used in This Report

BLM	Bureau of Land Management
BTEX	benzene, toluene, ethylbenzene, and xylene
CDPHE	Colorado Department of Public Health and Environment
CFU	colony forming units
DS	dissolved solids
ESTREND	Estimate Trend computer program
GMUG	Grand Mesa Uncompahgre and Gunnison (National Forests)
LOADEST	Load Estimation computer program
MCL	maximum contaminant level
µg/L	micrograms per liter
mg/L	milligrams per liter
NIWQP	National Irrigation Water Quality Program
NWIS	National Water Information System
PRESS	prediction sum of squares
TMDL	total maximum daily loads
TPH	total petroleum hydrocarbons
TVS	table-value standards
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

Characterization and Data-Gap Analysis of Surface-Water Quality in the Piceance Study Area, Western Colorado, 1959–2009

By Judith C. Thomas, Jennifer L. Moore, Keelin R. Schaffrath, Jean A. Dupree, Cory A. Williams, and Kenneth J. Leib

Abstract

The U.S. Geological Survey, in cooperation with Federal, State, county, and industry partners, developed a Web-accessible common data repository to provide access to historical and current (as of August 2009) water-quality information (available on the Internet at <http://rmgsc.cr.usgs.gov/cwqdr/Piceance/index.shtml>). Surface-water-quality data from public and private sources were compiled for the period 1931 to 2009 and loaded into the common data repository for the Piceance Basin. A subset of surface-water-quality data for 1959 to 2009 from the repository were compiled, reviewed, and checked for quality assurance for this report. This report contains data summaries, comparisons to water-quality standards, trend analyses, a generalized spatial analysis, and a data-gap analysis for select water-quality properties and constituents.

Summary statistics and a comparison to standards were provided for 347 sites for 33 constituents including field properties, nutrients, major ions, trace elements, suspended sediment, *Escherichia coli*, and BTEX (benzene, toluene, ethylbenzene, and xylene). When sufficient data were available, trends over time were analyzed and loads were calculated for those sites where there were also continuous streamflow data.

The majority of sites had information on field properties. Water temperature data was available for 316 sites where data were collected between 1959 and 2009. The only trend that was detected in temperature was an upward trend at the Gunnison River near Grand Junction, Colorado. There were 326 values out of a total of 32,006 values in the study area that exceeded the aquatic-life standard for daily maximum water temperature. For the entire study area, 196 sites had dissolved-oxygen data collected between 1970 and 2009, and median dissolved-oxygen concentrations ranged from 6.8 to 11.2 milligrams per liter (mg/L). There were 185 concentrations that exceeded the dissolved oxygen aquatic-life standard out of a total of 11,248 values. The pH data were available for 276 sites, and median pH values ranged from 7.5 to 9.0. There were 241 values that exceeded the high pH standard and 13 values that were less than the low pH standard of the 16,790 values in the study area.

Nutrients within the study area were not well represented in each basin and were often not being sampled currently. For the entire study area, 62 sites had nitrate data collected between 1958 and 2009, and median nitrate concentrations ranged from less than detection to 3.72 mg/L as nitrogen. The maximum contaminant level for domestic water supply for nitrate is 10 mg/L and was exceeded once in 3,736 samples. Total phosphorus was collected at 113 sites between 1974 and 2009, and median total phosphorus concentrations ranged from less than detection to 5.04 mg/L. The U.S. Environmental Protection Agency recommendation for phosphorus is less than 0.1 mg/L, and 1,469 of 4,842 samples exceeded this recommended standard. An upward trend in both nitrate and total phosphorus was detected in the White River above Coal Creek near Meeker, Colo.

Standards for major ions exist only for chloride and sulfate. For the entire study area, 118 sites had both chloride and sulfate concentration data collected between 1958 and 2009. Median chloride concentrations ranged from 0.085 mg/L to 280 mg/L. Median sulfate concentrations ranged from 4.57 mg/L to 15,000 mg/L. Both chloride and sulfate domestic water-supply standards are 250 mg/L. There were 120 chloride concentrations and 1,111 sulfate concentration samples that exceeded these standards. A downward trend in dissolved solids was detected at the Colorado River near the Colorado-Utah state border and could be a result of salinity control work near Grand Junction, Colo.

Trace elements were relatively well represented both temporally and spatially in the study area though the number of trace element samples per site was not typically enough to compute trends or loads except for selenium. There were 127 sites that had dissolved iron concentration data collected between 1961 and 2009, and median iron concentrations ranged from less than detection to 1,100 micrograms per liter (µg/L). The 30-day drinking-water standard for iron is 300 µg/L, and 203 samples exceeded the standard. Selenium was the best represented trace element with selenium concentration data collected at 197 sites between 1973 and 2009, and median selenium concentrations range from less than detection to 181 µg/L. The chronic standard of 4.6 µg/L for

selenium concentrations was exceeded in 899 samples, and the acute aquatic-life standard of 18.4 µg/L for selenium was exceeded in 629 samples. High concentrations of selenium are of concern in the Lower Gunnison River Basin because of the combination of geologic formations and land use. There were significant downward trends in selenium at both main-stem sites on the Gunnison River at Delta, Colo., and the Gunnison River near Grand Junction, Colo. High selenium concentrations correlate with high salinity concentrations; thus, when salinity control efforts are conducted in selenium-rich areas in the Lower Gunnison River Basin, both salinity and selenium have the potential to decrease.

Spatial, temporal, and analytical data gaps were identified in the study area. The spatial coverage of sampling sites could be expanded in the White River Basin by adding more tributary sites. No water-quality data exist for tributary streams in the area north of Rangely, Colo., where extensive energy development has occurred in a complex geologic setting. Douglas Creek has a drainage area of 425 square miles and has limited historic water-quality and water-quantity data. Limited data were available for field properties, major ions, nutrients, and trace elements on the main stem of the Colorado River between Glenwood Springs and Cameo, Colo. Nutrient data were minimally collected upstream from Colorado River at the Colorado-Utah state border and on the Gunnison River (major tributary in the reach). Approximately 30 percent of the samples for total phosphorus in the Lower Gunnison River Basin exceeded the recommended standard, yet there were insufficient data to do trends analysis in the Lower Gunnison River Basin except at the Gunnison near Grand Junction site. There is limited trace element data except for selenium in the Lower Gunnison River Basin. Additional sampling is necessary to understand the occurrence, concentrations, and loads of these constituents.

Introduction

Water resources can be affected by natural and human factors. Human factors can include activities such as urbanization, agriculture, and multiple types of development and changes in land use, including energy development and infrastructure. Northwestern Colorado is experiencing many of these types of changes in land use, which can result in short- and long-term changes in the water resources in the study area. Ongoing monitoring and assessment are required to periodically reestablish our understanding of baseline conditions and to detect changes. Substantial water-resource datasets, publications, and other materials have been developed in past years and can be used to assess baseline conditions and to evaluate land-use effects. However, these data are generally stored in disparate formats among numerous agencies, energy companies, private consulting firms, universities, and stakeholder groups. A publically accessible common data repository was needed to compile water-quality data collected by various entities. Compilation and quality assurance of existing

water-quality data from the currently disparate sources and formats provides a useful contribution to public and private entities tasked with planning, oversight, conservation, and management of water resources. The U.S. Geological Survey (USGS), in cooperation with Federal, State, county, and industry partners, developed a Web-accessible common data repository to provide energy operators, researchers, consultants, agencies, and interested stakeholders equal access to historical and current (as of August 2009) water-quality information (available on the Internet at <http://rmgsc.cr.usgs.gov/cwqdr/Piceance/index.shtml>). The following is an alphabetical list of cooperators involved in this study: Antero Resources, Bureau of Land Management, Bureau of Reclamation, Chevron Corporation, City of Grand Junction and City of Rifle, Colo., Colorado Department of Agriculture, Colorado Department of Natural Resources, Colorado Department of Public Health and Environment, Colorado Division of Wildlife–River Watch, Colorado Oil and Gas Conservation Commission, Colorado River Water Conservation District, Delta County, Colo., EnCana Oil & Gas (USA) Inc., Garfield County, Colo., Gunnison Energy Corp., National Park Service, Natural Soda, Inc., North Fork River Improvement Association, Oxy Petroleum Corporation, Petroleum Development Corp., Rio Blanco County, Shell Oil Company, Solvay Chemicals, Towns of Carbondale, De Beque, Palisade, Parachute, Rangely, and Silt, Colo., U.S. Forest Service, West Divide Water Conservancy District, and Williams Companies, Inc.

Purpose and Scope

This report provides an analysis of select surface-water data for 1959–2009 from the common data repository for the Piceance study area. Data were summarized to identify available data and evaluate temporal and spatial patterns in the study area. These data were analyzed to provide a baseline assessment of available water-resource data and aid in the development of regional monitoring strategies. The report contains data summaries, comparisons to standards, trend analyses, and a generalized spatial analysis for selected water-quality properties and constituents. Gaps in available data were identified from these analyses.

Description of the Study Basin Areas

The Piceance study area refers to an area of approximately 9,500 square miles (mi²) in western Colorado extending from north of Rangely to south of Delta and east to west from Glenwood Springs, Colorado (Colo.) to the Colorado-Utah state border (fig. 1). The study area was delineated based on hydrology, geology, and political boundaries. The Piceance study area is subdivided into three study basin areas: the White River Basin, the Colorado River Basin, and the Lower Gunnison River Basin (fig. 1). The climate of the Piceance study area is arid to semiarid with the exception of higher elevations of the Grand Mesa and the Roan Plateau, which are considered subalpine zones (fig. 1). The majority

Figure 1. Location of the Piceance study area, western Colorado.

of precipitation in the lower elevations falls as rain during the late summer and early fall. The majority of precipitation in the higher elevations falls as snow and accumulates in a seasonal snowpack (Western Regional Climate Center, 2012).

White River Basin

The White River Basin is partially defined by the Piceance Structural Basin boundary and begins near the mouth of Coal Creek and extends downstream to the White River at the Colorado-Utah state border. Elevations range from more than 8,675 feet (ft) at Cathedral Bluffs to about 5,200 ft on the White River near the Colorado-Utah state border. The basin is located in Rio Blanco, Garfield, and Moffat Counties (fig. 1). The towns of Meeker and Rangely are the two largest population centers in the basin (fig. 1). Meeker had a population of 2,475 in 2010, and Rangely had a population of 2,365 in 2010 (U.S. Census Bureau, 2011).

Colorado River Basin

The Colorado River Basin includes the drainage area from Glenwood Springs, Colo., to the Colorado-Utah state border (fig. 1). Elevations range from more than 11,000 ft on the Grand Mesa (fig. 1) down to about 4,300 ft on the Colorado River at the Colorado-Utah border. The basin is located in Garfield and Mesa Counties (fig. 1). The primary population centers in this basin (from east to west) are Glenwood Springs, New Castle, Silt, Rifle, Parachute, Collbran, De Beque, Palisade, Grand Junction, and Fruita, Colo. (fig. 1). The largest population center in the basin is Grand Junction, which had a population of 58,566 in 2010 (U.S. Census Bureau, 2011). In comparison, Collbran had a population of 708 in 2010 (U.S. Census Bureau, 2011).

Lower Gunnison River Basin

The Lower Gunnison River Basin is the southernmost section of the Piceance study area (fig. 1). The Lower Gunnison River Basin is only a part of the entire Gunnison River Basin; the Gunnison River is the largest tributary to the Colorado River in Colorado. The Lower Gunnison River Basin, for this study, included the entire drainage area of the North Fork of the Gunnison River and the drainage area beginning slightly downstream from the Gunnison Tunnel on both the Gunnison River and the Uncompahgre River. The Gunnison Tunnel diverts irrigation water from the Gunnison River to the Uncompahgre River. Elevations in the Lower Gunnison River Basin range from about 13,000 ft in the West Elk Mountains (fig. 1) located in the southeast corner of the basin to 4,600 ft near the confluence of the Gunnison River and Colorado River. The basin is located in Delta, Mesa, Gunnison, and Montrose Counties (fig. 1). The largest population center in the basin is Delta which had a population of 8,915 in 2010 (U.S. Census Bureau, 2011). The smallest population center in the basin is Hotchkiss, which had a population of 944 in 2010 (U.S. Census Bureau, 2011).

Geology

The Piceance study area lies within the Piceance Structural Basin, which is a downwarped region surrounded by uplifted regions including the Axial Basin Arch to the north, the Grand Hogback to the east, the Gunnison Uplift to the southeast, the Uncompahgre Uplift to the southwest, and the Douglas Creek Arch to the west (fig. 2). Outcropping bed-rock units in the center of the downwarped region are Tertiary sedimentary rocks (fig. 3). Uplifted regions at the boundaries of the structural basin are primarily Cretaceous sedimentary rocks (figs. 2 and 3).

The surface geology of the study area ranges from Quaternary to Jurassic age (Tweto, 1979; Green, 1992) (fig. 3). Alluvial, terrace, and valley-fill deposits of Quaternary age form the unconsolidated materials in the valleys. The Green River Formation, of early Tertiary age, rests conformably on the Wasatch Formation (older Tertiary rock). The Green River Formation is well known for rich oil-shale deposits. The Green River Formation also contains natural resources of economic interest including nacholite, dawsonite, potable groundwater, natural gas, and crude oil, depending on location in the basin. The Wasatch Formation consists of a varied colored mudstone with sandstone lenses (Johnson and Flores, 2003). Some of the sandstone lenses, such as the Wasatch “G” interval of the Wasatch Formation, are appreciable reservoirs of natural gas in or near Parachute and Rulison, Colo. (Nelson and Santus, 2010). The Wasatch Formation is also a source of potable water.

Cretaceous sedimentary rocks of primary interest in the study area were the Mesaverde Group, the Mancos Shale, and the Dakota Sandstone (fig. 3). The Mesaverde Group was formed by a series of marine transgressions and regressions with later periods of fluvial deposition (Johnson, 1989) resulting in a sequence of marine shales, siltstones, and sandstones capped by a thick sequence of terrestrial fluvial deposits. The fluvial deposits of the Mesaverde Group consist almost entirely of lenticular channel sandstones and fine-grained flood-plain deposits. The channel sandstones are the primary reservoirs for natural gas and require a dense pattern of drilling to recover the gas from these sandstones (Nelson and Santus, 2010). The Mesaverde Group consists of the Iles Formation and the Williams Fork Formation. The Iles Formation contains the Corcoran, Cozzette, and Rollins Members (Reinecke and others, 1991). The Williams Fork Formation is an important natural gas producing unit within the study area. The Mancos Shale is of Late Cretaceous age and is composed of massive, fossiliferous marine shale with interbedded sandstone, siltstone, and devitrified volcanic ash layers. The Mancos Shale is a major source of dissolved solids and selenium in the study area. The Mancos Shale is the lateral equivalent to the Niobrara Shale, Cody Shale, and Pierre Shale in Colorado, Montana, Nebraska, South Dakota, and Wyoming (Tweto, 1979; Green, 1992; Wright and Butler, 1993). The Dakota Sandstone, of Early Cretaceous age, is composed of interbedded, hard sandstone, conglomerates, shale, and coal (Brune, 1953); it is a potential source of potable water as well as a source of dissolved solids in the study area.

Figure 2. Generalized geologic structures of the Piceance study area, western Colorado.

Figure 3. Generalized geologic map of the Piceance study area, western Colorado.

EXPLANATION

Geologic unit	
	Quaternary sedimentary units, undifferentiated
	Quaternary-Tertiary ancient alluvium
	Tertiary volcanic and plutonic units
	Tertiary Browns Park Formation
	Tertiary Uinta Formation
	Oligocene sedimentary rocks
	Tertiary Green River Formation
	Tertiary Lower Green River and Wasatch Formation
	Tertiary Wasatch Formation
	Tertiary Fort Union Formation
	Mesozoic rocks, undifferentiated
	Cretaceous-Jurassic Dakota, Burro Canyon, Morrison, Wanakah, and Entrada Formations
	Cretaceous Dakota Sandstone and Burro Canyon Formation
	Cretaceous Mesaverde Group
	Cretaceous Mount Garfield Formation and Sego Sandstone
	Cretaceous Sego Sandstone, Buck Tongue of Mancos Shale, and Castlegate Sandstone
	Cretaceous Mancos Shale
	Jurassic units, undifferentiated
	Triassic Kayenta Formation
	Triassic Wingate Sandstone and Chinle Formations
	Triassic-Permian Chinle, Moenkopi, Park City, and State Bridge Formations
	Triassic Chinle Formation
	Pennsylvanian Maroon Formation and Weber Sandstone
	Pennsylvanian Minturn
	Pennsylvanian Belden Formation
	Pennsylvanian evaporitic facies
	Pennsylvanian Morgan Valley Formation and Round Valley Limestone
	Mississippian-Cambrian units, undifferentiated
	Precambrian, undifferentiated
	Fault
	Study area boundary

Hydrology

The Piceance study area has three study basin areas: the White River, Colorado River, and the Lower Gunnison River (fig. 4). The annual streamflow cycle in the study area is marked by spring snowmelt, which causes water levels in the river to rapidly rise. Low-flow conditions are characteristic of the late summer through winter seasons. Annual-mean streamflows at 10 USGS streamflow-gaging stations were calculated (1990 through 2009) to represent effects such as the construction of major diversions or storage facilities and climatic effects such as wet and dry hydrologic cycles (table 1, fig. 5). Streamflow data were obtained from the National Water Information System (NWIS) website (<http://waterdata.usgs.gov>). Generally, the annual-mean streamflows were variable based on basin area. Annual-mean

streamflows in the Piceance study area demonstrated a wet period from approximately 1997 through 1999 followed by a dry period from approximately 2002 through 2004.

Land Use and Land Cover

Land use and land cover in the Piceance study area are varied, including forested land, rangeland/shrubland, agricultural land, barren land, and developed/urban land, which includes ski resorts and energy development (fig. 6). The total study area is almost 9,500 mi² and includes 4,600 mi² (about 50 percent) of forested land and 3,800 mi² (about 40 percent) of rangeland (Homer and others, 2004). Natural gas development has increased in the study area since 2000, in part because of advancements in the application of hydraulic fracturing, which has allowed successful extraction of natural gas from previously inaccessible sources (Nelson and Santus, 2010).

White River Basin

The area of the White River Basin is 3,160 mi². The Bureau of Land Management (BLM) owns 2,176 mi² (69 percent), and private entities own 837 mi² (26 percent) (Bureau of Land Management, 2009). The dominant land cover in the basin in 2001 was rangeland/shrubland (48 percent) (Homer and others, 2004). Much of the BLM land serves multiple uses, including ranching of sheep and cattle, natural gas development, and oil shale research development and demonstration leases (Bureau of Land Management, 2009). Part of the BLM land is managed for wild horse and burro herds (Bureau of Land Management, 2011a). Natural gas development on public lands in Rio Blanco County has increased from 58 permits in 2001 to 200 permits in 2006, and a total of 2,556 multiple well pads are projected during the next 20 years (Bureau of Land Management, 2011b).

The White River Basin is located primarily in Rio Blanco County (fig. 1) and is a tributary to the Green River, which then flows into the Colorado River in Utah. The White River Basin includes the White River and other major tributaries such as Piceance Creek, Yellow Creek, and Douglas Creek (fig. 1). Sedimentary rocks of Tertiary age including the Uinta Formation and the Green River Formation outcrop in the eastern and central part of the White River Basin (fig. 3). Cretaceous Mesaverde Group rocks outcrop in the western part of the White River Basin (fig. 3), specifically within the Douglas Creek drainage area (figs. 1 and 3). The White River has no major transbasin diversions or diversions for agricultural use. Oil shale and natural gas development have been and continue to be one of the most important land uses in the White River Basin. Conventional and unconventional natural gas extraction and the associated infrastructure are becoming increasingly prevalent in the basin. Rio Blanco County is one

Figure 4. The hydrology of the Piceance study area, western Colorado.

Table 1. Annual-mean streamflow, in cubic feet per second, for selected U.S. Geological Survey streamflow-gaging stations in the Piceance study area for the period 1990 through 2009, western Colorado.

[Mean annual streamflow calculated using data from 1990 through 2009]

Site identification number (fig. 4)	Station name	Mean annual streamflow, in cubic feet per second	Drainage area, in square miles
White River Basin			
09304800	White River below Meeker, Colo.	614	1,024
09306222	Piceance Creek at White River, Colo.	38	652
09306290	White River below Boise Creek, near Rangely, Colo.	723	2,530
Colorado River Basin			
09085100	Colorado River below Glenwood Springs, Colo.	3,344	6,014
09095500	Colorado River near Cameo, Colo.	3,854	7,986
09105000	Plateau Creek near Cameo, Colo.	194	592
09163500	Colorado River near Colorado-Utah State Line	6,465	17,849
Lower Gunnison River Basin			
09149500	Uncompahgre River at Delta, Colo.	335	1,114
09144250	Gunnison River at Delta, Colo.	1,964	5,636
09152500	Gunnison River near Grand Junction, Colo.	2,600	7,923

of the six counties in Colorado that have the greatest number of actively operating gas wells; there were 2,906 active gas wells in Rio Blanco County as of October 2011 (Colorado Oil and Conservation Commission, 2011).

Colorado River Basin

The area of the Colorado River Basin (study area) is 3,560 mi², and the area of the drainage area of the Colorado River upstream from the site at the Colorado-Utah state border is 17,843 mi². About 1,600 mi² (45 percent) of the study area are managed by the Bureau of Land Management (Bureau of Land Management, 2009). About 1,400 mi² (39 percent) of the basin were privately owned and 500 mi² (14 percent) were managed by the U.S. Forest Service (Bureau of Land Management, 2009). The dominant land cover (48 percent) in the basin during 2001 was deciduous and evergreen forest. More than 230 mi² (6.5 percent) had an agricultural land cover in 2001 (Homer and others, 2004) and 220 mi² were irrigated (Techni Graphics Systems, Inc., 2004).

The Colorado River drains watersheds from seven states, and the headwaters originate in Colorado. Large diversions of water from the Colorado River are used for agricultural irrigation and by municipalities for drinking water. There are thermal hot springs adjacent to the Colorado River in Glenwood Springs. The water chemistry of the springs comprises up to 22,200 milligrams per liter (mg/L) dissolved solids, 7,600 mg/L of sodium, 11,000 mg/L of chloride, and 2,450 mg/L of sulfate (Lund and Hunter, 2009). The springs also contain significant quantities of fluoride, silica, barium, iron, lithium, and boron. Water temperatures from the springs flowing to the river are approximately 32–49 °C (Lund and Hunter, 2009). Uranium and vanadium mining and milling operations took place in Rifle, Colo., in the 1920s and again from 1947 to 1957 (U.S. Energy Information Administration,

2011). During the latter time period, the mill processed ore at about 200 tons/day. A second mill was built in 1958 with an ore processing capacity of 400 tons/day. Both mill locations were remediated by the U.S. Department of Energy starting in 1989 (U.S. Energy Information Administration, 2011).

The economy of the basin is dominated by agriculture, energy development, industry, real estate development, tourism, and recreation (Leib and Bauch, 2008). The Colorado River is home to 14 native species of fish, of which four are endemic and endangered: the Colorado pikeminnow, razorback sucker, bonytail chub, and humpback chub (U.S. Fish and Wildlife Services, 2011). The Roan Plateau (fig. 1) provides habitat to a native, genetically diverse population of cutthroat trout (Bureau of Land Management, 2002). The Grand Mesa has more than 200 lakes and reservoirs. The Grand Mesa, as part of the Grand Mesa Uncompahgre and Gunnison National Forests (GMUG), has unique natural peat-forming wetlands called fens that are considered an aquatic resource of national importance by the U.S. Environmental Protection Agency (USEPA) (U.S. Forest Service, 2011). The Roan Plateau is leased for the drilling of natural gas. Based on estimates from the BLM management plan for the Roan Plateau Planning area, Federal lands on the Roan Plateau could provide 3,630 billion cubic feet (ft³) of natural gas during the next 20 years (Bureau of Land Management, 2002). The estimated technically recoverable gas resource within the Roan Plateau Planning Area of Federal lands is approximately 8,900 billion ft³. Colorado Oil and Gas Conservation Commission issued 13,775 application permits to develop natural gas since 2004 in Garfield County (fig. 6) (Colorado Oil and Gas Conservation Commission, 2011). The Roan Plateau area also is a potential region for the development of oil shale. The Parachute Creek Member of the Green River Formation is about 900 to 1,200 ft thick in the Roan Plateau area and is generally considered the primary oil shale unit of interest (Bureau of Land Management, 2002).

Figure 5. Annual-mean streamflows for selected U.S. Geological Survey streamflow-gaging stations in the Piceance study area for 1990 through 2009, western Colorado.

Figure 6. Land cover of the Piceance study area, western Colorado.

Lower Gunnison River Basin

The area of the Lower Gunnison River Basin is 2,700 mi², and the entire drainage area (measured from where the Gunnison River enters the Colorado River) is 7,900 mi². The U.S. Forest Service manages the GMUG National Forests, which comprise 1,100 mi² (about 41 percent) within the basin. The BLM manages public lands with an area of about 790 mi² (29 percent) of public land; private ownership accounts for about 780 mi² (29 percent) (Bureau of Land Management, 2009). The land cover in the Lower Gunnison River Basin is dominated by forest (48 percent), rangeland (33 percent), and agriculture (8 percent) (Homer and others, 2004). Throughout the lower elevations in the Lower Gunnison River Basin, about 6 percent (173 mi²) of the land is irrigated agriculture (Techni Graphic Systems, Inc., 2004). Coal mining occurs within the national forest in the North Fork of the Gunnison River. The GMUG has approximately 25 mi² of Federal coal leases (U.S. Forest Service, 2011).

The Gunnison River is the largest tributary to the Colorado River in Colorado. Major storage facilities such as the Wayne N. Aspinall Federal Storage Unit (fig. 1; outside the study area) are situated in line with the main channel of the Gunnison River (Bureau of Reclamation, 2011). There are multiple beneficial uses of Aspinall Project water, including irrigation and domestic supplies, hydropower generation, and essential environmental and recreational uses in Colorado. The Gunnison Tunnel (fig. 1) delivers about 320,000 acre-ft per year from the Gunnison River to the Uncompahgre River during the irrigation season (April through October) (Colorado Department of Public Health and Environment, 2010). Nearly 173 mi² of land are irrigated in the Lower Gunnison River Basin (Techni Graphic Systems, 2004). The complex geology, combined with various land-use types such as irrigation and residential development, can greatly impact water-quality conditions in the Lower Gunnison River Basin.

The source water for the City of Grand Junction comes from Juniata Reservoir and Kannah Creek (fig. 1), which drain the western slopes of the Grand Mesa into the Lower Gunnison River Basin. Energy development (gas drilling) is increasing in scale on the slopes of the Grand Mesa (Bureau of Land Management, 2004). This type of development has the potential to affect groundwater and surface-water quality running off the Grand Mesa.

Land-Use Impacts

Agricultural land use in the study area is largely irrigated where 440 mi² of the 540 mi² of agricultural land cover was irrigated in 2001 (Techni Graphic Systems, Inc., 2004; Homer and others, 2004). Irrigated agriculture is a main concern to water managers because of the additional dissolved solids (DS) that enter the watershed. Natural sources of DS include seeps or springs that originate from geological formations with high salt content. Salts are mobilized through dissolution, surface runoff, and deep percolation into the

groundwater system that discharges to the river system as base flow (Kanzer and Merritt, 2008). The application of irrigation water to these agricultural lands increases the rate at which salts in the bedrock are dissolved and transported to streams (Prairie and others, 2005; Kenney and others, 2009). The history of salinity control efforts in the Gunnison and Colorado River Basins dates back to the 1970s when the Salinity Control Act, Public Law 93–320, prompted the creation of the Colorado River Basin Salinity Control Forum to investigate, plan, and construct projects to reduce salinity loading to the Colorado River (Bureau of Reclamation, 2009). Investigations and projects completed by the Colorado River Basin Salinity Control Forum refer to the entire drainage area of the Gunnison River or Colorado River, rather than the parts of the basins presented in this report. The Bureau of Reclamation (2011a) estimated that 47 percent of the salinity load in the entire Colorado River Basin is derived from natural sources, including geological formations, saline springs, and surface runoff; 37 percent results from irrigation; and the remaining 16 percent results from reservoir-storage effects and municipal and industrial activities.

Selenium is another concern in the Lower Gunnison and Colorado River Basins. The National Irrigation Water Quality Program (NIWQP) is a multiagency program within the Department of the Interior that has performed investigations of various irrigation projects in the Western United States to determine whether irrigation drainage was having adverse effects on water quality and on fish and wildlife (Butler and Leib, 2002). NIWQP studies were initiated in the Lower Gunnison River Basin in 1988. In 1997 the Colorado State Water Quality Control Commission revised the chronic aquatic-life criterion for dissolved selenium from 17 micrograms per liter (µg/L) to 4.6 µg/L. In response to this action and in cooperation with NIWQP, the Gunnison Basin Selenium Task Force was established in 1998 as a group of private, local, State, and Federal interests to develop ideas and projects for reducing selenium in the Lower Gunnison River Basin.

Previous Studies

The Piceance study area in western Colorado contains energy, mineral, and other natural resources that have been the subject of numerous studies and publications. Selected publications that relate to water resources within the study area are summarized herein.

The relationship between groundwater and surface water in the White River Basin has been evaluated in several studies. A study of simulated effects of oil shale development used digital models to evaluate the hydrologic system (Weeks and others, 1975). The study, specifically in the Piceance and Yellow Creek drainage areas, concluded that proposed oil shale development would have significant effects on the surface-water and groundwater systems. A study from 1977 to 1981 of Piceance and Yellow Creeks collected physical and chemical data at perennial and intermittent streams

(Tobin and others, 1985). The study indicated that groundwater contributions to streams during medium and low flow result in increases in fluoride, sulfate, dissolved solids, arsenic, boron, lithium, and strontium. A study conducted during December 2000 used tracer-dilution techniques and synoptic-water-quality sampling to evaluate mass loading in Piceance Creek (Ortiz, 2002). Groundwater upwelling in the Alkali Flats area (fig. 1) contributed substantially to observed increases in constituent concentrations; however, losses in streamflow resulted in small increases in loads downstream on the study reach.

Trends and loads of DS, suspended sediment, and other constituents in the White River Basin have been conducted. A study from 1975 to 1988 of sediment transport, water-quality characteristics, and loads on the White River determined that snowmelt runoff from the headwaters of the White River dilutes and transports large concentrations of suspended sediment and dissolved solids in the central part of the basin (Tobin, 1993). A study of characteristics and trends of streamflow and dissolved solids in the White River Basin reported a decrease in annual-median-flow-adjusted concentrations of dissolved solids in the White River below Meeker from 1974 through 1983 (Liebermann and others, 1989).

Water quality has been studied in springs and surface water in the Colorado River Basin. A study in the Colorado River Basin from 1981 to 1983 of discharge, water-quality, and radiochemical data collected at springs in the oil shale regions of the Roan and Parachute Creek Basins reported that springs were mixed-cation bicarbonate water types (Butler, 1985). The study also concluded that springs located near oil shale mines or processing plants could be used for monitoring groundwater quality and quantity. In 2008, the USGS published a report of DS trends (1986–2003) in the Upper Colorado River Basin upstream from the Grand Valley Salinity Control Unit (Leib and Bauch, 2008). The report details results for trends in concentrations and loads of DS and selected major ions near the Grand Valley Salinity Control Unit. The largest decrease in salinity load was 6,590 tons per year (ton/yr) and occurred in the area between the Colorado River at Cameo, Colo., and the Colorado River above Glenwood Springs, Colo. Downward trends in DS load (11,200 ton/yr) were detected at the Gunnison River near Grand Junction, Colo., streamflow-gaging station. A USGS study from 2004 to 2006 analyzed DS and selenium trends (concentrations and loads) in the Upper Colorado River Basin, specifically, in three tributaries to the Colorado River in the Grand Valley (Leib, 2008). The report states that the reduction in annual DS load at Lewis Wash (fig. 1) could be the result of either salinity-control work or land-use change, particularly the conversion of agricultural land to residential development. A USGS study from 2000 to 2004 collected and analyzed water-quality data for the Government Highline Canal and Highline Lake, which are located in the Grand Valley area (Ortiz, 2005). Data were used to characterize the seasonal stratification patterns, water-quality chemistry, bacteria populations, and phytoplankton community structure in the lake. Highline Lake was reported

as having strong thermal and dissolved-oxygen stratification patterns during the summer months, which likely released ammonia from the bottom sediments. Generally, the seasonal succession of phytoplankton was similar to that of other lakes in similar climates.

The importance and complexity of DS and selenium in the Gunnison River is reflected in the abundance of studies and publications on the topics. These efforts have included quantifying the natural component of the DS load as well as identifying trends over time in DS and selenium concentrations and loads. Salt loading from natural sources in the Gunnison River Basin was 542,000 ton/yr for water years 1914–1957 (a water year is from October 1 through the following September 30 and is designated by the year in which it ends), assuming the 1957 level of water-resources development (Iorns and others, 1965). Another study for the same period used a mass balance approach and reported that 431,000–463,000 tons of DS load were caused by natural sources (Mueller and Osen, 1988). The DS concentration and load results were reported in both studies for the site Gunnison River near Grand Junction, Colo. (streamflow-gaging station 09152500).

Studies that quantified DS trends over time relative to land-use changes have reported downward trends in DS at the Gunnison River near Grand Junction, Colo. (09152500) for different study periods. Liebermann and others (1989) quantified the DS trends at the Gunnison River near Grand Junction (streamflow-gaging station 09152500) based on the completion of the Blue Mesa Dam in 1965, the uppermost of the three dams that make up the Aspinall Unit. The Aspinall Unit is located outside of the study area upstream from the Lower Gunnison River Basin (fig. 1). The pre-reservoir period was 1934–1965 and the post-reservoir period was 1966–1983, and they performed a step trend test to determine whether there were significant differences between the pre- and post-dam periods as well as trend tests within each of the two periods. A downward step trend of 119,000 tons (pre- and post-dam comparison) was reported at the Gunnison River near Grand Junction, Colo., site as a result of the construction and operation of Blue Mesa reservoir, but there were no significant trends within each of the two periods (Liebermann and others, 1989). Streamflow and DS concentrations in the Gunnison River decreased during high flow (May–June) and increased during the low-flow period (August–March) as a result of Blue Mesa Reservoir. Butler and others (1996) reported a net downward trend of 146,000 tons of DS at Gunnison River near Grand Junction (streamflow-gaging station 09152500) from 1970 to 1993. Butler and others (1996) concluded that the measured decreases were not the result of DS control projects implemented by the Bureau of Reclamation and the Natural Resources Conservation Service. Leib and Bauch (2008) showed a downward trend of 201,600 tons in the Gunnison River near Grand Junction, Colo., for water years 1986–2003. Schaffrath (2012) quantified trends at 15 sites in the Gunnison River Basin. Results indicated a downward trend of 247,000 tons from 1989 to 2004. The downward trend was smaller at 190,000 tons from 1989 to 2007, potentially indicating that DS concentration and load are leveling off.

The effect of converting previously irrigated agricultural land to urban land use was investigated during two recent studies (Mayo, 2008; Moore, 2011) in western Colorado. The Grand Valley study measured irrigation-water application and deep percolation on urban sites in Grand Junction, Colo., where deep percolation was defined as infiltration of water below the top 12 inches of soil (Mayo, 2008). The measurements were compared to water application and deep percolation data from agricultural sites provided by the Natural Resources Conservation Service. The study results indicated that conversion of land from agricultural use to urban residential use can result in a decrease in salt loading of 90 percent per developed acre. The second study compared DS concentrations and load between two sites on the Montrose Arroyo near Montrose, Colo. (Moore, 2011). One site was upstream and the other was downstream from increased urbanization. The previous land use was dominated by irrigated agriculture but included other land-use categories. There were no significant differences between DS at the two sites, which implies that urbanization had no effect on DS concentration or load at that scale.

A study in 2007 analyzed selenium load from 1978 to 2005 in the Lower Gunnison River Basin in support of the development of total maximum daily loads (TMDLs) for selenium (Thomas and others, 2008). Results for the Uncompahgre River indicated that a reduction of 69 percent of the mean annual load of selenium for water years 2001–2005 was necessary to meet the water-quality standard for the Uncompahgre River at Delta, Colo., streamflow-gaging station.

Methods

The data compiled in the Web-accessible common data repository were analyzed to provide a baseline assessment of available water-resource data and aid in the development of regional monitoring strategies. Selected water-quality properties and constituents were compared to Federal and State standards or previous studies where applicable. When sufficient data were available, trends over time were analyzed and loads were calculated for those sites where there were also continuous streamflow data.

Compilation of Data

A repository of available water-quality data was compiled from local, State, and Federal agencies and private entities (consulting firms, energy, and mining companies). The data repository is accessible on the Internet at <http://rmgsc.cr.usgs.gov/cwqdr/Piceance/index.shtml>. Not all known data sources were loaded into the data repository for a variety of reasons, such as non-participation, non-electronic format, insufficient metadata, and late data submission.

However, the repository represents the most comprehensive set of surface-water-quality data for the study area available as of August 2009. Data were evaluated for duplication (the same site, sample, or result submitted to the repository under two or more source agencies) and removed prior to analysis. Sites and water-quality data were evaluated to determine if it was appropriate to aggregate data if sites were within a 50-ft buffer of one another. The USGS NWIS Water-Quality User Manual was consulted for evaluating properties and constituents that can be recensored (assigned the value of “less than the censoring level”) if the stored value is zero and for properties and constituents that allow negative values (U.S. Geological Survey, 2011).

The data repository contained 1,433 surface-water sites, 45,008 samples, and 1,144,808 water-quality results for the period from 1931 to 2009. A subset of data from the repository was extracted and checked for quality assurance for this report using the following criteria. Only water-quality data from the most recent 50 water years (1959 to 2009) were included, so data had to be collected after September 30, 1958. Sites were required to have five or more samples, collected over at least 13 months so that seasonality would be represented. USEPA water-quality standards and guidelines were used to analyze a subset of the available constituents. Additionally, specific constituents of interest were analyzed based on stakeholder input, land-use factors, recommendations from the Colorado Department of Public Health and Environment (CDPHE) 303d (table 2), and monitoring and evaluation lists (Colorado Department of Public Health and Environment, 2010). Lake sites were not included because of the lack of depth information associated with samples. When multiple samples were collected in a single day, such as stormwater sampling, the first sample was included and the remaining data were removed from the analysis. The final dataset used in this report included 347 surface-water sites, 35,970 samples, and 228,242 water-quality results (app. 1). Limited metadata were available for much of the data, which limited the ability to evaluate the quality of the water-quality data. No distinctions between water-quality data collection methods or laboratory-analytical techniques were made owing to this limited metadata. Disparities between data from various sources resulting from these differences may bias the statistical results. Robust statistical methods were employed to limit these sources of bias on the statistical results.

Analysis of Data

The final dataset that resulted from the compilation of the data contained 347 sites and 33 constituents. These data were summarized using summary statistics and compared to USEPA and CDPHE recommendations and standards. Additional criteria were applied to select data for analysis of time trends and load calculations.

Table 2. Colorado Department of Public Health and Environment section 303(d) list of impaired waters and monitoring and evaluation list for the Piceance study area, western Colorado, 2011.

[CDPHE, Colorado Department of Public Health and Environment; WBID, water-body identifier; *E. coli*, *Escherichia coli*; Fe, iron; Se, selenium; Trec, total recoverable; USFS, U.S. Forest Service; USGS, U.S. Geological Survey. Data from Colorado Department of Public Health and Environment (2011b)]

Segment	CDPHE WBID	Segment description	Segment portion	Clean Water Act Section 303(d) impairment	303(d) priority
LGunn_2	COGULG02	Gunnison River, Uncompahgre River to Colorado River	all	Se	high
LGunn_8	COGULG08	Tributaries to Gunnison River, Kannah Creek	Kannah Creek below USGS station 09152000	Se	high
NFkGunn_3	COGUNF03	North Fork of the Gunnison from Black Bridge above Paonia to the confluence within the Gunnison	all	Se	high
NFkGunn_5	COGUNF05	Hubbard, Terror, Minnesota and Leroux Creeks from USFS boundary to N. Fork. main stem of Jay Creek and main stem and tributaries of Roatcap Creek to the N. Fork	Leroux Creek, Jay Creek,	Se	high
L_Gunn_8	COGUNF06a	Tributaries to the North Fork of the Gunnison River not on USFS lands	Short Draw	Se	high
NFkGunn_6b	COGUNF06b	Bear Creek, Reynolds Creek, Bell Creek, McDonald Creek, Cottonwood Creek, Love Gulch, Cow Creek, Dever Creek, German Creek, Miller Creek, Stevens Gulch, Big Gulch, Stingley Gulch and Alum Gulch not on national forest lands from the source to the North Fork of the Gunnison River	Cottonwood Creek	Se	high
Uncom_4b	COGUUN04b	Uncompahgre River, La Salle Road to Confluence Park	all	Se	high
Uncom_4c	COGUUN04c	Uncompahgre River, Confluence Park to Gunnison River	all	Se	high
Uncom_12	COGUUN12	Tributaries to Uncompahgre River, South Canal to Gunnison River	all	Se	high
LCol_2b	COLCLC02b	Colorado River, Rapid Creek to Gunnison River	Humphrey Backwater area	Se	medium
LCol_3	COLCLC03	Colorado River, Gunnison River to state line	all	Se	medium
LCol_4a	COLCLC04a	Tributaries to Colorado River, Roaring Fork to Parachute Creek except for specific segments	all	Se	medium
LCol_10	COLCLC10	East Rifle Creek, West Rifle Creek and Rifle Creek, including tributaries from Rifle Gap to the Colorado River	all	Se	low
LCol_13b	COLCLC13b	Tributaries to Colorado River from Government Highline Canal Diversion to Salt Creek	Salt Creek	sediment	low
LCol_13b	COLCLC13b	Tributaries to Colorado River from Government Highline Canal Diversion to Salt Creek except specific segments	all	Se	medium
LCol_13b	COLCLC13b	Tributaries to Colorado River from Government Highline Canal Diversion to Salt Creek except specific segments	Adobe Creek	<i>E. coli</i> , Fe(Trec)	high
LCol_13c	COLCLC13c	Walker Wildlife Area Ponds	all	Se	medium
LCol_14c	COLCLC14c	Main stem of Roan Creek including all tributaries from Kimball Creek to the Colorado River	Dry Fork	Se	low
LCol_19	COLCLC19	Lakes and reservoirs tributary to the Colorado River, Parachute Creek to the Colorado/Utah border	West Pond Orchard Mesa Wildlife Area	Se	high
White_9d	COLCWH09d	Sulphur Creek and tributaries from source to White River. Flag Creek and tributaries from the East Fork of Flag Creek to the White River	all	Se	low
White_22	COLCWH22	Tributaries to White River, Douglas Creek to Colorado-Utah border	West Evacuation Wash, Douglas Creek	sediment	low

Summary Statistics

Summary statistics were computed for each of the 347 sites and the selected constituents, including the period of record, the number of observations, the number of censored observations, and minimum, 25th percentile, median (50th percentile), 75th percentile, and maximum values (app. 1). Most of the 33 constituents are dissolved, meaning the sample was filtered, unless otherwise stated. Unfiltered samples will be referred to as total or total recoverable. In addition, certain constituents are never filtered and include field properties (pH, temperature, dissolved oxygen, specific conductance). Constituents like *E. coli* and suspended sediment are also unfiltered as these are particulates carried in water. The determination of the chemical properties of waters can result in left-censored data (nondetects) because of analytical limits of the laboratory analysis. In a dataset of this breadth, there can be multiple forms of bias in nondetect data including antiquated methods for storing nondetects (zero and negative values) and changes in the meaning of less-than values (Helsel, 2005a). In an effort to reduce these sources of bias, zero-values were changed to the appropriate reporting limit for select constituents. Where multiple censoring levels exist for a single constituent, data were not edited to a common censoring level in this report (Helsel, 2005b). Instead, data were re-censored using the long-term method detection limit where applicable. This resulted in an improvement to the overall dataset but did not remove all instances of these forms of bias; therefore, these results should be considered with this in mind. Summary statistics were computed using Kaplan-Meier methods when no more than 50 percent of the observations were censored (Helsel, 2005b). Maximum likelihood estimations were computed for greater than 50 observations and where 50 to 80 percent of the observations were censored. Regression-on-order statistics were computed for less than 50 observations where 50 to 80 percent of the observations were censored. The data range, censoring levels, and maximum observation were reported where more than 80 percent of the observations were censored (Helsel, 2005b).

Comparison to Standards

Instream water-quality standards for surface water in Colorado have been established by the Water Quality Control Commission of the CDPHE to protect the beneficial uses of surface water, which include aquatic life, domestic water supply, agriculture, and recreation (Colorado Department of Public Health and Environment, 2010). The CDPHE provides basic standards (Regulation 31) and separates Colorado into 13 planning and management regions for regulatory purposes, each with standards tabulated by stream-reach segment. Stream-segment descriptions for this study were used to assign each surface-water measurement site to a segment to apply the appropriate standards. Surface-water sites in the study area are located in one of the following three management regions: the Upper Colorado River Basin and North Platte River (Region

12, Regulation 33), the Lower Colorado River Basin (Region 11, Regulation 37), or the Gunnison and Lower Dolores River Basins (Region 10, Regulation 35). Not all constituents are regulated by established water-quality standards. The CDPHE has not established a water-quality standard for the constituent total phosphorus; therefore, the standard of 0.1 mg/L recommended by USEPA was used (U.S. Environmental Protection Agency, 2000). Data from the study area were compared to the CDPHE and USEPA standards to guide interpretation of surface-water quality, look for spatial patterns of standard exceedances, and obtain a broad understanding of water-quality conditions across the study area. The objective of this comparison was not to assess stream impairment or compliance with standards.

Each stream segment has a different standard and can be regulated for multiple beneficial uses. For example, a given segment may have a different standard for iron concentrations for drinking-water supply than for aquatic life. Standards can vary by season, elevation, or fish species believed to be present in the segment (for example, water temperature). Several segments that were matched to sites in the study area have temporary standards for certain constituents, particularly for selenium concentrations. Table 3 lists constituents and the standards for individual segments that were used to assess water-quality measurement sites in the study area.

The CDPHE has established two types of numeric water-quality standards: (1) fixed-value standards and (2) table-value standards (TVSs) (Colorado Department of Public Health and Environment, 2011). Fixed-value standards can be aquatic-life standards; USEPA maximum contaminant levels (MCLs); standards for domestic water supply; or recreation-based standards (table 3). An MCL is a legally enforceable standard that applies to drinking water from public water systems only. The TVSs are usually calculated values that are established for aquatic-life protection and include acute and chronic classifications. An acute standard is not to be exceeded by the concentration in a single sample or by the average concentration of all samples collected during a one-day period. For water temperature, the acute standard is the daily maximum, which is the highest 2-hour average temperature measured in a 24-hour period. A chronic standard is a value not to be exceeded by the concentration for either a single representative sample or by the average of all samples collected during a 30-day period. The chronic standard for water temperature is based on the average of equally spaced measurements (a minimum of three per day) made for seven consecutive days. The chronic standard is implemented in combination with a selected duration and frequency of recurrence. The TVSs for water temperature are specified for Regulation 37, the Lower Colorado River region, and are based on water temperature, fish species, and season. Acute and chronic TVSs based on pH and temperature have been established for total ammonia for cold- and warm-water stream segments. The TVSs have been established for trace elements based on stream hardness. The CDPHE hardness-dependent TVSs were calculated for samples analyzed for trace elements using either a hardness

Table 3. Selected Colorado Department of Public Health and Environment instream water-quality standards for stream segments in the Piceance study area, western Colorado. Segments are listed only if a surface-water-measurement site was matched to the segment and contained data for the given constituent.

[mg/L, milligrams per liter; °C, degrees Celsius; col/mL, colonies per 100 milliliters; DM, daily maximum; MWAT, maximum weekly average temperature; TVS, table-value standard; MCL; maximum contaminant level; µg/L, micrograms per liter; sc, sculpin. Water-quality standards are from the Colorado Department of Public Health and Environment (2011) except for the recommended total phosphorus level, which is from the U.S. Environmental Protection Agency (2000)]

Physical property or constituent (units)	Instream water-quality standard			Stream segment
	Type	Value ¹	Qualification	
Field parameters				
pH (standard units)	Aquatic life	6.5–9.0		all
Dissolved oxygen (mg/L)	Aquatic life	5.0		Regulation 35, Lower Gunnison River: 4a, 4b and North Fork Gunnison River: 6b and Uncompahgre River: 4b, 12
		6.0		Regulation 37, Lower Colorado River: 2a, 2b, 3, 4d, 13a, 13b, 14c and White River: 11, 12, 13b, 13c, 15, 16, 21, 22
				Regulation 33, Upper Colorado River: 3
				Regulation 35, Lower Gunnison River: 1, 2, 3, 5, 6, 7, 8, 10 and North Fork Gunnison River: 1, 2, 3, 4, 5
				Regulation 37, Lower Colorado River: 1, 5, 6, 7a, 7b, 8, 9b, 11a, 11b, 11d, 11e, 11f, 11g, 11h, 14a, 15, 16, 17a and White River: 4, 7, 9a, 9c, 14a, 14b, 17, 18, 20
		7.0	spawning season only	Regulation 33, Upper Colorado River: 3
				Regulation 35, Lower Gunnison River: 1, 2, 3, 5, 6, 7, 8, 10 and North Fork Gunnison River: 1, 2, 3, 4, 5
				Regulation 37, Lower Colorado River: 1, 5, 6, 7a, 7b, 8, 9b, 11a, 11b, 11d, 11e, 11f, 11g, 11h, 14a, 15, 16, 17a and White River: 4, 7, 9a, 9c, 14a, 14b, 17, 18, 20
Water temperature (°C)	Aquatic life	17.0 (MWAT ³)	only for sites at greater than 7,000 feet elevation in listed segments	Regulation 35, Lower Gunnison River: 3, 7, 8 and North Fork Gunnison River: 4, 5, 6a, 6b
	Aquatic life, cold class 1 or 2	20.0 (MWAT ³)		Regulation 35, Lower Gunnison River: 1, 3, 5, 6, 7, 8, 10 and North Fork Gunnison River: 1, 2, 3, 4, 5
	Aquatic life, warm class 1 or 2	30.0 (MWAT ³)		Regulation 35, Lower Gunnison River: 2, 4a, 4b and North Fork Gunnison River: 6a, 6b and Uncompahgre: 4b, 12
	Aquatic life Cold Stream Tier I (June–September)	TVS, 21.2 (acute, DM ²)		Regulation 37, Lower Colorado River: 5, 6, 7a, 8, 11a, 11b, 11d, 11e, 11f, 11g, 14a and White River: 4, 9a, 9c, 14a, 17, 20
	Aquatic life Cold Stream Tier I (October–May)	TVS, 13.0 (acute, DM ²)		Regulation 37, Lower Colorado River: 5, 6, 7a, 8, 11a, 11b, 11d, 11e, 11f, 11g, 14a and White River: 4, 9a, 9c, 14a, 17, 20
	Aquatic life Cold Stream Tier II (April–October)	TVS, 23.8 (acute, DM ²)		Regulation 33, Upper Colorado River: 3
	Aquatic life Cold Stream Tier II (November–March)	TVS, 13.0 (acute, DM ²)		Regulation 37, Lower Colorado River: 1, 4a, 4d, 7b, 10, 11h, 14b, 16, 17a and White River: 7, 14b, 18
	Aquatic life Cold Lake (April–December)	TVS, 21.2 (acute, DM ²)		Regulation 33, Upper Colorado River: 3
	Aquatic life Cold Lake (January–March)	TVS, 13.0 (acute, DM ²)		Regulation 37, Lower Colorado River: 1, 4a, 4d, 7b, 10, 11h, 14b, 16, 17a and White River: 7, 14b, 18
	Aquatic life Warm Stream Tier II (March–November)	TVS, 29.0 (acute, DM ²)		Regulation 37, Lower Colorado River: 9b
	Aquatic life Warm Stream Tier II (December–February)	TVS, 14.5 (acute, DM ²)		Regulation 37, Lower Colorado River: 2a, 2b, 3, 13b, 14c and White River: 12, 13c, 15, 21
	Aquatic life Warm Stream Tier IV (March–November)	TVS, 28.6 (acute, DM ²)		Regulation 37, Lower Colorado River: 2a, 2b, 3, 13b, 14c and White River: 12, 13c, 15, 21
	Aquatic life Warm Stream Tier IV (December–February)	TVS, 14.3 (acute, DM ²)		Regulation 37, Lower Colorado River: 13a and White River: 13b, 16, 22
				Regulation 37, Lower Colorado River: 13a and White River: 13b, 16, 22

Table 3. Selected Colorado Department of Public Health and Environment instream water-quality standards for stream segments in the Piceance study area, western Colorado. Segments are listed only if a surface-water-measurement site was matched to the segment and contained data for the given constituent.—Continued

[mg/L, milligrams per liter; °C, degrees Celsius; col/mL, colonies per 100 milliliters; DM, daily maximum; MWAT, maximum weekly average temperature; TVS, table-value standard; MCL; maximum contaminant level; µg/L, micrograms per liter; sc, sculpin. Water-quality standards are from the Colorado Department of Public Health and Environment (2011) except for the recommended total phosphorus level, which is from the U.S. Environmental Protection Agency (2000)]

Physical property or constituent (units)	Instream water-quality standard			Stream segment
	Type	Value ¹	Qualification	
Field parameters—Continued				
	Aquatic life Warm Lakes (April–December)	TVS, 29.3 (acute, DM ²)		Regulation 37, White River: 11
	Aquatic life Warm Lakes (January–March)	TVS, 14.6 (acute, DM ²)		Regulation 37, White River: 11
Sulfate, dissolved (mg/L)	Domestic water supply	250		Major ions Regulation 33, Upper Colorado River: 3 Regulation 35, Lower Gunnison River: 1, 3, 4a, 4b, 8 and North Fork Gunnison River: 1, 2, 4, 5, 6b Regulation 37, Lower Colorado River: 1, 2a, 2b, 7a, 7b, 8, 9b, 11a, 11e, 14c, 15, 16, 17a and White River: 4, 7, 9a, 11, 12, 21
		480		Regulation 35, Lower Gunnison River: 2
Chloride, dissolved (mg/L)	Domestic water supply	250		Regulation 33, Upper Colorado River: 3 Regulation 35, Lower Gunnison River: 1, 2, 3, 4a, 4b, 7, 8 and North Fork Gunnison River: 1, 2, 4, 5, 6b Regulation 37, Lower Colorado River: 1, 2a, 2b, 7a, 7b, 8, 9b, 11a, 11e, 14c, 15, 16, 17a and White River: 4, 7, 9a, 11, 12, 15, 16, 21
Nutrients				
Nitrate, dissolved (mg/L as N)	MCL, Domestic water supply	10		Regulation 33, Upper Colorado River: 3 Regulation 35, Lower Gunnison River: 1, 2, 4a, 7, 8 and North Fork Gunnison River: 2 Regulation 37, Lower Colorado River: 1, 2a, 2b, 4d, 7a, 7b, 8, 9b, 11a, 11e, 11f, 14c, 15, 16, 17a and White River: 4, 7, 9a, 11, 12, 21
Nitrate, dissolved (mg/L as N)	Agriculture	100		Regulation 35, Lower Gunnison River: 1, 2, 3, 4a, 4b, 7, 8 and North Fork Gunnison River: 1, 2, 4, 5, 6b Regulation 37, Lower Colorado River: 1, 2a, 2b, 7a, 7b, 8, 9b, 11a, 11e, 14c, 15, 16, 17a and White River: 4, 7, 9a, 11, 12, 15, 16, 21
Ammonia, total (mg/L as N)	Aquatic life	TVS (acute, chronic)		Regulation 35, Lower Gunnison River: 6, 10 and North Fork Gunnison River: 3 and Uncompaghre River: 4b, 12 Regulation 37, Lower Colorado River: 11b, 11d, 11g, 13a, 13b and White River: 13b, 13c, 14a, 14b, 15, 16, 17, 18, 20
Phosphorus, total (mg/L as P)	Recommended	0.1		all
Trace elements				
Copper, dissolved (µg/L)	Aquatic life	TVS (acute, chronic)		Regulation 33, Upper Colorado River: 3 Regulation 35, Lower Gunnison River: 1, 2, 3, 4a, 4b, 5, 6, 7, 8, 10 and North Fork Gunnison River: 1, 2, 3, 4, 5, 6b and Uncompaghre River: 4b, 12 Regulation 37, Lower Colorado River: 1, 2a, 2b, 3, 5, 6, 7a, 7b, 8, 9b, 11a, 11d, 11f, 11h, 13b, 14a, 14c, 15, 16, 17a and White River: 4, 7, 9a, 9c, 12, 13b, 13c, 14a, 14b, 15, 16, 17, 18, 20, 21
Copper, total recoverable (µg/L)	Water and Fish Aquatic life	1,300 (acute) 200 (chronic)		Regulation 35, North Fork Gunnison River: 6b Regulation 37, Lower Colorado River: 11b, 11e, 11g, 13a and White River: 22

Table 3. Selected Colorado Department of Public Health and Environment instream water-quality standards for stream segments in the Piceance study area, western Colorado. Segments are listed only if a surface-water-measurement site was matched to the segment and contained data for the given constituent.—Continued

[mg/L, milligrams per liter; °C, degrees Celsius; col/mL, colonies per 100 milliliters; DM, daily maximum; MWAT, maximum weekly average temperature; TVS, table-value standard; MCL, maximum contaminant level; µg/L, micrograms per liter; sc, sculpin. Water-quality standards are from the Colorado Department of Public Health and Environment (2011) except for the recommended total phosphorus level, which is from the U.S. Environmental Protection Agency (2000)]

Physical property or constituent (units)	Instream water-quality standard			Stream segment
	Type	Value ¹	Qualification	
Trace elements—Continued				
Iron, dissolved (µg/L)	Domestic water supply	300 (chronic)		Regulation 33, Upper Colorado River: 3 Regulation 35, Lower Gunnison River: 1, 2, 3, 4a, 4b, 8, 10 and North Fork Gunnison River: 1, 2, 4, 5, 6b Regulation 37, Lower Colorado River: 1, 2a, 2b, 4d, 5, 6, 7a, 7b, 8, 9b, 11a, 11e, 11f, 14a, 14c, 15, 16, 17a and White River: 4, 7, 9a, 9c, 12, 21
Iron, total recoverable (µg/L)	Aquatic life	1,000 (chronic)		Regulation 33, Upper Colorado River: 3 Regulation 35, Lower Gunnison River: 1, 2, 3, 4a, 4b, 6, 7, 8, 10 and North Fork Gunnison River: 1, 2, 3, 4, 5, 6a, 6b and Uncompaghre River: 4b, 12 Regulation 37, Lower Colorado River: 1, 2a, 2b, 3, 4d, 5, 6, 7a, 7b, 8, 9b, 11a, 11d, 11f, 11h, 13b, 14a, 14c, 15, 16, 17a and White River: 4, 7, 9a, 9c, 12, 13b, 13c, 14a, 14b, 15, 16, 17, 18, 20, 21
		existing ambient quality (chronic)		Regulation 35, North Fork Gunnison River: 6b
Lead, dissolved (µg/L)	Aquatic life	TVS (acute, chronic)		Regulation 35, Lower Gunnison River: 1, 2, 3, 4a, 4b, 5, 6, 7, 8, 10 and North Fork Gunnison River: 1, 2, 3, 4, 5, 6a, 6b and Uncompaghre River: 4b, 12 Regulation 37, Lower Colorado River: 1, 2a, 2b, 3, 5, 6, 7a, 7b, 8, 9b, 11a, 11d, 11f, 11h, 13b, 14a, 14c, 15, 16, 17a and White River: 4, 7, 9a, 9c, 12, 13b, 13c, 14a, 14b, 15, 16, 17, 18, 20, 21
Lead, total recoverable (µg/L)	Aquatic life	100 (chronic)		Regulation 37, Lower Colorado River: 11b, 11e, 11g, 13a and White River: 22
Selenium, dissolved (µg/L)	Aquatic life	TVS, 18.4 (acute), 4.6 (chronic)		Regulation 33, Upper Colorado River: 3 Regulation 35, Lower Gunnison River: 1, 2, 3, 4a, 4b, 5, 6, 7, 8, 10 and North Fork Gunnison River: 1, 2, 3, 4, 5, 6a, 6b and Uncompaghre River: 4b, 12 Regulation 37, Lower Colorado River: 1, 2a, 2b, 3, 4d, 5, 6, 7a, 7b, 8, 11a, 11d, 11f, 11h, 13b, 14a, 14c, 15, 16, 17a and White River: 4, 7, 9a, 9c, 12, 13b, 13c, 14a, 14b, 15, 16, 17, 18, 20, 21
		5.7 (chronic)	temporary, expires 12/31/2012	Regulation 35, North Fork Gunnison River: 3
		8.4 (chronic)	temporary, expires 12/31/2012	Regulation 35, Lower Gunnison River: 2
		9.3 (chronic)	temporary, expires 12/31/2012	Regulation 35, Lower Gunnison River: 7
		20 (chronic)	temporary, expires 12/31/2012	Regulation 35, Uncompaghre River: 4b
	Water and Fish Fish ingestion	170 (acute)		Regulation 35, North Fork Gunnison River: 6b
	Aquatic life	4,200 (acute)		Regulation 37, White River: 17
Selenium, total recoverable (µg/L)		existing ambient quality (chronic)	temporary, expires 12/31/2012	Regulation 35, Lower Gunnison River: 4a and North Fork Gunnison River: 5, 6b and Uncompaghre River: 12
		20 (chronic)		Regulation 37, Lower Colorado River: 11b, 11e, 11g, 13a and White River: 22

Table 3. Selected Colorado Department of Public Health and Environment instream water-quality standards for stream segments in the Piceance study area, western Colorado. Segments are listed only if a surface-water-measurement site was matched to the segment and contained data for the given constituent.—Continued

[mg/L, milligrams per liter; °C, degrees Celsius; col/mL, colonies per 100 milliliters; DM, daily maximum; MWAT, maximum weekly average temperature; TVS, table-value standard; MCL, maximum contaminant level; µg/L, micrograms per liter; sc, sculpin. Water-quality standards are from the Colorado Department of Public Health and Environment (2011) except for the recommended total phosphorus level, which is from the U.S. Environmental Protection Agency (2000)]

Physical property or constituent (units)	Instream water-quality standard			Stream segment	
	Type	Value ¹	Qualification		
Trace elements—Continued					
Zinc, dissolved (µg/L)	Aquatic life	TVS (acute, chronic)	Regulation 33, Upper Colorado River: 3		
			Regulation 35, Lower Gunnison River: 1, 2, 3, 4a, 4b, 5, 6, 7, 8, 10 and North Fork Gunnison River: 1, 2, 3, 4, 5, 6a, 6b and Uncompaghre River: 4b, 12		
		TVS (sc) (chronic)	Regulation 37, Lower Colorado River: 1, 2a, 2b, 3, 5, 6, 7a, 7b, 8, 9b, 11a, 11d, 11h, 13b, 14a, 14c, 15, 16, 17a and White River: 4, 7, 9a, 9c, 12, 13b, 13c, 14a, 14b, 15, 16, 17, 18, 20, 21		
			Regulation 33: 3		
Zinc, total recoverable (µg/L)	Water and Fish	7,400 (acute)	Regulation 35, North Fork Gunnison River: 1, 2		
			Regulation 37, Lower Colorado River: 7a, 15 and White River: 4		
		Fish ingestion	26,000 (acute)		Regulation 35, North Fork Gunnison River: 6b
					Regulation 37, White River: 17
Aquatic life	2,000 (chronic)	Regulation 37, Lower Colorado River: 11b, 11e, 11g, 13a and White River: 22			
Microorganisms					
<i>Escherichia coli</i> (col/100 mL)	Recreation, Class N (Not Primary Contact Use)	126/100 ⁴	Regulation 35, Lower Gunnison River: 1, 2, 4b, 8 and North Fork Gunnison: 3 (April 1 to September 30)		
			Regulation 37, Lower Colorado River: 1, 2a, 2b, 13b and White River: 7 (March 2 to November 30), 12		
	Recreation, Class P (Potential Primary Contact Use)	205/100 ⁴	Regulation 35, North Fork Gunnison River: 5		
			Regulation 37, Lower Colorado River: 14c and White River: 7 (December 1 to March 1), 14b, 15		
	Recreation, Class E (Existing Primary Contact)	630/100 ⁴	Regulation 35, Lower Gunnison River: 4a and Uncompaghre River: 4b and North Fork Gunnison: 3 (October 1 to March 30)		
			Regulation 37, White River: 13b, 13c		

¹Table value standards for trace elements vary with hardness. See Colorado Department of Public Health and Environment (2011).

²Daily maximum (DM) is the highest two-hour average water temperature recorded during a given 24-hour period (Colorado Department of Public Health and Environment, 2011).

³Maximum weekly average temperature (MWAT) is the maximum average of multiple, equally spaced, daily temperatures over seven consecutive days with a minimum of three data points spaced equally throughout the day. It is calculated from the optimum and upper temperatures tolerated by a species (Colorado Department of Public Health and Environment, 2011).

⁴Attainment of the standard is based on a two-month geometric mean of the data.

value measured for the same sample or a calculated hardness derived from calcium and magnesium data for that sample. When hardness values exceed 400 mg/L, a hardness of 400 mg/L (113 mg/L for zinc, sculpin standards) was used to determine trace element standards (Sarah Johnson, Colorado Department of Public Health and Environment, written commun., September 26, 2011).

Trend Analysis and Load Calculation

Data were selected from the original dataset of 347 sites for analysis of trends based on several criteria. Trend analysis using the method chosen was best for periods of 20 years or less; thus, data had to be collected after October 1, 1989, with a minimum of 8 years of continuous data. Data from 68 of the 347 sites met these criteria. Separate techniques for trends analysis were used depending on the constituent. Monotonic trends in field properties (water temperature, dissolved oxygen, and pH) were assessed using the seasonal Kendall test, a nonparametric technique (Hirsch and others, 1982; Helsel and Hirsch, 2002). Regression models define the relation between the concentration of a given water-quality constituent with explanatory variables such as streamflow, seasonality, and time (Helsel and Hirsch, 2002; Cohn, 2005). The relation of concentration with time in the regression model describes the time trend.

The load of a given constituent is the mass of the constituent transported in the water. Regression models, which are parametric techniques, were used for estimating loads from the concentration data. Loads calculated from the field properties are either not possible (temperature or pH) or not meaningful (dissolved oxygen).

Parametric techniques assume a normal distribution of the data, while nonparametric techniques do not require the data to be normally distributed (Helsel and Hirsch, 2002). Where there is a perfect normal distribution of the data, parametric tests have more statistical power. However, water-quality data will only approximate a normal distribution, so the statistical power in parametric and nonparametric techniques is similar for analysis of water-quality data (Helsel and Hirsch, 2002). Statistical power, in this analysis, refers to the probability of rejecting the null hypothesis that there is no time trend when there is a net trend (Alley, 1988; Hirsch and others, 1991).

Seasonal Kendall Test

Monotonic trends in temperature, dissolved oxygen, and pH data were tested using the seasonal Kendall test (Hirsch and others, 1982, 1991; Schertz and others, 1991; Helsel and Hirsch, 2002). The seasonal Kendall test accounts for seasonal variability in the field property data through the separation and comparison of data by each season. The seasonal Kendall test was applied using the computer program Estimate Trend (ESTREND) (Schertz and others, 1991), which was modified to run in the S-Plus Statistical Package (TIBCO Software, Inc., 1998–2008).

To run ESTREND, sites had to have a minimum of 8 years of record with 10 or more samples and less than 50 percent of the data could be censored. A total of 30 sites had sufficient data to meet these criteria for at least one of the three field properties. Seasonality was characterized within the ESTREND interface with input from the user. For the analysis presented in this report, a sampling frequency of 2 to 4 months was required, which allow trends to be run with 6 or 4 seasons, respectively. The choice of the number of seasons was determined using the first and last fifths of the record (Lanfear and Alexander, 1990; Schertz and others, 1991). If the site did not have at least one sample for each of at least four seasons in the first and last fifths of the record, the analysis was not completed. The user defines adequate seasonal characterization within ESTREND. For example, each season of every year for a 10-year study period is compared to that same season for all other years. The user for this analysis required that at least 50 percent of possible seasonal comparisons were possible and that at least 3 of 4 seasons or 5 of 6 seasons must meet the 50 percent criteria to qualify for analysis (Schertz and others, 1991).

The seasonal Kendall tests for the significance of Kendall's tau, which in this case is testing time against concentration. The test is completed on each of the 4 to 6 seasons, the results are combined, and the resulting test statistic is evaluated against a standard normal distribution (Mann, 1945; Kendall, 1975; Hirsch and others, 1982; Schertz and others, 1991; Helsel and Hirsch, 2002). The p-value associated with Kendall's tau was used to determine the significance of a time trend, where the p-value is a measure of the probability of incorrectly rejecting the null hypothesis. The null hypothesis is that the probability distribution of the random concentration variable has not changed over time. The test statistic is adjusted in the ESTREND program to account for serial correlation among the seasons and compute a corrected p-value. The trend was considered highly significant when the corrected p-value was less than 0.01 and significant when the corrected p-value was greater than 0.01 and less than or equal to 0.05. The trend direction from the seasonal Kendall test is the sign on the slope, which is computed as the median of all slopes between data pairs within the same season (Sen, 1968; Schertz and others, 1991; Helsel and Hirsch, 2002). The slope describes the monotonic trend observed throughout the entire trend period instead of an average annual slope, and the trend is not necessarily linear.

Trends in field properties or concentrations can be due to variability in streamflow quantity or timing. Where adequate streamflow data were available and the amount of censored water-quality data was less than 8 percent, the field property data were flow adjusted to account for the variability that was related to streamflow (Helsel and Hirsch, 2002). The flow-adjustment portion of this analysis is derived from the relation between streamflow and the field property result where the flow-adjusted data are the residuals from the relation. The relation between streamflow and the field property data was significant when the p-value on the streamflow term was less

than or equal to 0.05. The ESTREND program has 13 flow-adjustment models, and the best model was chosen based on the PRESS (prediction sum of squares) statistic (Myers, 1986; Schertz and others, 1991). The best model was the model with the minimum PRESS value, which indicates that the model has the lowest prediction error among the models compared. Residual plots were inspected qualitatively to assure that regression assumptions were met. Approximate normality of model residuals was apparent when the normal-probability plot was approximately linear relative to a 1:1 line and the plots of the residuals have no pattern and show uniformity of scatter (homoscedacity). Flow-adjusted analysis better quantifies changes in the field property over time that are not the result of changes in streamflow; therefore, where both trend tests were evaluated, preference was given to flow-adjusted trend results when the relation between streamflow and the field property was significant.

Regression Model

Additional selection criteria were applied to the dataset of 68 sites for analysis using the regression model. A total of 28 sites met the criteria of having a minimum of 8 years of record with at least 20 observations and less than 80 percent censoring of the data (Runkel and others, 2004).

Trends in concentration data were tested using regression models developed for each site, where constituent load was the response variable. The models were used to calculate annual load of each constituent. Concentrations are a mass per known volume of a constituent, and load represents the mass of the constituent in the river per unit time. Load (in tons or pounds) is computed by multiplying the concentration (milligrams or micrograms per liter) by the streamflow (cubic feet per second) and a unit conversion constant. Loads can be estimated for any day when a sample has been collected by assuming that the concentration represents the daily mean concentration. A regression model is used for the days when no sample was collected.

The regression model used for trend analysis was applied using a USGS statistical program, LOADEST (Load Estimation), that was developed by Runkel and others (2004). S-LOADEST is a version of the LOADEST software developed to run as a plug-in program to the PC-based statistical software package Spotfire S+ and was used in this study (TIBCO Software, Inc., 1998–2008). S-LOADEST uses up to six explanatory variables to build a regression model that defines the relation of a constituent load to streamflow, time, and season. The inclusion of streamflow in the regression meant that there had to be existing streamflow associated with each sample included in this part of the trend analysis. The resulting general equation form used in this analysis is similar to Runkel and others (2004), Cohn (2005), and Dalby (2006) and is represented below in equation 1.

$$\ln L = b_0 + (\ln Q - \ln Q^*) + b_2 (t - t^*) + b_3 (\sin(2\pi T)) + b_4 (\cos(2\pi T)) + e \quad (1)$$

where

- L is the load, in tons, pounds, or million colonies;
- b_0 is the regression equation intercept;
- b_n is the coefficient on the n^{th} regression variable, where n is 1 through 4;
- Q is a streamflow term, in cubic feet per second;
- Q^* is the streamflow centering value, in cubic feet per second;
- t is time, in decimal years;
- t^* is the time centering value from the calibration dataset, in decimal years;
- T is the decimal portion of the year starting January 1;
- e is the error associated with the regression equation;
- $\sin$ is the sine; and
- $\cos$ is the cosine.

The model is developed using a calibration dataset that includes the date of the periodic sample collection, the associated value of concentration, and a streamflow value associated with the sampling date. The input values for concentration and streamflow were log transformed to meet the assumptions of normality and constant variance (Hirsch and others, 1991). Quadratic terms for decimal time and (or) streamflow were significant variables in some of the final selected model equations. However, with both the linear and quadratic terms in the equation, the possibility of multicollinearity increases, which inflates the variance in the associated coefficients. Streamflow and decimal time were centered to reduce the likelihood of multicollinearity and to ensure orthogonality in the streamflow and decimal time variables (Cohn and others, 1992). Compensation for differences in seasonal flux was accomplished, where significant, using Fourier series (Runkel and others, 2004; Cohn, 2005; Dalby, 2006). Fourier series uses sine and cosine terms to describe continual changes over the seasonal period. Model coefficients (b_n) were estimated using adjusted maximum likelihood estimation (Runkel and others, 2004).

The p-value associated with the model coefficient on the time parameter(s) was used to determine the significance of a time trend. The p-value associated with model coefficient(s) is the probability of obtaining the computed parameter coefficient when the null hypothesis is true, where the null hypothesis is that the coefficient is zero. The trend was considered highly significant when the p-value for the time term(s) was less than 0.01 and significant when the p-value was greater than 0.01 and less than or equal to 0.05. The sign (positive or negative) on the model coefficient(s) was used to determine the net direction of the trend. The time term in the model represents the trend over time for concentration and load and accounts for flow and seasonal variability. The net direction was only presented when the p-value indicated that the linear time term was significant. When quadratic time was significant, the trend was referred to as parabolic. The water year when the slope of the parabola was zero was presented as the year when the direction changed. The zero-slope year and the

directions of the trend before and after the zero-slope year were visually determined using plots of the model line without streamflow or seasonality terms. The model line describes the mean response of the concentration and load variable relative to the explanatory variables (time, streamflow, and seasonality) that were significant.

The final model equations were obtained by iteration using the option that is built into S-LOADEST that chooses the best model from nine model options made up of varying combinations of the variables listed in equation 1. The best model has the lowest Akaike Information Criteria (Runkel and others, 2004). S-LOADEST outputs diagnostic plots and statistics that were used to determine whether the calibration data met the assumptions of normality. The plots included a normal-probability plot and plots of the standardized residuals. Normality of model residuals was apparent when the normal-probability plot was approximately linear relative to a 1:1 line and the plots of the residuals have no pattern and show uniformity of scatter (homoscedacity). The plots were assessed qualitatively by the authors of this report. The criteria for the model statistics were that the variance inflation factor had to be less than 10 for each parameter in the model; serial correlation of the residuals had to be less than 0.6 and estimated residual variance had to be less than 1. Additionally, the p-values of the model coefficients had to be significant, or less than 0.05, to be included in the final model (app. 2). This final criterion had two exceptions: (1) only one of the model coefficients on the sine-cosine pair of the Fourier series had to be significant for the pair to be included in the model and (2) the linear time term was included anytime quadratic time was significant, even if the linear time was not significant. If the final model failed any of these diagnostics, results from the trend analysis were not presented. This scenario may indicate that more data might be required or a more randomized sampling approach might be needed to acquire a normal distribution of data.

Annual loads were used for a regional loading analysis. Using the selected form of equation 1 that was unique for each site and an estimation dataset with daily streamflow values, daily load and concentration were estimated. Annual loads were the sum of the daily loads for the water year. Each site and constituent had different study periods for trend analysis and, in some cases, the daily streamflow record had missing years; therefore, a comparison of sites required the selection of a common year among the sites based on the average annual streamflows for each site. Discussion of the loads using a common year provided the opportunity to describe sources of the constituent of interest. For each constituent described in the regional loading analysis, the average annual streamflow was calculated for each site. The average annual streamflow was calculated for the common study period of all the sites where the same constituent was analyzed. For example, the Colorado River Basin had four DS sites that had sufficient data for trend analysis and load calculation. The longest study period was 1990 to 2009 and the shortest was 1992 to 2002. Thus, the average annual streamflow for those four sites was calculated for the period 1992 to 2002. The one year within that period was chosen that most closely

matched the average annual streamflow for each site. That common year was the year that represented the common study period for that constituent and basin.

Temporal trends have both a statistical significance and an environmental significance, but this distinction is often a subjective decision based on the context of the current stream conditions. Review of trend summaries requires consideration of the specific constituent of concern and any corresponding standard.

Characterization and Data-Gap Analysis of Surface-Water Quality

Surface-water quality can be affected by natural and human factors. Natural factors affecting water quality include but are not limited to geology, soil type, vegetation, streamflow, precipitation, and climate. Human factors can include activities such as urbanization, agriculture, and other types of land development, including energy development and infrastructure. Potential effects of land-use activities on water quality may include changes in streamflow, changes in DS concentration and load, detection of chemicals associated with energy development, and increases in sediment in streams that can potentially transport chemicals that have adhered to the sediment. The relation between land use and surface-water quality is complex and often requires special monitoring efforts to identify specific sources contributing to changes in surface-water quality. Land and water-use managers need a better understanding of the relationship between land use and water quality. The descriptions of surface-water quality in this study are designed as an inclusive approach to help understand changes in the Piceance study area. Data gaps and limitations might inhibit the analysis from conveying specific conclusions that identify pollution sources or their immediate effects within the study area.

Summary Statistics and Comparison to Standards

Summary statistics and water-quality exceedances are discussed by basin to provide a general overview of water quality (app. 1). Throughout the Piceance study area, water-quality constituent sampling was variable among basins. Summary statistics and comparison to standards were provided for 347 sites. The locations of these sites are shown on plate 1 and exceedances of water-quality standards are shown on plates 2 through 5. The constituents summarized include field properties (pH, temperature, dissolved oxygen), nutrients (ammonia, nitrate, orthophosphate, total phosphorus, dissolved organic carbon), major ions (calcium, magnesium, sodium, potassium, chloride, sulfate, fluoride, silica, alkalinity, bicarbonate, carbonate, dissolved solids), dissolved trace elements (copper, iron, lead, zinc, selenium), total recoverable iron,

Escherichia coli (*E. coli*), suspended sediment, and BTEX compounds (benzene, toluene, ethylbenzene, xylene). The number of observations, number of censored observations, period of record, minimum, 25th percentile, median (50th percentile), 75th percentile, maximum values, and, where appropriate, information on censored values for each constituent, and comparison to water-quality standards are provided in appendix 1.

The collection of field properties is an important component to all water-quality sampling in order to properly characterize water-quality results. The majority of sites had information on field properties (app. 1, pl. 2). For the entire study area, 316 sites had temperature data collected between 1959 and 2009: 41 sites in the White River Basin, 165 sites in the Colorado River Basin, and 110 sites in the Lower Gunnison River Basin. Median temperature values ranged from 0.5 to 17.0 degrees Celsius (°C) in the White River Basin, from 4.0 to 19.0 °C in the Colorado River Basin, and from 0.7 to 19.5 °C in the Lower Gunnison River Basin. There were 326 values out of a total of 32,006 values in the study area that exceeded the aquatic-life standard for daily maximum water temperature: 220 values in the White River Basin and 106 values in the Colorado River Basin. There were 220 values that exceeded the aquatic-life standard for maximum weekly average water temperature in the study area: all 220 occurred in the Lower Gunnison River Basin. Maximum weekly average water temperature standards only exist for the Lower Gunnison in the study area (table 3). For the entire study area, 196 sites had dissolved-oxygen data collected between 1970 and 2009: 34 sites in the White River Basin, 111 sites in the Colorado River Basin, and 51 sites in the Lower Gunnison River Basin. Median dissolved-oxygen concentrations ranged from 7.6 to 11.2 mg/L in the White River Basin, from 6.8 to 10.9 mg/L in the Colorado River Basin, and from 7.0 to 11.2 mg/L in the Lower Gunnison River Basin. There were 185 concentrations that exceeded the dissolved oxygen aquatic-life standard out of a total of 11,248 values in the study area: 13 in the White River Basin, 168 in the Colorado River Basin, and 4 in the Lower Gunnison River Basin. There were 273 concentrations that exceeded the aquatic-life standard for dissolved oxygen (spawning season only) in the study area: 27 in the White River Basin, 214 in the Colorado River Basin, and 32 in the Lower Gunnison River Basin. For the entire study area, 276 sites had pH data collected between 1958 and 2009: 39 sites in the White River Basin, 147 sites in the Colorado River Basin, and 90 sites in the Lower Gunnison River Basin. Median pH values ranged from 7.9 to 8.9 in the White River Basin, from 7.5 to 9.0 in the Colorado River Basin, and from 7.4 to 8.7 in the Lower Gunnison River Basin. There were 241 values out of a total of 16,307 values that exceeded the high pH standard in the study area: 32 in the White River Basin, 191 in the Colorado River Basin, and 18 in the Lower Gunnison River Basin. There were 7 values that were less than the low pH standard in the study area: 1 in the White River Basin, 2 in the Colorado River Basin, and 4 in the Lower Gunnison River Basin.

Natural changes in precipitation and streamflow and anthropogenic changes in nutrient sources (such as wastewater treatment facilities, golf courses, urban runoff, agricultural fields, and septic tanks) can influence nutrient concentrations in streams (Sprague and others, 2009). Nitrogen and phosphorus inputs to the stream could be derived from fertilizer and manure applications to agricultural land areas (Puckett, 1994; Paschke and others, 2008). Nutrients within the study area were not well represented in each basin and were often not being sampled currently (August 2009) (app. 1, pl. 3). The White River Basin, in contrast to the other basins, had recent nutrient data collected in the past 5 years and historic nutrient data. For the entire study area, 62 sites had nitrate data collected between 1958 and 2009: 24 sites in the White River Basin, 22 sites in the Colorado River Basin, and 16 sites in the Lower Gunnison River Basin. Median nitrate concentrations ranged from less than detection to 1.49 mg/L as nitrogen (N) in the White River Basin, from less than detection to 2.70 mg/L as N in the Colorado River Basin, and from less than detection to 3.72 mg/L as N in the Lower Gunnison River Basin. The MCL for domestic water supply for nitrate is 10 mg/L and was exceeded once in 3,736 samples. Total phosphorus data was better represented spatially throughout the study area relative to other nutrients. Total phosphorus was collected at 113 sites between 1974 and 2009: 32 sites in the White River Basin, 43 sites in the Colorado River Basin, and 38 sites in the Lower Gunnison River Basin. Median total phosphorus concentrations ranged from 0.02 to 5.04 mg/L in the White River Basin, from less than detection to 0.6 mg/L in the Colorado River Basin, and from less than detection to 0.55 mg/L in the Lower Gunnison River Basin. The USEPA recommendation for phosphorus is less than 0.1 mg/L, and 1,469 of 4,842 samples exceeded this recommended standard in the study area. Overall, 400 values in the White River Basin, 586 values in the Colorado River Basin, and 483 values in the Lower Gunnison River Basin exceeded the recommended standard.

Standards for major ions exist only for chloride and sulfate (app. 1, pl. 4). For the entire study area, 118 sites had chloride and sulfate concentration data collected between 1958 and 2009: 27 sites in the White River Basin, 49 sites in the Colorado River Basin, and 42 sites in the Lower Gunnison River Basin. Median chloride concentrations ranged from 1.4 to 165 mg/L in the White River Basin, from 1.4 to 280 mg/L in the Colorado River Basin, and from 0.085 to 190 mg/L in the Lower Gunnison River Basin. There were 120 samples with chloride concentrations that exceeded the chloride domestic water-supply standard of 250 mg/L from a total of 8,817 samples with chloride concentration data: 86 in the White River Basin and 34 in the Colorado River Basin. Median sulfate concentrations ranged from 57.5 to 1,780 mg/L in the White River Basin, from 11.0 to 15,000 mg/L in the Colorado River Basin, and from 4.57 to 1,680 mg/L in the Lower Gunnison River Basin. There were 1,111 samples with sulfate concentrations that exceeded the sulfate domestic water-supply standard of 250 mg/L (477 mg/L in the Lower Gunnison River Basin)

(table 3) from a total of 8,736 samples with sulfate concentration data in the study area: 503 in the White River Basin, 131 values in the Colorado River Basin, and 477 in the Lower Gunnison River Basin.

Many trace elements in natural waters are essential to plant and aquatic life. There are natural (geology) and anthropogenic sources of trace elements in streams. Mining can provide conduits for water and air to come in contact with the underlying geologic material, where both physical and chemical weathering can dissolve and transport these constituents into streams. River segments adjacent to urban areas are subject to mobilization of trace elements from urban runoff and treated wastewater. Trace elements were relatively well represented both temporally and spatially in the study area (app. 1, pl. 5), though the number of trace element samples per site was not typically enough to compute trends or loads except for selenium. There were 109 sites that had dissolved copper concentration data collected between 1972 and 2009: 27 sites in the White River Basin, 42 sites in the Colorado River Basin, and 40 sites in the Lower Gunnison River Basin. Median copper concentrations ranged from less than detection to 4.5 µg/L in the White River Basin, from 0.62 to 6 µg/L in the Colorado River Basin, and from 0.53 to 5 µg/L in the Lower Gunnison River Basin. Copper concentrations were compared to two standards: the chronic (30-day) aquatic-life standard, which ranges from 1.57 to 29.3 µg/L, and the acute aquatic-life standard, which ranges from 1.96 to 49.6 µg/L in the study area (table 3). There were 69 samples with copper concentrations that exceeded the chronic standard from a total of 2,885 samples with copper concentration data: 12 in the White River Basin, 23 in the Colorado River Basin, and 34 in the Lower Gunnison River Basin. There were 29 samples with copper concentrations that exceeded the acute standard: 9 in the White River Basin, 2 in the Colorado River Basin, and 18 in the Lower Gunnison River Basin. There were 127 sites that had dissolved iron concentration data collected between 1961 and 2009: 33 sites in the White River Basin, 63 sites in the Colorado River Basin, and 31 sites in the Lower Gunnison River Basin. Median iron concentrations ranged from 7 to 78 µg/L in the White River Basin, from less than detection to 1,100 µg/L in the Colorado River Basin, and from 4 to 120 µg/L in the Lower Gunnison River Basin. The 30-day drinking-water standard for iron is 300 µg/L, and 203 samples exceeded the standard from a total of 5,027 samples with iron concentration data, 196 of which occurred in the Colorado River Basin, most of which are from Divide Creek. The samples on Divide Creek were collected as part of a multiphase water-quality investigation associated with a leaking natural gas well (Papadopoulos & Associates, Inc., 2008). Selenium was the best represented trace element with selenium concentration data collected at 197 sites between 1973 and 2009: 28 sites in the White River Basin, 94 sites in the Colorado River Basin, and 75 sites in the Lower Gunnison River Basin. Median selenium concentrations range from 0.79 to 5.7 µg/L in the White River Basin, from less than detection to 86 µg/L in the Colorado River Basin, and from less than detection to

181 µg/L in the Lower Gunnison River Basin. For most stream segments in the study area, the chronic (30-day) aquatic-life selenium standard is 4.6 µg/L, but a few segments have temporary chronic standards based either on a fixed standard or on the 85th-percentile data value for a given site, which can be as high as 280 µg/L (table 3). The chronic standard for selenium concentrations was exceeded in 899 samples: 22 in the White River Basin, 741 in the Colorado River Basin, and 136 in the Lower Gunnison River Basin. The acute aquatic-life standard of 18.4 µg/L for selenium was exceeded in 629 samples: 202 in the Colorado River Basin and 427 in the Lower Gunnison River Basin.

Statistics for suspended sediment, *E. coli*, and BTEX were summarized (app. 1). The study area included 53 sites with suspended sediment data. Sediment affects macroinvertebrate and fish habitat and municipal water treatment. Where sediment is on the monitoring and evaluation list of the CDPHE 303d list, there is not an easily defined standard. Only 18 sites had *E. coli* concentration data that could provide an assessment of the suitability of the water for recreational use. The *E. coli* recreational standard is 630 colony forming units (CFU) in streams where primary contact (such as swimming or other water sports) will occur, 205 CFU in areas of potential primary contact, and 126 CFU where the stream is not suitable for primary contact recreation (table 3). Of the 18 sites, 11 sites had exceedances of the *E. coli* recreational standard (app. 1). The seasonal *E. coli* standard is 126 CFU and was only exceeded once in the White River Basin. There were 5 sites in the Colorado River Basin that had BTEX concentration data, which could be a constituent of interest when looking at energy-related activities. For example, in the Divide Creek and Mamm Creek area (fig. 1), BTEX concentration data were used to evaluate the impacts from faulty natural gas production well completion where detections and elevated concentrations of BTEX were observed in surface water and groundwater (Papadopoulos & Associates, Inc., 2008). BTEX does not persist in the environment where conditions are typically well oxygenated, so BTEX might not be a constituent to add to routine monitoring of surface water, but more for use in evaluating known occurrences and persistent sources of BTEX.

Temporal Trends and Loads

The results of the trend analysis are presented for the three study basins starting with the northernmost basin (White River Basin) and ending with the southernmost basin (Lower Gunnison River Basin). Within each basin, results are presented beginning with the main-stem sites in the basin, starting with the most upstream site and ending with the most downstream site. The most downstream site on the main stem in each basin represents the entire drainage area of the basin. After the main-stem sites, tributary sites are presented from upstream to downstream. Finally, trends for lower order tributaries are presented where there were sufficient data for analysis. Only 37 sites met the final selection criteria for trend

analysis: 31 sites had sufficient field property data for analysis using the seasonal Kendall test and 28 sites had sufficient concentration data for analysis using regression models (fig. 7).

Loads and exceedances are presented for some constituents not only to provide context to the trends analysis results, but also to identify data gaps. Additionally, the land use and geology for each basin, as it may relate to water quality, are presented in further detail. Loading profiles are presented for selected constituents for all sites where trend analysis was computed and where there were sufficient streamflow data to compute a load. The figures include both main-stem and tributary sites and are ordered from upstream to downstream (figs. 8–12).

Loads and loading profiles are presented in figures 8–12, and trend data are presented in tables 4–7. Table 4 contains the results of the trend analysis for field properties using ESTREND. Tables 5–7 present the results of the trends analysis for concentration data (nutrients, major ions and dissolved solids, and trace elements, respectively) using S-LOADEST. Tables include the study period and a trend direction (where trends were significant) when sufficient data existed for trend analysis. The code “ND” was used to indicate that there were no data for that constituent at that site. The code “IS” indicates that there were data but they did not meet the selection criteria detailed in the “Trend Analysis and Load Calculation” section presented earlier in this report (p. 21). The code “NT” was used to indicate no trend, and “F” was used to indicate the model failed diagnostics. The code “NA” was used to indicate not applicable. In the field properties table (table 4), there are also dashes (—) that were used to indicate that the dataset met the initial criteria but did not meet the internal ESTREND criteria to adequately characterize seasonality.

White River Basin

Temporal and spatial variability of water-quality data in the White River Basin were evaluated at 10 sites: 6 sites on the White River main stem and 4 sites on tributaries to the White River (tables 4–7, fig. 7). Main-stem sites on the White River were 09304200 (White River above Coal Creek), 09304500 (White River near Meeker), 09304800 (White River below Meeker), 09306224 (White River above Crooked Wash near White River City), 09306290 (White River below Boise Creek, near Rangely), and 09306305 (White River below Taylor Draw Reservoir, above Rangely) (fig. 1) in order from upstream to downstream. Tributary sites included 2 sites on Piceance Creek, 09306200 (Piceance Creek below Ryan Gulch, near Rio Blanco) and 09306222 (Piceance Creek at White River) from upstream to downstream; 09306242 (Corral Gulch near Rangely), which is tributary to Yellow Creek; and 09306255 (Yellow Creek near White River), which then flows into the White River downstream from Piceance Creek.

Field Properties

Results of the trend analysis for water temperature, pH, and dissolved oxygen are presented in table 4. Sufficient data were available to analyze for water temperature trends at 8 sites in the White River Basin; however, there were no significant trends in water temperature at any of these sites. Sufficient data were available to analyze for dissolved-oxygen trends at 6 sites; however, no trends were detected from 1990 to 2009 for all sites. Sufficient data existed to analyze for pH trends at 6 sites. An upward trend in pH was observed at the most upstream site, 09304200 (White River above Coal Creek), from 1990 to 2009, and no trends were detected at the remaining 5 sites for the same period.

Nutrients

Trends in nutrient concentration data were evaluated for ammonia, nitrate, orthophosphate, and total phosphorus in the White River main stem (table 5). In addition, organic carbon and *E. coli* are discussed in this section as well. At 09304200 (White River above Coal Creek, near Meeker), a net, upward trend was detected in nitrate from 1990 to 2009. The trend was parabolic with a zero-slope year around 2002, after which the shape of the parabola indicated a downward trend. Trends were detected in other nutrients at this site, including an upward trend in total phosphorus from 1991 to 2009 and a downward trend in orthophosphate from 1990 to 2009. A net, downward trend in orthophosphate was detected at 09304800 (White River below Meeker) from 1990 to 2009. The trend was parabolic with a zero-slope year around 1997, prior to which the shape of the parabola indicated an upward trend. Trends in orthophosphate were consistently downward throughout the main stem of the White River. All other models failed diagnostics for nutrients for this site. Downstream at site 09306290 (White River below Boise Creek, near Rangely), dissolved organic carbon had a net, downward trend from 1990 to 2009. The trend was parabolic with a zero-slope year around 1999, prior to which the shape of the parabola indicated an upward trend.

Trends were analyzed for nutrients on tributary sites to the White River Basin (table 5). Downward trends were detected for nitrate, orthophosphate, and organic carbon at site 09306200 (Piceance Creek below Ryan Gulch, near Rio Blanco) from 1990 to 2009. Downstream, at site 09306222 (Piceance Creek at White River), no trend was detected in orthophosphate and the model failed diagnostics for nitrate for the same period. It is unclear why the trend in orthophosphate is not consistent between Piceance Creek below Ryan Gulch, near Rio Blanco, and Piceance Creek at White River for the same period. All trend models failed diagnostics for nutrients at 09306255 (Yellow Creek near White River); however, no trend was detected in nitrate or orthophosphate from 1990 to 2008 at 09306242 (Corral Gulch near Rangely), a tributary to Yellow Creek.

Figure 8. Loading profile for (A) nitrate and (B) orthophosphate in the White River Basin, western Colorado.

Figure 9. Loading profile for (A) dissolved solids, (B) iron, and (C) selenium in the White River Basin, western Colorado.

Figure 10. Loading profile for (A) nitrate and (B) orthophosphate in the Colorado River Basin, western Colorado.

Figure 11. Loading profile for (A) dissolved solids, (B) iron, and (C) selenium in the Colorado River Basin, western Colorado.

Figure 12. Loading profile for (A) dissolved solids and (B) selenium in the Lower Gunnison River Basin, western Colorado.

Table 4. Summary of the seasonal Kendall test trend analysis results for field properties, Piceance study area, western Colorado, 1990–2009.

[NP, data not provided in the repository; IS, did not meet seasonal Kendall criteria due to insufficient data; —, data was not sufficient do adequately characterize seasonality; ND, no data available]

Site name	Site identification number	Drainage area, in square miles	Water temperature, in degrees Celsius		Dissolved oxygen, in milligrams per liter		pH, in standard units	
			Study period	Trend type	Study period	Trend type	Study period	Trend type
White River Basin								
White River above Coal Creek, near Meeker, Colo.	09304200	648	1990–2009	no trend	1990–2009	no trend	1990–2009	upward
White River near Meeker, Colo.	09304500	755	1990–2005	no trend	ND		IS	
White River below Meeker, Colo.	09304800	1,024	1990–2009	no trend	1990–2009	no trend	1990–2009	no trend
Piceance Creek below Ryan Gulch, near Rio Blanco, Colo.	09306200	506	1990–2009	no trend	1990–2009	no trend ¹	1990–2009	no trend
Piceance Creek at White River, Colo.	09306222	652	1990–2009	no trend	1990–2009	no trend ¹	1990–2009	no trend
Corral Gulch near Rangely, Colo.	09306242	32	1990–2009	no trend	—	—	—	—
Yellow Creek near White River, Colo.	09306255	262	1990–2009	no trend	1990–2009	no trend	1990–2009	no trend
White River below Boise Creek, near Rangely, Colo.	09306290	2,530	1990–2009	no trend	1990–2009	no trend	1990–2009	no trend
White River below Taylor Draw Reservoir, above Rangely Colo.	09306305	2,776	—		—		—	
Colorado River Basin								
Colorado River Devereaux Bridge	CDOWRW-47	NP	1991–2007	no trend	1991–2007	downward	—	
West Divide Creek near Raven, Colo.	09089500	65	—		IS		IS	
Colorado River Rifle Bridge	CDOWRW-550	NP	—		—		—	
Dry Fork at Upper Station, near DeBeque, Colo.	09095300	97	—		—		—	
Colorado River near Cameo, Colo.	09095500	8,050	1990–2009	no trend	1991–2008	no trend	1990–2009	upward
Plateau Creek near Cameo, Colo.	09105000	592	1990–2009	no trend	1991–2008	no trend ¹	1991–2009	no trend
Colorado River below Grand Valley Diversion, near Palisade, Colo.	09106150	8,753	—		—		—	
Colorado River Highway 6	CDOWRW-555	NP	—		—		—	
Colorado River Watson	CDOWRW-560	NP	—		—		—	
Reed Wash near Mack, Colo.	09153290	16	1990–2000	no trend	—		—	
Colorado River near Colorado-Utah state line	09163500	17,843	1990–2009	no trend	1990–2008	no trend	1990–2009	no trend
Lower Gunnison River Basin								
North Fork Gunnison River near Somerset, Colo.	09132500	526	—		ND		IS	
Minnesota Creek near Paonia, Colo.	09134000	41	—		ND		ND	
North Fork of the Gunnison River below Leroux Creek, near Hotchkiss, Colo.	09135950	922	—		IS		IS	
Smith Fork near Crawford, Colo.	09128500	43	—		ND		IS	
Sunflower Drain at Highway 92, near Read	384551107591901	NP	—		—		—	
Surface Creek near Cedaredge, Colo.	09143000	27	—		ND		ND	
Surface Creek at Cedaredge, Colo.	09143500	39	1990–2004	no trend	ND		ND	
Gunnison River at Delta, Colo.	09144250	5,628	1990–2009	no trend	—		—	
Loutsenhizer Arroyo at North River Road	383946107595301	NP	—		—		—	
Uncompahgre River at Delta, Colo.	09149500	1,115	1990–2009	no trend	—		—	
Gunnison River near Grand Junction, Colo.	09152500	7,928	1990–2009	upward	1990–2009	no trend	1990–2009	no trend

¹Indicates that there were not sufficient streamflow data to flow adjust the concentrations.

Table 5. Summary of regression model trend analysis results for nutrients and *Escherichia coli*, Piceance study area, western Colorado, 1990–2009.

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other columns contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Site name	Site identification number	Drainage area, in square miles	Ammonia, filtered, in milligrams per liter as nitrogen		Nitrate, in milligrams per liter as nitrogen	
			Upward	Downward	Upward	Downward
White River Basin						
White River above Coal Creek, near Meeker, Colo.	09304200	648	F; 1990–2009		1990–2002	2002–2009
White River below Meeker, Colo.	09304800	1,024	F; 1990–2009		F; 1990–2009	
Piceance Creek below Ryan Gulch, near Rio Blanco, Colo.	09306200	506	NT; 1990–2009		NA	1990–2009
Piceance Creek at White River, Colo.	09306222	652	1990–2001	2001–2009	F; 1990–2009	
White River above Crooked Wash, near White River City, Colo.	09306224	1,821	F; 1990–2008		NT; 1990–2008	
Corral Gulch near Rangely, Colo.	09306242	32	F; 1990–2008		NT; 1990–2008	
Yellow Creek near White River, Colo.	09306255	262	F; 1990–2009		F; 1990–2009	
White River below Boise Creek, near Rangely, Colo.	09306290	2,530	F; 1990–2009		F; 1990–2009	
White River below Taylor Draw Reservoir, above Rangely, Colo.	09306305	2,776	NT; 1995–2009		NT; 1995–2009	
Colorado River Basin						
Colorado River Devereaux Bridge	CDOWRW-47	—	ND		ND	
Colorado River above South Canyon Creek, near Glenwood Springs, Colo.	09085150	6,040	ND		ND	
Dry Fork at Upper Station, near DeBeque, Colo.	09095300	97	F; 1996–2004		1996–1998	1998–2004
Colorado River near Cameo, Colo.	09095500	8,050	F; 1991–2002		F; 1991–2002	
Plateau Creek near Cameo, Colo.	09105000	592	IS		IS	
Colorado River below Grand Valley Diversion, near Palisade, Colo.	09106150	8,753	IS		IS	
Colorado River Hwy 6	CDOWRW-555	—	ND		ND	
Lewis Wash near Grand Junction, Colo.	09106200	4.7	IS		IS	
Colorado River Watson	CDOWRW-560	—	ND		ND	
Reed Wash near Mack, Colo.	09153290	16	IS		IS	
Colorado River near Colorado-Utah State Line	09163500	17,843	2002–2008	1990–2002	NA	1990–2008
Lower Gunnison River Basin						
North Fork Gunnison River above mouth, near Lazear, Colo.	09136100	969	IS		IS	
Sunflower Drain at Highway 92, near Read	384551107591901	—	IS		IS	
Gunnison River at Delta, Colo.	09144250	5,628	IS		IS	
Loutsenhizer Arroyo at Falcon Road	383528107552001	—	ND		ND	
West Tributary of Loutsenhizer Arroyo below East Canal	383728107572001	—	ND		ND	
Loutsenhizer Arroyo at North River Road	383946107595301	—	IS		IS	
Uncompahgre River at Delta, Colo.	09149500	1,115	IS		—	
Gunnison River near Grand Junction, Colo.	09152500	7,928	F; 1990–2002		NT; 1990–2002	

Table 5. Summary of regression model trend analysis results for nutrients and *Escherichia coli*, Piceance study area, western Colorado, 1990–2009.—Continued

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other columns contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Orthophosphate, filtered, in milligrams per liter		Total phosphorous, in milligrams per liter		Organic carbon, filtered, in milligrams per liter		<i>Escherichia coli</i> , colonies per 100 milliliters	
Upward	Downward	Upward	Downward	Upward	Downward	Upward	Downward
White River Basin							
NA	1990–2009	1991–2009	NA	IS		NT; 1991–2004	
1990–1997	1997–2009	F; 1991–2009				F; 1991–2003	
NA	1990–2009	—		NA	1993–2009	IS	
NT; 1990–2009		—		NT; 1991–2009		IS	
NT; 1990–2008		IS		IS		ND	
NT; 1990–2008		—		F; 1991–2008		IS	
F; 1990–2009		—		NT; 1991–2009		IS	
NA	1990–2009	F; 1990–2009		1990–1999	1999–2009	IS	
NA	1995–2009	1995–2009	NA	ND		IS	
Colorado River Basin							
ND		IS		ND		ND	
ND		ND		ND		ND	
NT; 1996–2004		F; 1996–2004		—		IS	
IS		IS		IS		IS	
—		IS		ND		IS	
IS		IS		ND		IS	
ND		IS		ND		ND	
—		IS		IS		ND	
ND		IS		ND		ND	
IS		IS		IS		ND	
NA	1990–2008	1990–2008	NA	NT; 1995–2002		ND	
Lower Gunnison River Basin							
ND		ND		ND		ND	
IS		IS		IS		ND	
IS		IS		ND		IS	
ND		ND		ND		ND	
ND		ND		ND		ND	
IS		ND		ND		ND	
—		IS		IS		IS	
NT; 1990–1998		F; 1990–2002		NT; 1995–2002		IS	

Table 6. Summary of regression model trend analysis results for dissolved solids and major ions, Piceance study area, western Colorado, 1990–2009.

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other columns contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Site name	Site identification number	Drainage area, in square miles	Calcium, filtered, in milligrams per liter	
			Upward	Downward
White River Basin				
White River above Coal Creek, near Meeker, Colo.	09304200	648	NT; 1990–2002	
White River below Meeker, Colo.	09304800	1,024	NT; 1990–2009	
Piceance Creek below Ryan Gulch, near Rio Blanco, Colo.	09306200	506	1990–2009	NA
Piceance Creek at White River, Colo.	09306222	652	2000–2009	1990–2000
White Riv above Crooked Wash near White River City, Colo.	09306224	1,821	—	
Corral Gulch near Rangely, Colo.	09306242	32	1990–1996	1996–2008
Yellow Creek near White River, Colo.	09306255	262	NT; 1990–2009	
White River below Boise Creek, near Rangely, Colo.	09306290	2,530	NT; 1990–2009	
White River below Taylor Draw Reservoir, above Rangely Colo.	09306305	2,776	IS	
Colorado River Basin				
Colorado River Devereaux Bridge	CDOWRW-47	—	NT; 2000–2007	
Colorado River above South Canyon Creek near Glenwood Springs, Colo.	09085150	6,040	IS	
Dry Fork at Upper Station, near DeBeque Colo.	09095300	97	IS	
Colorado River near Cameo, Colo.	09095500	8,050	1990–2001	2001–2009
Plateau Creek near Cameo, Colo.	09105000	592	NT; 1991–2009	
Colorado River below Grand Valley Diversion near Palisade, Colo.	09106150	8,753	NT; 1992–2002	
Colorado River Hwy 6	CDOWRW-555	—	IS	
Lewis Wash near Grand Junction, Colo.	09106200	4.7	NT; 1991–2006	
Colorado River Watson	CDOWRW-560	—	IS	
Reed Wash near Mack, Colo.	09153290	16	IS	
Colorado River near Colorado-Utah State Line	09163500	17,843	2001–2009	1990–2001
Lower Gunnison River Basin				
North Fork Gunnison River above mouth near Lazear, Colo.	09136100	969	NA	1991–2009
Sunflower Drain at Highway 92, near Read	384551107591901	—	NT; 1991–2003	
Gunnison River at Delta, Colo.	09144250	5,628	F; 1991–2009	
Loutsenhizer Arroyo at Falcon Road	383528107552001	—	IS	
West Tributary of Loutsenhizer Arroyo below East Canal	383728107572001	—	IS	
Loutsenhizer Arroyo at North River Road	383946107595301	—	NT; 1991–2009	
Uncompahgre River at Delta, Colo.	09149500	1,115	2001–2009	1991–2001
Gunnison River near Grand Junction, Colo.	09152500	7,928	2002–2009	1990–2002

Nitrate and orthophosphate loads and total phosphorus standard exceedances were evaluated in the White River Basin. The White River Basin had the greatest number of nitrate concentration samples; however, use of the loading profile for nitrate was limited at the main stem of the White River because load could not be calculated for the most downstream site 09306290 (White River below Boise Creek, near Rangely) (fig. 8A). A loading profile for orthophosphate in the White River Basin indicated a slight increase in orthophosphate from upstream to downstream (fig. 8B). Between 09304800 (White River below Meeker) and 09306290 (White River below Boise Creek, near Rangely), orthophosphate increased by only 0.2 tons while tributaries between the two sites sum to more than 6 tons of additional orthophosphate. There were 29 sites that had exceedances of the recommended total phosphorus standard, with more than 402 exceedances, many of which occur prior to 2000 (21 sites and 323 samples had total phosphorus standard exceedances) (app. 1).

Dissolved Solids and Major Ions

Dissolved solids (DS) refers to the concentration of dissolved solids in water, including calcium, magnesium, sodium, potassium, silica, chloride, sulfate, and carbonate species. Although DS has not been a significant water-quality concern in the White River Basin, a potential source of the DS might be 55 mi² of irrigated land in the basin. Irrigation occurs primarily near Meeker, Colo., and in the Piceance Creek Basin. Prior to 1980, Meeker Dome, 3 miles east of the town of Meeker, was a point source for DS on the White River owing to highly saline water that was discharging at the surface through abandoned and improperly plugged exploration oil wells drilled during the 1920s (Liebermann and others, 1989). The wells were eventually plugged during the 1960s and 1980s and the source was mitigated. However, results from this previous study indicated that there were potentially large conduits for high DS groundwater to upwell to the surface and enter surface water.

Table 6. Summary of regression model trend analysis results for dissolved solids and major ions, Piceance study area, western Colorado, 1990–2009.—Continued

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other columns contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Magnesium, filtered, in milligrams per liter		Sodium, filtered, in milligrams per liter		Potassium, filtered, in milligrams per liter		Chloride, filtered, in milligrams per liter	
Upward	Downward	Upward	Downward	Upward	Downward	Upward	Downward
White River Basin							
NT; 1990–2002		1990–1992	1992–2002	F; 1990–2002		NT; 1990–2009	
NT; 1990–2009		NT; 1990–2009		NT; 1990–2009		NA	1990–2009
NT; 1990–2009		1997–2009	1990–1997	NT; 1990–2009		2003–2009	1990–2003
1999–2009	1990–1999	NT; 1990–2009		NT; 1990–2009		NA	1990–2009
—		—		—		—	
1990–1996	1996–2008	NA	1990–2008	NT; 1990–2008		2002–2008	1990–2002
F; 1990–2009		NT; 1990–2009		NT; 1990–2009		1999–2009	1990–1999
1990–1999	1999–2009	1990–1998	1998–2009	1990–1999	1999–2009	NA	1990–2009
IS		IS		IS		IS	
Colorado River Basin							
NT; 2000–2007		ND		ND		ND	
IS		IS		IS		IS	
IS		IS		IS		NT; 1996–2004	
NT; 1990–2009		NT; 1990–2009		NT; 1990–2009		1990–2009	NA
NT; 1991–2009		NA	1991–2009	NT; 1991–2009		1991–2002	2002–2009
NT; 1992–2002		NT; 1992–2002		NT; 1992–2002		NT; 1992–2002	
IS		ND		ND		ND	
NA	1991–2006	NT; 1991–2006		NT; 1991–2006		F; 1991–2006	
IS		ND		ND		ND	
IS		IS		IS		IS	
2004–2009	1990–2004	2002–2009	1990–2002	1999–2009	1990–1999	NT; 1990–2009	
Lower Gunnison River Basin							
NA	1991–2009	NA	1991–2009	NT; 1991–2009		F; 1991–2009	
NT; 1991–2003		NT; 1991–2003		NT; 1991–2003		NT; 1991–2003	
NA	1991–2009	F; 1991–2009		NT; 1991–2009		F; 1991–2009	
IS		IS		IS		IS	
IS		IS		IS		IS	
NT; 1991–2009		NT; 1991–2009		NT; 1991–2009		NT; 1991–2009	
2000–2009	1991–2000	2000–2009	1991–2000	NT; 1991–2009		2000–2009	1991–2000
2003–2009	1990–2003	2005–2009	1990–2005	2000–2009	1990–2000	2002–2009	1990–2002

Sufficient data were available to analyze for trends in DS and other major ions for 3 sites on the White River main stem: 09304200 (White River above Coal Creek, near Meeker), 09304800 (White River below Meeker), and 09306290 (White River below Boise Creek, near Rangely). No trends were detected from 1990 to 2002 at 09304200 (White River above Coal Creek, near Meeker) for calcium, magnesium, chloride, sulfate, silica, and DS (table 6). Sodium had a net, downward trend at 09304200 from 1990 to 2002. The trend was parabolic with a zero-slope year around 1992, after which the shape of the parabola indicated an upward trend. No trends were detected downstream at 09304800 (White River below Meeker) from 1990 to 2009 for calcium, magnesium, sodium, potassium, sulfate, fluoride, silica, or DS. A downward trend was detected for chloride at 09304800 from 1990 to 2009. Net, downward trends were detected for DS and sodium from 1990 to 2009 at site 09306290 (White River below Boise Creek, near Rangely). The trend for both constituents was parabolic

with a zero-slope year around 1998, prior to which the shape of the parabola indicated an upward trend. It is unclear what contributed to the fluctuation in DS throughout the main stem of the White River.

Trends in DS and other major ions were analyzed for 4 tributary sites to the White River. At site 09306200 (Piceance Creek below Ryan Gulch, near Rio Blanco), a net, downward trend was detected for DS from 1990 to 2009. The trend was parabolic with a zero-slope year of 2003, after which the shape indicated an upward trend (table 6). At the next site downstream, 09306222 (Piceance Creek at White River), a downward trend was detected for DS from 1990 to 2009 (table 6). No trends were detected at 09306255 (Yellow Creek near White River); however, at 09306242 (Corral Gulch near Rangely), a tributary to Yellow Creek, a net, downward trend was detected for DS from 1990 to 2008. The trend was parabolic with a zero-slope year around 1993 prior to which the shape of the parabola indicated an upward trend.

Table 6. Summary of regression model trend analysis results for dissolved solids and major ions, Piceance study area, western Colorado, 1990–2009.—Continued

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other column contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Site name	Site identification number	Sulfate, filtered, in milligrams per liter	
		Upward	Downward
White River Basin			
White River above Coal Creek, near Meeker, Colo.	09304200	NT; 1990–2002	
White River below Meeker, Colo.	09304800	NT; 1990–2009	
Piceance Creek below Ryan Gulch, near Rio Blanco, Colo.	09306200	NA	1990–2009
Piceance Creek at White River, Colo.	09306222	2004–2009	1990–2004
White Riv above Crooked Wash near White River City, Colo.	09306224	—	
Corral Gulch near Rangely, Colo.	09306242	F; 1990–2008	
Yellow Creek near White River, Colo.	09306255	NT; 1990–2009	
White River below Boise Creek, near Rangely, Colo.	09306290	NA	1990–2009
White River below Taylor Draw Reservoir, above Rangely Colo.	09306305	IS	
Colorado River Basin			
Colorado River Devereaux Bridge	CDOWRW-47	ND	
Colorado River above South Canyon Creek near Glenwood Springs, Colo.	09085150	IS	
Dry Fork at Upper Station, near DeBeque Colo.	09095300	1996–1999	1999–2004
Colorado River near Cameo, Colo.	09095500	NA	1990–2009
Plateau Creek near Cameo, Colo.	09105000	NA	1991–2009
Colorado River below Grand Valley Diversion near Palisade, Colo.	09106150	NT; 1992–2002	
Colorado River Hwy 6	CDOWRW-555	ND	
Lewis Wash near Grand Junction, Colo.	09106200	NA	1991–2006
Colorado River Watson	CDOWRW-560	ND	
Reed Wash near Mack, Colo.	09153290	IS	
Colorado River near Colorado-Utah State Line	09163500	2008–2009	1990–2008
Lower Gunnison River Basin			
North Fork Gunnison River above mouth near Lazear, Colo.	09136100	NA	1991–2009
Sunflower Drain at Highway 92, near Read	384551107591901	NT; 1991–2003	
Gunnison River at Delta, Colo.	09144250	F; 1991–2009	
Loutsenhizer Arroyo at Falcon Road	383528107552001	IS	
West Tributary of Loutsenhizer Arroyo below East Canal	383728107572001	IS	
Loutsenhizer Arroyo at North River Road	383946107595301	NT; 1991–2009	
Uncompahgre River at Delta, Colo.	09149500	2000–2009	1991–2000
Gunnison River near Grand Junction, Colo.	09152500	NA	1990–2009

Generally, the trend analysis indicated that there was either no change or a net, downward trend in DS and other major ions. However, there were exceedances of chloride and sulfate standards in the upstream area of the basin on tributaries to the White River. Only 2 sites had exceedances of the chloride standard, most of these exceedances occurred at 09304550 (Curtis Creek), and all exceedances occurred from data sampled prior to 1985 (app. 1). There were a total of 504 exceedances of the sulfate standard at 6 sites, although most of the exceedances occurred at 09304480 (Coal Creek) and 09304550 (Curtis Creek), 196 and 294 exceedances respectively. Most exceedances occurred prior to 1986; no sampling for chloride and sulfate occurred after that time at Curtis Creek and Coal Creek (app. 1). Insufficient data were available on the remaining tributaries to further aid in the analysis of DS in the White River Basin.

A loading profile for the White River Basin indicated increasing DS loads from upstream to downstream (fig. 9A). The total DS load from the White River Basin was represented by the most downstream site, 09306290 (White River below Boise Creek, near Rangely), where the load in water year 2000 was 245,000 tons. The DS load at 09304200 for water year 2000 was 102,000 tons, which was about 41 percent of the load in the White River Basin at site 09306290. The DS load at 09304800 (White River below Meeker) for water year 2000 was 164,000 tons, which was about 67 percent of the load from the White River Basin. Between 09304200 and 09304800 more than 60,000 tons of DS load are generated that could potentially be from irrigated agriculture. Load from 09306222 (Piceance Creek at White River) for water year 2000 was about 26,600 tons, which was about 11 percent of the load from the White River Basin. Alkali Flats is an area

Table 6. Summary of regression model trend analysis results for dissolved solids and major ions, Piceance study area, western Colorado, 1990–2009.—Continued

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other columns contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Fluoride, filtered, in milligrams per liter		Silica, filtered, in milligrams per liter		Alkalinity, filtered, in milligrams per liter as calcium carbonate		Dissolved solids, in milligrams per liter	
Upward	Downward	Upward	Downward	Upward	Downward	Upward	Downward
White River Basin							
IS		NT; 1990–2002		—		NT; 1990–2002	
NT; 1990–2009		NT; 1990–2009		—		NT; 1990–2009	
NT; 1990–2009		NT; 1990–2009		NT; 1999–2009		2003–2009	1990–2003
NT; 1990–2009		NT; 1990–2009		NT; 1998–2009		NA	1990–2009
—		—		IS		—	
NT; 1990–2008		1990–1999	1999–2008	NA	1999–2008	1990–1993	1993–2008
1990–2000	2000–2009	NT; 1990–2009		F; 1999–2009		F; 1990–2009	
NT; 1990–2009		NT; 1990–2009		IS		1990–1998	1998–2009
IS		IS		IS		IS	
Colorado River Basin							
ND		ND		ND		ND	
IS		IS		IS		IS	
IS		IS		1996–1999	1999–2004	IS	
F; 1990–2009		NA	1990–2009	NT; 1996–2009		NA	1990–2009
NT; 1991–2009		NT; 1991–2009		1995–2002	2002–2009	NA	1991–2009
IS		NT; 1992–2002		IS		NT; 1992–2002	
ND		ND		ND		ND	
NT; 1991–2006		NT; 1991–2006		NT; 1998–2006		NT; 1991–2006	
ND		ND		ND		ND	
IS		IS		IS		IS	
NT; 1990–2009		F; 1990–2009		2001–2009	1990–2001	2005–2009	1990–2005
Lower Gunnison River Basin							
NT; 1991–2009		NT; 1991–2009		1999–2004	2004–2009	NA	1991–2009
1991–2003	NA	1991–2003	NA	IS		NT; 1991–2003	
F; 1990–2009		NT; 1991–2009		IS		F; 1991–2009	
IS		IS		IS		IS	
IS		IS		IS		IS	
NT; 1991–2009		1991–2009	NA	NT; 2001–2009		NT; 1991–2009	
1991–2009	NA	1991–2009	NA	NT; 1998–2009		2001–2009	1991–2001
NT; 1990–2009		NT; 1990–2009		1999–2009	1990–1999	2005–2009	1990–2005

of known groundwater upwelling upstream from 09306222 (Piceance Creek at White River). The area could represent an important input of DS to surface water, though losses in streamflow in the Alkali Flats area may also be occurring (Tobin and others, 1985; Ortiz, 2002). The sum of the loads at 09304800 (White river below Meeker) and the tributary sites do not equal the load calculated at the most downstream site 09306290 (White River below Boise Creek, near Rangely). The remaining DS load measured at the gage and unaccounted for by tributary inputs might be sourced from groundwater or unsampled tributaries.

Trace Elements

Sufficient data were available to compare the results of the trends analysis only for iron and total recoverable iron in the White River Basin (table 7). Along the main stem of the

White River, no trend was detected in iron or total recoverable iron at either 09304800 (White River below Meeker) or 09306290 (White River below Boise Creek, near Rangely) for the periods 1995 to 2009 and 1990 to 2009, respectively (table 7). At site 09306200 (Piceance Creek below Ryan Gulch, near Rio Blanco), no trend was detected in iron from 1990 to 2009. Downstream at site 09306222 (Piceance Creek at White River), there was no net trend from 1991 to 2009, although there was a parabolic trend. The parabolic trend in iron was initially downward until around 2001, after which the trend was upward. An upward trend in iron was detected at 09306255 (Yellow Creek near White River) from 1991 to 2009. Only 2 of the 33 sites had exceedances of the 30-day drinking-water standard for iron; 1,871 samples had iron data (app. 1). The loading profile for the of the White River Basin indicated that iron load between the two White River sites (below Meeker and near Rangely) increased although the sampled tributaries did not

Table 7. Summary of regression model trend analysis results for trace elements and suspended sediment, Piceance study area, western Colorado, 1990–2009.

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other columns contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Site name	Site identification number	Drainage area, in square miles	Copper, filtered, in micrograms per liter	
			Upward	Downward
White River Basin				
White River above Coal Creek, near Meeker, Colo.	09304200	648		IS
White River below Meeker, Colo.	09304800	1,024		F; 1991–2009
Piceance Creek below Ryan Gulch, near Rio Blanco, Colo.	09306200	506	1999–2002	2002–2009
Piceance Creek at White River, Colo.	09306222	652	1999–2003	2003–2009
White River above Crooked Wash, near White River City, Colo.	09306224	1,821		IS
Corral Gulch near Rangely, Colo.	09306242	32		—
Yellow Creek near White River, Colo.	09306255	262		—
White River below Boise Creek, near Rangely, Colo.	09306290	2,530		—
White River below Taylor Draw Reservoir, above Rangely, Colo.	09306305	2,776		IS
Colorado River Basin				
Colorado River Devereaux Bridge	CDOWRW-47	—	1991–1999	1999–2006
Colorado River above South Canyon Creek, near Glenwood Springs, Colo.	09085150	6,040		ND
Dry Fork at Upper Station, near DeBeque Colo.	09095300	97		ND
Colorado River near Cameo, Colo.	09095500	8,050		IS
Plateau Creek near Cameo, Colo.	09105000	592		IS
Colorado River below Grand Valley Diversion, near Palisade, Colo.	09106150	8,753		IS
Colorado River Hwy 6	CDOWRW-555	—		IS
Lewis Wash near Grand Junction, Colo.	09106200	4.7		IS
Colorado River Watson	CDOWRW-560	—		IS
Reed Wash near Mack, Colo.	09153290	16		ND
Colorado River near Colorado-Utah State Line	09163500	17,843		—
Lower Gunnison River Basin				
North Fork Gunnison River above mouth, near Lazear, Colo.	09136100	969		IS
Sunflower Drain at Highway 92, near Read	384551107591901	—		IS
Gunnison River at Delta, Colo.	09144250	5,628		IS
Loutsenhizer Arroyo at Falcon Road	383528107552001	—		ND
West Tributary of Loutsenhizer Arroyo below East Canal	383728107572001	—		ND
Loutsenhizer Arroyo at North River Road	383946107595301	—		IS
Uncompahgre River at Delta, Colo.	09149500	1,115		—
Gunnison River near Grand Junction, Colo.	09152500	7,928		—

account for the increase (fig. 9B). Load from 09304800 (White River below Meeker) for water year 1996 was 21,000 pounds per year, which is 60 percent of the load from the White River Basin (fig. 9B). The remaining load might be sourced from groundwater or unsampled tributaries.

Suspended Sediment

Suspended sediment is a water-quality concern in the White River Basin, specifically in Douglas Creek. Douglas Creek is listed on the CDPHE 303(d) list for suspended sediment (table 2), yet there were no suspended sediment data available to evaluate trends and or calculate suspended sediment load. Suspended sediment loads were previously evaluated on the White River as part of the design of the Taylor Draw Reservoir (also known as Kenney Reservoir) (Salas and Shin, 1999).

Trends in suspended sediment were analyzed for 4 sites on the White River main stem. No trends were detected from 1990 to 2001 at 09304200 (White River above Coal Creek, near

Meeker) (table 7). The suspended sediment model failed diagnostics at 09304800 (White River below Meeker) from 1990 to 2009. A downward trend was detected at 09306290 (White River below Boise Creek, near Rangely) in suspended sediment from 1990 to 2009. A net, downward trend was detected at 09306305 (White River below Taylor Draw Reservoir, above Rangely) from 1995 to 2002. The trend was parabolic with a zero-slope year around 1996, prior to which the shape of the parabola indicated a downward trend. The downward trend at 09306305 could be related to Taylor Draw Reservoir, which was constructed in 1984. The efficiency of a reservoir to retain sediment is a function of reservoir capacity, inflow volume, mean velocity of flow through the reservoir, and size composition of the sediment load (Churchill, 1948; Brune, 1953). A reservoir's ability to retain sediment can increase as the ratio of the reservoir capacity to inflow volume increases or the percent composition of silt and clay in the sediment load decreases, or both. The downward trend at 09306305 might reflect a decrease in inflow volume or changes in sources of fluvial sediment.

Table 7. Summary of regression model trend analysis results for trace elements and suspended sediment, Piceance study area, western Colorado, 1990–2009.—Continued

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other columns contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Iron, filtered, in micrograms per liter		Iron, total recoverable, in micrograms per liter		Lead, filtered, in micrograms per liter		Zinc, filtered, in micrograms per liter		Selenium, filtered, in micrograms per liter	
Upward	Downward	Upward	Downward	Upward	Downward	Upward	Downward	Upward	Downward
White River Basin									
IS		NA	1991–2001	IS		IS		IS	
NT; 1995–2009		NT; 1991–2002		—		F; 1991–2009		F; 1991–2009	
NT; 1990–2009		IS		F; 1999–2009		NA	1990–2009	NT; 1999–2009	
2001–2009	1991–2001	IS		NT; 1999–2009		NA	1991–2009	NT; 1999–2009	
IS		IS		IS		IS		IS	
—		IS		—		—		—	
1991–2009	NA	IS		—		F; 1991–2009		—	
NT; 1990–2009		NT; 1991–2001		—		—		NT; 1990–2009	
IS		IS		ND		ND		IS	
Colorado River Basin									
NA	1991–2007	2000–2007	1991–2000	IS		1991–1995	1995–2007	IS	
ND		ND		ND		ND		NT; 2006–2009	
IS		ND		ND		ND		IS	
1999–2002	1995–1999	IS		IS		IS		NT; 1991–2009	
—		IS		IS		IS		IS	
—		IS		IS		IS		IS	
IS		IS		IS		IS		IS	
—		ND		IS		IS		2000–2006	1991–2000
IS		IS		ND		IS		IS	
IS		ND		ND		ND		IS	
1997–2002	1990–1997	IS		—		—		NA	1990–2009
Lower Gunnison River Basin									
ND		IS		IS		IS		NT; 1991–2009	
IS		ND		IS		IS		NA	1991–2003
ND		IS		IS		IS		NA	1991–2009
ND		ND		ND		ND		IS	
ND		ND		ND		ND		IS	
IS		IS		IS		IS		1991–2009	NA
—		—		—		IS		2002–2009	1991–2002
1999–2002	1990–1999	—		—		—		NA	1990–2009

Trends in suspended sediment were analyzed for 4 tributary sites to the White River. A downward trend in suspended sediment was detected at 09306200 (Piceance Creek below Ryan Gulch, near Rio Blanco) from 1990 to 2009. A net, downward trend in suspended sediment was detected at 09306222 (Piceance Creek at White River) from 1990 to 2009. The trend was parabolic with a zero-slope year around 2003, prior to which the shape of the parabola indicates a downward trend. Both site 09306255 (Yellow Creek near White River) and site 09306242 (Corral Gulch near Rangely) failed model diagnostics.

Colorado River Basin

Temporal and spatial variability of water-quality data in the Colorado River Basin were evaluated at 13 sites: 8 sites on the Colorado main stem and 5 sites on tributaries to the Colorado River (tables 4–7, fig. 7). Main-stem

sites on the Colorado River were CDOWRW-47 (Colorado River Deveraux Bridge), 09085150 (Colorado River above South Canyon near Glenwood Springs), CDOWRW-550 (Colorado River Rifle Bridge), 09095500 (Colorado River near Cameo), 09106150 (Colorado River below Grand Valley Diversion near Palisade), CDOWRW-555 (Colorado River Highway 6), CDOWRW-560 (Colorado River Watson), and 09163500 (Colorado River near Colorado-Utah state line). Tributary sites were 09089500 (West Divide Creek near Raven), 09095300 (Dry Fork at Upper Station, near DeBeque), 09105000 (Plateau Creek near Cameo), 09106200 (Lewis Wash near Grand Junction), and 09153290 (Reed Wash near Mack). The Gunnison River is also a tributary to the Colorado River, and it is discussed as a separate basin in this report. The most downstream site in the Lower Gunnison River Basin, 09152500 (Gunnison River near Grand Junction), is included in the figures and discussion of loading profiles for the Colorado River Basin to complete the discussion of spatial patterns.

Table 7. Summary of regression model trend analysis results for trace elements and suspended sediment, Piceance study area, western Colorado, 1990–2009.—Continued

[The upward and downward columns are populated whenever there is a significant trend. If the trend was parabolic, then both columns contain the time frame of the respective trend direction, the net direction of the trend is indicated by shading. If the trend was monotonic, then the respective column contains the respective time frame and the other columns contains NA. If no significant trend was detected, then the combined columns contain an indicator of no trend and the time frame of the analysis; NT, no trend detected; F, model failed the model diagnostics; —, site did not have sufficient data for trend analysis; ND, site did not have data; IS, insufficient data for regression model analysis]

Site name	Site identification number	Suspended sediment, in milligrams per liter	
		Upward	Downward
White River Basin			
White River above Coal Creek, near Meeker, Colo.	09304200		NT; 1990–2001
White River below Meeker, Colo.	09304800		F; 1990–2009
Piceance Creek below Ryan Gulch, near Rio Blanco, Colo.	09306200	NA	1990–2009
Piceance Creek at White River, Colo.	09306222	2003–2009	1990–2003
White River above Crooked Wash, near White River City, Colo.	09306224		—
Corral Gulch near Rangely, Colo.	09306242		F; 1990–2008
Yellow Creek near White River, Colo.	09306255		F; 1990–2009
White River below Boise Creek, near Rangely, Colo.	09306290	NA	1990–2009
White River below Taylor Draw Reservoir, above Rangely, Colo.	09306305	1995–1996	1996–2002
Colorado River Basin			
Colorado River Devereaux Bridge	CDOWRW–47		ND
Colorado River above South Canyon Creek, near Glenwood Springs, Colo.	09085150		ND
Dry Fork at Upper Station, near DeBeque Colo.	09095300		F; 1996–2004
Colorado River near Cameo, Colo.	09095500		F; 1990–1998
Plateau Creek near Cameo, Colo.	09105000		ND
Colorado River below Grand Valley Diversion, near Palisade, Colo.	09106150		ND
Colorado River Hwy 6	CDOWRW–555		ND
Lewis Wash near Grand Junction, Colo.	09106200		IS
Colorado River Watson	CDOWRW–560		ND
Reed Wash near Mack, Colo.	09153290		IS
Colorado River near Colorado–Utah State Line	09163500		F; 1990–2008
Lower Gunnison River Basin			
North Fork Gunnison River above mouth, near Lazear, Colo.	09136100		IS
Sunflower Drain at Highway 92, near Read	384551107591901		IS
Gunnison River at Delta, Colo.	09144250		ND
Loutsenhizer Arroyo at Falcon Road	383528107552001		ND
West Tributary of Loutsenhizer Arroyo below East Canal	383728107572001		ND
Loutsenhizer Arroyo at North River Road	383946107595301		ND
Uncompahgre River at Delta, Colo.	09149500		—
Gunnison River near Grand Junction, Colo.	09152500		F; 1990–2007

Field Properties

Results of the trend analysis for water temperature, pH, and dissolved oxygen are presented in table 4. Sufficient data were available to analyze for temperature trends at 5 sites in the Colorado River Basin. No significant trends in temperature were detected throughout the Colorado main-stem section. Sufficient data were available to analyze for pH trends at 3 sites in the Colorado River Basin. An upward trend in pH was detected at 09095500 (Colorado River near Cameo) from 1990 to 2009. Sufficient data were available to analyze for dissolved-oxygen trends at 4 sites. A downward trend in dissolved oxygen was detected at CDOWRW-47 (Colorado River Devereux Bridge) from 1991 to 2007.

Nutrients

Trends in nutrient concentration data were evaluated for ammonia, nitrate, orthophosphate, and total phosphorus. Models failed diagnostics for ammonia and nitrate at site 09095500

(Colorado River near Cameo) from 1991 to 2002 (table 5). Additionally, between 1980 and 1998, there were 16 exceedances for total phosphorus (app. 1). At 09163500 (Colorado River near Colorado-Utah state line), a downward trend was detected in nitrate and orthophosphate from 1990–2008. A net, downward trend in ammonia was detected at this site from 1990 to 2008. The trend was parabolic with a zero-slope year around 2002, prior to which the shape of the parabola indicates a downward trend. An upward trend was detected in total phosphorus at the same site during the same time period, and there were 122 exceedances from 1979–2008 (app. 1). Without a regression model for nutrient data upstream from 09095500 (Colorado River near Cameo) on the main stem of the Colorado River, it is difficult to determine what the potential upstream sources were contributing to the observed trends at 09163500 (Colorado River near Colorado-Utah state line).

Limited nutrient data were available for tributaries to the Colorado main stem. Sufficient data were not available for trend analysis at 09153290 (Reed Wash near Mack), but

there were 40 exceedances in total phosphorus from 1995 to 1998 (app. 1). As such, Reed Wash was a probable source of total phosphorus to the Colorado River. No trend was detected at 09095300 (Dry Fork at Upper Station, near DeBeque) for orthophosphate from 1996 to 2004, and a net, downward trend in nitrate was detected from 1996 to 2004. The total phosphorus model failed diagnostics for site 09095300 (Dry Fork at Upper Station, near DeBeque) from 1996 to 2004; 24 exceedances were observed for the same period (app. 1).

Although neither the nitrate nor the orthophosphate loading profile for the Colorado River has sufficient information for a comprehensive analysis (fig. 10), the lower Colorado River was analyzed with respect to the contributions from its principal tributary, the Gunnison River. The total nitrate load from the Gunnison River, represented by 091520500 (Gunnison River near Grand Junction), was 1,670 tons in 1996, which was 52 percent of the total load at 09163500 (Colorado River near Colorado-Utah state line) (fig. 10A). The total nitrate load from the Colorado River Basin, represented by the most downstream site 09163500 (Colorado River near Colorado-Utah state line), was 3,230 tons. Orthophosphate load from the Gunnison River in water year 1996 was 125 tons, 32 percent of the total load at the Colorado River near Colorado-Utah state line (385 tons) (fig. 10B). These results indicated that the Gunnison River is a substantial source of nitrate and orthophosphate to the Colorado River.

Dissolved Solids and Major Ions

Trends in DS were evaluated at 3 sites on the Colorado main stem. A downward trend was detected in DS at 09095500 (Colorado River near Cameo) from 1990 to 2009, and no trend was detected at 09106150 (Colorado River below Grand Valley Diversion near Palisade) from 1992 to 2002 (table 6). A net, downward trend in DS was detected at 09163500 (Colorado River near Colorado-Utah state border) from 1990 to 2009. The trend was parabolic with a zero-slope year around 2005, prior to which the shape of the parabola indicates a downward trend. Salinity control work in the Grand Valley could have contributed to the downward trend at 09163500 (Colorado River near Colorado-Utah state border). Trends in other major ion concentrations may aid in identifying sources of DS based on mineral composition, where dissolution of these sources might be controlling DS contribution to the Colorado River. The trend results indicated that other major ions (sulfate, chloride, magnesium, and sodium) had similar trend patterns as DS throughout the basin.

The three tributary sites for the Colorado River that had sufficient data for trend analysis for the majority of major ions were 09095300 (Dry Fork at Upper Station, near DeBeque), 09105000 (Plateau Creek near Cameo), and 09106200 (Lewis Wash near Grand Junction) (table 6). Net, downward trends were detected for sulfate, alkalinity, and bicarbonate at site 09095300 (Dry Fork at Upper Station, near DeBeque) from 1996 to 2004. The trends were parabolic with a zero-slope year around 1999, prior to which the shape of the

parabola indicated an upward trend. No trends were detected at 09095300 (Dry Fork at Upper Station, near DeBeque) for chloride and carbonate, and there were insufficient data to analyze trends in DS. A downward trend was detected at 09105000 (Plateau Creek near Cameo) from 1991 to 2009 for DS, sulfate, and sodium. A net, downward trend was detected for chloride from 1991 to 2009. The trend was parabolic with a zero-slope year around 2002, prior to which the shape of the parabola indicated an upward trend. There were no trends detected in calcium, magnesium, potassium, fluoride, or silica. An upward trend was detected for bicarbonate from 1995 to 2009, while no trend was detected for carbonate during the same period. The headwaters of Plateau Creek originate on the Grand Mesa (fig. 1) where the geology is dominated by vesicular basalt. The Grand Mesa has relatively little urban development in comparison to the Colorado River main-stem corridor, but the area is experiencing increasing energy development. Downstream, Plateau Creek flows over Tertiary sedimentary formations composed of mudstone and sandstone, which are a likely source for DS in Plateau Creek. Downward trends were detected at 09106200 (Lewis Wash near Grand Junction) for magnesium and sulfate from 1991 to 2006; no trends were detected for DS and the other major ions (table 6).

Natural sources and anthropogenic activities contribute to DS along the Colorado River main stem. The Eagle Valley Evaporite (fig. 3), present upstream from Glenwood Springs and in the Roaring Fork drainage area, is a natural source of DS in the upper part of the basin. Chafin and Butler (2002) reported that the Eagle Valley Evaporite contributed approximately 800,000 metric tons of salt per year to the Colorado River. Salts from the Eagle Valley Evaporite contributed nearly 60 percent of the annual DS load observed at the USGS gaging station Colorado River near Cameo (09095500) (Chafin and Butler, 2002). The high concentrations of DS downstream from 09095500 (Colorado River near Cameo) can be attributed to irrigation of the sedimentary formations such as the Mancos Shale and Dakota Sandstone (fig. 3). Irrigation return flows generally have a higher salinity concentration than the applied water because of the effect of salt dissolution in the soil and subsurface materials and the concentrating effect of evapotranspiration (Vaill and Butler, 1999). A loading profile for the Colorado River Basin indicated increasing DS load from upstream to downstream with the exception of the Colorado River below the Grand Valley Diversion (fig. 11A). The total DS load from the Colorado River Basin is represented by the most downstream site, 09163500 (Colorado River near Colorado-Utah state line). The load in water year 1999 was 2,850,000 tons (fig. 11A), which is about 10 times larger than the DS load from the White River Basin in water year 2000 (fig. 9A). Load at 09095500 (Colorado River near Cameo) for water year 1999 was 1,380,000 tons, which was about 48 percent of the load from the Colorado River Basin (fig. 11A). Load from 09105000 (Plateau Creek near Cameo) for water year 1999 was 59,700 tons, which was about 2 percent of the load from the Colorado River Basin

(fig. 11A). Load from 09106150 (Colorado River below the Grand Valley Diversion near Palisade) was 1,090,000 tons for water year 1999, which was about 38 percent of the load from the Colorado River Basin. The reduction in load from 09095500 (Colorado River near Cameo) to 09106150 (Colorado River below the Grand Valley Diversion near Palisade) indicated that DS loads were removed along with significant diversions in this area (fig. 11A). Downstream from 09095500 (Colorado River near Cameo) there are two diversions of irrigation water that have an estimated capacity of 2,380 cubic feet per second (ft³/s), and about 650 ft³/s is returned to the Colorado River just above the site 09106150 (Colorado River below the Grand Valley Diversion near Palisade) (Butler, 1985; Kuhn and Williams, 2004). Leib and Bauch (2008) estimated an average annual DS concentration of 374 mg/L for 09095500 in water year 1999, which included both irrigated and non-irrigated seasons. Using the concentration of 374 mg/L resulted in an estimation of approximately 350,000 tons of dissolved solids that could be diverted between 09095500 and 09106150, and this estimation would vary based on season and water availability. The Gunnison River, represented by 09152500 (Gunnison River near Grand Junction), contributed 1,064,000 tons of dissolved solids to the Colorado River in water year 1996 (fig. 11A), which was 37 percent of the most downstream site, 09163500 (Colorado River near Colorado-Utah state line).

Trace Elements

Sufficient data were available to compare the results of the trends analysis for iron in the Colorado River Basin (table 7). A downward trend for iron was detected at site CDOWRW-47 (Colorado River Devereux Bridge) from 1991 to 2007 (table 7). At 09095500 (Colorado River near Cameo), a net, downward trend in iron was detected from 1995 to 2002. The trend was also parabolic with a zero-slope year around 1999, after which the shape of the parabola indicated an upward trend. At 09163500 (Colorado River near Colorado-Utah state line), a net, downward trend was detected in iron from 1990 to 2002. The trend also was parabolic with a zero-slope year around 1997, after which the shape of the parabola indicated an upward trend. The loading profile for iron indicated a decreasing iron load downstream (fig. 11B). The iron load in water year 1996 at 09163500 (Colorado River near Colorado-Utah state line) was 134,000 pounds, which was 43,000 pounds less than the iron load from the upstream site, 09095500 (Colorado River near Cameo) (177,000 pounds). Despite the contribution of 41,700 pounds of iron in water year 1996 from 09152500 (Gunnison River near Grand Junction), there still was a loss in iron load (1,300 pounds) at 09163500 (Colorado River near Colorado-Utah state line). There are no major hard-rock mines in the Colorado River Basin that could have been potential point sources for selected trace elements like iron. Further study of iron sources and

sinks in the Colorado River Basin near Grand Junction would be beneficial to better understand these results. Results for total recoverable iron throughout the Colorado River Basin reported 600 exceedances of the chronic aquatic-life standard (app. 1). There were approximately 82 exceedances observed at 4 sites on Plateau Creek, although the sampling period was from 1992 to 2004. Insufficient data were available to perform a trend analysis on any Plateau Creek site.

Similar to DS, selenium is a water-quality concern in the Colorado River Basin because of the combination of geologic formations and land use. The CDPHE has listed many stream segments from East Rifle Creek to the Colorado-Utah state border for selenium impairments (table 2). No trend was detected in selenium at 09095500 (Colorado River near Cameo) from 1991 to 2009, and a downward trend was detected at 09163500 (Colorado River near Colorado-Utah state line) from 1990 to 2009. Results for selenium in the Colorado River Basin reported 741 exceedances of the chronic aquatic-life standard and 201 exceedances of the acute standard (app. 1).

A loading profile for the Colorado River Basin indicated increased selenium load between the 09095500 (Colorado River near Cameo) and 09163500 (Colorado River near Colorado-Utah state line) sites (fig. 11C). The total selenium load from the Colorado River Basin at the most downstream site 09163500 (Colorado River near Colorado-Utah state line) in water year 1999 was 36,200 pounds. Load at 09095500 (Colorado River near Cameo) for water year 1999 was 3,900 pounds, which was about 11 percent of the load from the Colorado River Basin. Load at 09152500 (Gunnison River near Grand Junction) for water year 1999 was 18,900 pounds, which was about 52 percent of the load from the Colorado River Basin, indicating that the Lower Gunnison River Basin is one of the major source of selenium in this part of the Colorado River Basin.

Insufficient data were available to analyze selenium data for trends or loads on tributaries to the Colorado River upstream from Plateau Creek. Median selenium concentration at 09095300 (Dry Fork at Upper Station, near De Beque) was 4 µg/L, and there were 16 exceedances from 1996 to 2001 of the chronic aquatic-life standard. The site is listed on the CDPHE 303d list for selenium impairment. Additional water-quality monitoring could help land managers to identify what is causing the selenium impairment. Sites on Divide Creek (LANG2ST-LANG8ST) had a median selenium concentration of 5.6 µg/L and approximately 62 exceedances from 2004 to 2005 of the chronic aquatic-life standard. Other tributaries in the basin such as East Rifle Creek, West Rifle Creek, and Rifle Creek are listed on the CDPHE 303d list for selenium impairment, but insufficient data were available from this study to analyze for trends.

Suspended Sediment

Suspended sediment data did not meet the criteria for trend analysis at most sites, and the models failed diagnostics at sites where there were sufficient data. Failed diagnostics were reported at sites 09095300 (Dry Fork at Upper Station, near DeBeque), 09095500 (Colorado River near Cameo), and 09163500 (Colorado River near Colorado-Utah state line). Sediment is listed on the 303d list for Salt Creek, which is a tributary to the Colorado River (table 2).

Lower Gunnison River Basin

Temporal and spatial variability of water-quality data in the Lower Gunnison River Basin were evaluated at 14 sites: 2 sites on the Gunnison River main stem and 12 sites on tributaries to the Gunnison River (tables 4–7, fig. 7). Main-stem sites on the Gunnison River were 09144250 (Gunnison River at Delta) and 09152500 (Gunnison River near Grand Junction). Tributary sites included 09132500 (North Fork Gunnison River near Somerset), 09136100 (North Fork Gunnison River above mouth near Lazear), 09134000 (Minnesota Creek near Paonia), 09135950 (North Fork of the Gunnison below Leroux Creek, near Hotchkiss), 09128500 (Smith Fork near Crawford), 384551107591901 (Sunflower Drain at Highway 92, near Read), 09143000 and 09143500 (Surface Creek near and at Cedaredge, respectively), and 09149500 (Uncompahgre River at Delta). There were 3 sites on Loutsenhizer Arroyo, which is a tributary to the Uncompahgre River: 383528107552001 (Loutsenhizer Arroyo at Falcon Road), 383728107572001 (West tributary of Loutsenhizer Arroyo below East Canal), and 383946107595301 (Loutsenhizer Arroyo at North River Road).

Field Properties

Results of the trend analysis for water temperature, pH, and dissolved oxygen are presented in table 4. Sufficient data were available to analyze for temperature trends at 4 sites in the Lower Gunnison River Basin. No trends were detected at 3 of these sites. However, an upward trend was detected in water temperature from 1990 to 2009 at 09152500 (Gunnison River near Grand Junction), the most downstream site. This same site, 09152500, also had sufficient data to analyze for trends in dissolved oxygen and pH from 1990 to 2009 and no trends were detected.

Nutrients

There are limited nutrient data in the Lower Gunnison River Basin (table 5). Only one site, 09152500 (Gunnison River near Grand Junction), met the criteria for the trend analysis. No trend was detected in nitrate from 1990 to 2002, orthophosphate from 1990 to 1998, or organic carbon from 1995 to 2002. Comparisons to the recommended total phosphorus standard showed nearly 500 exceedances out of

1,538 samples. Additional long-term monitoring of nutrients in surface water could provide an opportunity to describe the current nutrient levels in the Lower Gunnison River Basin.

Dissolved Solids and Major Ions

Dissolved solids are a water-quality concern to land and water managers in the Lower Gunnison River Basin because of the combination of geologic formations and land use. This scenario is in contrast to the Colorado River Basin where DS levels are greatly elevated from natural sources such as the Eagle Valley Evaporite Formation (Chafin and Butler, 2002). Natural sources of DS include seeps or springs that originate from geological formations with high DS content, such as the Mancos Shale and Dakota Sandstone in the Lower Gunnison River Basin (fig. 3). Another source of DS in the Lower Gunnison River Basin is the result of irrigated agriculture in areas underlain by Mancos Shale (Butler and others, 1996).

In the Lower Gunnison River Basin, trends in DS and other major ions were tested at 2 sites on the main stem and 4 tributary sites of the Gunnison River. The main-stem sites were 09152500 (Gunnison River near Grand Junction) and 09144250 (Gunnison River at Delta). The DS model failed diagnostics at 09144250 (app. 1, table 6); many of the other models for trends in major ions also failed model diagnostics for this site. However, a downward trend at 09144250 (Gunnison River at Delta) was detected in magnesium, and no trend was detected in potassium or silica from 1991 to 2009. Schaffrath (2011) reported a downward trend in DS for the period 1989 through 2004. The most downstream site in the basin was 09152500 (Gunnison River near Grand Junction), where a net, downward trend was detected from 1990 to 2009. The trend was parabolic with a zero-slope year around 2005, after which the shape of the parabola indicated an upward trend. This conclusion is supported by the findings reported by Schaffrath (2012); that is, a downward trend from 1989 through 2003 and a net, downward trend from 1989 through 2007 for DS. Other major ions analyzed for trends at this site (and study period) generally had the same result. Calcium, magnesium, sodium, and chloride all had the same general trend pattern. Parabolic trends were detected for potassium and alkalinity with zero slope years of 2000 and 1999, respectively. No net trend was detected for the time period for both of these constituents. No trend was detected for silica or bicarbonate. Downward trends were detected for sulfate and carbonate, while an upward trend was detected for fluoride from 1990 to 2009.

Trends were analyzed at 4 tributary sites: 09136100 (North Fork Gunnison River above mouth near Lazear), 384551107591901 (Sunflower Drain at Highway 92, near Read), 09149500 (Uncompahgre River at Delta), and 383946107595301 (Loutsenhizer Arroyo at North River Road) (table 6). The first three sites are tributaries to the main stem of the Gunnison River while the fourth site is tributary

to the Uncompahgre River. A downward trend was detected for DS, calcium, magnesium, sodium, and sulfate at site 09136100 (North Fork Gunnison River above mouth near Lazear) from 1991 to 2009, and no trends were detected for potassium, fluoride, or silica. No trends were detected for DS, calcium, magnesium, sodium, potassium, chloride, or sulfate at 384551107591901 (Sunflower Drain at Highway 92, near Read) for the period from 1991 to 2003. However, upward trends were detected for fluoride and silica from 1991 to 2003 at 384551107591901 (Sunflower Drain at Highway 92, near Read). The trend analysis period for this site may not reflect the most recent condition in that area. A portion of the DS (and other major ions) load measured at site 384551107591901 (Sunflower Drain at Highway 92, near Read) was from water diverted from the Uncompahgre River Basin; however, the actual amount is unknown because of data limitations. A net, downward trend was detected for DS at site 09149500 (Uncompahgre River at Delta) from 1991 to 2009. The trend was parabolic with a zero-slope year around 2001, after which the shape of the parabola indicated an upward trend. Downward trends with significant parabolic trends similar to DS were detected for calcium, magnesium, sodium, chloride, and sulfate. An upward trend was detected for fluoride from 1991 to 2009. The shape of the major ion trends at 09149500 (Uncompahgre River at Delta) was similar to those detected at 09152500 (Gunnison River near Grand Junction), but the zero-slope years differed slightly. Both the North Fork and the Uncompahgre River Basins have similar DS and major ion trends and are the two major tributaries to the Gunnison River. This would indicate that both the North Fork and Uncompahgre River Basins were controlling the trends at the 09152500 (Gunnison River near Grand Junction) site; however, the trend at 09149500 (Uncompahgre River at Delta) may have more influence based on its similar trend slope and direction to that found for 09152500 (Gunnison River near Grand Junction). Schaffrath (2012) reported a downward trend in DS at 09149500 (Uncompahgre River at Delta) from 1989 to 2004. The drainage area above this site is dominated by agricultural land and is underlain by Mancos Shale. Salinity-control efforts have been focused in this area since the 1980s. The site that was a tributary to the Uncompahgre River, 383946107595301 (Loutsenhizer Arroyo at North River Road), did not have a trend in DS or other major ions except for an upward trend for silica from 1991 to 2009.

The DS load from the Gunnison River Basin is represented by the most downstream site, 09152500 (Gunnison River near Grand Junction). The Gunnison River is a tributary to the Colorado River, so the loading profile was compared to 09163500 (Colorado River at the Colorado-Utah state line) (fig. 12A). Load at 09152500 (Gunnison River near Grand Junction) for water year 1999 was approximately 1,060,000 tons (fig. 12A), which was about 37 percent of the load calculated for 09163500 (Colorado River at the Colorado-Utah state line) (fig. 11A). Load at 09136100 (North Fork Gunnison River above mouth near Lazear) could not be calculated because of an incomplete streamflow record.

The DS load in the North Fork of the Gunnison River drainage area is primarily from natural and agricultural sources based on the low levels of industrial and residential uses (Homer and others, 2004), and salinity control efforts are ongoing in the area. The models failed diagnostics for loads in DS at 09144250 (Gunnison River at Delta) and 09149500 (Uncompahgre River at Delta). However, Schaffrath (2012) developed model equations for 09144250, 09149500, and 09152500. Using those equations, the 1999 water year load calculated for 09152500 (Gunnison River near Grand Junction) was 1,070,000 tons, which was only 10,000 tons more than the load calculated using the model equations developed in this report. The DS load in water year 1999 at 09144250 (Gunnison River at Delta), for comparison, was 582,000 tons, which was about 54 percent of the load from the Lower Gunnison River Basin. The Uncompahgre River flows into the Gunnison River just downstream from site 09149500 (Uncompahgre River at Delta). The DS load at 09144250 (Gunnison River at Delta) for water year 1999, also calculated using equations from Schaffrath (2012), was approximately 371,000 tons, which was about 35 percent of the load from the Lower Gunnison River Basin that year. Load at the Loutsenhizer Arroyo site could not be calculated because of insufficient streamflow data.

The majority of DS load and respective salinity-control efforts have occurred in the Gunnison River drainage area downstream from the Gunnison Tunnel (Lower Gunnison River Basin). Schaffrath (2012) reported no downward trends in DS in the Upper Gunnison River drainage area, defined in this report as the region of the Gunnison River upstream from the Gunnison Tunnel. Efforts to reduce DS load in the Lower Gunnison River Basin have been ongoing since the 1980s through salinity control efforts. On-farm and small irrigation ditch improvements as of 2007 had been implemented in 76 mi² in the Lower Gunnison River Basin, resulting in estimates of DS load reduction of 95,200 tons (Frank Riggle, Natural Resources Conservation Service, written commun., July 28, 2010; Schaffrath, 2011). Bureau of Reclamation also sponsors programs to reduce DS load in the Lower Gunnison River Basin; they had participated in projects that included 29 miles of canal lining and elimination of stock watering areas that resulted in estimates of DS load reduction of 49,520 tons as of 2007 (Mike Baker, Bureau of Reclamation, written commun., September 20, 2010; Schaffrath, 2012).

Trace Elements

Sufficient data were available only for trend analysis of iron at site 09152500 (Gunnison River near Grand Junction) and selenium at various other sites in the Lower Gunnison River Basin (table 7). A net, downward trend in iron was detected at 09152500 (Gunnison River near Grand Junction) from 1990 to 2002. The trend also was parabolic with a zero-slope year of 1999, prior to which the shape of the parabola indicated an upward trend. The Lower Gunnison River Basin had 326 exceedances of the chronic (30-day) aquatic-life

standard for iron (app. 1). There were exceedances for many of the trace elements sampled in the basin. For example, 34 exceedances for the aquatic-life 30-day standard for copper, 18 exceedances for the acute copper standard, 73 exceedances of the chronic (30-day) aquatic-life standard for lead, and 4 exceedances of the acute standard for lead were observed. Zinc had no more than 7 exceedances of the chronic or acute water-quality standards. About 25 mi² of the Lower Gunnison River Basin are Federal coal leases, and Oxbow Mining and Mountain Coal Company are interested in developing approximately 3 mi² (U.S. Forest Service, 2011). The infrequent sampling for trace elements and high number of exceedances in the Lower Gunnison River Basin illustrated a data gap in the Piceance study area.

Selenium is a major water-quality concern for land and water managers in the Lower Gunnison River Basin. Similar to DS, high selenium concentrations are due to the combination of geologic formations and land use. Selenium is primarily sourced from a geologic formation known as the Mancos Shale; that is, DS is sourced from the Mancos Shale formation and a variety of sedimentary rock formations in the area. Selenium is leached from soils in a similar manner as DS by way of irrigation and natural chemical processes. Selenium is more chemically reactive than the major ions included in the DS measurements. The reactive nature of selenium can cause selenium to oxidize and reduce between mobile and immobile forms. Therefore, there is a high degree of the temporal and spatial variability in selenium concentrations. This extreme variability is complicated, and scientists and land managers often have a difficult time understanding the effects that various types of land use in the Lower Gunnison River Basin have on selenium concentrations in rivers and streams. Previous studies in the Lower Gunnison River Basin have documented that high selenium concentrations correlate with high DS concentrations. The nature of this paired occurrence means that when salinity control efforts are conducted in selenium-rich areas of the Lower Gunnison River Basin, both DS and selenium concentrations have the potential to decrease (Butler and others, 1996; Moore, 2011).

Trends in selenium were analyzed at 2 sites on the main stem of the Gunnison River and at 4 sites on tributaries to the Gunnison River. Main-stem sites were 09144250 (Gunnison River at Delta) and 09152500 (Gunnison near Grand Junction). Downward trends in selenium were detected at both main-stem sites from 1991 to 2009 at 09144250 (Gunnison River at Delta) and from 1990 to 2009 at 09152500 (Gunnison near Grand Junction) (table 7).

The 4 tributary sites to the Gunnison River were 09136100 (North Fork of the Gunnison above mouth near Lazear), 09149500 (Uncompahgre River at Delta), 384551107591901 (Sunflower Drain at Highway 92, near Read), and 383946107595301 (Loutsenhizer Arroyo at North River Road). No selenium trend was detected at site 09136100 (North Fork of the Gunnison near the mouth of Lazear) from 1991 to 2009. A net, downward trend for selenium was detected at site 09149500 (Uncompahgre River at Delta) from 1991 to 2009. The trend

was also parabolic with a zero-slope year of 2002, after which the shape of the parabola indicates an upward trend. The shape of the selenium trend at this site was very similar to that of the DS trend observed at this site. A downward trend in selenium was detected at 384551107591901 (Sunflower Drain at Highway 92, near Read) from 1991 to 2003. The period of record for 384551107591901 (Sunflower Drain at Highway 92, near Read) ends in 2003; therefore, it is unknown if the downward trend for the 1991 to 2003 period is representative of current conditions. An upward trend in selenium was detected at 383946107595301 (Loutsenhizer Arroyo at North River Road), a tributary to the Uncompahgre River, from 1991 to 2009. This was the only site tested in the Lower Gunnison River Basin that had an upward trend in selenium. Selenium load reported by Butler and Leib (2002) indicated that Loutsenhizer Arroyo drainage area is one of the largest sources of selenium load in the Lower Gunnison River Basin. This may explain why there is a parabolic trend in selenium at the 09149500 (Uncompahgre River at Delta) while 09152500 (Gunnison River near Grand Junction) only had a downward trend.

The loading profile includes the two main-stem Gunnison River sites, 09144250 (Gunnison River at Delta) and 09152500 (Gunnison River near Grand Junction), and a site on the Uncompahgre River, 09149500 (Uncompahgre River at Delta) (fig. 12B). The other sites for which selenium trends were analyzed did not have sufficient streamflow data to calculate annual loads. The load at the most downstream site in the basin, 09152500 (Gunnison River near Grand Junction), was 19,000 pounds in 1999. This basin is a tributary to the Colorado River, and 19,000 pounds is about 52 percent of the load estimated for 09163500 (Colorado River at the Colorado-Utah state line) (fig. 11C). Mayo and Leib (2012) reported a downward trend in load at this site for the period 1986 to 2008. Mayo and Leib also reported the magnitude of the trend to be an approximate decrease of 2 µg/L, which is about 6,000 pounds annual difference between 1986 and 2008. Selenium load at 09144250 (Gunnison River at Delta) for water year 1999 was 9,180 pounds in 1999, which was about 48 percent of the load from site 09152500 (Gunnison River near Grand Junction). Selenium load at 09144250 (Gunnison River at Delta) is sourced not only from the Gunnison River and North Fork of the Gunnison River Basins, but also from parts of the Uncompahgre River Basin as a result of multiple water diversions from the Uncompahgre River. The elevated selenium load is counterintuitive because the Uncompahgre River Basin is a tributary to the Gunnison River downstream from 09144250 (Gunnison River at Delta). The actual portion of selenium load from the Uncompahgre River Basin at 09144250 (Gunnison River at Delta) is unknown because of data limitations. Moore (2011) reported upward trends in selenium concentration and load in Montrose Arroyo. Montrose Arroyo is situated geologically in a similar manner and has similar geology as Loutsenhizer Arroyo in the Uncompahgre River Basin but is outside the study area. Moore (2011) suggested that changes in land use and possible geochemical factors could be causing the increases in selenium.

Suspended Sediment

Sufficient data were available at 09152500 (Gunnison River near Grand Junction) to perform trend analysis, but the model failed diagnostics. Therefore, insufficient data were available and trend analysis could not be performed for the Lower Gunnison River Basin (table 7).

Data Gaps

Spatial, temporal, and analytical data gaps were identified in the study area. Spatial data gaps were identified where surface-water monitoring sites were not sufficient to characterize trends and loads, especially in areas contributing to a municipal drinking-water intake. Temporal data gaps were identified where data were collected in the past but are not being collected currently. Analytical data gaps were identified where analysis was incomplete (for example, not enough major ions to do a charge balance), entire constituent groups were omitted (for example, nutrients in the Lower Gunnison River Basin), or select constituents were not sampled for (for example, BTEX in the White River Basin).

White River Basin

The White River Basin had 45 water-quality sites of which 10 could be used for analysis of trends and loads (fig. 13). Sites where trends or loads were not analyzed included sites that were not currently being sampled, did not have sufficient data for analysis beyond summary statistics and comparison to standards, or lacked continuous streamflow data.

The spatial coverage of sampling sites could be expanded in the White River Basin by adding more tributary sites. Water-quality and streamflow data for Douglas Creek are not currently being collected. The exception is a single site located at the mouth of Douglas Creek where streamflow gaging and sampling were discontinued in 1996. Douglas Creek has a drainage area of 425 mi² of the 2,776 mi² (about 15 percent) of the White River Basin. Water-quality samples are collected on Coal, Flag, and Strawberry Creeks, but the addition of streamflow data could greatly enhance these datasets. No water-quality data exists for tributaries in the area north of Rangely, Colo., where extensive energy development has occurred in a complex geologic setting.

Analytical data gaps were identified in several constituent groups in the White River Basin. Owing to the amount of natural gas development and the potential for naturally occurring sources of BTEX, a synoptic sampling of BTEX at surface-water sites and springs could provide useful baseline information to better understand BTEX concentrations in the White River Basin, specifically in the Piceance and Yellow Creek drainage areas. Trace elements were collected at a few sites, mostly on tributaries (Piceance Creek), thus limiting the ability to understand occurrence, concentrations, and load. Selenium is identified on the 303d list for Black Sulphur Creek and Flag Creek (table 2), both tributaries to the White

River. However, sufficient data were not available at either site to obtain an understanding of the sources or sinks of selenium in the area. Furthermore, neither site has continuous streamflow to enable calculation of loads. Sediment is identified on the 303d list for Douglas Creek and West Evacuation Creek (table 2), but water-quality and quantity data are not currently being collected on Douglas Creek or West Evacuation Creek.

Colorado River Basin

Data collection has occurred at numerous sites throughout the Colorado River Basin (fig. 14). The spatial and temporal continuity of these data efforts are often inconsistent. An attempt to calculate loads in the Colorado River Basin resulted in only 13 of the 179 sites meeting the criteria for trend analysis. Limited data were available for field properties, major ions, nutrients, and trace elements on the main stem of the Colorado River between Glenwood Springs and Cameo, Colo. Limited data were available on Plateau Creek for nutrients and trace elements. Urban growth, energy development, and land-use change in the Colorado River Basin increases the need to understand changes in water quality in the main stem and the respective tributaries.

The main analytical data gaps identified in the Colorado River Basin were nutrients and trace elements. The nitrate and orthophosphate trend analysis demonstrated at the Colorado River near the Colorado-Utah state line (09163500) is a downward trend from 1990 to 2008. Nutrient data were collected minimally upstream from 09163500 on the main stem of the Colorado River, and data were not collected on the Gunnison River (major tributary in the reach). Therefore, existing data are not sufficient to identify the land-use change and sources of the nutrient trends.

Iron loads decreased between 09095500 (Colorado River at Cameo) and 09163500 (Colorado River near Colorado-Utah state line), and further study is needed to understand iron sources and sinks in this area. Selenium has been identified on the 303d list for all tributaries to the Colorado River between the confluence of the Roaring Fork and the Colorado River downstream to Parachute Creek (fig. 1). These tributaries have limited or no streamflow or water-quality data to complete load or trend analysis. Sediment has been identified on the 303d list for Salt Creek and *E.coli* and total recoverable iron for Adobe Creek (table 2, fig. 14). Salt Creek and Adobe Creek are tributaries to the Colorado River, and water-quality and water-quantity data are not being collected currently.

Lower Gunnison River Basin

There were 130 water-quality sites in the Lower Gunnison River Basin: 17 sites had sufficient data for trends analysis and 3 sites had sufficient streamflow data to calculate loads (fig. 15). Other sites were not currently being sampled, did not have sufficient data for analysis beyond summary statistics and comparison to standards, or lacked continuous streamflow.

Figure 13. Locations of continuous streamflow, physical parameter data trend, concentration data trend, and summary statistic sites in the White River Basin, western Colorado.

Figure 14. Locations of continuous streamflow, physical parameter data trend, concentration data trend, and summary statistic sites in the Colorado River Basin, western Colorado.

Figure 15. Locations of continuous streamflow, physical parameter data trend, concentration data trend, and summary statistic sites in the Lower Gunnison River Basin, western Colorado.

Geographic coverage of surface-water-quality sites in the Lower Gunnison River could be enhanced to include more tributaries. The majority of sampling has occurred near Delta, Colo. Additional sampling of tributaries to the Gunnison River could enhance the existing dataset. The only data for Surface Creek and the North Fork of the Gunnison River were field properties. Downstream from Delta, Colo., to the Gunnison River near Grand Junction (09152500), no surface-water quality data were available that could be used for trends or loads. Additional measurement of streamflow at the majority of these sites could greatly enhance the dataset and provide a more complete loading profile for the basin for any constituent sampled.

Analytical data gaps were identified in several constituent groups in the Lower Gunnison River Basin. A total of 84 samples were collected for *E. coli*, and 17 samples exceeded the recommended standard (app. 1). However, insufficient data were available to do any trend analysis of *E. coli*. Almost 30 percent of the samples for total phosphorus in the basin exceeded the recommended standard (app. 1), yet there were insufficient data to do trend analysis at all but one site (09152500) (table 5). A better understanding of nutrient levels in the Lower Gunnison River Basin will not be possible without additional nutrient sampling in the area. The same data gap exists for trace elements. Only one site, Gunnison River near Grand Junction, had sufficient data for trend analysis in iron. There were exceedances in copper, total recoverable iron, lead, zinc, and selenium, yet data were insufficient to complete a trend analysis or calculate load. Additional sampling is necessary to understand the occurrence, concentrations, and loads of these elements. Continuous streamflow data are necessary to calculate loads for any of the constituents sampled.

Summary

Northwestern Colorado is experiencing changes in land-use including urbanization, agriculture, and increasing energy development and infrastructure. These land-use changes can result in short- and long-term changes in the water resources in the study area. Ongoing monitoring and assessment are required to periodically reestablish our understanding of baseline conditions and to detect changes. Substantial water-resource datasets, publications, and other materials have been developed in past years and can be used to assess baseline conditions and to evaluate land-use effects. The U.S. Geological Survey (USGS), in cooperation with Federal, State, county and industry partners, developed a Web-accessible common data repository to provide energy operators, researchers, consultants, agencies, and interested stakeholders equal access to historical and current (as of August 2009) water-quality information (available on the Internet at <http://rmgsc.cr.usgs.gov/cwqdr/Piceance/index.shtml>).

The following is an alphabetical list of cooperators involved in this study: Antero Resources, Bureau of Land Management, Chevron Corporation, City of Grand Junction, City of Rifle, Colorado Department of Agriculture, Colorado Department of Natural Resources, Colorado Department of Public Health and Environment, Colorado Division of Wildlife–River Watch, Colorado Oil and Gas Conservation Commission, Colorado River Water Conservation District, Delta County, EnCana Oil & Gas (USA) Inc., Garfield County, Gunnison Energy Corp, National Park Service, Natural Soda, Inc., North Fork River Improvement Association, Oxy Petroleum Corporation, Petroleum Development Corp, Rio Blanco County, Shell Oil Company, Solvay Chemicals, Town of Carbondale, Town of De Beque, Town of Palisade, Town of Parachute, Town of Rangely, Town of Silt, Bureau of Reclamation, U.S. Forest Service, West Divide Water Conservancy District, and Williams Companies, Inc. These data are analyzed to provide a baseline assessment of available water-resource data and aid in the development of regional monitoring strategies.

The Piceance study area is subdivided into three study basin areas: the White River Basin, the Colorado River Basin, and the Lower Gunnison River Basin. The White River Basin is partially defined by the Piceance Structural Basin boundary and begins roughly at the mouth of Coal Creek and extends downstream to the White River at the Colorado-Utah state border. The Colorado River Basin includes the drainage area from Glenwood Springs to the Colorado-Utah state border. The Gunnison River is the largest tributary to the Colorado River in Colorado. The Lower Gunnison River Basin is only a part of the entire Gunnison River Basin. The Lower Gunnison River Basin for this study included the entire drainage area of the North Fork of the Gunnison River and the drainage area beginning slightly downstream from the Gunnison Tunnel on both the Gunnison River and the Uncompahgre River.

The area of the White River Basin is 3,160 mi². Land use in the White River Basin is affected by oil shale and natural gas development. Conventional and unconventional natural gas extraction and the associated infrastructure are becoming increasingly prevalent in this basin. The area of the Colorado River Basin (study area) is 3,560 mi², and the area of the drainage area of the Colorado River upstream from the site at the Colorado-Utah state border is 17,843 mi². The economy of the Colorado River Basin is dominated by agriculture, energy development, industry, real estate development, tourism, and recreation. The area of the Lower Gunnison River Basin is 2,700 mi², and the entire drainage area (measured from where the Gunnison River enters the Colorado River) is 7,900 mi². A primary concern of water managers in the Lower Gunnison River Basin is the presence of salinity and selenium in the surface water as a result of irrigated agriculture. The complex geology, combined with various land-use types such as irrigation and residential development, can influence water-quality conditions in the Lower Gunnison River Basin.

Data were summarized to identify available data and evaluate temporal and spatial patterns in the Piceance study area. The report contains data summaries, comparison to water-quality standards, trend analysis, a generalized spatial analysis, and a data-gap analysis for select water-quality properties and constituents. Gaps in available data were identified from these analyses and are provided in this report. A repository of available water-quality data was compiled from local, State, and Federal agencies and private entities (consulting firms, energy, and mining companies). The data repository contained 1,433 surface-water sites, 45,008 samples, and 1,144,808 water-quality results from 1931 to 2009. A subset of surface-water-quality data from the repository was compiled, reviewed, and checked for quality assurance for this report.

Summary statistics and comparison to standards were provided for 347 sites for 33 constituents including field properties, nutrients, major ions, trace elements, suspended sediment, *Escherichia coli*, and BTEX (benzene, toluene, ethylbenzene, xylene). Data from the study area were compared to the Colorado Department of Public Health and Environment and U.S. Environmental Protection Agency standards and recommendations to guide interpretation of surface-water quality, evaluate spatial patterns, and obtain a broad understanding of water-quality conditions across the study area. When sufficient data were available, trends over time were analyzed and loads were calculated for those sites where there were also continuous streamflow data.

Summary statistics and water-quality exceedances are discussed by basin to provide a general overview of water quality. The collection of field properties is an important component to all water-quality sampling in order to properly characterize water-quality results. The majority of sites had information on field properties. For the entire study area, 316 sites had temperature data collected between 1959 and 2009. There were 326 values out of a total of 32,006 values in the study area that exceeded the aquatic-life standard for daily maximum water temperature. For the entire study area, 196 sites had dissolved-oxygen data collected between 1970 and 2009. Median dissolved-oxygen concentrations ranged from 6.8 to 11.2 mg/L. There were 185 concentrations that exceeded the dissolved oxygen aquatic-life standard out of a total of 11,248 values in the study area. For the entire study area, 276 sites had pH data collected between 1958 and 2009. Median pH values ranged from 7.5 to 9.0. There were 241 values out of a total of 16,307 values that exceeded the high pH standard in the study area, while there were 7 values that were less than the low pH standard in the study area. Nutrients within the study area were not well represented in each basin and were often not being sampled currently. For the entire study area, 62 sites had nitrate data collected between 1958 and 2009, and median nitrate concentrations ranged from less than detection to 3.72 mg/L as nitrogen (N). The maximum contaminate level for domestic water supply for nitrate is 10 mg/L and was exceeded once in 3,736 samples. Total phosphorus was collected at 113 sites between 1974 and 2009, and median total phosphorus concentrations ranged

from less than detection to 5.04 mg/L. The USEPA recommendation for phosphorus is less than 0.1 mg/L, and 1,469 of 4,842 samples exceeded this recommended standard in the study area. Standards for major ions exist only for chloride and sulfate. For the entire study area, 118 sites had chloride and sulfate concentration data collected between 1958 and 2009. Median chloride concentrations ranged from 0.085 to 280 mg/L. There were 120 of the 8,817 chloride concentration samples that exceeded the chloride domestic water-supply standard of 250 mg/L. Median sulfate concentrations ranged from 4.57 to 15,000 mg/L. There were 1,111 of the 8,736 sulfate concentration samples that exceeded the sulfate domestic water-supply standard of 250 mg/L. Trace elements were relatively well represented both temporally and spatially in the study area, though the number of trace element samples per site was not typically enough to compute trends or loads except for selenium. There were 127 sites that had dissolved iron concentration data collected between 1961 and 2009, and median iron concentrations ranged from less than detection to 1,100 µg/L. The 30-day drinking-water standard for iron is 300 µg/L, and 203 samples exceeded the standard. Selenium was the best represented trace element with selenium concentration data collected at 197 sites between 1973 and 2009, and median selenium concentrations range from less than detection to 181 µg/L. The chronic aquatic-life standard of 4.6 µg/L for selenium concentrations was exceeded in 899 samples, and the acute aquatic-life standard of 18.4 µg/L for selenium was exceeded in 629 samples.

Natural changes in precipitation and streamflow and anthropogenic changes in nutrient sources (such as wastewater treatment facilities, golf courses, urban runoff, agricultural fields, and septic tanks) can influence nutrient concentrations in streams throughout the study area. Upward trends in nitrate and total phosphorus were detected in the White River Basin at 09304200 (White River above Coal Creek near Meeker) from 1990 to 2009 and 1991 to 2009, respectively. Downward trends in DS were detected at 09163500 (Colorado River near Colorado-Utah state line) from 1990 to 2009. Salinity control work in the Colorado River Basin near Grand Junction might have contributed to the downward trend. Field properties such as water temperature, pH, and dissolved oxygen were tested for trends over time. An upward trend in water temperature was detected at the Gunnison River near Grand Junction (09152500). There are limited trace element data except for selenium in the Lower Gunnison River Basin. Concentrations of trace elements, and more specifically selenium, are of concern to water and land managers in the Lower Gunnison River Basin because of the combination of geologic formations and land use. Downward trends in selenium were detected at both main-stem sites, from 1991 to 2009 at 09144250 (Gunnison River at Delta) and from 1990 to 2009 at 09152500 (Gunnison River near Grand Junction). High selenium concentrations correlate with high salinity concentrations; thus, when salinity control efforts are conducted in selenium-rich areas in the Lower Gunnison River Basin, both salinity and selenium have the potential to decrease.

Spatial, temporal, and analytical data gaps were identified in the study area. No water-quality data exist for tributaries in the area north of Rangely, Colo., where extensive energy development has occurred in a complex geologic setting. The spatial coverage of sampling sites could be expanded in the White River Basin by adding more tributary sites. Douglas Creek has a drainage area of 425 mi², and no water-quality or quantity data are currently being collected at this site. Data in the Colorado River Basin for all constituent groups were limited on the main stem of the Colorado River between Glenwood Springs and Cameo, Colo. Nutrient data were minimally collected upstream from Cameo, Colo., on the main stem of the Colorado River and were minimally collected on the Gunnison River (a major tributary in the reach). Almost 30 percent of the samples for total phosphorus in this Lower Gunnison River Basin exceeded the recommended standard, yet there were insufficient data to do trends analysis in the Lower Gunnison River Basin except at the Gunnison River near Grand Junction site. Only one site had sufficient data for trends analysis in iron (Gunnison River near Grand Junction). Additional sampling is necessary to better understand the occurrence, concentrations, and loads of these elements.

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Appendixes

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Basin	Site name	Site identification number	County	Agency
White	LOST CREEK NEAR BUFORD, CO.	09302450	Rio Blanco County	U.S. Geological Survey
White	BIG BEAVER CREEK NEAR BUFORD, CO.	09304100	Rio Blanco County	U.S. Geological Survey
White	WHITE R AB MILLER CR NR BUFORD, CO	395643107461200	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER ABOVE COAL CREEK, NEAR MEEKER, CO.	09304200	Rio Blanco County	U.S. Geological Survey
White	COAL CREEK BELOW LITTLE BEAVER C, NR MEEKER, CO.	09304480	Rio Blanco County	U.S. Geological Survey
White	COAL CREEK NEAR MEEKER, CO.	09304300	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER NEAR MEEKER, CO.	09304500	Rio Blanco County	U.S. Geological Survey
White	CURTIS CREEK NEAR MEEKER, CO.	09304550	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER AT MEEKER, CO.	09304600	Rio Blanco County	U.S. Geological Survey
White	FLAG CK AT COUNTY RD 36 NR MEEKER, CO	4000001075434	Rio Blanco County	
White	WHITE R AT HWY 13 BRIDGE BL MEEKER, CO	400113107574500	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER AT MEEKER	000043	Rio Blanco County	Colorado Department of Public Health and Environment
White	STRAWBERRY CK AT HWY 64 NR MEEKER, CO	400206108005901	Rio Blanco County	
White	WHITE RIVER BELOW MEEKER, CO	09304800	Rio Blanco County	U.S. Geological Survey
White	ENPR20ST	ENPR20ST	Garfield County	EnCana Oil & Gas (USA) Inc.
White	ENPR21ST	ENPR21ST	Garfield County	EnCana Oil & Gas (USA) Inc.
White	ENPR19ST	ENPR19ST	Garfield County	EnCana Oil & Gas (USA) Inc.
White	PICEANCE CREEK BELOW RIO BLANCO, CO.	09306007	Rio Blanco County	U.S. Geological Survey
White	WEST FORK STEWART GULCH NEAR RIO BLANCO, CO.	09306025	Rio Blanco County	U.S. Geological Survey
White	W F STEWART GULCH AT MOUTH, NEAR RIO BLANCO, CO.	09306028	Rio Blanco County	U.S. Geological Survey
White	STEWART GULCH AB WEST FORK NR RIO BLANCO, CO	09306022	Rio Blanco County	U.S. Geological Survey
White	SORGHUM GULCH NEAR RIO BLANCO, CO.	09306033	Rio Blanco County	U.S. Geological Survey
White	COTTONWOOD GULCH NEAR RIO BLANCO, CO.	09306039	Rio Blanco County	U.S. Geological Survey
White	PICEANCE CREEK TRIBUTARY NEAR RIO BLANCO, CO.	09306042	Rio Blanco County	U.S. Geological Survey
White	SCANDARD GULCH NEAR RIO BLANCO, CO.	09306050	Rio Blanco County	U.S. Geological Survey
White	SCANDARD GULCH AT MOUTH, NEAR RIO BLANCO, CO.	09306052	Rio Blanco County	U.S. Geological Survey
White	WILLOW CREEK NEAR RIO BLANCO, CO.	09306058	Rio Blanco County	U.S. Geological Survey
White	PICEANCE CREEK AB HUNTER C, NEAR RIO BLANCO, CO.	09306061	Rio Blanco County	U.S. Geological Survey
White	BLACK SULPHUR CK. @ 29 RD	11625	Rio Blanco County	Colorado Department of Public Health and Environment
White	BLACK SULPHUR CREEK NEAR RIO BLANCO, CO.	09306175	Rio Blanco County	U.S. Geological Survey
White	PICEANCE CREEK BL RYAN GULCH, NR RIO BLANCO, CO.	09306200	Rio Blanco County	U.S. Geological Survey
White	PICEANCE CREEK NEAR WHITE RIVER, CO.	09306210	Rio Blanco County	U.S. Geological Survey
White	PICEANCE CREEK AT WHITE RIVER, CO	09306222	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER BELOW PICEANCE CK	000117	Rio Blanco County	Colorado Department of Public Health and Environment
White	WHITE RIV AB CROOKED WASH NR WHITE RIVER CITY, CO	09306224	Rio Blanco County	U.S. Geological Survey
White	BOX ELDER GULCH NEAR RANGELY, CO.	09306240	Rio Blanco County	U.S. Geological Survey
White	BOX ELDER GULCH TRIBUTARY NEAR RANGELY, CO.	09306241	Rio Blanco County	U.S. Geological Survey
White	CORRAL GULCH BELOW WATER GULCH, NR RANGELY, CO.	09306235	Rio Blanco County	U.S. Geological Survey
White	CORRAL GULCH NEAR RANGELY, CO	09306242	Rio Blanco County	U.S. Geological Survey
White	CORRAL GULCH AT 84 RANCH, CO.	09306244	Rio Blanco County	U.S. Geological Survey
White	WHITE R. @ RANGELY	11702	Rio Blanco County	Colorado Department of Public Health and Environment
White	YELLOW CREEK NEAR WHITE RIVER, CO.	09306255	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER BELOW BOISE CREEK, NEAR RANGELY, CO.	09306290	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER ABOVE RANGELY, CO.	09306300	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER BL. TAYLOR DRAW RES., ABV. RANGELY CO.	09306305	Rio Blanco County	U.S. Geological Survey
White	DOUGLAS CREEK AT RANGELY, CO	09306380	Rio Blanco County	U.S. Geological Survey
White	WHITE R AT HWY 64 BRIDGE BL RANGELY, CO	400535108485700	Rio Blanco County	U.S. Geological Survey
White	WHITE RIVER AT RANGELY	000044	Rio Blanco County	Colorado Department of Public Health and Environment
Colorado	COLORADO RIVER AT GLENWOOD SPRINGS, CO.	09072500	Garfield County	U.S. Geological Survey
Colorado	Colorado River Ped Br	CDOWRW-46	Garfield County	Colorado Wildlife Division, CO
Colorado	COLORADO R. U/S ROARING FORK R.	12100	Garfield County	Colorado Department of Public Health and Environment
Colorado	Colorado River Dev Br	CDOWRW-47	Garfield County	Colorado Wildlife Division, CO
Colorado	COLORADO RIVER BELOW GLENWOOD SPRINGS, CO.	09085100	Garfield County	U.S. Geological Survey

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Basin	Site name	Site identification number	County	Agency
Colorado	OASIS CK ABV DIVERSION @ 600 HIGHLANDS RD.	11109A	Garfield County	Colorado Department of Public Health and Environment
Colorado	Mitchell Cr River Gregory Pk	CDOWRW-197	Garfield County	Colorado Wildlife Division, CO
Colorado	COLORADO R ABV SOUTH CANYON CR NR GLENWOOD SPGS CO	09085150	Garfield County	U.S. Geological Survey
Colorado	CANYON CREEK ABOVE NEW CASTLE, CO.	09085200	Garfield County	U.S. Geological Survey
Colorado	POSSUM CREEK NEAR NEW CASTLE, CO.	09085400	Garfield County	U.S. Geological Survey
Colorado	EAST CANYON CREEK NEAR NEW CASTLE, CO.	09085300	Garfield County	U.S. Geological Survey
Colorado	COLORADO RIVER AT NEW CASTLE	000047	Garfield County	Colorado Department of Public Health and Environment
Colorado	Colorado River Boat Ramp	CDOWRW-546	Garfield County	Colorado Wildlife Division, CO
Colorado	MAIN ELK CREEK NEAR NEW CASTLE, CO.	09086470	Garfield County	U.S. Geological Survey
Colorado	MAIN ELK CK. @ FR 603	11190H	Garfield County	Colorado Department of Public Health and Environment
Colorado	WEST ELK CREEK NEAR NEW CASTLE, CO	09086000	Garfield County	U.S. Geological Survey
Colorado	EAST ELK CREEK AB BOILER CREEK NR NEW CASTLE, CO	09086970	Garfield County	U.S. Geological Survey
Colorado	EAST ELK CREEK NORTH OF NEWCASTLE @ GRAY EAGLE RANCH	11195	Garfield County	Colorado Department of Public Health and Environment
Colorado	Elk Cr River Elk Br	CDOWRW-547	Garfield County	Colorado Wildlife Division, CO
Colorado	COLORADO RIVER AT NEW CASTLE, CO.	09087600	Garfield County	U.S. Geological Survey
Colorado	ALKALI CK. @ NEWCASTLE	11189	Garfield County	Colorado Department of Public Health and Environment
Colorado	WEST DIVIDE CREEK BL WILLOW CREEK, NR RAVEN, CO.	09089000	Mesa County	U.S. Geological Survey
Colorado	WEST DIVIDE CK. @ GAGE BLW LITTLE MUDDY GULCH	11185	Mesa County	Colorado Department of Public Health and Environment
Colorado	WEST DIVIDE CREEK NEAR RAVEN, CO	09089500	Mesa County	U.S. Geological Survey
Colorado	LANG6ST	LANG6ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	LANG5ST	LANG5ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	LANG4ST	LANG4ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	LANG3ST	LANG3ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	LANG7ST	LANG7ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	LANG8ST	LANG8ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	LANG9ST	LANG9ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	LANG10ST	LANG10ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	EAST DIVIDE CREEK NEAR SILT, CO.	09090700	Garfield County	U.S. Geological Survey
Colorado	COLORADO RIVER AT SILT, CO.	09090800	Garfield County	U.S. Geological Survey
Colorado	DUNC1ST	DUNC1ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	City of Silt Inlet	COS-INTAKE	Garfield County	Town of Silt
Colorado	MAMM CREEK NEAR SILT, CO.	09091100	Garfield County	U.S. Geological Survey
Colorado	Colorado River Rifle Br	CDOWRW-550	Garfield County	Colorado Wildlife Division, CO
Colorado	Colorado River Parachute Br	CDOWRW-559	Garfield County	Colorado Wildlife Division, CO
Colorado	BEAVER CREEK NEAR RIFLE, CO.	09092500	Garfield County	U.S. Geological Survey
Colorado	COGCC Facility ID:704569	704569	Garfield County	Colorado Oil and Gas Conservation Commission
Colorado	EAST RIFLE CREEK NEAR RIFLE, CO.	09091500	Garfield County	U.S. Geological Survey
Colorado	RIFLE CREEK NEAR RIFLE, CO.	09092000	Garfield County	U.S. Geological Survey
Colorado	COLORADO RIVER AT RULISON	000147	Garfield County	Colorado Department of Public Health and Environment
Colorado	BATTLEMENT CREEK NEAR PARACHUTE, CO.	09092600	Garfield County	U.S. Geological Survey
Colorado	NORTHWATER CREEK NEAR ANVIL POINTS, CO.	09092830	Garfield County	U.S. Geological Survey
Colorado	EAST MIDDLE FORK PARACHUTE CR NR RIO BLANCO, CO.	09092850	Garfield County	U.S. Geological Survey
Colorado	ENPR13ST	ENPR13ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR12ST	ENPR12ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR4ST	ENPR4ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR1ST	ENPR1ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR2ST	ENPR2ST	Garfield County	EnCana Oil & Gas (USA) Inc.

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Basin	Site name	Site identification number	County	Agency
Colorado	ENPR10ST	ENPR10ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR9ST	ENPR9ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR5ST	ENPR5ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR6ST	ENPR6ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	WEST FORK PARACHUTE CREEK NEAR PARACHUTE, CO.	09092800	Garfield County	U.S. Geological Survey
Colorado	ENPR3ST	ENPR3ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	W. FORK PARACHUTE CK NEAR MOUTH	11145A	Garfield County	Colorado Department of Public Health and Environment
Colorado	MIDDLE FORK PARACHUTE CK ABV WEST FORK PARACHUTE CK	11145B	Garfield County	Colorado Department of Public Health and Environment
Colorado	EAST FORK PARACHUTE CREEK NR ANVIL POINTS, CO.	09092960	Garfield County	U.S. Geological Survey
Colorado	EAST FORK PARACHUTE CREEK NEAR RULISON, CO.	09092970	Garfield County	U.S. Geological Survey
Colorado	ENPR16ST	ENPR16ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	BEN GOOD CREEK NEAR RULLISON, CO.	09092980	Garfield County	U.S. Geological Survey
Colorado	ENPR18ST	ENPR18ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR17ST	ENPR17ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR14ST	ENPR14ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR15ST	ENPR15ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	ENPR11ST	ENPR11ST	Garfield County	EnCana Oil & Gas (USA) Inc.
Colorado	PARACHUTE CREEK NEAR PARACHUTE CO.	09093000	Garfield County	U.S. Geological Survey
Colorado	PARACHUTE CK. N. OF THE TOWN OF PARACHUTE	11210	Garfield County	Colorado Department of Public Health and Environment
Colorado	PARACHUTE CREEK AT PARACHUTE, CO.	09093500	Garfield County	U.S. Geological Survey
Colorado	COLORADO RIVER NEAR DE BEQUE, CO.	09093700	Mesa County	U.S. Geological Survey
Colorado	ROAN CK. BLW BRUSH CR.	11205	Garfield County	Colorado Department of Public Health and Environment
Colorado	ROAN CREEK ABOVE CLEAR CREEK, NEAR DE BEQUE, CO.	09094200	Garfield County	U.S. Geological Survey
Colorado	CLEAR CREEK NEAR DE BEQUE, CO.	09094400	Garfield County	U.S. Geological Survey
Colorado	ROAN CREEK NEAR DE BEQUE, CO.	09095000	Garfield County	U.S. Geological Survey
Colorado	DRY FORK AT UPPER STATION, NEAR DE BEQUE CO.	09095300	Garfield County	U.S. Geological Survey
Colorado	DRY FORK NEAR DE BEQUE, CO.	09095400	Garfield County	U.S. Geological Survey
Colorado	ROAN CK. N. OF DEBUQUE	11202	Mesa County	Colorado Department of Public Health and Environment
Colorado	ROAN CREEK NEAR DE BEQUE	000148	Mesa County	Colorado Department of Public Health and Environment
Colorado	COLORADO RIVER NEAR CAMEO, CO.	09095500	Mesa County	U.S. Geological Survey
Colorado	BUZZARD CREEK BL OWENS CREEK, NR HEIBERGER, CO.	09096800	Mesa County	U.S. Geological Survey
Colorado	BUZZARD CREEK NEAR COLLBRAN, CO	09097500	Mesa County	U.S. Geological Survey
Colorado	BUZZARD CR. AB BRUSH CR.	11155	Mesa County	Colorado Department of Public Health and Environment
Colorado	BRUSH CREEK NEAR COLLBRAN, CO	09097600	Mesa County	U.S. Geological Survey
Colorado	PLATEAU CREEK NEAR HEIBERGER, CO.	09095800	Mesa County	U.S. Geological Survey
Colorado	PLATEAU CREEK NEAR COLLBRAN, CO.	09096500	Mesa County	U.S. Geological Survey
Colorado	SALT CREEK NEAR COLLBRAN, CO	391507107550601	Mesa County	U.S. Geological Survey
Colorado	Plateau Cr River Collbran	CDOWRW-56	Mesa County	Colorado Wildlife Division, CO
Colorado	Buzzard Cr River Buzzard Cr Br	CDOWRW-55	Mesa County	Colorado Wildlife Division, CO
Colorado	PLATEAU CREEK BELOW COLLBRAN, CO	09097900	Mesa County	U.S. Geological Survey
Colorado	Plateau Cr River Job Corps Br	CDOWRW-54	Mesa County	Colorado Wildlife Division, CO
Colorado	Plateau Cr River At PVHS	CDOWRW-53	Mesa County	Colorado Wildlife Division, CO
Colorado	PLATEAU CREEK NEAR CAMEO, CO	09105000	Mesa County	U.S. Geological Survey, Colorado Wildlife Division, CO
Colorado	COLORADO R. @ CAMEO	11103	Mesa County	Colorado Department of Public Health and Environment
Colorado	UP RAPID CRK INTAKE	UP RAPID CRK INTAKE	Mesa County	Town of Palisade (via Western Water and Land)
Colorado	RC-2	RC-2	Mesa County	Town of Palisade (via Western Water and Land)

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Basin	Site name	Site identification number	County	Agency
Colorado	RC-3	RC-3	Mesa County	Town of Palisade
Colorado	LOWER RAPID CRK	LOWER RAPID CRK	Mesa County	(via Western Water and Land)
Colorado	L COTTONWOOD INTAKE	L COTTONWOOD INTAKE	Mesa County	Town of Palisade
Colorado	COTTONWOOD CREEK NEAR MOUTH NORTH OF PALISADE	11151	Mesa County	(via Western Water and Land)
Colorado	COLORADO RIVER AT PALISADE, CO	390622108205400	Mesa County	Colorado Department of Public Health and Environment
Colorado	COLO RIVER BELOW GRAND VALLEY DIV NR PALISADE, CO	09106150	Mesa County	U.S. Geological Survey
Colorado	Colorado River PHS	CDOWRW-553	Mesa County	U.S. Geological Survey
Colorado	Colorado River Hwy 6	CDOWRW-555	Mesa County	Colorado Wildlife Division, CO
Colorado	DRAIN, C 1/2 AND 33 3/4 ROADS, CEN.ORCHARD MESA	390322108253401	Mesa County	U.S. Geological Survey
Colorado	DRAIN AT D AND 32 1/2 ROADS, NEAR CLIFTON	390348108265601	Mesa County	U.S. Geological Survey
Colorado	Colorado River Com Lake	CDOWRW-556	Mesa County	Colorado Wildlife Division, CO
Colorado	COLORADO RIVER AT CLIFTON	390319108273200	Mesa County	U.S. Geological Survey
Colorado	COLORADO RIVER AT 32 ROAD NEAR CLIFTON, CO	390318108273200	Mesa County	U.S. Geological Survey
Colorado	Colorado River BMS	CDOWRW-557	Mesa County	Colorado Wildlife Division, CO
Colorado	LEWIS WASH NEAR GRAND JUNCTION, CO.	09106200	Mesa County	U.S. Geological Survey
Colorado	HUMPHREY BACKWATER, SITE 2,POOL ABOVE CRWA OUTLET	390324108291301	Mesa County	U.S. Geological Survey
Colorado	COLORADO R. WILDLIFE AREA, WEST POOL OUTLET	390326108291601	Mesa County	U.S. Geological Survey
Colorado	HUMPHREY BACKWATER BELOW CRWA.OUTLET	390323108291601	Mesa County	U.S. Geological Survey
Colorado	THE “OM4” DRAIN AT MOUTH AT OMWA (SITE GF6)	390303108291601	Mesa County	U.S. Geological Survey
Colorado	HUMPHREY BACKWATER,SITE 4,LOWER CHANNEL	390322108292301	Mesa County	U.S. Geological Survey
Colorado	HUMPHREY BACKWATER BELOW DRAIN GJ3	390318108293301	Mesa County	U.S. Geological Survey
Colorado	WEST GULLY AT MOUTH (GF5), O.M.WILDLIFE AREA	390302108293801	Mesa County	U.S. Geological Survey
Colorado	DRAIN AT C 1/2 AND 28 1/2 ROADS	390319108312501	Mesa County	U.S. Geological Survey
Colorado	INDIAN WASH AT C 1/2 ROAD	390320108315901	Mesa County	U.S. Geological Survey
Colorado	Colorado River Knights	CDOWRW-558	Mesa County	Colorado Wildlife Division, CO
Colorado	Colorado River Watson	CDOWRW-560	Mesa County	Colorado Wildlife Division, CO
Colorado	COLORADO RIVER AT GRAND JUNCTION, CO	09106500	Mesa County	U.S. Geological Survey
Colorado	COLORADO RIVER ABOVE GUNNISON RIVER	390337108342800	Mesa County	U.S. Geological Survey
Colorado	Colorado River Grand Br	CDOWRW-563	Mesa County	Colorado Wildlife Division, CO
Colorado	INDIAN WASH NEAR MOUTH	11135A	Mesa County	Colorado Department of Public Health and Environment
Colorado	Colorado River 25 Rd	CDOWRW-749	Mesa County	Colorado Wildlife Division, CO
Colorado	LEACH CREEK AT DURHAM, CO.	09152650	Mesa County	U.S. Geological Survey
Colorado	LEACH CREEK NEAR MOUTH	11135	Mesa County	Colorado Department of Public Health and Environment
Colorado	DUKE POND AT OUTLET CHANNEL, CONNECTED LAKES PARK	390449108364101	Mesa County	U.S. Geological Survey
Colorado	DRAIN ALONG REDLANDS PARKWAY, AT MOUTH	390514108373201	Mesa County	U.S. Geological Survey
Colorado	COLORADO R. AT REDLANDS PARKWAY NR GRAND JCT., CO	390521108373300	Mesa County	U.S. Geological Survey
Colorado	COLORADO R.DIVERSION AT WALTER WALKER SWA	390607108384201	Mesa County	U.S. Geological Survey
Colorado	WALKER SWA CHANNEL, SEEPAGE SITE WWC1-SW	390609108384701	Mesa County	U.S. Geological Survey
Colorado	WALKER SWA CHANNEL,SEEPAGE SITE WC4B (X-S WW6)	390613108385603	Mesa County	U.S. Geological Survey
Colorado	WALKER SWA CHANNEL, SEEPAGE SITE WWC11- SW	390625108390402	Mesa County	U.S. Geological Survey
Colorado	WALKER SWA CHANNEL, SEEPAGE SITE WWC10 (SW)	390617108391001	Mesa County	U.S. Geological Survey
Colorado	WALKER SWA,CHANNEL OUTFLOW NR BOR GAGE	390632108392101	Mesa County	U.S. Geological Survey
Colorado	EAST DRAIN NR MOUTH, PANORAMA	390624108394701	Mesa County	U.S. Geological Survey
Colorado	BOTTOMLANDS AREA			
Colorado	PERSIGO WASH AT J ROAD	390859108364101	Mesa County	U.S. Geological Survey
Colorado	PERSIGO WASH AT RIVER ROAD	390645108390101	Mesa County	U.S. Geological Survey
Colorado	HUNTER WASH AT RIVER ROAD	390717108400501	Mesa County	U.S. Geological Survey

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Basin	Site name	Site identification number	County	Agency
Colorado	BACKWATER SITE AT FORRESTERS,EAST OF 19 ROAD	390718108415701	Mesa County	U.S. Geological Survey
Colorado	ADOBE CREEK NEAR FRUITA, CO.	09152900	Mesa County	U.S. Geological Survey
Colorado	ADOBE CREEK NEAR MOUTH	11133	Mesa County	Colorado Department of Public Health and Environment
Colorado	SECONDARY CHANNEL ABOVE ADOBE C., ADOBE BOTOMLAND	390741108424001	Mesa County	U.S. Geological Survey
Colorado	ADOBE CR.AT MOUTH, ADOBE CR.BOTOMLANDS AREA	390741108424301	Mesa County	U.S. Geological Survey
Colorado	SECONDARY CHANNEL BLW ADOBE CR., ADOBE BOTOMLAND	390741108425301	Mesa County	U.S. Geological Survey
Colorado	COLORADO RIVER NEAR FRUITA, CO.	09153000	Mesa County	U.S. Geological Survey
Colorado	COLORADO RIVER NEAR FRUITA	000049	Mesa County	Colorado Department of Public Health and Environment
Colorado	LITTLE SALT WASH AT HWY 50, AT FRUITA	390938108443101	Mesa County	U.S. Geological Survey
Colorado	BIG SALT CK BELOW RUBY LEE RES.	11110	Mesa County	Colorado Department of Public Health and Environment
Colorado	BIG SALT WASH AT GOVT.HIGHLINE CANAL	391509108433001	Mesa County	U.S. Geological Survey
Colorado	BIG SALT WASH AT FRUITA, CO.	09153270	Mesa County	U.S. Geological Survey
Colorado	GOVERNMENT HIGHLINE CA AT 16 ROAD, NR LOMA, CO.	09095526	Mesa County	U.S. Geological Survey
Colorado	KIEFER EXTENSION GRAND VALLEY CA NR FRUITA, CO.	09106104	Mesa County	U.S. Geological Survey
Colorado	CAMP NO. 7 SPILLWAY NEAR MACK, CO.	09095529	Mesa County	U.S. Geological Survey
Colorado	GOVT HIGHLINE CA AB CAMP #7 SPILL, NR MACK, CO.	090955285	Mesa County	U.S. Geological Survey
Colorado	LATERAL NO. 48 NEAR MACK, CO.	09095528	Mesa County	U.S. Geological Survey
Colorado	REED WASH NEAR MACK, CO.	09153290	Mesa County	U.S. Geological Survey
Colorado	REED WASH NEAR LOMA, CO.	09153300	Mesa County	U.S. Geological Survey
Colorado	LOMA DRAIN AT MOUTH	391038108475601	Mesa County	U.S. Geological Survey
Colorado	COLORADO R. @ LOMA	000050	Mesa County	Colorado Department of Public Health and Environment
Colorado	REED WASH NEAR FRUITA, CO.	391029108480200	Mesa County	U.S. Geological Survey
Colorado	COLORADO R. @ HORSETHIEF SWA	11101	Mesa County	Colorado Department of Public Health and Environment
Colorado	EAST SALT CREEK NEAR MACK, CO.	09163310	Mesa County	U.S. Geological Survey
Colorado	MACK WASH NEAR MACK, CO.	09163340	Mesa County	U.S. Geological Survey
Colorado	WEST SALT CREEK NEAR CARBONERA, CO.	09153330	Garfield County	U.S. Geological Survey
Colorado	WEST SALT CREEK NEAR MACK, CO.	09153400	Mesa County	U.S. Geological Survey
Colorado	WEST SALT CREEK NEAR S ROAD	391646108572301	Mesa County	U.S. Geological Survey
Colorado	BADGER WASH OBSERVATION RES 2-A NEAR MACK, CO.	09161000	Mesa County	U.S. Geological Survey
Colorado	BADGER WASH OBSERVATION RES 12 NEAR MACK, CO.	09160500	Mesa County	U.S. Geological Survey
Colorado	BADGER WASH NEAR MACK, CO.	09163050	Mesa County	U.S. Geological Survey
Colorado	SALT CREEK NEAR MACK, CO.	09163490	Mesa County	U.S. Geological Survey
Colorado	COLORADO RIVER NEAR COLORADO-UTAH STATE LINE	09163500	Mesa County	U.S. Geological Survey
Lower Gunnison	ANTHRACITE CK ABV ERICKSON SPRINGS CG	10485	Gunnison County	Colorado Department of Public Health and Environment
Lower Gunnison	ANTHRACITE CREEK NEAR SOMERSET, CO.	09132050	Gunnison County	U.S. Geological Survey
Lower Gunnison	CLEAR FORK NEAR RAGGED MOUNTAIN, CO.	09129800	Gunnison County	U.S. Geological Survey
Lower Gunnison	WEST MUDDY CREEK NEAR RAGGED MOUNTAIN, CO.	09130600	Delta County	U.S. Geological Survey
Lower Gunnison	WEST MUDDY CREEK NEAR BOWIE, CO.	09130800	Delta County	U.S. Geological Survey
Lower Gunnison	COW CREEK NEAR PAONIA, CO.	09131100	Delta County	U.S. Geological Survey
Lower Gunnison	WEST MUDDY CREEK NEAR SOMERSET, CO.	09131200	Delta County	U.S. Geological Survey
Lower Gunnison	MUDDY CK ABV PAONIA RESERVOIR	10490	Gunnison County	Colorado Department of Public Health and Environment
Lower Gunnison	NORTH FORK GUNNISON RIVER NEAR SOMERSET, CO.	09132500	Gunnison County	U.S. Geological Survey
Lower Gunnison	NORTH FORK GUNNISON RIVER NEAR BOWIE	000152	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	MAIN HUBBARD CREEK NEAR PAONIA, CO.	09132700	Delta County	U.S. Geological Survey
Lower Gunnison	MIDDLE HUBBARD CREEK NEAR PAONIA, CO.	09132800	Delta County	U.S. Geological Survey
Lower Gunnison	WEST HUBBARD CREEK NEAR PAONIA, CO.	09132900	Delta County	U.S. Geological Survey
Lower Gunnison	HUBBARD CREEK NEAR BOWIE, CO.	09132920	Delta County	U.S. Geological Survey

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Basin	Site name	Site identification number	County	Agency
Lower Gunnison	HUBBARD CREEK ABOVE IRON POINT GULCH NR BOWIE, CO	09132940	Delta County	U.S. Geological Survey
Lower Gunnison	HUBBARD CK ABV NF GUNNISON R	10406H	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	HUBBARD CREEK AT HIGHWAY 133 AT MOUTH NR BOWIE, CO	09132960	Delta County	U.S. Geological Survey
Lower Gunnison	E FORK TERROR CR BLW COTTONWOOD STOMP NR BOWIE, CO	09132985	Delta County	U.S. Geological Survey
Lower Gunnison	TERROR CREEK AT MOUTH NEAR BOWIE, CO	09132995	Delta County	U.S. Geological Survey
Lower Gunnison	MINNESOTA CREEK NEAR PAONIA, CO.	09134000	Delta County	U.S. Geological Survey
Lower Gunnison	MINNESOTA CK NEAR MOUTH AT 41.10 DR BRIDGE	10436	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	MINNESOTA CREEK AT PAONIA, CO.	09134050	Delta County	U.S. Geological Survey
Lower Gunnison	ROATCAP CREEK AT HIGHWAY 133, NR MOUTH	385144107371701	Delta County	
Lower Gunnison	NORTH FORK GUNNISON RIVER BELOW PAONIA, CO	09134100	Delta County	U.S. Geological Survey
Lower Gunnison	REYNOLDS CK NEAR PAONIA CO	385049107372402	Delta County	U.S. Geological Survey
Lower Gunnison	BELL CREEK AT CTY ROAD AND RR TRACKS, NR MOUTH	384922107402001	Delta County	U.S. Geological Survey
Lower Gunnison	COTTONWOOD CREEK NEAR HOTCHKISS, CO.	09134200	Delta County	U.S. Geological Survey
Lower Gunnison	COTTONWOOD CREEK AT CTY ROAD J75, NR MOUTH	384822107411201	Delta County	U.S. Geological Survey
Lower Gunnison	SMITH FK BLW CRAWFORD	10212	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	SHORT DRAW WEST OF CTY FAIRGROUNDS, AT HOTCHKISS	384747107430501	Delta County	U.S. Geological Survey
Lower Gunnison	LEROUX CREEK NEAR CEDAREEDGE, CO.	09134500	Delta County	U.S. Geological Survey
Lower Gunnison	COW CREEK NEAR CEDAREEDGE, CO.	09134700	Delta County	U.S. Geological Survey
Lower Gunnison	LEROUX CK BELOW DEVER CK	10415	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	LEROUX CREEK AT HOTCHKISS, CO.	09135900	Delta County	U.S. Geological Survey
Lower Gunnison	LEROUX CK NR MOUTH AT J.80 RD	10411	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	LEROUX CREEK AT MOUTH	384732107434801	Delta County	U.S. Geological Survey
Lower Gunnison	N.F. GUNNISON R BLW LEROUX CR, NR HOTCHKISS, CO	09135950	Delta County	U.S. Geological Survey
Lower Gunnison	N FK OF GUNNISON R BELOW HOTCHKISS	000100	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	ALUM GULCH NR HOTCHKISS CO	384434107432701	Delta County	U.S. Geological Survey
Lower Gunnison	ALUM GULCH AT MOUTH	384610107455001	Delta County	U.S. Geological Survey
Lower Gunnison	HOTCHKISS NFH NORTH FORK GUNISON	231275	Delta County	U.S. Environmental Protection Agency
Lower Gunnison	HOTCHKISS NFH NORTH FORK GUNISON	231272	Delta County	U.S. Environmental Protection Agency
Lower Gunnison	HOTCHKISS NFH NORTH FORK GUNISON	231273	Delta County	U.S. Environmental Protection Agency
Lower Gunnison	HOTCHKISS NFH NORTH FORK GUNISON	231274	Delta County	U.S. Environmental Protection Agency
Lower Gunnison	NORTH FK GUNNISON RIVER ABOVE MOUTH NR LAZEAR, CO	09136100	Delta County	U.S. Geological Survey
Lower Gunnison	NORTH FORK GUNNISON R AT MOUTH	10400	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	GUNNISON RIVER NEAR LAZEAR, CO.	09136200	Delta County	U.S. Geological Survey
Lower Gunnison	UNNAMED DRAINAGE BELOW OASIS POND, AT CTY ROAD	384643107540301	Delta County	U.S. Geological Survey
Lower Gunnison	CURRANT CK NR MOUTH	10587	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	CURRANT CREEK NEAR READ, CO.	09137050	Delta County	U.S. Geological Survey
Lower Gunnison	ALFALFA RUN AT AUSTIN	384649107570501	Delta County	U.S. Geological Survey
Lower Gunnison	GUNNISON RIVER AT 2200 RD BRIDGE, AT AUSTIN	384624107570701	Delta County	U.S. Geological Survey
Lower Gunnison	PEACH VALLEY ARROYO NEAR MOUTH	384604107570701	Delta County	U.S. Geological Survey

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Basin	Site name	Site identification number	County	Agency
Lower Gunnison	GUNNISON RIVER NEAR DELTA	000056	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	GUNNISON RIVER AT AUSTIN, CO.	09137300	Delta County	U.S. Geological Survey
Lower Gunnison	SUNFLOWER DRAIN AT HIGHWAY 92, NEAR READ	384551107591901	Delta County	U.S. Geological Survey
Lower Gunnison	GUNNISON RIVER NEAR CORY, CO.	09137500	Delta County	U.S. Geological Survey
Lower Gunnison	SURFACE CREEK NEAR CEDAREEDGE, CO	09143000	Delta County	U.S. Geological Survey
Lower Gunnison	SURFACE CREEK AT CEDAREEDGE, CO.	09143500	Delta County	U.S. Geological Survey
Lower Gunnison	SURFACE CREEK AT ORCHARD CITY	000116	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	WARD CREEK NEAR GRAND MESA, CO.	09139200	Delta County	U.S. Geological Survey
Lower Gunnison	KISER CREEK NEAR GRAND MESA, CO.	09140200	Delta County	U.S. Geological Survey
Lower Gunnison	COTTONWOOD CREEK NEAR GRAND MESA, CO.	09140700	Delta County	U.S. Geological Survey
Lower Gunnison	YOUNGS CREEK NEAR GRAND MESA, CO.	09141200	Delta County	U.S. Geological Survey
Lower Gunnison	DIRTY GEORGE CREEK NEAR GRAND MESA, CO.	09137800	Delta County	U.S. Geological Survey
Lower Gunnison	SURFACE CK NR MOUTH	10582	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	TONGUE CREEK AT CORY, CO.	09144200	Delta County	U.S. Geological Survey
Lower Gunnison	GUNNISON RIVER AT DELTA	10516	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	GUNNISON RIVER AT DELTA, CO.	09144250	Delta County	U.S. Geological Survey
Lower Gunnison	LOUTZENHIZER ARROYO ABOVE SELIG CANAL	383404107534101	Montrose County	U.S. Geological Survey
Lower Gunnison	LOUTZENHIZER ARROYO BLW SELIG CANAL/6400 RD	383408107535101	Montrose County	U.S. Geological Survey
Lower Gunnison	LOUTSENHIZER ARROYO AT FALCON ROAD	383528107552001	Montrose County	U.S. Geological Survey
Lower Gunnison	LOUTSENHIZER ARROYO BELOW EAST CANAL	383741107565701	Montrose County	U.S. Geological Survey
Lower Gunnison	WEST TRIB OF LOUTSENHIZER ARROYO BLW EAST CANAL	383728107572001	Montrose County	U.S. Geological Survey
Lower Gunnison	LOUTSENHIZER ARROYO NEAR MOUTH	10661	Montrose County	Colorado Department of Public Health and Environment
Lower Gunnison	LOUTZENHIZER ARROYO AT N.RIVER ROAD	383946107595301	Montrose County	U.S. Geological Survey
Lower Gunnison	LOUTSENHIZER ARROYO BLW GARNET CANAL, AT MOUTH	383953108001701	Montrose County	U.S. Geological Survey
Lower Gunnison	DIVERSION DRAIN AT GARNET MESA RESERVOIR	384231108020301	Delta County	U.S. Geological Survey
Lower Gunnison	UNCOMPAGHRE R. AB. DRY CR. @ 17 RD BRIDGE	10602	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	DRY CREEK AT BEGONIA RD, NR DELTA, CO.	09149480	Montrose County	U.S. Geological Survey
Lower Gunnison	DRY CREEK AT MOUTH, NEAR DELTA	384202108032001	Delta County	U.S. Geological Survey
Lower Gunnison	DRY CR. NR. MOUTH	10611	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	UNCOMPAHGRE RIVER IN DELTA @ 6.00 RD	000055	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	UNCOMPAHGRE RIVER AT DELTA, CO.	09149500	Delta County	U.S. Geological Survey
Lower Gunnison	CUMMINGS GULCH AT MOUTH	384448108070301	Delta County	U.S. Geological Survey
Lower Gunnison	GUNNISON R. @ 6.50 RD.	10515	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	SEEP CREEK AT G ROAD, NEAR MOUTH	384408108091501	Delta County	U.S. Geological Survey
Lower Gunnison	ROUBIDEAU CREEK ABV CONFLUENCE WITH POTTER CREEK	10562	Montrose County	Colorado Department of Public Health and Environment
Lower Gunnison	ROUBIDEAU CREEK UPSTREAM OF UNCOMPAHGRE PROJECT	384013108091401	Delta County	U.S. Geological Survey
Lower Gunnison	ROUBIDEAU CREEK AT MOUTH, NEAR DELTA, CO.	09150500	Delta County	U.S. Geological Survey
Lower Gunnison	ALKALI CREEK BELOW HWY 50, NEAR DELTA	384510108111801	Delta County	U.S. Geological Survey
Lower Gunnison	GUNNISON RIVER AB ESCALANTE CREEK, NEAR DELTA	384527108152701	Delta County	U.S. Geological Survey
Lower Gunnison	ESCALANTE CR. @ ESCALANTE FORKS	10555	Mesa County	Colorado Department of Public Health and Environment
Lower Gunnison	ESCALANTE CK @ ESCALANTE SWA	10551	Delta County	Colorado Department of Public Health and Environment
Lower Gunnison	ESCALANTE CREEK NEAR DELTA, CO.	09151500	Delta County	U.S. Geological Survey

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Basin	Site name	Site identification number	County	Agency
Lower Gunnison	WELLS GULCH AT DOMINGUEZ ROAD CROSSING	384813108184301	Delta County	U.S. Geological Survey
Lower Gunnison	WHITEWATER CK @ 32.70 RD.	10505A	Mesa County	Colorado Department of Public Health and Environment
Lower Gunnison	W. Fork 2 Creek	WSWF2CR	Mesa County	City of Grand Junction
Lower Gunnison	E. Fork 2 Creek	WSEF2CR	Mesa County	City of Grand Junction
Lower Gunnison	Two Creek	WSTWOCR	Mesa County	City of Grand Junction
Lower Gunnison	KC above CG (intake)	WSKCINTK	Mesa County	City of Grand Junction
Lower Gunnison	KANNAH CK ABOVE DOW FISHING AREA	10575	Mesa County	Colorado Department of Public Health and Environment
Lower Gunnison	KANNAH CREEK NEAR WHITEWATER, CO.	09152000	Mesa County	U.S. Geological Survey
Lower Gunnison	KC below CG	WSKCBLCG	Mesa County	City of Grand Junction
Lower Gunnison	Juniata Inlet	WSJUNNLT	Mesa County	City of Grand Junction
Lower Gunnison	Lower JUNNLT	WSJUNNLTLO	Mesa County	City of Grand Junction
Lower Gunnison	KANNAH CK @ 65.00 RD	10572	Mesa County	Colorado Department of Public Health and Environment
Lower Gunnison	NF KC at WR CG	WSNFKCWR	Mesa County	City of Grand Junction
Lower Gunnison	NF Kannah Cr at Div.	WSNFKCDV	Mesa County	City of Grand Junction
Lower Gunnison	NF KC at SR CG	WSNFKCSR	Mesa County	City of Grand Junction
Lower Gunnison	NF Kannah Cr at Inlt	WSNFKCINLT	Mesa County	City of Grand Junction
Lower Gunnison	KANNAH CREEK ABOUT .1 MI BELOW INDIAN CREEK	385600108250301	Mesa County	U.S. Geological Survey
Lower Gunnison	KANNAH CK @ FS.50 RD	10530	Mesa County	Colorado Department of Public Health and Environment
Lower Gunnison	Lockhart Draw	WSLOCKDRW	Mesa County	City of Grand Junction
Lower Gunnison	Whitewater Creek	WSWHITCR	Mesa County	City of Grand Junction
Lower Gunnison	WHITEWATER CREEK .4 MI ABOVE MOUTH,AT WHITEWATER	385839108264401	Mesa County	U.S. Geological Survey
Lower Gunnison	GUNNISON R. @ WHITEWATER	10505	Mesa County	Colorado Department of Public Health and Environment
Lower Gunnison	Gunnison River Whitewater Br	CDOWRW-562	Mesa County	Colorado Wildlife Division, CO
Lower Gunnison	GUNNISON RIVER NEAR GRAND JUNCTION, CO.	09152500	Mesa County	U.S. Geological Survey
Lower Gunnison	GUNNISON SOUTHEAST OF GRD JUNCT	000054	Mesa County	Colorado Department of Public Health and Environment
Lower Gunnison	CALLOW CREEK AT WHITEWATER, CO	09152520	Mesa County	U.S. Geological Survey
Lower Gunnison	ORCHARD MESA DRAIN AT GRAND JUNCTION, CO.	09152600	Mesa County	U.S. Geological Survey

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Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
09302450	White_4	40.050	−107.469	2	267/0	11/20/1964–6/11/2007	0.0	0.5	4.0	11.5	22.0
09304100	White_9a	39.969	−107.647	3	52/0	8/11/1959–11/4/1964	0.5	5.3	13.3	18.5	24.5
395643107461200	White_7	39.945	−107.771	5							
09304200	White_7	40.005	−107.825	9	816/0	9/19/1961–7/22/2009	0.0	3.0	7.2	12.0	23.0
09304480	White_9a	40.031	−107.822	16	296/0	7/6/1978–6/11/2007	0.0	2.0	7.3	14.0	22.0
09304300	White_9a	40.091	−107.770	18	113/0	8/12/1959–9/23/2005	0.0	2.0	8.5	14.0	66.0
09304500	White_7	40.034	−107.862	19	446/0	8/11/1959–9/24/2005	0.0	3.2	8.5	12.0	22.0
09304550	White_9a	40.039	−107.882	20	302/0	8/30/1973–9/23/2005	0.0	1.0	9.5	16.0	28.0
09304600	White_7	40.033	−107.919	28	296/0	7/6/1978–9/24/2005	0.0	2.0	7.0	12.5	20.0
4000001075434		40.005	−107.911	34	12/0	10/19/1999–6/11/2007	0.1	3.6	11.5	17.1	22.0
400113107574500	White_7	40.020	−107.963	39							
000043	White_7	40.017	−107.983	42	145/0	1/24/1968–4/21/1992	0.0	2.2	7.2	11.7	21.1
400206108005901		40.0350861	−108.0162556	45	6/0	6/24/2005–6/11/2007	2.5	3.4	14.0	15.3	15.5
09304800	White_7	40.013	−108.093	51	837/0	9/20/1961–9/29/2009	−0.1	3.2	9.1	14.0	25.5
ENPR20ST	White_16	39.686	−107.985	59							
ENPR21ST	White_16	39.668	−108.007	60							
ENPR19ST	White_16	39.692	−108.005	61							
09306007	White_14a	39.826	−108.183	63	638/0	4/23/1974–10/5/1998	0.0	5.0	9.5	14.0	28.0
09306025	White_17	39.784	−108.190	64	70/0	5/3/1974–2/18/1980	0.0	8.5	15.0	20.0	30.0
09306028	White_17	39.812	−108.184	65							
09306022	White_17	39.813	−108.184	66	193/0	9/12/1974–9/3/1998	1.0	7.8	10.0	12.5	18.0
09306033	White_16	39.785	−108.210	67							
09306039	White_16	39.827	−108.208	68	11/0	12/1/1974–3/11/1985	0.0	1.0	9.0	19.0	19.0
09306042	White_16	39.834	−108.221	69	170/0	3/17/1977–6/18/1991	0.0	11.0	17.0	23.0	29.5
09306050	White_16	39.794	−108.228	71	6/0	3/4/1975–2/19/1980	0.0	0.5	3.0	4.5	4.5
09306052	White_16	39.814	−108.244	72	11/0	3/4/1975–3/11/1985	0.0	0.0	0.5	1.5	6.0
09306058	White_18	39.837	−108.244	74	395/0	4/23/1974–9/3/1998	0.0	6.0	10.0	14.0	27.0
09306061	White_14a	39.851	−108.259	75	472/0	4/23/1974–11/19/1993	−0.5	5.5	10.0	14.0	24.0
11625	White_20	39.858	−108.311	81	9/0	8/18/1999–6/21/2007	2.7	8.3	12.4	14.7	22.2
09306175	White_20	39.871	−108.288	82	336/0	1/15/1975–8/17/1983	0.0	6.0	10.8	13.0	23.0
09306200	White_14b	39.921	−108.298	86	761/0	6/9/1964–7/8/2009	0.0	5.0	10.0	15.0	26.3
09306210	White_15	39.939	−108.290	106	91/0	10/13/1964–8/18/1976	0.0	1.5	8.0	14.0	26.0

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
09306222	White_15	40.078	−108.236	153	674/0	12/15/1970–7/7/2009	−0.1	4.5	11.0	17.0	30.0
000117	White_12	40.1	−108.25	154	110/0	11/2/1971–4/21/1992	0.0	1.7	8.1	13.3	22.2
09306224	White_12	40.163	−108.345	158	88/0	11/9/1982–9/29/2009	0.0	6.7	11.5	15.5	25.0
09306240	White_13b	39.888	−108.528	159	102/0	4/27/1974–3/11/1985	0.0	10.0	14.0	19.0	27.5
09306241	White_13b	39.914	−108.485	160	15/0	2/13/1976–2/23/1982	0.0	0.0	0.5	0.5	8.0
09306235	White_13b	39.906	−108.533	161	288/0	3/13/1974–10/3/1989	0.0	4.0	11.0	17.0	30.0
09306242	White_13b	39.920	−108.473	162	525/0	3/14/1974–7/8/2009	0.0	8.0	11.0	15.0	24.0
09306244	White_13b	39.934	−108.427	163	87/0	6/12/1975–10/24/1978	1.0	8.0	14.0	19.0	24.0
11702	White_12	40.056	−108.490	167	32/0	9/14/1999–6/12/2007	−0.2	1.1	11.4	19.6	24.1
09306255	White_13c	40.169	−108.401	169	555/0	5/16/1972–7/7/2009	0.0	3.8	11.6	18.0	31.0
09306290	White_12	40.180	−108.565	175	593/0	11/9/1982–10/26/2009	0.0	7.2	12.0	17.0	185.0
09306300	White_12	40.107	−108.713	179	165/0	4/7/1972–10/11/1982	0.0	4.0	11.0	17.0	24.0
09306305	White_12	40.103	−108.716	181	91/0	4/21/1995–7/28/2009	0.3	8.7	13.6	18.0	24.8
09306380	White_22	40.087	−108.776	185	46/0	2/8/1977–1/23/1996	0.0	9.9	10.0	14.5	29.0
400535108485700	White_21	40.093	−108.816	189	9/0	8/25/1981–7/28/2009	0.5	5.4	14.5	19.0	22.4
000044	White_21	40.1	−108.85	190	91/0	1/24/1968–6/7/1982	0.0	1.1	10.0	15.0	25.6
09072500	UCol_3	39.550	−107.321	194	62/0	7/18/1960–8/30/1966	0.0	8.0	10.3	14.5	20.5
CDOWRW-46	UCol_3	39.548	−107.324	195	234/0	11/26/1990–5/7/2007	−2.0	5.0	9.5	13.0	24.0
12100	LCol_1	39.549	−107.329	196	10/0	2/14/2001–8/20/2002	1.7	6.7	12.0	19.5	22.9
CDOWRW-47	LCol_1	39.552	−107.336	198	228/0	11/26/1990–5/7/2007	−1.0	5.0	9.0	12.0	23.0
09085100	LCol_1	39.555	−107.338	200	506/0	10/7/1966–8/10/1999	0.0	4.0	9.0	12.9	20.5
11109A	LCol_6	39.567	−107.337	201	5/0	10/23/2000–4/18/2007	4.9	9.2	9.5	11.1	11.8
CDOWRW-197	LCol_7a	39.572	−107.370	202	6/0	1/8/2000–5/11/2001	2.0	3.5	5.0	5.0	5.0
09085150	LCol_1	39.562	−107.407	204	22/0	4/13/2006–10/13/2009	0.6	5.5	9.3	13.9	20.6
09085200	LCol_7a	39.605	−107.448	210	150/0	9/9/1969–8/29/1986	0.0	4.0	8.0	11.0	19.0
09085400	LCol_7a	39.598	−107.424	211	115/0	4/27/1967–9/16/1982	0.0	2.0	6.0	9.0	14.5
09085300	LCol_7a	39.609	−107.435	212	124/0	2/19/1969–9/12/1983	0.0	1.5	5.0	9.0	16.0
000047	LCol_1	39.566	−107.467	215	489/0	1/4/1968–4/18/2007	−0.6	3.9	8.9	14.4	37.0
CDOWRW-546	LCol_1	39.568	−107.523	216	93/0	11/9/1995–5/7/2004	1.0	6.0	10.0	13.0	23.0

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Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
09086470	LCol_5	39.678	-107.573	217	69/0	10/4/1990–1/5/1998	0.1	2.6	6.0	9.0	13.0
11190H	LCol_5	39.677	-107.571	218	5/0	11/30/2000–4/18/2007	1.3	3.6	5.7	5.9	11.5
09086000	LCol_5	39.666	-107.627	219	61/0	9/11/1990–1/5/1998	0.0	1.5	6.0	11.0	16.6
09086970	LCol_5	39.668	-107.525	220	68/0	10/3/1990–1/5/1998	1.0	2.2	4.7	7.5	13.2
11195	LCol_11g	39.643	-107.533	221	11/0	10/2/1995–8/21/1996	1.1	3.9	6.1	8.9	14.4
CDOWRW-547	LCol_7a	39.571	-107.539	223	88/0	11/25/1995–5/7/2004	1.0	6.0	9.0	12.0	25.0
09087600	LCol_1	39.568	-107.545	225	79/0	8/2/1966–11/7/2008	0.0	3.0	9.5	14.5	21.0
11189	LCol_11g	39.563	-107.544	226	10/0	8/18/1999–10/17/2006	0.0	2.3	6.2	18.7	22.6
09089000	LCol_5	39.276	-107.520	233	72/0	10/4/1963–10/6/1970	0.0	4.8	9.0	11.8	18.0
11185	LCol_7b	39.331	-107.580	234	10/0	10/2/1995–8/15/1996	0.0	1.8	8.9	17.5	22.2
09089500	LCol_7b	39.331	-107.580	235	404/0	8/10/1959–11/1/2004	-0.1	2.0	7.0	12.3	24.0
LANG6ST	LCol_7b	39.464	-107.621	254	117/0	4/13/2004–9/29/2008	-0.3	0.5	6.3	11.0	20.1
LANG5ST	LCol_7b	39.463	-107.621	255	128/0	4/13/2004–9/29/2008	-0.3	0.6	6.4	13.0	24.0
LANG4ST	LCol_7b	39.464	-107.621	256	127/0	4/13/2004–9/29/2008	-0.3	0.7	6.5	12.2	23.7
LANG3ST	LCol_7b	39.464	-107.622	260	117/0	4/13/2004–9/29/2008	-0.3	0.6	6.2	10.9	21.0
LANG7ST	LCol_7b	39.464	-107.621	263	119/0	4/13/2004–9/29/2008	-0.2	0.7	6.2	11.2	20.2
LANG8ST	LCol_7b	39.465	-107.620	265	116/0	4/13/2004–9/29/2008	-0.3	0.5	6.4	11.1	20.2
LANG9ST	LCol_7b	39.465	-107.620	268	81/0	12/9/2004–9/29/2008	-0.3	0.2	5.6	10.5	20.3
LANG10ST	LCol_7b	39.465	-107.620	271	81/0	12/9/2004–9/29/2008	-0.3	0.1	5.6	10.5	20.4
09090700	LCol_7b	39.436	-107.570	274	44/0	5/10/1960–10/4/1965	0.0	7.0	12.0	15.5	22.0
09090800	LCol_1	39.542	-107.646	299	25/0	8/26/1970–5/22/1973	0.0	2.3	8.5	12.3	18.5
DUNC1ST	LCol_4d	39.470	-107.653	305	29/0	4/14/2004–6/6/2006	-0.1	4.4	10.5	15.0	20.4
COS-INTAKE	LCol_1	39.543	-107.668	325	13/0	5/25/2006–5/14/2009	2.7	4.6	10.2	16.2	20.6
09091100	LCol_4a	39.532	-107.714	366	19/0	5/7/1990–10/2/1995	0.2	8.0	12.3	15.5	21.1
CDOWRW-550	LCol_1	39.526	-107.777	377	49/0	11/19/1995–5/11/2005	0.5	5.0	8.0	11.0	24.0
CDOWRW-559	LCol_2a	39.457	-107.829	380	14/0	10/4/2004–9/18/2007	1.0	3.5	6.5	13.5	16.0
09092500	LCol_7a	39.472	-107.833	382	240/0	8/10/1959–9/7/1982	0.0	1.0	6.5	11.0	22.0
704569	LCol_1	39.514	-107.818	386							
09091500	LCol_10	39.678	-107.698	387	54/0	8/10/1959–9/30/1964	3.0	11.0	12.0	14.5	18.0

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Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
09092000	LCol_10	39.620	−107.763	393	55/0	8/11/1959– 9/30/1964	0.5	9.0	13.0	18.0	22.0
000147	LCol_2a	39.494	−107.939	399	94/0	5/31/1979– 5/20/1998	0.6	3.9	10.0	13.9	22.0
09092600	LCol_7a	39.436	−107.977	407	75/0	8/10/1959– 4/27/1977	0.5	4.5	9.0	13.5	21.0
09092830	LCol_8	39.620	−108.013	414	60/0	2/9/1976– 5/5/1983	0.0	1.0	4.0	12.0	21.0
09092850	LCol_8	39.621	−108.030	416	75/0	2/9/1976– 7/29/1983	0.0	2.0	5.0	12.5	19.0
ENPR13ST	LCol_8	39.607	−108.101	417	5/0	3/11/2003– 5/31/2007	6.8	8.5	10.8	14.4	17.2
ENPR12ST	LCol_11d	39.587	−108.110	418	5/0	5/5/2005– 5/4/2006	1.5	4.6	9.0	12.5	14.4
ENPR4ST	LCol_11a	39.631	−108.202	419							
ENPR1ST	LCol_11b	39.627	−108.152	420	6/0	10/27/2004– 4/27/2006	0.1	0.3	6.6	10.3	14.4
ENPR2ST	LCol_11b	39.607	−108.143	421	6/0	10/27/2004– 4/27/2006	0.2	0.6	7.1	11.0	15.0
ENPR10ST	LCol_11b	39.597	−108.183	422							
ENPR9ST	LCol_11b	39.584	−108.183	423							
ENPR5ST	LCol_11b	39.598	−108.163	424							
ENPR6ST	LCol_11b	39.602	−108.142	425							
09092800	LCol_11b	39.587	−108.143	426	32/0	7/16/1959– 10/5/1962	0.5	7.3	11.8	16.3	24.0
ENPR3ST	LCol_11b	39.585	−108.117	428	7/0	10/27/2004– 4/27/2006	7.1	8.4	9.1	12.5	13.2
11145A	LCol_11b	39.581	−108.113	429	16/0	9/30/1999– 4/10/2007	4.3	5.5	7.9	11.5	20.1
11145B	LCol_11d	39.581	−108.112	430	16/0	9/30/1999– 4/10/2007	4.7	7.6	9.3	12.9	18.4
09092960	LCol_11a	39.555	−107.983	432	52/0	2/8/1976– 9/7/1983	0.0	3.0	8.3	14.8	20.0
09092970	LCol_11a	39.567	−108.021	433	73/0	4/21/1977– 9/9/1983	0.0	4.0	8.0	12.0	16.5
ENPR16ST	LCol_11e	39.578	−108.033	434							
09092980	LCol_11e	39.590	−108.041	435	44/0	11/19/1976– 9/12/1983	0.0	4.5	10.0	12.8	16.5
ENPR18ST	LCol_11g	39.553	−108.060	436							
ENPR17ST	LCol_11e	39.588	−108.060	437							
ENPR14ST	LCol_11f	39.581	−108.088	438	6/0	10/27/2004– 5/19/2006	7.2	7.3	8.6	9.4	10.5
ENPR15ST	LCol_11f	39.577	−108.107	439	5/0	10/27/2004– 5/5/2006	5.0	5.9	7.7	11.7	14.7
ENPR11ST	LCol_11f	39.576	−108.109	440	6/0	10/27/2004– 5/5/2006	4.8	6.7	8.3	13.8	15.4
09093000	LCol_11h	39.567	−108.111	441	213/0	9/22/1964– 9/10/1986	0.0	5.5	9.0	12.0	22.0
11210	LCol_11h	39.470	−108.080	445	10/0	10/18/1995– 8/21/1996	3.9	9.2	11.9	17.1	23.9
09093500	LCol_11h	39.453	−108.060	446	84/0	11/21/1974– 10/13/1982	0.0	4.3	10.0	15.3	21.5
09093700	LCol_2a	39.362	−108.153	454	339/0	5/17/1965– 1/8/1998	0.0	5.5	11.0	15.0	22.5
11205	LCol_14a	39.504	−108.391	459	9/0	8/16/1999– 10/10/2006	5.5	10.9	13.8	19.4	21.2

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Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
09094200	LCol_14a	39.491	-108.355	461	89/0	10/5/1962–9/27/1968	0.0	4.0	9.0	13.5	23.0
09094400	LCol_14b	39.483	-108.327	469	23/0	6/16/1966–6/14/1968	0.0	2.0	10.0	16.5	23.0
09095000	LCol_14c	39.453	-108.317	470	222/0	9/25/1962–10/23/2003	0.0	4.0	9.5	14.5	25.5
09095300	LCol_14c	39.375	-108.318	472	103/0	10/19/1995–9/7/2004	-0.2	2.9	9.0	16.4	29.6
09095400	LCol_14c	39.369	-108.262	474	78/0	8/5/1975–11/15/1983	0.0	6.0	13.5	18.0	30.0
11202	LCol_14c	39.366	-108.253	475	10/0	10/12/1995–8/15/1996	1.7	6.9	10.0	23.2	30.6
000148	LCol_14c	39.365	-108.252	476	91/0	5/31/1979–4/11/2007	-0.0	4.5	11.1	17.3	29.1
09095500	LCol_2a	39.239	-108.266	485	1,167/0	3/18/1960–10/27/2009	0.0	6.0	11.0	15.5	25.1
09096800	LCol_16	39.236	-107.634	487	109/0	5/10/1960–10/7/1970	0.0	2.0	9.0	15.0	24.0
09097500	LCol_16	39.272	-107.851	491	198/0	7/15/1959–9/7/2005	0.0	1.0	8.5	15.0	26.5
11155	LCol_16	39.273	-107.851	492	11/0	10/12/1995–8/15/1996	0.0	0.6	9.4	20.0	24.4
09097600	LCol_5	39.325	-107.842	494	78/0	8/10/1959–9/21/1967	0.0	3.5	9.0	12.0	19.5
09095800	LCol_15	39.217	-107.775	499	44/0	6/4/1960–10/2/1964	0.0	6.3	11.5	17.0	22.0
09096500	LCol_15	39.251	-107.841	505	192/0	8/10/1959–8/19/1980	0.0	1.0	7.0	13.0	22.0
391507107550601	LCol_15	39.252	-107.919	507							
CDOWRW-56	LCol_15	39.241	-107.960	509	82/0	2/25/1992–10/15/1998	1.0	8.0	11.5	17.0	27.0
CDOWRW-55	LCol_16	39.241	-107.963	511	26/0	1/14/1992–7/27/1995	1.0	8.0	11.5	15.0	22.0
09097900	LCol_16	39.240	-107.971	527	17/0	4/22/2003–9/20/2005	2.1	9.1	12.2	15.4	20.7
CDOWRW-54	LCol_16	39.240	-107.977	530	25/0	1/8/1992–5/24/1995	2.0	7.5	11.5	15.0	30.0
CDOWRW-53	LCol_16	39.235	-107.997	532	73/0	3/16/1992–7/31/2003	2.0	8.0	11.0	16.0	25.0
09105000	LCol_16	39.184	-108.268	584	662/0	7/15/1959–10/27/2009	0.0	5.0	10.5	17.2	27.5
11103	LCol_2a	39.149	-108.315	590	92/0	12/14/1995–4/11/2007	-0.0	5.0	11.0	15.7	24.2
UP RAPID CRK INTAKE	LCol_17a	39.086	-108.249	602	5/0	5/22/2007–5/29/2008	1.0	3.5	6.5	13.8	14.0
RC-2	LCol_17a	39.099	-108.261	603	7/0	11/20/1997–11/12/1999	4.2	6.3	8.0	9.9	11.1
RC-3	LCol_17a	39.096	-108.267	608	8/0	11/20/1997–6/27/2007	3.6	8.1	9.5	10.9	12.4
LOWER RAPID CRK	LCol_17a	39.105	-108.270	610	5/0	5/22/2007–5/29/2008	1.6	3.1	9.4	11.9	14.0
L COTTONWOOD INTAKE	LCol_15	39.08069101	-108.28586195	621	4/0						
11151	LCol_15	39.131	-108.321	625	11/0	10/23/1995–4/11/2007	0.1	5.0	8.9	14.4	21.7
390622108205400	LCol_2b	39.106	-108.349	628	23/0	7/5/1994–4/19/1995	0.0	7.5	13.7	20.4	24.4

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
09106150	LCol_2b	39.099	−108.355	630	166/0	10/5/1990–10/8/2004	0.5	9.8	13.7	19.5	25.5
CDOWRW-553	LCol_2b	39.093	−108.393	635	71/0	12/13/1995–10/23/2006	−1.0	6.0	11.0	15.0	22.0
CDOWRW-555	LCol_2b	39.076	−108.418	636	52/0	12/13/1995–2/28/2003	2.0	5.0	9.0	13.0	22.0
390322108253401	LCol_13b	39.056	−108.427	640	5/0	3/22/1991–5/5/1998	5.0	11.0	15.0	16.0	18.0
390348108265601	LCol_13b	39.063	−108.450	644	6/0	3/22/1991–9/23/1993	7.0	7.8	15.0	19.1	19.5
CDOWRW-556	LCol_2b	39.055	−108.459	646	93/0	2/7/1996–1/30/2004	1.0	8.0	12.0	16.0	27.0
390319108273200	LCol_2b	39.055	−108.460	647	13/0	11/9/1976–8/15/1991	4.5	5.0	6.5	7.0	21.5
390318108273200	LCol_2b	39.055	−108.460	648	26/0	6/30/1994–7/31/2002	−0.1	9.8	18.1	21.7	26.1
CDOWRW-557	LCol_2b	39.058	−108.477	649							
09106200	LCol_13b	39.061	−108.478	665	81/0	4/11/1973–3/6/2006	0.0	4.5	12.0	17.0	23.7
390324108291301	LCol_13b	39.057	−108.488	670	18/0	7/23/1998–9/3/2003	2.5	5.7	11.5	16.5	22.5
390326108291601	LCol_13b	39.057	−108.488	672	59/0	1/24/1997–9/3/2003	1.5	6.5	12.5	20.5	26.0
390323108291601	LCol_13b	39.056	−108.488	673	13/0	10/28/1998–12/12/2002	3.5	5.4	11.5	14.8	22.4
390303108291601	LCol_13b	39.051	−108.488	683	19/0	10/15/1997–7/13/2001	6.5	9.1	10.0	16.0	23.5
390322108292301	LCol_13b	39.056	−108.490	685	12/0	7/23/1998–9/3/2003	5.5	11.0	11.9	19.8	25.5
390318108293301	LCol_13b	39.055	−108.493	687	11/0	3/18/1999–4/22/2003	7.0	10.5	13.0	16.6	21.0
390302108293801	LCol_13b	39.051	−108.495	688	15/0	10/15/1997–5/23/2000	6.5	8.9	12.0	13.8	15.5
390319108312501	LCol_13b	39.055	−108.524	693	5/0	3/21/1991–5/6/1998	3.0	11.2	13.0	14.0	17.5
390320108315901	LCol_13b	39.056	−108.534	694	8/0	3/21/1991–5/6/1998	4.3	6.1	9.0	13.1	19.0
CDOWRW-558	LCol_2b	39.053	−108.547	695	56/0	12/5/1995–11/9/1999	1.0	7.0	11.5	15.0	25.0
CDOWRW-560	LCol_2b	39.055	−108.564	696	130/0	11/3/1995–6/20/2003	1.0	8.0	12.0	18.0	25.0
09106500	LCol_2b	39.054	−108.566	697	30/0	7/1/1994–9/7/1995	1.0	10.4	17.7	21.0	26.9
390337108342800	LCol_3	39.060	−108.575	701	10/0	11/9/1976–8/15/1991	6.0	6.5	7.3	7.5	21.5
CDOWRW-563	LCol_3	39.067	−108.582	1110	115/0	12/12/1995–12/16/2003	1.0	8.0	12.0	17.0	25.0
11135A	LCol_13b	39.079	−108.588	1121	8/0	7/26/2005–1/9/2007	12.1	13.3	14.9	22.2	24.0
CDOWRW-749	LCol_3	39.080	−108.589	1123	6/0	1/29/1999–10/27/2000	10.0	14.5	19.0	28.8	31.0
09152650	LCol_13b	39.091	−108.608	1137	135/0	4/2/1973–8/9/1999	0.5	5.3	11.5	18.0	23.0
11135	LCol_13b	39.090	−108.608	1138	7/0	7/26/2005–10/11/2006	3.0	11.8	14.0	20.1	21.9
390449108364101	LCol_13b	39.080	−108.612	1140	18/0	11/5/1998–11/14/2000	3.1	7.8	15.5	20.7	26.0

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
390514108373201	LCol_13b	39.087	-108.626	1151	5/0	3/21/1991–5/7/1998	3.0	3.0	10.5	18.0	18.5
390521108373300	LCol_3	39.089	-108.626	1152	16/0	7/20/1994–8/1/2002	1.0	7.6	13.2	21.6	23.4
390607108384201	LCol_3	39.102	-108.647	1157	42/0	12/11/1996–4/18/2002	1.0	6.4	10.0	13.1	22.6
390609108384701	LCol_13b	39.102	-108.648	1158	15/0	10/6/1994–4/18/2002	4.5	4.5	10.5	17.5	25.2
390613108385603	LCol_13b	39.104	-108.650	1160	12/0	12/2/1998–4/18/2002	5.0	5.1	10.7	17.6	21.9
390625108390402	LCol_13b	39.106	-108.652	1161	20/0	3/5/1997–4/18/2002	1.5	4.3	7.4	15.4	25.6
390617108391001	LCol_13b	39.105	-108.653	1162	11/0	2/2/1998–6/12/2001	2.0	3.4	6.0	17.0	19.5
390632108392101	LCol_13b	39.107	-108.656	1163	13/0	3/5/1997–7/22/1999	1.5	3.0	4.0	7.8	24.2
390624108394701	LCol_13b	39.107	-108.663	1166	9/0	3/12/1997–9/4/2001	2.6	7.3	11.5	19.4	20.7
390859108364101	LCol_13b	39.150	-108.612	1176	5/0	2/3/1992–11/21/2004	4.5	7.3	15.0	17.0	18.0
390645108390101	LCol_13b	39.112	-108.651	1191	20/0	3/21/1991–3/7/2006	0.0	7.8	11.4	19.0	21.5
390717108400501	LCol_13b	39.121	-108.669	1209	8/0	3/20/1991–5/12/1998	3.5	9.2	17.0	18.5	20.0
390718108415701	LCol_13b	39.122	-108.700	1211	5/0	3/14/1995–7/31/1996	9.0	12.4	16.7	18.0	18.0
09152900	LCol_13b	39.137	-108.697	1229	84/0	4/3/1973–5/12/1998	0.0	5.8	10.5	16.3	21.5
11133	LCol_13b	39.132	-108.701	1230	9/0	7/26/2005–4/11/2007	2.3	5.9	11.8	16.7	20.0
390741108424001	LCol_3	39.128	-108.711	1237	7/0	7/24/2000–7/2/2003	4.3	8.4	16.0	22.8	23.0
390741108424301	LCol_13b	39.128	-108.712	1238	13/0	7/24/2000–3/8/2006	2.7	7.0	9.6	16.5	20.0
390741108425301	LCol_3	39.129	-108.715	1239	9/0	7/24/2000–7/2/2003	3.9	6.4	15.7	20.1	21.5
09153000	LCol_3	39.137	-108.731	1240	17/0	10/15/1970–8/1/2002	0.3	8.3	11.3	19.6	24.3
000049	LCol_3	39.142	-108.738	1241	73/0	1/9/1968–12/4/1978	0.0	3.9	10.6	16.7	24.4
390938108443101	LCol_13b	39.161	-108.743	1245	5/0	3/20/1991–5/12/1998	0.0	10.0	15.3	16.5	23.0
11110	LCol_13a	39.336	-108.748	1246	10/0	10/12/1995–7/18/1996	0.0	9.9	14.2	26.2	30.6
391509108433001	LCol_13a	39.252	-108.726	1247	8/0	5/2/1991–5/3/2000	2.0	7.4	9.9	14.5	27.9
09153270	LCol_13b	39.164	-108.751	1251	69/0	3/7/1973–3/8/1999	1.5	5.7	9.0	15.5	22.5
09095526	LCol_13b	39.257	-108.757	1255	137/0	10/19/1977–9/10/1984	7.0	12.5	16.0	20.0	24.5
09106104	LCol_13b	39.225	-108.775	1256	61/0	10/13/1976–11/12/1985	0.5	10.5	14.5	19.5	24.0
09095529	LCol_13b	39.273	-108.833	1259	20/0	7/14/2000–9/16/2003	12.4	16.8	18.7	23.3	24.5
090955285	LCol_13b	39.272	-108.833	1260	24/0	4/15/1983–11/13/1985	6.0	11.0	14.0	17.5	23.0

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						Date range	Min	25th	50th	75th	Max
09095528	LCol_13b	39.271	−108.834	1261	32/0	10/12/1976–9/17/1981	6.0	13.5	16.3	20.0	24.0
09153290	LCol_13b	39.211	−108.804	1264	278/0	10/13/1976–10/3/2000	0.0	8.0	12.0	16.0	23.0
09153300	LCol_13b	39.184	−108.787	1266	116/0	4/3/1973–3/8/1999	0.5	5.9	10.0	16.0	21.5
391038108475601	LCol_13b	39.177	−108.800	1268	9/0	7/9/1993–7/14/1999	2.0	7.0	9.5	14.0	19.5
000050	LCol_3	39.175	−108.801	1270	479/0	1/9/1968–7/29/1996	−1.1	5.0	11.7	17.2	26.7
391029108480200	LCol_13b	39.175	−108.801	1271	9/0	11/10/1976–6/25/1991	6.0	6.0	7.0	7.5	14.5
11101	LCol_3	39.170	−108.811	1272	42/0	8/11/1999–4/11/2007	−0.2	3.6	14.2	18.7	25.3
09163310	LCol_13b	39.297	−108.867	1277	56/0	7/2/1973–2/4/1992	0.0	4.5	12.0	17.5	28.0
09163340	LCol_13b	39.266	−108.843	1281	64/0	7/27/1973–6/15/1982	3.0	9.5	12.8	17.8	24.5
09153330	LCol_13b	39.396	−108.981	1285	11/0	6/12/1979–9/14/1981	5.0	15.0	18.5	29.0	32.0
09153400	LCol_13b	39.309	−108.984	1287	32/0	9/12/1973–3/13/1997	2.0	9.0	12.0	24.5	33.0
391646108572301	LCol_13b	39.279	−108.957	1288	5/0	5/2/1991–5/3/2000	0.9	7.0	11.0	19.9	20.4
09161000	LCol_13b	39.329	−108.943	1289	9/0	11/11/1978–11/12/1978	5.0	5.0	5.0	5.0	5.0
09160500	LCol_13b	39.323	−108.931	1290		4/12/1973–9/8/1982	5.0	13.0	15.8	19.5	24.5
09163050	LCol_13b	39.293	−108.934	1291	42/0	4/4/1973–5/13/1998	0.0	3.8	12.0	17.0	23.0
09163490	LCol_13b	39.222	−108.893	1293	99/0	7/9/1959–11/5/2009	0.0	6.0	12.2	17.3	26.0
09163500	LCol_3	39.133	−109.027	1296	782/0	10/11/1995–3/17/2005	0.0	3.2	6.4	8.9	16.1
10485	NFkGunn_1	38.956	−107.268	705	14/0	10/26/1977–9/24/1981	0.0	1.0	6.0	12.0	17.0
09132050	NFkGunn_1	38.954	−107.274	706	108/0	9/9/1965–8/16/1983	0.0	1.0	7.0	13.0	22.0
09129800	NFkGunn_4	39.143	−107.431	708	83/0	8/3/1960–10/7/1965	0.0	5.0	10.8	16.3	23.0
09130600	NFkGunn_4	39.131	−107.575	711	44/0	11/5/1968–10/4/1974	0.0	1.0	6.0	11.0	21.0
09130800	NFkGunn_4	39.116	−107.524	712	50/0	10/15/1968–8/16/1983	0.0	1.0	6.8	12.0	20.0
09131100	NFkGunn_4	39.104	−107.585	713	94/0	6/14/1961–10/9/1973	0.0	3.0	9.0	14.5	24.0
09131200	NFkGunn_4	39.090	−107.505	714	103/0	10/11/1995–3/17/2005	0.6	3.4	5.0	9.4	18.9
10490	NFkGunn_4	38.988	−107.348	718	13/0	7/2/1959–7/21/2009	−0.1	2.5	7.3	12.5	23.5
09132500	NFkGunn_2	38.926	−107.434	721	472/0	5/14/1979–5/25/2006	−0.6	2.6	7.8	11.9	19.4
000152	NFkGunn_2	38.925	−107.518	730	35/0	6/1/1961–9/11/1968	0.0	1.5	4.5	8.5	15.5
09132700	NFkGunn_4	39.057	−107.630	731	46/0	5/11/1961–9/11/1968	0.0	1.5	3.8	8.0	16.0
09132800	NFkGunn_4	39.049	−107.621	732	50/0						

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09132900	NFkGunn_4	39.032	-107.614	733	74/0	6/1/1961–6/19/1973	0.0	1.0	3.8	8.0	12.0
09132920	NFkGunn_4	39.045	-107.567	734	42/0	1/23/1969–10/4/1974	0.0	1.0	6.8	11.0	16.5
09132940	NFkGunn_4	38.982	-107.532	744	14/0	8/28/2001–11/2/2004	0.1	7.0	11.8	14.6	21.0
10406H	NFkGunn_5	38.925	-107.518	749							
09132960	NFkGunn_5	38.926	-107.518	750	23/0	1/2/2002–10/14/2004	0.1	3.3	9.0	13.6	24.6
09132985	NFkGunn_4	38.965	-107.567	759	15/0	8/28/2001–11/2/2004	0.0	5.5	11.1	14.1	20.7
09132995	NFkGunn_5	38.904	-107.562	772	33/0	5/10/1999–3/16/2005	0.0	2.9	7.0	12.0	21.6
09134000	NFkGunn_5	38.870	-107.504	775	173/0	1/2/1986–10/14/2004	0.0	3.0	9.0	13.8	27.0
10436	NFkGunn_5	38.874	-107.588	776	6/0	3/31/1998–3/16/2005	0.7	1.2	3.9	6.3	14.3
09134050	NFkGunn_5	38.874	-107.589	777	46/0	5/21/1976–3/13/2000	0.0	5.0	9.8	14.0	21.5
385144107371701		38.862	-107.622	793	10/0	3/31/1998–5/24/2005	3.9	6.4	7.3	12.9	19.2
09134100	NFkGunn_3	38.858	-107.622	794	28/0	3/2/2000–10/13/2004	0.4	6.3	11.1	16.1	21.9
385049107372402	NFkGunn_6b	38.847	-107.623	795	6/0	5/8/2008–4/14/2009	0.4	2.3	9.3	12.6	16.0
384922107402001	NFkGunn_6b	38.823	-107.673	797	12/0	5/11/1999–4/14/2009	0.4	8.0	13.1	17.8	20.5
09134200	NFkGunn_6b	38.806	-107.687	800	38/0	5/18/1976–7/25/2000	0.0	6.0	14.0	18.2	24.0
384822107411201	NFkGunn_6b	38.806	-107.687	801	11/1	3/31/1998–4/14/2009	0.6	4.3	8.1	11.2	19.1
10212	LGunn_10	38.791	-107.710	803	40/0	10/24/1995–5/25/2006	-0.1	3.6	9.7	14.7	27.3
384747107430501	NFkGunn_6a	38.796	-107.719	804	7/0	10/15/1998–3/14/2000	8.3	9.4	12.5	16.8	16.9
09134500	NFkGunn_5	38.926	-107.794	808	110/0	10/6/1960–6/20/2000	0.0	1.5	7.0	11.0	18.0
09134700	NFkGunn_6b	38.926	-107.793	809	89/0	4/25/1961–6/20/2000	0.0	3.0	9.0	12.0	18.5
10415	NFkGunn_5	38.881	-107.786	816	9/0	10/11/1995–8/6/1996	4.4	7.5	8.9	21.1	22.8
09135900	NFkGunn_5	38.798	-107.732	830	223/0	5/19/1976–12/5/2000	0.5	7.0	12.0	16.5	27.0
10411	NFkGunn_5	38.796	-107.731	831	20/0	4/1/1998–3/15/2005	6.4	9.7	12.1	15.9	21.3
384732107434801	NFkGunn_5	38.792	-107.731	832	7/0	10/14/1998–12/5/2000	4.9	10.6	11.6	16.9	22.1
09135950	NFkGunn_3	38.788	-107.740	833	43/0	3/24/1997–10/13/2004	2.0	10.1	16.0	19.5	25.4
000100	NFkGunn_3	38.767	-107.75	835	191/0	8/11/1971–2/1/2001	0.0	5.6	10.0	15.0	24.4
384434107432701	NFkGunn_6b	38.743	-107.724	836	7/0	5/12/2008–4/10/2009	0.4	7.4	12.1	15.7	19.2
384610107455001	NFkGunn_6b	38.769	-107.765	839	5/0	10/15/1998–3/14/2000	3.9	5.1	9.7	15.0	17.0
231275	NFkGunn_3	38.771	-107.777	840							
231272	NFkGunn_3	38.771	-107.779	841							

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
231273	NFkGunn_3	38.771	−107.779	842							
231274	NFkGunn_3	38.771	−107.779	843							
09136100	NFkGunn_3	38.783	−107.836	849	48/0	7/22/1991– 10/26/2009	1.3	6.6	8.9	16.9	21.2
10400	NFkGunn_3	38.784	−107.835	850	18/0	11/13/2003– 5/15/2007	−0.3	5.2	8.7	14.6	25.6
09136200	LGunn_1	38.783	−107.838	851	213/0	5/12/1962– 9/10/2001	0.0	6.0	11.0	16.0	27.0
384643107540301	LGunn_4a	38.779	−107.901	856	6/0	5/17/1999– 3/14/2000	5.9	7.3	18.4	20.9	21.1
10587	LGunn_4a	38.789	−107.939	862	5/0	4/1/1998– 5/11/2005	3.6	4.6	6.3	7.9	8.5
09137050	LGunn_4a	38.785	−107.939	863	111/0	5/7/1976– 3/28/2001	0.0	6.5	11.5	18.0	27.5
384649107570501	LGunn_4a	38.780	−107.952	868	8/0	7/22/1991– 3/15/2000	7.6	11.0	13.8	17.1	18.5
384624107570701	LGunn_1	38.773	−107.953	869	18/0	7/18/1991– 9/10/2002	3.0	6.8	12.3	17.0	19.0
384604107570701	LGunn_4a	38.768	−107.953	871	11/0	7/22/1991– 3/15/2000	0.0	3.0	14.6	17.5	21.0
000056	LGunn_1	38.776	−107.961	872	162/0	1/10/1968– 8/8/1994	0.0	4.4	8.9	13.3	27.2
09137300	LGunn_1	38.776	−107.961	873							
384551107591901	LGunn_4a	38.764	−107.989	876	108/0	7/22/1991– 3/25/2003	−0.1	4.1	10.1	16.0	20.9
09137500	LGunn_1	38.773	−108.003	877							
09143000	LGunn_8	38.985	−107.855	881	384/0	7/1/1959– 10/12/2004	−0.1	1.0	5.6	11.5	19.0
09143500	LGunn_8	38.902	−107.921	888	417/0	7/1/1959– 10/12/2004	−0.1	2.0	7.0	12.0	22.5
000116	LGunn_7	38.833	−107.967	889	62/0	8/11/1971– 6/14/1982	0.0	3.9	7.8	13.9	25.0
09139200	LGunn_7	38.984	−107.972	892	103/0	7/1/1959– 10/2/1969	0.0	4.0	8.0	12.0	19.0
09140200	LGunn_7	38.987	−107.944	893	101/0	7/1/1959– 10/2/1969	0.0	3.0	7.0	12.0	19.0
09140700	LGunn_4a	38.927	−107.951	896	75/0	7/1/1959– 9/5/1968	0.0	2.0	6.5	11.0	18.5
09141200	LGunn_7	38.958	−107.919	897	111/0	7/1/1959– 10/1/1969	0.0	2.0	7.0	12.0	20.0
09137800	LGunn_4a	38.945	−108.028	901	89/0	6/16/1959– 10/7/1969	0.0	4.5	10.0	12.0	19.5
10582	LGunn_7	38.788	−107.995	904							
09144200	LGunn_7	38.788	−107.995	905	219/0	7/2/1959– 6/5/2000	0.0	7.5	12.0	17.5	29.0
10516	LGunn_1	38.751	−108.069	913	21/0	1/3/2001– 9/10/2003	0.1	3.6	12.2	19.4	21.8
09144250	LGunn_1	38.753	−108.078	914	327/0	10/7/1976– 11/3/2009	0.0	6.0	11.0	16.0	23.0
383404107534101	Uncom_12	38.568	−107.895	924	22/0	2/29/2000– 2/6/2009	0.0	3.6	7.0	12.8	16.7
383408107535101	Uncom_12	38.569	−107.898	926	53/0	3/10/1992– 11/4/2009	0.0	3.3	8.7	13.9	18.2
383528107552001	Uncom_12	38.591	−107.923	931	52/0	2/29/2000– 4/21/2003	0.0	2.0	9.1	14.3	20.8
383741107565701	Uncom_12	38.628	−107.950	936	14/0	2/29/2000– 12/13/2002	0.0	4.4	12.4	16.1	19.2

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
383728107572001	Uncom_12	38.624	-107.956	940	53/0	2/29/2000–4/21/2003	0.6	4.4	9.1	15.3	19.0
10661	Uncom_12	38.658	-107.992	955	14/0	4/1/1998–4/19/2007	-0.1	4.6	9.7	12.3	18.4
383946107595301	Uncom_12	38.663	-107.999	957	97/0	7/23/1991–11/4/2009	0.0	4.0	9.5	15.0	20.8
383953108001701	Uncom_12	38.665	-108.005	958	5/0	2/19/1992–2/13/2001	0.5	3.0	4.5	7.1	13.7
384231108020301	Uncom_12	38.709	-108.035	962	8/0	11/17/1987–9/17/2007	4.0	9.3	16.2	20.2	22.9
10602	Uncom_4b	38.703	-108.046	966	8/0	4/1/1998–6/16/2005	4.4	6.5	12.5	15.6	18.1
09149480	Uncom_12	38.646	-108.049	974	51/0	10/26/1995–9/2/1998	-0.2	6.0	8.5	15.7	21.5
384202108032001	Uncom_12	38.701	-108.056	976	19/0	11/28/1978–2/13/2001	0.0	3.6	6.5	13.5	20.5
10611	Uncom_12	38.716	-108.057	978	5/0	4/1/1998–4/14/2005	4.0	4.1	7.8	9.6	11.4
000055	Uncom_4b	38.741	-108.080	979	455/0	1/11/1968–6/13/2007	-1.1	4.4	10.6	16.1	25.0
09149500	Uncom_4b	38.742	-108.081	980	704/0	6/16/1959–11/3/2009	0.0	5.5	11.0	16.0	32.0
384448108070301	LGunn_4a	38.747	-108.118	990	14/0	7/15/1991–3/20/2000	2.0	4.1	8.6	15.9	20.0
10515	LGunn_2	38.748	-108.121	991	31/0	1/12/1999–6/13/2007	1.4	4.0	10.5	15.8	20.4
384408108091501	LGunn_4a	38.736	-108.155	995	5/0	1/29/1992–5/14/1998	1.5	11.2	14.0	15.0	16.0
10562	LGunn_5	38.639	-108.196	998	10/0	10/30/1995–7/22/1996	0.0	2.2	9.2	14.3	28.3
384013108091401	LGunn_6	38.670	-108.155	1001	6/0	7/15/1991–7/20/1999	0.5	6.5	19.5	25.0	25.5
09150500	LGunn_6	38.735	-108.162	1007	114/0	5/6/1976–3/20/2000	0.0	6.0	11.0	16.0	24.5
384510108111801	LGunn_4a	38.753	-108.189	1010	10/0	11/24/1995–4/4/2000	0.0	0.2	0.7	2.2	8.1
384527108152701	LGunn_2	38.757	-108.258	1013	9/0	11/19/1987–9/8/1999	3.0	4.0	11.2	14.9	24.0
10555	LGunn_6	38.628	-108.396	1014	13/0	10/4/1995–5/2/2005	0.6	5.6	7.8	13.3	20.6
10551	LGunn_6	38.718	-108.269	1017	12/0	10/4/1995–9/28/2004	1.7	5.8	11.9	17.8	22.2
09151500	LGunn_6	38.757	-108.260	1019	142/0	5/7/1976–5/25/2005	0.0	6.0	11.0	18.0	30.0
384813108184301	LGunn_4a	38.804	-108.313	1021	12/0	3/10/1999–4/19/2007	-0.3	4.0	12.1	18.7	22.5
10505A	LGunn_4a	38.894	-108.446	1029							
WSWF2CR	LGunn_8	38.960	-108.214	1045	7/0	11/1/1989–5/5/1997	4.0	4.2	7.0	16.5	17.0
WSEF2CR	LGunn_8	38.960	-108.214	1046	7/0	11/1/1989–5/5/1997	4.0	4.2	6.5	16.5	17.0
WSTWOCR	LGunn_8	38.963	-108.214	1047	41/0	7/1/1987–8/29/2006	1.0	6.0	9.5	14.0	20.0
WSKCINTK	LGunn_8	38.963	-108.226	1048							
10575	LGunn_8	38.962	-108.230	1049	11/0	9/14/1995–5/2/2005	1.1	2.2	5.0	8.9	18.3

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	CDPHE segment	Latitude (decimal degrees)	Longitude (decimal degrees)	Downstream order number	No. of samples/ No. of censored	Temperature, water, degrees Celsius					
						Date range	Min	25th	50th	75th	Max
09152000	LGunn_8	38.962	−108.230	1050	288/0	7/10/1959–10/17/2003	0.0	3.0	8.0	13.0	24.5
WSKCBLCG	LGunn_8	38.962	−108.232	1051	24/0	1/13/1988–7/1/1991	0.0	3.1	5.9	15.0	21.0
WSJUNNLT	LGunn_4b	38.962	−108.274	1052	13/0	3/11/2002–10/8/2007	2.1	5.0	5.3	9.3	15.3
WSJUNNLTLO	LGunn_4b	38.963	−108.275	1053	10/0	9/14/1995–5/2/2005	5.0	7.2	8.9	13.3	21.1
10572	LGunn_4b	38.930	−108.332	1055	10/0	7/1/1987–7/1/1991	3.0	7.1	9.0	10.4	17.2
WSNFKCWR	LGunn_3	39.013	−108.232	1057	17/0	7/1/1987–10/8/2007	0.0	5.9	10.0	14.0	21.7
WSNFKCDV	LGunn_4a	38.997	−108.277	1058	81/0	9/1/1989–7/1/1991	4.4	5.5	10.1	11.9	13.0
WSNFKCSR	LGunn_3	39.004	−108.238	1059	6/0	4/29/1999–3/12/2002	0.0	3.8	13.4	16.6	21.8
WSNFKCINLT	LGunn_4a	38.969	−108.285	1060	17/0	3/9/1999–4/26/2006	−0.2	10.3	12.7	17.2	24.1
385600108250301	LGunn_4b	38.933	−108.418	1068	5/0	10/6/2003–10/8/2007	5.7	6.3	9.0	13.2	17.8
10530	LGunn_4b	38.939	−108.426	1069	6/0	7/1/1991–8/8/2006	4.0	10.0	13.9	16.5	20.5
WSLOCKDRW	LGunn_4a	39.008	−108.346	1082	41/0	4/29/1999–5/23/2002	−0.1	4.4	12.2	17.7	20.9
WSWHITCR	LGunn_4a	39.001	−108.374	1083	21/0	1/12/1999–5/15/2007	−0.3	4.4	12.2	18.0	23.6
385839108264401	LGunn_4a	38.977	−108.446	1097	42/0	3/11/1997–6/8/1999	2.0	7.8	11.0	15.0	24.0
10505	LGunn_2	38.984	−108.451	1098	807/0	4/1/1960–9/28/2009	0.0	6.0	11.9	17.2	25.5
CDOWRW-562	LGunn_2	38.984	−108.451	1099	182/0	1/11/1968–4/30/1979	0.0	4.4	10.0	16.7	25.0
09152500	LGunn_2	38.983	−108.451	1100	27/0	4/29/1999–9/10/2003	0.7	9.5	12.5	18.5	21.5
000054	LGunn_2	38.983	−108.45	1101	95/0	4/2/1973–5/7/1998	0.5	8.0	14.0	18.5	25.0
09152520	LGunn_4a	38.989	−108.449	1102							
09152600	LCol_13b	39.047	−108.572	1109							

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Site identification number	Temperature, aq life		Temperature, aq life, maximum weekly average temperature (MWAT)		No. of samples/ No. of censored	Date range	Dissolved oxygen (DO), water, unfiltered, mg/L				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
09302450	2	10/1/1969– 8/5/1970			9/0	8/17/1999– 6/11/2007	6.5	7.9	9.3	9.9	11.2
09304100	6	10/5/1960– 7/7/1964									
395643107461200 09304200					116/0	8/8/1973– 7/22/2009	7.1	8.9	9.9	11.2	12.8
09304480	5	5/24/1979– 5/24/1984			5/0	8/26/1981– 6/11/2007	9.2	9.3	10.4	11.4	11.8
09304300	2	9/1/1965– 5/24/1966									
09304500					9/0	8/8/1973– 8/27/1981	9.1	9.5	11.0	11.8	12.2
09304550	53	5/29/1974– 7/11/1984			5/0	8/30/1973– 8/26/1981	7.8	8.0	8.7	8.8	10.2
09304600 4000001075434					10/0	10/19/1999– 6/11/2007	6.0	8.3	9.0	10.0	11.8
400113107574500 000043					103/0	3/13/1973– 4/21/1992	7.9	10.2	11.2	12.4	14.9
400206108005901 09304800	3	7/20/1977– 7/18/2002			4/0 187/0	4/24/1974– 9/29/2009	6.5	8.8	9.9	11.2	14.2
ENPR20ST ENPR21ST ENPR19ST											
09306007	44	5/31/1974– 10/4/1994			229/0	4/23/1974– 9/3/1998	6.2	8.9	9.8	10.7	14.5
09306025	24	5/3/1974– 7/22/1976			36/0	5/3/1974– 2/18/1980	5.0	8.1	9.1	9.8	11.8
09306028 09306022	6	4/23/1984– 4/17/1997			156/0	9/12/1974– 9/3/1998	6.4	9.0	9.9	10.5	13.9
09306033 09306039 09306042					68/0	3/17/1977– 6/18/1991	4.8	6.8	7.6	8.9	13.0
09306050 09306052 09306058	5	7/22/1976– 3/23/1998			186/0	4/23/1974– 9/3/1998	6.4	8.6	9.7	10.6	13.2
09306061	31	4/23/1974– 5/19/1982			185/0	4/23/1974– 11/19/1991	6.4	8.6	9.7	10.7	13.4
11625	2	8/18/1999– 5/16/2000			8/0	8/18/1999– 6/21/2007	8.1	8.6	9.2	9.7	13.5
09306175	20	3/31/1976– 5/19/1982			118/0	1/15/1975– 8/17/1983	6.0	8.7	9.5	10.4	12.8
09306200	8	7/15/1965– 7/29/2003			254/0	1/27/1971– 7/8/2009	5.8	8.7	9.8	11.0	13.7
09306210					44/0	1/27/1971– 8/18/1976	6.1	8.9	10.1	11.0	12.3

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Site identification number	Temperature, aq life		Temperature, aq life, maximum weekly average temperature (MWAT)		No. of samples/ No. of censored	Date range	Dissolved oxygen (DO), water, unfiltered, mg/L				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
09306222	2	7/17/1972– 7/27/1978			245/0	1/27/1971– 7/7/2009	3.6	8.6	9.6	10.7	16.2
000117					101/0	3/13/1973– 4/21/1992	7.6	9.2	10.6	11.8	13.8
09306224					33/0	11/9/1982– 9/29/2009	7.8	8.5	9.5	10.6	12.7
09306240					22/0	4/27/1974– 5/22/1984	5.5	7.0	8.3	9.0	11.9
09306241											
09306235					75/0	3/14/1974– 11/8/1988	2.0	7.6	9.0	10.2	12.6
09306242					187/0	3/25/1974– 7/8/2009	4.4	7.0	7.9	9.4	13.0
09306244					20/0	6/12/1975– 10/24/1978	4.4	8.3	9.4	11.0	13.4
11702					30/0	9/14/1999– 6/12/2007	7.3	8.3	9.7	11.3	13.1
09306255	6	10/15/1975– 8/26/1981			170/0	5/3/1974– 7/7/2009	4.4	9.0	9.9	11.5	14.2
09306290	1	8/22/1984– 8/22/1984			161/0	11/9/1982– 9/30/2009	7.0	8.4	9.5	10.4	13.1
09306300					72/0	8/6/1975– 9/22/1982	6.0	8.1	9.3	11.3	13.4
09306305					90/0	4/21/1995– 7/28/2009	4.7	7.9	8.7	9.5	12.4
09306380					21/0	2/8/1977– 5/4/1995	5.8	8.2	10.0	10.1	10.4
400535108485700					9/0	8/25/1981– 7/28/2009	7.2	8.1	9.1	10.3	12.2
000044					48/0	3/13/1973– 6/7/1982	7.0	8.8	9.9	11.7	13.2
09072500											
CDOWRW-46	1	7/18/2002– 7/18/2002			245/0	11/26/1990– 5/7/2007	5.0	8.9	10.0	11.4	15.0
12100					8/0	2/14/2001– 7/16/2002	7.5	8.5	9.5	11.5	12.3
CDOWRW-47					243/0	11/26/1990– 5/7/2007	4.0	9.0	10.0	12.0	16.0
09085100					11/0	3/19/1991– 6/19/1995	8.3	8.5	9.1	10.5	12.6
11109A					5/0	10/23/2000– 4/18/2007	5.7	9.6	9.7	11.0	14.0
CDOWRW-197					6/0	1/8/2000– 5/11/2001	9.1	9.4	10.3	10.8	10.9
09085150					22/0	4/13/2006– 10/13/2009	7.3	9.0	9.6	10.9	13.0
09085200	3	10/1/1969– 10/5/1981									
09085400											
09085300											
000047	2	1/8/1974– 11/28/1977			445/0	3/15/1973– 4/18/2007	2.0	9.4	10.5	12.2	15.8

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Temperature, aq life		Temperature, aq life, maximum weekly average temperature (MWAT)		No. of samples/ No. of censored	Date range	Dissolved oxygen (DO), water, unfiltered, mg/L				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
000147					93/0	5/31/1979– 4/24/1998	6.0	9.2	10.5	12.0	14.2
09092600	1	3/20/1969– 3/20/1969									
09092830					33/0	1/9/1978– 3/23/1983	7.1	8.4	9.4	10.6	12.0
09092850					34/0	1/9/1978– 7/29/1983	6.7	8.5	9.8	10.8	11.6
ENPR13ST					5/0	3/11/2003– 5/31/2007	1.6	4.8	8.9	11.4	12.5
ENPR12ST					5/0	5/5/2005– 5/4/2006	1.8	3.9	8.6	9.8	9.9
ENPR4ST ENPR1ST					6/0	10/27/2004– 4/27/2006	7.1	8.1	10.5	12.9	13.5
ENPR2ST					6/0	10/27/2004– 4/27/2006	7.0	7.9	10.2	12.3	13.1
ENPR10ST ENPR9ST ENPR5ST ENPR6ST 09092800	4	7/14/1960– 10/5/1962									
ENPR3ST					7/0	10/27/2004– 4/27/2006	2.3	5.1	9.3	10.1	11.9
11145A	1	5/30/2000– 5/30/2000			16/0	9/30/1999– 4/10/2007	8.2	9.8	10.3	10.7	14.0
11145B	1	5/30/2000– 5/30/2000			16/0	9/30/1999– 4/10/2007	7.7	9.6	10.4	11.2	12.7
09092960					37/0	12/6/1976– 9/7/1983	6.3	7.5	8.4	9.5	10.2
09092970					43/0	4/21/1977– 9/9/1983	6.5	8.3	9.4	10.1	11.1
ENPR16ST 09092980					38/0	4/21/1978– 9/12/1983	6.4	8.4	9.3	9.6	11.6
ENPR18ST ENPR17ST ENPR14ST					6/0	10/27/2004– 5/19/2006	3.5	4.1	6.8	10.8	11.5
ENPR15ST					5/0	10/27/2004– 5/5/2006	2.9	6.1	9.6	12.0	13.0
ENPR11ST	1	5/9/2005– 5/9/2005			6/0	10/27/2004– 5/5/2006	2.6	5.0	10.5	13.4	14.2
09093000	1	3/25/1968– 3/25/1968			59/0	4/21/1975– 9/24/1981	7.8	8.6	9.4	10.6	13.0
11210	1	7/30/1996– 7/30/1996			10/0	10/18/1995– 8/21/1996	7.6	8.6	9.5	10.2	11.7
09093500					68/0	11/21/1974– 10/13/1982	7.4	9.0	9.8	11.1	12.9
09093700					88/0	8/30/1972– 10/25/1982	7.4	8.6	9.2	11.2	14.2

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Temperature, aq life		Temperature, aq life, maximum weekly average temperature (MWAT)		Dissolved oxygen (DO), water, unfiltered, mg/L						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
390607108384201					6/0	4/2/1998– 4/18/2002	8.7	8.8	9.2	9.9	10.2
390609108384701					5/0	4/8/1999– 4/18/2002	4.3	5.6	7.4	8.7	9.3
390613108385603					8/0	2/10/1998– 4/18/2002	4.4	5.3	7.8	9.7	10.2
390625108390402											
390617108391001											
390632108392101											
390624108394701											
390859108364101					6/0	3/21/1991– 3/7/2006	7.3	8.7	9.6	11.5	12.0
390645108390101											
390717108400501											
390718108415701											
09152900											
11133					43/0	8/7/1973– 5/12/1998	7.0	8.1	9.7	11.8	14.1
390741108424001					9/0	7/26/2005– 4/11/2007	7.3	7.6	8.7	9.9	11.3
390741108424301					5/0	3/5/2003– 3/8/2006	7.0	8.7	10.9	12.2	13.1
390741108425301											
09153000											
000049											
390938108443101											
11110					27/0	3/15/1973– 12/4/1978	7.0	8.3	9.8	11.8	14.7
391509108433001					10/0	10/12/1995– 7/18/1996	5.4	7.3	8.6	9.9	12.3
09153270											
09095526											
09106104											
09095529											
090955285					35/0	8/7/1973– 5/13/1998	7.4	8.4	9.7	10.5	12.8
09095528											
09153290											
09095526											
09106104											
09095529					19/0	7/14/2000– 9/16/2003	6.5	7.2	7.7	8.4	9.4
090955285					56/0	9/10/1991– 9/8/1998	7.0	7.8	8.7	10.4	13.1
09095528											
09153290											
09153300											
391038108475601											
000050					62/0	8/7/1973– 5/13/1998	6.5	8.2	9.6	11.2	13.6
391029108480200					442/0	3/15/1973– 7/29/1996	6.8	8.5	9.8	11.6	15.0
11101											
09163310											
					8/0	11/10/1976– 3/20/1991	8.3	8.6	9.4	10.4	10.9
					43/0	8/11/1999– 4/11/2007	6.5	8.6	9.7	12.4	16.8
					50/0	8/8/1973– 2/4/1992	7.0	8.2	9.1	10.1	12.6

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Temperature, aq life		Temperature, aq life, maximum weekly average temperature (MWAT)		Dissolved oxygen (DO), water, unfiltered, mg/L						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09163340					47/0	8/8/1973– 6/15/1982	6.5	7.8	8.4	9.0	10.1
09153330	3	6/12/1979– 7/14/1981									
09153400	3	9/12/1973– 8/9/1983			11/0	9/12/1973– 10/5/1981	6.2	6.6	8.8	9.4	11.9
391646108572301											
09161000											
09160500											
09163050					23/0	8/8/1973– 7/15/1980	6.8	7.5	8.1	9.2	9.8
09163490					58/0	8/8/1973– 5/13/1998	6.9	8.0	9.1	11.4	13.8
09163500					385/0	5/5/1970– 11/5/2009	5.5	8.0	9.2	10.6	14.6
10485					14/0	10/11/1995– 3/17/2005	7.6	9.8	10.6	11.2	12.4
09132050					35/0	10/26/1977– 9/1/1981	7.4	8.9	9.6	10.4	12.7
09129800			8	9/9/1965– 8/16/1983							
09130600			6	6/26/1963– 7/21/1965							
09130800			2	9/2/1969– 6/23/1970							
09131100			2	4/23/1969– 8/16/1983							
09131200			8	7/15/1963– 8/17/1971							
10490					13/0	10/11/1995– 3/17/2005	7.8	9.1	10.6	11.0	12.4
09132500			12	8/1/1960– 9/12/2007	37/0	10/20/1977– 8/24/1982	6.8	8.3	8.8	10.0	13.4
000152					35/0	5/14/1979– 5/25/2006	7.4	9.1	10.3	11.8	15.8
09132700											
09132800											
09132900											
09132920											
09132940			1	7/2/2002– 7/2/2002							
10406H											
09132960			3	7/2/2002– 8/12/2003							
09132985			2	8/28/2001– 8/13/2003							
09132995			2	7/2/2002– 8/12/2003	4/0						
09134000			2	6/25/1986– 7/8/1986							
10436											
09134050			1	7/13/1978– 7/13/1978							

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Temperature, aq life		Temperature, aq life, maximum weekly average temperature (MWAT)		Dissolved oxygen (DO), water, unfiltered, mg/L						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
385144107371701 09134100			4	8/23/2000– 7/3/2002							
385049107372402 384922107402001 09134200 384822107411201 10212			6	7/8/1996– 7/11/2005	34/0	10/24/1995– 5/25/2006	5.9	8.3	10.1	11.4	16.0
384747107430501 09134500			2	8/2/1966– 7/16/1968							
09134700			2	7/19/1962– 8/15/1963							
10415			2	7/10/1996– 8/6/1996	9/0	10/11/1995– 8/6/1996	7.0	7.5	10.6	12.4	14.0
09135900			19	7/13/1976– 7/24/1996	9/0	3/19/1991– 8/11/1993	7.5	8.3	8.6	9.8	11.1
10411			1	6/14/2000– 6/14/2000	17/0	8/10/1999– 3/15/2005	8.1	8.8	9.4	10.5	12.3
384732107434801			1	6/20/2000– 6/20/2000							
09135950			10	7/10/1997– 8/9/2004							
000100			6	7/26/1977– 6/14/2000	173/1	3/14/1973– 2/1/2001	1.0	9.5	10.4	11.8	17.6
384434107432701 384610107455001 231275					24/0	5/12/1971– 4/5/1972	7.7	8.5	8.8	9.3	10.9
231272					24/0	5/12/1971– 4/5/1972	8.0	8.3	9.1	9.8	11.2
231273					24/0	5/12/1971– 4/5/1972	6.0	6.8	7.0	8.0	8.4
231274					24/0	5/12/1971– 4/5/1972	7.7	8.4	8.9	9.1	9.9
09136100			5	7/22/1991– 9/3/2009	6/0	7/22/1991– 10/26/2009	8.8	8.8	9.6	10.2	10.9
10400			2	7/22/2004– 7/11/2005	18/0	11/13/2003– 5/15/2007	8.4	9.3	9.4	10.4	13.1
09136200			20	8/23/1962– 8/23/1983							
384643107540301 10587 09137050 384649107570501 384624107570701 384604107570701 000056			4	7/24/1969– 8/16/1988	117/0	3/14/1973– 8/8/1994	6.7	9.5	10.5	11.9	14.9
09137300 384551107591901					13/0	7/22/1991– 3/25/2003	6.3	8.2	8.9	10.8	12.0

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Temperature, aq life		Temperature, aq life, maximum weekly average temperature (MWAT)		No. of samples/ No. of censored	Date range	Dissolved oxygen (DO), water, unfiltered, mg/L				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
09137500											
09143000			5	8/4/1960– 7/26/1999							
09143500			8	8/9/1961– 10/8/1986							
000116					49/0	3/14/1973– 6/14/1982	7.8	9.4	10.5	11.8	13.4
09139200			3	8/9/1961– 8/1/1966							
09140200			2	8/5/1960– 8/9/1961							
09140700											
09141200			4	8/10/1959– 8/1/1966							
09137800			3	6/4/1963– 7/21/1964							
10582											
09144200											
10516			5	6/18/2001– 7/16/2003	21/0	1/3/2001– 9/10/2003	7.2	9.6	11.1	12.6	16.0
09144250			11	7/26/1979– 8/3/2004	20/0	11/19/1987– 11/3/2009	6.9	8.4	10.1	11.4	13.2
383404107534101					7/0	1/7/2003– 12/23/2008	8.8	9.8	11.2	11.7	11.8
383408107535101					16/0	3/10/1992– 4/21/2003	7.7	8.3	8.9	10.6	11.6
383528107552001					20/0	4/25/2002– 4/21/2003	6.9	8.3	9.4	11.4	11.8
383741107565701											
383728107572001					22/0	4/25/2002– 4/21/2003	6.4	7.6	9.5	11.2	12.2
10661					11/0	11/2/2004– 4/19/2007	7.2	7.6	8.3	10.5	13.4
383946107595301					22/0	7/23/1991– 12/22/2008	6.4	7.8	8.8	10.9	12.7
383953108001701											
384231108020301											
10602					6/0	8/18/2004– 6/16/2005	8.1	8.1	9.7	13.0	13.0
09149480					44/0	10/26/1995– 9/2/1998	7.4	8.8	9.9	11.3	13.6
384202108032001					11/0	7/10/1991– 5/21/1998	7.0	8.2	9.2	10.5	12.2
10611											
000055					401/0	3/14/1973– 6/13/2007	3.6	8.6	9.8	11.9	17.3
09149500			1	7/30/1986– 7/30/1986	78/0	5/18/1970– 11/3/2009	1.0	8.6	9.8	11.3	13.6
384448108070301											
10515					30/0	1/12/1999– 6/13/2007	7.2	9.4	10.4	12.8	16.0
384408108091501											
10562			2	6/11/1996– 7/22/1996	10/0	10/30/1995– 7/22/1996	6.2	8.9	10.1	11.8	12.6

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Temperature, aq life		Temperature, aq life, maximum weekly average temperature (MWAT)		Dissolved oxygen (DO), water, unfiltered, mg/L						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
384013108091401			2	7/15/1991– 7/20/1999							
09150500			13	6/15/1976– 7/20/1999							
384510108111801 384527108152701					7/0	11/19/1987– 5/20/1998	7.5	9.7	10.8	12.0	12.8
10555			1	7/29/1996– 7/29/1996	13/0	10/4/1995– 5/2/2005	7.7	8.9	10.3	10.9	12.3
10551			2	6/20/1996– 8/19/1996	12/0	10/4/1995– 9/28/2004	7.2	8.3	9.9	10.6	12.4
09151500			20	7/15/1976– 7/20/1999	4/0						
384813108184301 10505A					12/0	3/10/1999– 4/19/2007	6.3	8.6	9.9	10.9	12.0
WSWF2CR WSEF2CR WSTWOCR WSKCINTK					15/0	7/1/1987– 7/17/1990	7.4	8.0	9.5	10.0	11.5
10575					11/0	9/14/1995– 5/2/2005	7.8	9.3	11.2	11.6	12.0
09152000			3	8/8/1961– 8/5/1966							
WSKCBLCG			1	7/25/1989– 7/25/1989	10/0	11/15/1987– 7/17/1990	7.4	7.9	10.2	11.4	11.5
WSJUNNLT WSJUNNLTLO 10572					10/0	9/14/1995– 5/2/2005	8.2	9.5	10.8	11.7	11.8
WSNFKCWR			1	6/22/1988– 6/22/1988	8/0	7/1/1987– 7/17/1990	7.6	7.8	9.1	10.0	11.2
WSNFKCDV					15/0	7/1/1987– 7/17/1990	7.6	9.5	10.0	11.1	12.6
WSNFKCSR WSNFKCINLT 385600108250301 10530 WSLOCKDRW WSWHITCR 385839108264401 10505					65/0	1/12/1999– 5/15/2007	6.5	8.3	9.9	11.7	16.1
CDOWRW-562					45/0	3/11/1997– 6/8/1999	6.5	8.3	9.0	10.5	16.0
09152500					355/0	4/24/1970– 9/28/2009	6.3	8.1	9.2	10.6	13.7
000054					136/0	3/15/1973– 4/30/1979	6.3	8.4	9.6	11.0	14.0
09152520 09152600					28/0	8/7/1973– 5/7/1998	6.6	8.8	10.1	11.5	12.7

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09302450			2	8/17/1999– 6/7/2000	9/0	8/17/1999– 6/11/2007	7.80	8.00	8.13	8.35	8.50
09304100 395643107461200 09304200					424/0	3/20/1970– 7/22/2009	7.50	8.20	8.30	8.50	9.10
09304480					296/0	7/6/1978– 6/11/2007	7.50	8.00	8.10	8.20	8.70
09304300 09304500					14/0	12/15/1970– 9/24/2005	7.80	8.00	8.25	8.58	9.50
09304550					299/0	8/30/1973– 9/23/2005	7.60	8.10	8.20	8.40	8.80
09304600					296/0	7/6/1978– 9/24/2005	7.40	8.20	8.30	8.50	9.10
4000001075434					12/0	10/19/1999– 6/11/2007	6.70	7.75	8.05	8.34	10.20
400113107574500 000043					136/0	1/24/1968– 4/21/1992	7.30	8.10	8.40	8.60	9.20
400206108005901					6/0	6/24/2005– 6/11/2007	8.07	8.11	8.16	8.43	8.46
09304800			4	8/13/1975– 8/12/1976	457/0	5/30/1974– 9/29/2009	6.30	8.10	8.27	8.40	9.00
ENPR20ST					5/0	5/19/2005– 9/23/2008	8.60	8.60	8.70	9.55	10.14
ENPR21ST					5/0	8/18/2005– 9/23/2008	7.79	8.00	8.30	9.06	9.71
ENPR19ST					7/0	5/19/2005– 9/17/2008	7.60	7.70	8.19	8.40	9.03
09306007			4	6/4/1975– 7/8/1987	239/0	4/23/1974– 9/3/1998	6.90	8.20	8.30	8.40	8.80
09306025	1	5/20/1975– 5/20/1975	4	5/31/1974– 7/1/1975	41/0	5/3/1974– 2/18/1980	7.40	8.20	8.40	8.60	8.90
09306028 09306022			3	6/14/1978– 6/13/1996	165/0	9/12/1974– 9/3/1998	7.40	8.10	8.25	8.40	8.80
09306033 09306039					8/0	12/5/1974– 3/11/1985	7.80	8.20	8.25	8.40	8.50
09306042	1	6/9/1981– 6/9/1981			71/0	3/17/1977– 6/18/1991	8.10	8.60	8.90	9.01	9.30
09306050 09306052 09306058			1	10/25/1978– 10/25/1978	192/0	4/23/1974– 9/3/1998	7.80	8.19	8.30	8.40	8.90
09306061			4	8/10/1974– 10/25/1978	194/0	4/23/1974– 11/19/1991	7.00	8.10	8.20	8.40	9.50
11625					8/0	8/18/1999– 6/21/2007	7.95	8.10	8.33	8.46	8.59
09306175			2	6/12/1975– 5/18/1978	124/0	1/15/1975– 8/17/1983	7.50	8.00	8.20	8.30	8.80
09306200	1	7/9/1981– 7/9/1981	3	6/12/1975– 8/11/1999	285/0	6/8/1965– 7/8/2009	7.10	8.14	8.30	8.43	8.90

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09306210					56/0	12/15/1970– 8/18/1976	7.40	7.90	8.10	8.25	8.70
09306222	3	7/21/1976– 8/28/1991			278/0	6/8/1965– 7/7/2009	7.40	8.27	8.50	8.60	8.90
000117					102/0	11/2/1971– 4/21/1992	7.40	8.10	8.40	8.60	8.90
09306224					48/0	11/9/1982– 9/29/2009	8.00	8.20	8.40	8.50	8.70
09306240					27/0	4/27/1974– 3/11/1985	6.90	8.00	8.10	8.30	9.00
09306241											
09306235	1	5/7/1985– 5/7/1985			87/0	3/14/1974– 11/8/1988	7.30	7.90	8.10	8.30	8.70
09306242	2	6/24/1975– 5/13/1981			195/0	3/14/1974– 7/8/2009	7.10	7.77	7.90	8.10	8.50
09306244	1	6/12/1975– 6/12/1975			25/0	6/12/1975– 10/24/1978	7.40	8.05	8.10	8.30	8.60
11702					31/0	9/14/1999– 6/12/2007	7.20	8.20	8.40	8.63	9.03
09306255	1	7/10/1981– 7/10/1981			167/0	4/8/1965– 7/7/2009	7.60	8.50	8.60	8.70	9.10
09306290					181/0	11/9/1982– 9/30/2009	7.50	8.30	8.40	8.50	8.80
09306300					77/0	8/6/1975– 9/22/1982	7.40	8.10	8.30	8.40	8.70
09306305	2	7/30/1998– 8/30/2000			81/0	4/21/1995– 7/28/2009	7.63	8.20	8.40	8.50	8.70
09306380					23/0	2/8/1977– 11/8/1995	7.85	8.30	8.44	8.50	8.59
400535108485700					9/0	8/25/1981– 7/28/2009	8.10	8.40	8.50	8.60	8.65
000044					82/0	1/24/1968– 6/7/1982	7.30	8.10	8.30	8.60	8.90
09072500					52/0	11/29/1958– 3/24/1966	7.00	7.50	7.70	7.95	8.20
CDOWRW-46	2	4/14/1995– 9/19/1996	7	5/12/1993– 11/18/2004	241/0	11/26/1990– 5/7/2007	7.08	7.94	8.11	8.25	9.14
12100					9/0	2/14/2001– 8/20/2002	7.85	7.94	8.06	8.26	8.40
CDOWRW-47	3	2/21/1996– 12/15/2004	9	5/20/1993– 2/23/2007	238/0	11/26/1990– 5/7/2007	7.32	8.00	8.20	8.39	8.76
09085100					262/0	12/6/1977– 6/19/1995	6.80	7.90	8.00	8.20	8.90
11109A	1	4/18/2007– 4/18/2007	1	4/18/2007– 4/18/2007	5/0	10/23/2000– 4/18/2007	8.09	8.21	8.26	8.39	8.46
CDOWRW-197					6/0	1/8/2000– 5/11/2001	8.45	8.46	8.50	8.92	9.42
09085150					22/0	4/13/2006– 10/13/2009	7.90	8.09	8.35	8.52	8.72
09085200											
09085400											
09085300											
000047	1	10/27/1992– 10/27/1992	1	10/27/1992– 10/27/1992	470/0	1/4/1968– 4/18/2007	6.45	8.10	8.30	8.50	9.50

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
CDOWRW-546			3	9/9/1998– 8/25/2003	91/0	11/25/1995– 5/7/2004	7.82	8.06	8.23	8.37	9.10
09086470 11190H					5/0	11/30/2000– 4/18/2007	8.09	8.20	8.23	8.34	8.44
09086000 09086970 11195					11/0	10/2/1995– 8/21/1996	8.20	8.40	8.40	8.50	8.60
CDOWRW-547	1	3/17/1998– 3/17/1998	3	8/15/1996– 3/11/1999	76/0	11/25/1995– 5/7/2004	8.04	8.19	8.32	8.44	8.81
09087600					18/0	7/31/2002– 11/7/2008	7.82	8.17	8.30	8.38	8.53
11189	1	8/18/1999– 8/18/1999	3	8/18/1999– 7/18/2000	10/0	8/18/1999– 10/17/2006	6.80	7.45	8.08	8.34	8.78
09089000 11185					10/0	10/2/1995– 8/15/1996	8.30	8.45	8.60	8.70	8.70
09089500					22/0	5/1/1986– 8/23/1990	7.90	8.00	8.12	8.32	8.58
LANG6ST	16	10/27/2004– 3/12/2007	19	5/3/2004– 3/12/2007	117/0	4/13/2004– 9/29/2008	7.48	8.00	8.30	8.69	9.47
LANG5ST	18	6/17/2004– 3/12/2007	22	5/3/2004– 3/12/2007	128/0	4/13/2004– 9/29/2008	7.60	8.01	8.33	8.67	9.64
LANG4ST	19	6/17/2004– 3/12/2007	23	5/3/2004– 3/12/2007	127/0	4/13/2004– 9/29/2008	7.02	8.01	8.25	8.62	9.52
LANG3ST	16	10/27/2004– 3/12/2007	18	10/27/2004– 3/12/2007	117/0	4/13/2004– 9/29/2008	6.18	8.01	8.30	8.65	9.43
LANG7ST	17	10/27/2004– 3/12/2007	19	5/3/2004– 3/12/2007	119/0	4/13/2004– 9/29/2008	6.86	8.03	8.31	8.69	9.50
LANG8ST	16	10/27/2004– 3/12/2007	19	5/3/2004– 3/12/2007	116/0	4/13/2004– 9/29/2008	7.56	8.03	8.34	8.73	9.50
LANG9ST	13	7/7/2005– 3/12/2007	13	7/7/2005– 3/12/2007	81/0	12/9/2004– 9/29/2008	7.54	7.90	8.33	8.74	9.53
LANG10ST	13	2/7/2005– 3/12/2007	13	2/7/2005– 3/12/2007	81/0	12/9/2004– 9/29/2008	7.55	7.91	8.33	8.74	9.53
09090700 09090800 DUNC1ST	5	7/7/2004– 11/2/2005			29/0	4/14/2004– 6/6/2006	7.61	7.83	8.22	8.53	9.31
COS-INTAKE			1	8/17/2006– 8/17/2006	13/0	5/25/2006– 5/14/2009	7.32	8.03	8.22	8.72	9.06
09091100 CDOWRW-550	1	8/24/2004– 8/24/2004	5	4/26/1996– 8/24/2004	47/0	11/19/1995– 5/11/2005	6.90	8.22	8.43	8.74	9.60
CDOWRW-559					15/0	10/4/2004– 9/18/2007	8.09	8.15	8.30	8.40	8.50
09092500 704569 09091500 09092000 000147					91/0	5/31/1979– 5/20/1998	7.00	8.00	8.20	8.40	8.80
09092600 09092830					63/0	2/9/1976– 5/5/1983	7.20	8.00	8.20	8.40	8.80

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		No. of samples/ No. of censored	Date range	pH, standard units				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
09094400											
09095000					67/0	2/24/1975– 11/15/1983	7.20	8.00	8.20	8.30	8.80
09095300					77/0	10/19/1995– 9/7/2004	8.20	8.40	8.50	8.58	9.00
09095400					20/0	8/5/1975– 11/15/1983	8.10	8.22	8.40	8.54	9.02
11202					10/0	10/12/1995– 8/15/1996	8.00	8.10	8.50	8.60	8.60
000148					87/0	5/31/1979– 4/11/2007	7.60	8.10	8.30	8.40	9.66
09095500					744/0	10/1/1958– 10/27/2009	7.00	7.70	8.10	8.30	8.97
09096800											
09097500											
11155					11/0	10/12/1995– 8/15/1996	8.10	8.30	8.40	8.60	8.70
09097600											
09095800											
09096500											
391507107550601											
CDOWRW-56	2	1/27/1994– 11/17/1997	6	9/21/1992– 2/2/1998	86/0	2/25/1992– 10/15/1998	7.83	8.59	8.72	8.86	9.55
CDOWRW-55					26/0	1/14/1992– 7/27/1995	8.09	8.34	8.50	8.58	9.12
09097900											
CDOWRW-54	1	3/17/1992– 3/17/1992	2	3/17/1992– 2/10/1994	27/0	1/8/1992– 5/24/1995	8.12	8.39	8.46	8.58	8.75
CDOWRW-53					75/0	3/16/1992– 7/31/2003	8.20	8.58	8.69	8.85	9.23
09105000	1	10/17/2003– 10/17/2003	3	7/21/1994– 8/13/2003	259/0	11/19/1968– 10/27/2009	6.80	8.30	8.50	8.60	9.36
11103	2	3/11/1999– 10/17/2003			89/0	12/14/1995– 4/11/2007	7.45	8.37	8.53	8.77	9.23
UP RAPID CRK INTAKE			1	6/26/2007– 6/26/2007	5/0	5/22/2007– 5/29/2008	8.33	8.39	8.52	8.68	8.77
RC-2					7/0	11/20/1997– 11/12/1999	6.50	7.10	8.30	8.42	8.54
RC-3					8/0	11/20/1997– 6/27/2007	7.46	8.52	8.58	8.73	8.87
LOWER RAPID CRK					5/0	5/22/2007– 5/29/2008	8.44	8.53	8.63	9.12	9.40
L COTTONWOOD INTAKE					4/0						
11151					10/0	10/23/1995– 4/11/2007	8.40	8.49	8.50	8.57	8.80
390622108205400					20/0	7/19/1994– 4/19/1995	8.00	8.10	8.15	8.20	8.30
09106150					43/0	1/16/1992– 7/31/2002	7.80	8.10	8.20	8.29	8.60
CDOWRW-553	2	1/24/2000– 10/5/2000			70/0	12/13/1995– 10/23/2006	7.87	8.50	8.63	8.84	9.58
CDOWRW-555					46/0	12/13/1995– 9/30/2002	8.00	8.43	8.56	8.65	9.39

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Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
390322108253401	1	9/19/2001– 9/19/2001			5/0	3/22/1991– 5/5/1998	7.50	7.60	7.70	7.70	7.80
390348108265601					6/0	3/22/1991– 9/23/1993	7.75	7.79	7.80	7.92	7.98
CDOWRW-556					85/0	2/7/1996– 1/30/2004	6.68	8.49	8.67	8.89	9.35
390319108273200					13/0	11/9/1976– 8/15/1991	8.20	8.40	8.50	8.70	8.75
390318108273200					23/0	7/19/1994– 7/31/2002	7.90	8.00	8.10	8.20	8.40
CDOWRW-557					5/0	11/29/1995– 3/13/1996	7.84	7.86	7.97	8.04	8.08
09106200					70/0	8/7/1973– 3/6/2006	7.30	8.00	8.10	8.30	8.80
390324108291301					18/0	7/23/1998– 9/3/2003	7.50	7.88	8.11	8.30	8.39
390326108291601					60/0	1/24/1997– 9/3/2003	8.20	8.39	8.46	8.58	8.69
390323108291601					12/0	11/9/1998– 12/12/2002	8.16	8.20	8.32	8.45	8.60
390303108291601	4	6/25/1996– 10/22/1998			19/0	10/15/1997– 7/13/2001	7.92	8.04	8.11	8.17	8.35
390322108292301					12/0	7/23/1998– 9/3/2003	7.80	8.04	8.07	8.36	8.45
390318108293301					12/0	3/18/1999– 9/3/2003	7.87	7.90	7.98	8.24	8.40
390302108293801					15/0	10/15/1997– 5/23/2000	7.87	7.92	7.96	7.97	7.98
390319108312501					5/0	3/21/1991– 5/6/1998	7.80	7.80	7.80	7.86	7.90
390320108315901					8/0	3/21/1991– 5/6/1998	7.95	8.02	8.15	8.31	8.63
CDOWRW-558					57/0	12/5/1995– 11/9/1999	8.07	8.41	8.54	8.66	9.26
CDOWRW-560					121/0	11/3/1995– 6/20/2003	8.15	8.33	8.44	8.55	8.98
09106500					31/0	7/1/1994– 7/31/2002	7.80	8.00	8.20	8.30	8.60
390337108342800					10/0	11/9/1976– 8/15/1991	8.35	8.40	8.55	8.80	9.00
CDOWRW-563			106/0	12/12/1995– 12/16/2003	7.80	8.28	8.40	8.61	9.28		
11135A			7/0	7/26/2005– 10/11/2006	7.59	7.64	7.82	7.85	7.91		
CDOWRW-749			8/0	1/29/1999– 10/27/2000	8.09	8.17	8.33	8.76	8.87		
09152650			80/0	8/7/1973– 8/9/1999	7.30	8.13	8.24	8.34	8.70		
11135			7/0	7/26/2005– 10/11/2006	8.01	8.06	8.16	8.34	8.47		
390449108364101			18/0	11/5/1998– 11/14/2000	8.25	8.43	8.49	8.56	8.71		
390514108373201			5/0	3/21/1991– 5/7/1998	8.00	8.10	8.10	8.10	8.20		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
390521108373300					16/0	7/20/1994– 8/1/2002	7.80	8.00	8.00	8.19	8.30
390607108384201					42/0	3/5/1997– 6/6/2002	8.10	8.34	8.42	8.49	8.77
390609108384701	1	4/8/1999– 4/8/1999			16/0	10/6/1994– 6/6/2002	7.73	8.03	8.26	8.38	8.58
390613108385603					12/0	12/2/1998– 4/18/2002	7.48	7.87	8.11	8.48	8.56
390625108390402	1	2/24/1999– 2/24/1999			20/0	3/5/1997– 4/18/2002	7.34	7.71	8.24	8.35	8.68
390617108391001					12/0	2/2/1998– 6/6/2002	7.60	8.03	8.27	8.50	9.23
390632108392101					13/0	3/5/1997– 7/22/1999	7.98	8.19	8.30	8.45	8.59
390624108394701					9/0	3/12/1997– 9/4/2001	8.06	8.16	8.24	8.31	8.35
390859108364101					5/0	2/3/1992– 11/21/2004	7.90	7.95	8.13	8.27	8.28
390645108390101					21/0	3/21/1991– 3/7/2006	8.00	8.14	8.19	8.21	8.45
390717108400501					8/0	3/20/1991– 5/12/1998	8.00	8.08	8.10	8.14	8.22
390718108415701					5/0	3/14/1995– 7/31/1996	7.71	7.83	8.01	8.10	8.16
09152900					49/0	8/7/1973– 5/12/1998	7.40	7.90	8.10	8.21	8.60
11133					8/0	7/26/2005– 4/11/2007	7.94	8.00	8.08	8.15	8.18
390741108424001					7/0	7/24/2000– 7/2/2003	7.90	7.90	7.96	8.20	8.20
390741108424301					13/0	7/24/2000– 3/8/2006	7.90	7.99	8.01	8.08	8.47
390741108425301					9/0	7/24/2000– 7/2/2003	7.90	7.97	8.03	8.11	8.13
09153000					16/0	7/20/1994– 8/1/2002	8.00	8.00	8.10	8.10	8.40
000049					63/0	1/9/1968– 12/4/1978	7.30	8.00	8.20	8.50	8.80
390938108443101					5/0	3/20/1991– 5/12/1998	8.00	8.20	8.20	8.30	8.30
11110					10/0	10/12/1995– 7/18/1996	8.40	8.40	8.50	8.63	8.80
391509108433001					8/0	5/2/1991– 5/3/2000	7.99	8.20	8.30	8.31	8.36
09153270					62/0	8/7/1973– 3/8/1999	7.20	7.90	8.09	8.14	8.60
09095526 09106104 09095529					20/0	7/14/2000– 9/16/2003	7.98	8.23	8.37	8.50	8.70
090955285 09095528 09153290					59/0	9/10/1991– 9/8/1998	7.70	7.93	8.00	8.10	8.30

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

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Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09132985											
09132995					7/0	5/10/1999– 3/16/2005	7.29	8.04	8.12	8.40	8.59
09134000											
10436					6/0	3/31/1998– 3/16/2005	6.65	7.62	8.33	8.64	9.09
09134050					5/0	5/11/1999– 3/13/2000	8.20	8.20	8.30	8.30	8.30
385144107371701					10/0	3/31/1998– 5/24/2005	6.75	7.88	8.24	8.40	8.52
09134100											
385049107372402					6/0	5/8/2008– 4/14/2009	8.00	8.00	8.20	8.38	8.44
384922107402001					12/0	5/11/1999– 4/14/2009	8.00	8.05	8.20	8.23	8.40
09134200					9/0	8/9/1977– 7/25/2000	7.02	8.00	8.20	8.20	8.60
384822107411201					11/0	3/31/1998– 4/14/2009	7.48	8.10	8.20	8.29	8.34
10212	1	7/22/1999– 7/22/1999	2	7/22/1999– 7/11/2005	38/0	10/24/1995– 5/25/2006	6.95	8.11	8.20	8.30	8.63
384747107430501					6/0	10/15/1998– 3/14/2000	7.90	7.90	8.00	8.15	8.30
09134500											
09134700											
10415					9/0	10/11/1995– 8/6/1996	8.30	8.45	8.60	8.70	8.80
09135900					16/0	12/6/1977– 12/5/2000	8.00	8.21	8.30	8.40	8.60
10411					19/0	4/1/1998– 3/15/2005	7.52	8.22	8.31	8.41	8.61
384732107434801					6/0	10/14/1998– 12/5/2000	8.12	8.26	8.30	8.51	8.55
09135950											
000100	1	2/1/1982– 2/1/1982	1	2/1/1982– 2/1/1982	177/0	8/11/1971– 2/1/2001	6.70	8.00	8.10	8.30	9.00
384434107432701					7/0	5/12/2008– 4/10/2009	7.20	7.20	7.45	7.80	8.00
384610107455001					5/0	10/15/1998– 3/14/2000	7.39	7.85	8.40	8.45	8.50
231275											
231272											
231273			11	6/3/1971– 4/5/1972							
231274											
09136100					65/0	2/15/1962– 10/26/2009	7.30	8.00	8.20	8.37	8.66
10400					18/0	11/13/2003– 5/15/2007	7.22	8.10	8.26	8.38	8.98
09136200											
384643107540301					6/0	5/17/1999– 3/14/2000	7.90	7.98	8.20	8.23	8.30

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
10587					5/0	4/1/1998– 5/11/2005	6.44	8.18	8.20	8.55	8.78
09137050					10/0	7/16/1991– 3/28/2001	7.76	8.00	8.10	8.25	8.40
384649107570501					8/0	7/22/1991– 3/15/2000	7.70	7.95	8.10	8.20	8.40
384624107570701					18/0	7/18/1991– 9/10/2002	7.90	8.10	8.20	8.28	8.64
384604107570701					11/0	7/22/1991– 3/15/2000	7.80	8.00	8.20	8.25	8.43
000056			1	7/26/1977– 7/26/1977	151/0	1/10/1968– 8/8/1994	6.50	7.90	8.20	8.50	9.40
09137300					47/0	5/8/1962– 6/26/1963	7.10	7.40	7.50	7.60	8.30
384551107591901					108/0	7/22/1991– 3/25/2003	7.87	8.15	8.25	8.31	8.57
09137500					32/0	10/1/1959– 8/26/1961	7.20	7.50	7.70	7.98	8.30
09143000 09143500 000116					52/0	8/11/1971– 6/14/1982	6.70	8.00	8.20	8.40	8.90
09139200 09140200 09140700 09141200 09137800 10582					5/0	4/1/1998– 4/13/2005	6.59	8.26	8.27	8.48	8.88
09144200					11/0	11/28/1978– 6/5/2000	8.00	8.20	8.32	8.40	8.72
10516					21/0	1/3/2001– 9/10/2003	7.15	8.09	8.52	8.90	9.34
09144250			1	9/11/2002– 9/11/2002	47/0	11/19/1987– 11/3/2009	6.40	8.10	8.30	8.53	8.70
383404107534101					21/0	2/29/2000– 2/6/2009	7.70	8.10	8.19	8.21	8.40
383408107535101					54/0	3/10/1992– 11/4/2009	7.80	8.09	8.20	8.30	8.48
383528107552001					52/0	2/29/2000– 4/21/2003	7.49	8.10	8.20	8.30	8.55
383741107565701					14/0	2/29/2000– 12/13/2002	7.99	8.10	8.20	8.25	8.42
383728107572001					53/0	2/29/2000– 4/21/2003	7.83	8.00	8.10	8.20	8.38
10661					14/0	4/1/1998– 4/19/2007	6.75	8.01	8.07	8.16	8.26
383946107595301					97/0	7/23/1991– 11/4/2009	7.82	8.10	8.20	8.30	8.45
383953108001701					5/0	2/19/1992– 2/13/2001	8.17	8.20	8.29	8.30	8.35
384231108020301					8/0	11/17/1987– 9/17/2007	8.20	8.31	8.41	8.48	8.62

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
10602					8/0	4/1/1998– 6/16/2005	6.46	8.11	8.38	8.67	8.77
09149480					48/0	10/26/1995– 9/2/1998	7.54	8.11	8.22	8.40	8.60
384202108032001					19/0	11/28/1978– 2/13/2001	8.00	8.19	8.30	8.41	8.51
10611					5/0	4/1/1998– 4/14/2005	6.58	8.10	8.16	8.31	8.43
000055	1	4/4/1978– 4/4/1978			422/0	1/11/1968– 6/13/2007	6.53	8.00	8.20	8.34	9.50
09149500	1	5/17/1971– 5/17/1971			250/0	11/6/1958– 11/3/2009	7.10	7.80	8.14	8.30	8.71
384448108070301					14/0	7/15/1991– 3/20/2000	7.58	8.06	8.17	8.23	8.41
10515					27/0	1/12/1999– 6/13/2007	7.90	8.00	8.28	8.50	8.90
384408108091501					5/0	1/29/1992– 5/14/1998	8.04	8.05	8.19	8.20	8.20
10562			1	7/22/1996– 7/22/1996	10/0	10/30/1995– 7/22/1996	8.00	8.30	8.40	8.53	8.60
384013108091401					6/0	7/15/1991– 7/20/1999	8.10	8.40	8.46	8.46	8.48
09150500					19/0	12/7/1977– 3/20/2000	7.99	8.10	8.20	8.30	8.63
384510108111801					10/0	11/24/1995– 4/4/2000	8.09	8.12	8.20	8.30	8.36
384527108152701					9/0	11/19/1987– 9/8/1999	8.00	8.20	8.30	8.40	8.63
10555					13/0	10/4/1995– 5/2/2005	8.18	8.30	8.30	8.50	8.70
10551					12/0	10/4/1995– 9/28/2004	8.00	8.19	8.40	8.50	8.50
09151500					10/0	12/7/1977– 5/2/2005	8.03	8.30	8.35	8.40	8.60
384813108184301					5/0	6/17/1999– 3/21/2000	7.90	8.28	8.72	9.20	9.40
10505A					12/0	3/10/1999– 4/19/2007	7.81	8.11	8.31	8.47	8.54
WSWF2CR WSEF2CR WSTWOCR					9/0	11/15/1989– 8/29/2006	6.80	7.59	7.92	8.20	8.40
WSKCINTK					41/0	7/15/1987– 8/29/2006	6.80	7.70	8.00	8.40	8.80
10575					11/0	9/14/1995– 5/2/2005	8.00	8.30	8.40	8.50	8.90
09152000					19/0	6/29/1999– 5/23/2002	7.50	7.80	8.11	8.21	8.60
WSKCBLCG					22/0	12/16/1987– 7/15/1991	7.00	7.60	8.00	8.33	8.70
WSJUNNLT					13/0	3/11/2002– 10/8/2007	7.42	7.80	8.15	8.25	8.38
WSJUNNLTLO 10572					10/0	9/14/1995– 5/2/2005	8.10	8.13	8.40	8.50	8.80

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	DO, aq life, standard		DO, aq life, standard, spawning period only		pH, standard units						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
WSNFKCWR					17/0	7/15/1987– 7/15/1991	6.70	7.45	8.00	8.10	8.30
WSNFKCDV					81/0	7/15/1987– 10/8/2007	7.00	7.86	8.20	8.30	8.60
WSNFKCSR					7/0	11/21/1988– 7/15/1991	6.90	7.40	7.80	8.30	8.40
WSNFKCINLT 385600108250301					17/0	4/29/1999– 3/12/2002	7.85	8.00	8.14	8.21	8.58
10530					5/0	3/9/1999– 4/26/2006	8.01	8.11	8.31	8.31	8.40
WSLOCKDRW					6/0	10/6/2003– 10/8/2007	7.99	8.12	8.29	8.44	8.46
WSWHITCR					40/0	7/15/1991– 8/8/2006	7.66	8.00	8.20	8.30	8.50
385839108264401					20/0	4/29/1999– 5/23/2002	7.82	8.10	8.20	8.29	8.42
10505			1	7/24/2002– 7/24/2002	62/0	1/12/1999– 5/15/2007	7.48	8.16	8.31	8.55	9.21
CDOWRW-562			1	6/8/1999– 6/8/1999	42/0	3/11/1997– 6/8/1999	8.01	8.21	8.43	8.61	8.90
09152500			11	7/27/1976– 7/14/2004	795/0	10/1/1958– 9/28/2009	6.70	7.70	8.00	8.30	8.91
000054			1	8/3/1976– 8/3/1976	169/0	1/11/1968– 4/30/1979	7.30	8.20	8.40	8.50	9.30
09152520					10/0	4/29/1999– 5/23/2002	7.87	8.20	8.28	8.35	8.50
09152600					34/0	8/7/1973– 5/7/1998	7.40	7.90	8.10	8.20	8.50

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	pH, aq life, high		pH, aq life, low		Specific conductance, µS/cm at 25 degrees Celcius						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09302450					143/0	5/19/1975– 6/11/2007	90	241	346	395	490
09304100											
395643107461200					5/0	8/27/1981– 9/21/2005	338	342	362	362	410
09304200	1	5/17/1984– 5/17/1984			648/0	3/20/1970– 7/22/2009	169	330	380	408	2,425
09304480					299/0	7/6/1978– 6/11/2007	410	736	1,100	1,372	2,150
09304300											
09304500	1	4/26/1979– 4/26/1979			273/0	12/15/1970– 9/24/2005	135	386	479	539	1,350
09304550					299/0	8/30/1973– 9/23/2005	1,020	2,650	4,030	6,000	8,330
09304600	1	4/4/1984– 4/4/1984			300/0	7/6/1978– 9/24/2005	214	430	510	580	840
4000001075434					12/0	10/19/1999– 6/11/2007	992	1,052	1,086	1,180	1,300
400113107574500					5/0	8/26/1981– 9/24/2005	490	562	574	582	710
000043	5	9/10/1969– 10/18/1988			139/0	1/24/1968– 4/21/1992	2	450	510	572	906
400206108005901					9/0	4/6/2005– 6/11/2007	477	670	790	2,550	2,960
09304800			1	7/31/1974– 7/31/1974	663/0	4/3/1974– 9/29/2009	220	486	573	640	1,100
ENPR20ST	1	6/1/2006– 6/1/2006			5/0	5/19/2005– 9/23/2008	492	536	610	700	710
ENPR21ST	1	5/30/2006– 5/30/2006			5/0	8/18/2005– 9/23/2008	412	426	470	516	520
ENPR19ST	1	5/30/2006– 5/30/2006			7/0	5/19/2005– 9/17/2008	514	525	620	650	713
09306007					345/0	4/23/1974– 10/5/1998	625	1,040	1,130	1,220	1,480
09306025					41/0	5/3/1974– 2/18/1980	111	1,520	1,580	1,630	2,070
09306028											
09306022					178/0	9/12/1974– 9/3/1998	897	1,320	1,350	1,380	1,750
09306033											
09306039					8/0	12/5/1974– 3/11/1985	225	280	342	700	1,220
09306042	18	9/21/1982– 6/18/1991			99/0	3/17/1977– 6/18/1991	650	2,100	2,250	2,400	2,580
09306050											
09306052					6/0	3/4/1975– 3/11/1985	119	130	220	240	300
09306058					204/0	4/23/1974– 9/3/1998	235	1,250	1,300	1,370	1,590
09306061	1	6/14/1977– 6/14/1977			213/0	4/23/1974– 11/19/1993	730	1,210	1,310	1,450	1,670
11625					9/0	8/18/1999– 6/21/2007	1,328	1,422	1,460	1,493	1,620

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	pH, aq life, high		pH, aq life, low		Specific conductance, µS/cm at 25 degrees Celcius						
	Count	Date range	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09306175					126/0	1/15/1975– 8/17/1983	490	1,490	1,590	1,700	2,000
09306200					380/0	6/8/1965– 7/8/2009	600	1,400	1,527	1,790	2,800
09306210					54/0	12/15/1970– 8/18/1976	684	1,530	1,600	1,930	2,740
09306222					435/0	4/10/1965– 7/7/2009	516	1,690	2,050	2,810	7,240
000117					106/0	11/2/1971– 4/21/1992	47	570	657	720	1,070
09306224					90/0	11/9/1982– 9/29/2009	8	445	633	725	880
09306240					29/0	4/27/1974– 3/11/1985	145	750	835	878	1,200
09306241 09306235					132/0	3/14/1974– 10/3/1989	287	1,090	1,140	1,440	1,750
09306242					295/0	3/14/1974– 7/8/2009	312	1,280	1,430	1,528	1,760
09306244					25/0	6/12/1975– 10/24/1978	1,520	1,725	1,800	1,875	2,000
11702	1	9/27/2006– 9/27/2006			32/0	9/14/1999– 6/12/2007	320	516	674	764	946
09306255	1	6/26/1975– 6/26/1975			315/0	4/8/1965– 7/7/2009	460	3,120	3,500	3,760	5,200
09306290					407/0	11/9/1982– 10/26/2009	268	511	677	756	1,039
09306300					98/0	10/3/1974– 9/22/1982	210	610	723	808	1,270
09306305					91/0	4/21/1995– 7/28/2009	314	412	645	716	966
09306380					49/0	2/8/1977– 8/20/2005	620	1,251	1,498	1,750	4,750
400535108485700					10/0	8/25/1981– 7/28/2009	383	506	646	711	871
000044					84/0	1/24/1968– 6/7/1982	71	580	689	771	1,340
09072500					52/0	11/29/1958– 3/24/1966	261	442	816	976	1,490
CDOWRW-46	1	4/24/2001– 4/24/2001									
12100					8/0	2/14/2001– 7/16/2002	169	330	653	1,220	2,299
CDOWRW-47 09085100					430/0	10/1/1976– 8/10/1999	180	542	823	1,050	3,100
11109A					5/0	10/23/2000– 4/18/2007	321	327	336	349	369
CDOWRW-197	1	12/5/2000– 12/5/2000									
09085150					22/0	4/13/2006– 10/13/2009	253	474	858	1,085	1,202

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	pH, aq life, high		pH, aq life, low		No. of samples/ No. of censored	Date range	Specific conductance, µS/cm at 25 degrees Celcius				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
CDOWRW-559											
09092500					65/0	10/5/1976– 9/7/1982	125	250	310	390	1,500
704569											
09091500											
09092000											
000147					71/0	5/31/1979– 4/15/1992	2	550	860	980	1,310
09092600											
09092830					64/0	2/9/1976– 5/5/1983	370	480	510	529	697
09092850					73/0	2/9/1976– 7/29/1983	380	481	523	540	1,250
ENPR13ST	1	5/23/2006– 5/23/2006			6/0	3/11/2003– 6/11/2008	429	448	501	3,310	49,700
ENPR12ST	2	3/2/2006– 5/4/2006			12/0	5/5/2005– 3/19/2009	470	710	818	863	7,470
ENPR4ST	2	11/9/2005– 5/4/2006			8/0	5/19/2005– 10/10/2008	493	526	616	693	820
ENPR1ST	2	11/14/2005– 2/28/2006			13/0	10/27/2004– 3/26/2009	476	604	647	760	880
ENPR2ST	2	11/14/2005– 2/28/2006			13/0	10/27/2004– 3/26/2009	440	557	663	720	860
ENPR10ST	1	5/4/2006– 5/4/2006			6/0	8/17/2005– 9/16/2008	448	583	640	696	800
ENPR9ST	2	11/10/2005– 5/2/2006			6/0	8/17/2005– 9/15/2008	393	545	656	693	730
ENPR5ST	2	11/14/2005– 6/1/2006			7/0	5/4/2005– 9/16/2008	510	528	590	700	710
ENPR6ST	2	5/4/2005– 2/28/2006			10/0	5/4/2005– 3/26/2009	205	502	635	720	840
09092800											
ENPR3ST	1	2/28/2006– 2/28/2006			13/0	10/27/2004– 3/26/2009	499	675	830	855	920
11145A					15/0	9/30/1999– 4/10/2007	736	781	802	831	914
11145B					15/0	9/30/1999– 4/10/2007	619	751	808	857	877
09092960					52/0	2/8/1976– 9/7/1983	388	448	470	500	680
09092970					53/0	4/21/1977– 9/9/1983	350	420	450	485	675
ENPR16ST	2	3/2/2006– 5/19/2006			5/0	5/6/2005– 6/19/2008	405	421	460	473	485
09092980	2	7/30/1981– 9/23/1982			43/0	11/19/1976– 9/12/1983	415	532	572	600	800
ENPR18ST	1	5/24/2006– 5/24/2006			5/0	8/24/2005– 9/24/2008	518	536	590	7,340	14,000
ENPR17ST	3	5/6/2005– 5/19/2006			5/0	5/6/2005– 6/19/2008	409	423	460	590	603
ENPR14ST	1	5/19/2006– 5/19/2006			11/0	10/27/2004– 3/30/2009	473	628	750	17,860	90,300
ENPR15ST					12/0	10/27/2004– 3/30/2009	413	575	765	855	870

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	pH, aq life, high		pH, aq life, low		No. of samples/ No. of censored	Date range	Specific conductance, µS/cm at 25 degrees Celcius				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
ENPR11ST	1	3/24/2006– 3/24/2006			13/0	10/27/2004– 3/26/2009	344	565	671	855	880
09093000	1	7/29/1981– 7/29/1981			115/0	4/21/1975– 9/10/1986	202	680	775	860	1,150
11210											
09093500					74/0	11/21/1974– 10/13/1982	520	1,090	1,230	1,400	2,300
09093700	1	2/18/1981– 2/18/1981			248/0	8/31/1970– 1/8/1998	240	590	926	1,050	1,980
11205					9/0	8/16/1999– 10/10/2006	977	1,014	1,140	1,172	1,285
09094200											
09094400											
09095000					70/0	2/24/1975– 10/23/2003	460	1,000	1,200	1,300	1,620
09095300					94/0	10/19/1995– 9/7/2004	517	2,030	2,499	3,480	4,350
09095400	1	10/8/1982– 10/8/1982			76/0	8/5/1975– 11/15/1983	950	1,588	1,875	2,610	4,200
11202											
000148	1	4/11/2007– 4/11/2007			84/0	5/31/1979– 4/11/2007	670	1,390	1,615	1,865	5,050
09095500					1156/0	10/1/1958– 10/27/2009	189	626	929	1,090	1,620
09096800											
09097500					48/0	10/4/1976– 9/7/2005	110	288	575	675	1,000
11155											
09097600											
09095800											
09096500					43/0	10/4/1976– 8/19/1980	80	120	180	220	475
391507107550601					5/0	9/9/1981– 9/8/2005	360	443	452	943	984
CDOWRW-56	12	5/19/1992– 11/17/1997									
CDOWRW-55	1	12/15/1993– 12/15/1993									
09097900					21/0	4/22/2003– 9/20/2005	191	229	504	750	844
CDOWRW-54											
CDOWRW-53	9	7/30/1992– 7/31/2003									
09105000	3	12/12/2007– 12/12/2007			459/0	11/19/1968– 10/27/2009	166	499	644	711	1,402
11103	10	12/16/1996– 5/6/1999			30/0	8/11/1999– 4/11/2007	324	746	932	1,125	1,405
UP RAPID CRK INTAKE					5/0	5/22/2007– 5/29/2008	201	285	424	463	494
RC-2					7/0	11/20/1997– 11/12/1999	390	410	747	864	864
RC-3					8/0	11/20/1997– 6/27/2007	260	342	504	537	639

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	pH, aq life, high		pH, aq life, low		No. of samples/ No. of censored	Date range	Specific conductance, µS/cm at 25 degrees Celcius				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
11135A					8/0	7/26/2005– 1/9/2007	2,780	2,880	3,915	7,935	9,250
CDOWRW-749 09152650					123/0	8/7/1973– 8/9/1999	680	1,330	1,950	3,920	5,250
11135					7/0	7/26/2005– 10/11/2006	1,023	1,260	1,333	2,060	4,410
390449108364101					18/0	11/5/1998– 11/14/2000	550	689	775	926	996
390514108373201					5/0	3/21/1991– 5/7/1998	962	1,260	1,470	2,630	2,680
390521108373300					16/0	7/20/1994– 8/1/2002	319	624	1,154	1,191	1,445
390607108384201					43/0	12/11/1996– 6/6/2002	282	507	788	883	1,250
390609108384701					16/0	10/6/1994– 6/6/2002	389	957	1,230	1,681	3,270
390613108385603					12/0	12/2/1998– 4/18/2002	391	800	1,265	3,538	7,760
390625108390402					20/0	3/5/1997– 4/18/2002	410	889	1,001	3,955	6,990
390617108391001	1	2/24/1999– 2/24/1999			12/0	2/2/1998– 6/6/2002	462	800	1,450	3,395	6,830
390632108392101					13/0	3/5/1997– 7/22/1999	640	920	959	1,915	5,260
390624108394701					9/0	3/12/1997– 9/4/2001	918	1,250	1,560	2,240	2,720
390859108364101					5/0	2/3/1992– 11/21/2004	831	1,350	1,420	3,810	4,260
390645108390101					21/0	3/21/1991– 3/7/2006	1,010	1,350	1,750	4,500	4,670
390717108400501					8/0	3/20/1991– 5/12/1998	1,060	1,285	1,550	2,950	4,340
390718108415701					5/0	3/14/1995– 7/31/1996	957	1,189	2,160	6,110	6,270
09152900					78/0	8/7/1973– 5/12/1998	845	1,400	1,825	4,280	5,000
11133					9/0	7/26/2005– 4/11/2007	1,229	1,348	1,460	3,222	4,350
390741108424001					7/0	7/24/2000– 7/2/2003	935	1,340	2,450	3,390	3,460
390741108424301					13/0	7/24/2000– 3/8/2006	1,270	1,600	3,920	4,110	4,220
390741108425301					9/0	7/24/2000– 7/2/2003	604	1,480	1,660	4,035	4,175
09153000					16/0	7/20/1994– 8/1/2002	313	640	1,160	1,227	1,335
000049					74/0	1/9/1968– 12/4/1978	10	858	1,075	1,242	2,300
390938108443101					5/0	3/20/1991– 5/12/1998	724	960	1,350	3,450	3,620
11110 391509108433001					8/0	5/2/1991– 5/3/2000	3,580	18,150	20,600	22,050	24,000

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	pH, aq life, high		pH, aq life, low		No. of samples/ No. of censored	Date range	Specific conductance, µS/cm at 25 degrees Celcius				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
10490											
09132500	1	7/15/1982– 7/15/1982	1	12/8/1981– 12/8/1981	305/0	10/6/1976– 7/21/2009	20	115	152	182	585
000152					24/0	5/14/1979– 5/25/2006	91	155	205	249	2,100
09132700											
09132800											
09132900											
09132920											
09132940					14/0	8/28/2001– 11/2/2004	126	173	204	222	274
10406H											
09132960					23/0	1/2/2002– 10/14/2004	91	147	281	381	779
09132985					15/0	8/28/2001– 11/2/2004	82	94	102	139	180
09132995					33/0	5/10/1999– 3/16/2005	1	154	328	480	1,084
09134000					174/0	1/2/1986– 10/14/2004	125	240	390	579	1,250
10436	1	12/1/1998– 12/1/1998									
09134050					46/0	5/21/1976– 3/13/2000	240	700	1,010	1,300	2,200
385144107371701											
09134100					29/0	3/2/2000– 10/13/2004	118	245	372	738	973
385049107372402					6/0	5/8/2008– 4/14/2009	1,294	1,366	1,640	2,054	2,650
384922107402001					12/0	5/11/1999– 4/14/2009	982	1,470	1,605	2,760	3,380
09134200					38/0	5/18/1976– 7/25/2000	1,320	2,650	3,000	4,000	5,600
384822107411201					9/0	1/11/2005– 4/14/2009	1,860	2,123	3,125	3,300	3,760
10212					13/0	3/1/1999– 5/25/2006	974	1,367	2,050	2,461	3,013
384747107430501					7/0	10/15/1998– 3/14/2000	1,370	1,500	1,530	2,390	2,790
09134500											
09134700											
10415											
09135900					222/0	5/19/1976– 12/5/2000	38	935	1,295	1,420	2,360
10411					18/0	8/10/1999– 3/15/2005	550	1,107	1,171	1,273	1,349
384732107434801					7/0	10/14/1998– 12/5/2000	1,140	1,190	1,230	1,430	1,470
09135950					42/0	3/24/1997– 10/13/2004	218	546	1,192	1,436	1,660
000100					125/0	8/11/1971– 2/1/2001	14	510	930	1,120	1,750
384434107432701					7/0	5/12/2008– 4/10/2009	1,300	1,835	2,180	2,400	2,415

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	pH, aq life, high		pH, aq life, low		No. of samples/ No. of censored	Date range	Specific conductance, µS/cm at 25 degrees Celcius				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
384610107455001					5/0	10/15/1998– 3/14/2000	1,680	1,950	2,230	2,445	2,450
231275											
231272											
231273											
231274											
09136100					65/0	2/15/1962– 10/26/2009	186	564	1,120	1,420	2,050
10400					18/0	11/13/2003– 5/15/2007	223	337	789	1,175	1,405
09136200					86/0	10/6/1976– 9/10/2001	155	370	900	1,200	1,780
384643107540301					6/0	5/17/1999– 3/14/2000	1,840	2,005	2,230	2,738	2,760
10587			1	4/1/1998– 4/1/1998							
09137050					101/0	5/21/1976– 3/28/2001	470	2,880	4,100	5,400	12,600
384649107570501					8/0	7/22/1991– 3/15/2000	443	1,881	2,060	2,320	2,690
384624107570701					18/0	7/18/1991– 9/10/2002	324	415	434	464	579
384604107570701					11/0	7/22/1991– 3/15/2000	613	881	1,160	5,990	7,420
000056	6	7/24/1969– 12/8/1971			143/0	1/10/1968– 4/2/1992	220	380	486	620	1,346
09137300					47/0	5/8/1962– 6/26/1963	184	433	749	888	1,290
384551107591901					108/0	7/22/1991– 3/25/2003	813	1,430	1,825	6,880	9,340
09137500					32/0	10/1/1959– 8/26/1961	231	278	720	1,033	1,990
09143000					236/0	10/7/1976– 10/12/2004	25	75	100	143	230
09143500					259/1	10/7/1976– 10/12/2004	50	90	125	177	885
000116					56/0	8/11/1971– 6/14/1982	130	310	590	745	1,100
09139200											
09140200											
09140700											
09141200											
09137800											
10582											
09144200					122/0	5/19/1976– 6/5/2000	300	790	1,400	1,800	3,200
10516	4	6/18/2001– 7/25/2002			21/0	1/3/2001– 9/10/2003	281	543	647	738	995
09144250			1	3/28/2002– 3/28/2002	320/0	10/7/1976– 11/3/2009	124	500	664	878	2,100
383404107534101					22/0	2/29/2000– 2/6/2009	684	813	1,400	2,370	5,370
383408107535101					54/0	3/10/1992– 11/4/2009	472	695	993	2,550	5,400

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	pH, aq life, high		pH, aq life, low		No. of samples/ No. of censored	Date range	Specific conductance, µS/cm at 25 degrees Celcius				
	Count	Date range	Count	Date range			Min	25th	50th	75th	Max
09152000					88/0	10/1/1976– 10/17/2003	59	110	150	180	600
WSKCBLCG											
WSJUNNLT											
WSJUNNLTLO											
10572											
WSNFKCWR											
WSNFKCDV											
WSNFKCSR											
WSNFKCINLT											
385600108250301					17/0	4/29/1999– 3/12/2002	403	2,035	2,550	3,190	3,650
10530					5/0	3/9/1999– 4/26/2006	2,120	2,340	2,346	2,480	2,790
WSLOCKDRW											
WSWHITCR											
385839108264401					21/0	4/29/1999– 5/23/2002	152	1,955	3,110	3,658	4,530
10505	1	12/6/2005– 12/6/2005			63/0	3/10/1999– 5/15/2007	355	624	819	980	1,580
CDOWRW-562											
09152500					2,048/0	10/1/1958– 9/28/2009	274	575	843	1,055	2,370
000054	2	7/24/1969– 5/13/1970			179/0	1/11/1968– 4/30/1979	147	700	950	1,300	2,020
09152520					27/0	4/29/1999– 9/10/2003	927	1,310	1,495	2,230	5,250
09152600					88/0	8/7/1973– 5/7/1998	690	1,700	2,140	3,885	5,000

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Turbidity, NTU							Alkalinity, mg/L as CaCO ₃						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09302450 09304100 395643107461200	11/0	11/20/1987– 7/30/2002	0.9	1.5	2.5	7.0	12.0	245/0	3/20/1970– 7/30/2002	0	200	210	220	262
09304480								191/0	7/6/1978– 9/30/1982	4	347	393	530	688
09304300 09304500								5/0	12/15/1970– 5/30/1974	133	146	228	272	290
09304550								198/0	8/30/1973– 9/23/2005	254	1,026	1,165	1,269	1,680
09304600								237/0	7/6/1978– 9/24/2005	147	220	236	254	394
4000001075434 400113107574500 000043								70/0	3/27/1968– 6/10/1980	2.4	5.0	9.4	16.0	305.0
400206108005901 09304800 ENPR20ST ENPR21ST ENPR19ST	48/0	4/3/1974– 9/10/2002	1.6	4.8	9.0	19.0	110.0	215/0	5/30/1974– 9/29/2009	0	238	266	310	524
09306007	57/0	12/4/1974– 9/25/1981	0.0	3.0	11.0	34.0	480.0	88/0	4/23/1974– 9/27/1979	475	787	859	906	1,049
09306025	11/0	5/9/1975– 10/7/1975	1.0	1.0	4.0	14.0	16.0	38/0	5/3/1974– 10/5/1976	247	751	834	888	1,241
09306028 09306022	22/0	12/4/1974– 10/31/1975	0.0	2.0	8.0	16.3	30.0	67/0	10/4/1974– 8/22/1979	490	777	803	836	1,282
09306033 09306039 09306042 09306050 09306052	47/0	4/15/1975– 9/25/1981	1.0	4.0	15.0	30.0	350.0	66/0	4/23/1974– 8/22/1979	533	783	809	838	934
09306058														
09306061														
11625 09306175	35/0	10/28/1976– 9/25/1981	1.0	2.0	8.0	24.0	430.0	57/0	1/15/1975– 9/27/1979	246	901	934	985	1,065
09306200	36/0	10/28/1976– 9/11/2002	2.0	4.0	9.0	30.0	280.0	142/0	6/8/1965– 7/8/2009	304	512	946	1,100	1,529
09306210								54/0	12/15/1970– 8/18/1976	459	970	1,092	1,216	1,770
09306222	35/0	10/28/1976– 7/31/2002	1.0	4.0	11.0	110.0	380.0	148/0	6/8/1965– 7/7/2009	412	1,050	1,468	1,948	7,687
000117	44/0	11/2/1971– 6/10/1980	2.7	12.0	30.8	72.5	500.0							
09306224	13/0	11/20/1987– 8/26/1988	8.0	11.4	19.0	56.5	310.0	10/0	10/19/2007– 9/29/2009	122	130	159	174	182
09306240	10/0	5/14/1975– 4/15/1982	2.0	13.0	105.0	300.0	590.0	15/0	4/27/1974– 6/16/1978	148	506	547	610	742

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Turbidity, NTU							Alkalinity, mg/L as CaCO ₃						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09306241														
09306235	27/0	1/8/1975– 5/24/1982	1.0	2.5	17.0	36.0	760.0	45/0	3/14/1974– 4/24/1979	533	621	639	667	841
09306242	40/0	12/11/1974– 9/11/2002	0.0	2.0	5.5	150.0	2,000.0	100/0	3/14/1974– 7/8/2009	267	435	759	829	1477
09306244	15/0	6/12/1975– 10/24/1978	0.0	0.6	1.5	5.0	20.0	24/0	6/12/1975– 10/24/1978	849	955	1,021	1,044	1,098
11702														
09306255	34/0	12/11/1974– 7/31/2002	2.5	4.9	43.0	150.0	5,500.0	94/0	4/8/1965– 7/7/2009	488	1,236	2,116	2,772	3,317
09306290	16/0	6/19/1987– 7/31/2002	10.0	13.9	20.0	52.5	320.0	12/0	6/4/1998– 9/30/2009	126	140	167	189	217
09306300	22/0	8/6/1975– 8/30/1977	1.5	12.0	26.0	112.5	5,200.0	45/0	8/6/1975– 8/16/1979	221	327	370	393	557
09306305														
09306380								6/0	2/8/1977– 10/7/1977	262	373	585	832	1352
400535108485700														
000044	66/0	3/27/1968– 6/10/1980	5.8	31.0	76.0	300.0	5,000.0							
09072500								48/0	11/29/1958– 3/24/1966	138	183	213	236	306
CDOWRW-46														
12100														
CDOWRW-47														
09085100								41/0	12/6/1977– 6/19/1995	62	182	234	245	311
11109A														
CDOWRW-197														
09085150								22/0	4/13/2006– 10/13/2009	64	84	106	117	121
09085200														
09085400														
09085300														
000047	201/0	2/21/1968– 7/16/1980	0.4	4.1	8.6	25.0	625.0							
CDOWRW-546														
09086470														
11190H														
09086000														
09086970														
11195														
CDOWRW-547														
09087600								18/0	7/31/2002– 11/7/2008	64	88	113	119	152
11189														
09089000														
11185														
09089500														
LANG6ST	116/0	4/13/2004– 9/29/2008	8.3	40.1	65.4	190.0	5,999.0	24/0	6/2/2004– 5/9/2006	410	743	1,131	1,287	1,423
LANG5ST	127/0	4/13/2004– 9/29/2008	7.0	40.6	67.4	224.5	5,999.0	34/0	5/26/2004– 5/9/2006	400	657	1,132	1,224	1,438
LANG4ST	126/0	4/13/2004– 9/29/2008	3.0	40.5	74.5	245.0	5,999.0	33/0	6/2/2004– 5/9/2006	407	658	1,170	1,240	1,418

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Turbidity, NTU							Alkalinity, mg/L as CaCO ₃						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09092980								7/0	4/21/1978– 8/20/1979	459	459	508	541	557
ENPR18ST														
ENPR17ST														
ENPR14ST	6/0	10/27/2004– 5/19/2006	3.2	11.8	30.5	60.8	104.0	5/0	5/6/2005– 5/19/2006	827	864	893	926	959
ENPR15ST	5/0	10/27/2004– 5/5/2006	3.0	7.1	33.1	53.6	62.3							
ENPR11ST	6/0	10/27/2004– 5/5/2006	10.0	12.5	42.4	143.8	336.0	5/0	5/9/2005– 5/5/2006	810	818	860	942	992
09093000	23/0	6/11/1975– 9/15/1977	0.1	1.3	3.0	20.0	110.0	41/0	4/21/1975– 8/17/1979	393	547	592	623	688
11210														
09093500								54/0	11/21/1974– 8/21/1979	318	671	744	790	951
09093700								54/0	8/31/1973– 12/12/1978	133	221	262	280	477
11205														
09094200														
09094400														
09095000								51/0	2/24/1975– 8/16/1979	233	754	836	885	942
09095300								75/0	10/19/1995– 9/7/2004	108	346	400	454	572
09095400														
11202														
000148	7/0	5/31/1979– 6/9/1980	44.0	66.0	370.0	960.0	2,300.0							
09095500								424/0	10/1/1959– 10/27/2009	64	148	239	279	361
09096800														
09097500														
11155														
09097600														
09095800														
09096500														
391507107550601														
CDOWRW-56														
CDOWRW-55														
09097900														
CDOWRW-54														
CDOWRW-53														
09105000								149/0	11/19/1968– 10/27/2009	71	267	311	593	738
11103														
UP RAPID CRK INTAKE														
RC-2	7/0	11/20/1997– 11/12/1999	0.0	0.0	0.5	3.0	245.0							
RC-3	6/0	11/20/1997– 11/12/1999	1.0	1.5	4.0	13.5	30.0							
LOWER RAPID CRK														
L COTTONWOOD INTAKE								4/0						

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Site identification number	Turbidity, NTU							Alkalinity, mg/L as CaCO ₃						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09132940		8/11/1971– 6/3/1980	0.4	3.7	8.1	41.0	420.0	6/0	5/8/2008– 4/14/2009	185	187	214	263	275
10406H														
09132960														
09132985														
09132995														
09134000														
10436														
09134050														
385144107371701														
09134100														
385049107372402														
384922107402001														
09134200														
384822107411201														
10212														
384747107430501														
09134500														
09134700														
10415														
09135900														
10411														
384732107434801														
09135950														
000100														
384434107432701														
384610107455001														
231275														
231272														
231273														
231274														
09136100														
10400														
09136200														
384643107540301														
10587														
09137050														
384649107570501														
384624107570701														
384604107570701														
000056														
09137300														
384551107591901														
09137500														
09143000														

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Turbidity, NTU							Alkalinity, mg/L as CaCO ₃						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09143500 000116	46/0	8/11/1971– 6/3/1980	0.8	2.0	4.6	11.0	33.0							
09139200 09140200 09140700 09141200 09137800 10582 09144200								6/0	11/28/1978– 3/15/2000	143	272	312	325	606
10516 09144250								11/0	9/1/1999– 11/3/2009	103	117	123	137	143
383404107534101								11/0	4/11/2001– 2/6/2009	117	125	252	299	321
383408107535101								48/0	5/23/2001– 11/4/2009	109	142	154	276	336
383528107552001								49/0	4/11/2001– 4/21/2003	131	190	263	309	376
383741107565701								8/0	7/30/2001– 12/13/2002	166	197	242	264	304
383728107572001								51/0	4/11/2001– 4/21/2003	154	189	219	325	373
10661 383946107595301								35/0	4/11/2001– 11/4/2009	145	187	212	304	356
383953108001701 384231108020301 10602 09149480								43/0	10/26/1995– 9/2/1998	78	133	201	233	270
384202108032001 10611 000055	164/0	2/20/1968– 7/17/1980	4.5	40.0	84.5	155.0	6,880.0							
09149500								169/0	11/6/1958– 11/3/2009	121	216	344	449	544
384448108070301 10515 384408108091501 10562 384013108091401 09150500								7/0	12/7/1977– 9/7/1999	52	52	201	393	410
384510108111801 384527108152701 10555 10551 09151500 384813108184301 10505A WSWF2CR WSEF2CR WSTWOCR								2/0						

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Turbidity, NTU							Alkalinity, mg/L as CaCO ₃						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
WSKCINTK	34/0	7/15/1987– 8/11/2008	0.2	2.0	3.1	5.6	46.0							
10575 09152000								13/0	7/25/2000– 5/23/2002	31	53	58	76	100
WSKCBLCG	18/0	10/22/1987– 7/15/1991	0.3	5.1	6.2	15.3	87.0							
WSJUNNLT	31/0	11/29/2005– 11/27/2006	2.0	3.1	5.0	7.5	14.2							
WSJUNNLTLO	29/0	11/29/2005– 11/27/2006	4.3	6.8	9.4	13.1	36.6							
10572 WSNFKCWR	12/0	7/15/1987– 7/15/1991	0.8	1.1	2.6	5.8	7.4							
WSNFKCDV	61/0	7/15/1987– 8/29/2006	0.4	2.1	5.4	9.5	29.0							
WSNFKCSR WSNFKCINLT 385600108250301								10/0	8/21/2000– 3/12/2002	62	225	264	292	308
10530 WSLOCKDRW WSWHITCR	34/0	7/15/1991– 8/8/2006	0.7	10.0	26.0	51.0	280.0							
385839108264401								16/0	6/29/1999– 5/23/2002	145	180	231	317	374
10505 CDOWRW-562 09152500	135/0	12/3/1975– 4/8/2005	1.0	7.6	27.0	74.0	1,800.0	544/0	10/1/1959– 9/28/2009	61	161	252	337	446
000054	166/0	2/20/1968– 4/30/1979	3.4	16.2	45.0	120.0	3,200.0							
09152520								9/0	8/21/2000– 5/23/2002	146	159	170	197	282
09152600								29/0	8/7/1973– 5/7/1998	148	346	471	552	615

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Dissolved solids, water, filtered, mg/L					Ammonia, water, filtered, mg/L as nitrogen									
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max
09302450	6/0	8/17/1999– 8/24/2000	130	138	245	265	280								
09304100															
395643107461200															
09304200	327/0	3/20/1970– 7/30/2002	0	193	226	240	365	88/49	8/27/1981– 7/22/2009	0.01 0.015 0.02 0.05	0.003	0.004	0.006	0.013	0.18
09304480	288/0	7/6/1978– 9/26/1984	311	490	748	997	1,560								
09304300															
09304500	11/0	12/15/1970– 3/7/1995	91	124	321	353	455								
09304550	297/0	8/30/1973– 9/23/2005	662	2,180	3,230	5,370	8,080								
09304600	292/0	7/6/1978– 9/24/2005	119	253	307	352	438								
4000001075434	8/0	10/19/1999– 9/27/2000	780	783	830	865	940								
400113107574500															
000043	137/0	1/24/1968– 4/21/1992	119	317	360	400	700								
400206108005901															
09304800	374/0	4/3/1974– 9/29/2009	130	300	364	407	734	99/60	8/26/1981– 9/29/2009	0.01 0.015 0.02 0.04 0.041 0.06	0.005	0.007	0.009	0.02	0.14
ENPR20ST	5/0	5/19/2005– 9/23/2008	330	350	390	435	450								
ENPR21ST	5/0	8/18/2005– 9/23/2008	230	240	270	310	330								
ENPR19ST	8/0	5/19/2005– 9/17/2008	310	310	360	378	390								
09306007	191/0	4/23/1974– 9/3/1998	427	664	706	769	908	164/23	12/4/1974– 9/3/1998	0.01 0.015 0.06	0	0.01	0.04	0.07	0.44
09306025	41/0	5/3/1974– 2/18/1980	85	1,060	1,110	1,150	1,450	19/10	5/9/1975– 2/18/1980	0.01	0.02	0.01	0.01	0.03	0.33
09306028															
09306022	154/0	9/12/1974– 9/3/1998	703	900	923	946	1,160	138/26	12/4/1974– 9/3/1998	0.01 0.015 0.06	0	0.01	0.03	0.05	0.17
09306033															
09306039	8/0	12/5/1974– 3/11/1985	127	172	218	436	814	6/0	12/5/1974– 3/11/1985		0	0.15	0.165	0.22	0.28
09306042	70/0	3/17/1977– 6/18/1991	491	1,240	1,395	1,490	1,620	68/8	8/7/1979– 6/18/1991	0.01 0.06	0.01	0.02	0.065	0.15	2.3
09306050															
09306052															
09306058	149/0	4/23/1974– 9/3/1998	699	845	882	935	1,150	132/28	4/15/1975– 9/3/1998	0.01 0.015 0.06	0	0.01	0.02	0.04	0.24
09306061	157/0	4/23/1974– 11/19/1991	465	817	887	965	1,120	136/19	12/6/1974– 11/19/1991	0.01 0.06	0	0.01	0.04	0.065	0.66
11625	5/0	8/18/1999– 7/13/2000	960	985	1,100	1,305	1,310								
09306175	85/0	1/15/1975– 8/17/1983	298	1,030	1,130	1,190	1,380	26/3	1/25/1977– 8/17/1983	0.01 0.06	0.01	0.01	0.03	0.07	0.24
09306200	245/0	6/8/1965– 7/8/2009	392	956	1,030	1,210	1,870	134/28	1/27/1977– 7/8/2009	0.01 0.02 0.021 0.015 0.06	0.009	0.010	0.03	0.06	0.694
09306210	58/0	12/15/1970– 8/18/1976	420	1,040	1,100	1,310	1,930								

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

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Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Dissolved solids, water, filtered, mg/L							Ammonia, water, filtered, mg/L as nitrogen							
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max
11195	10/0	10/2/1995– 8/21/1996	98	150	170	180	190								
CDOWRW-547															
09087600	18/0	7/31/2002– 11/7/2008	144	267	471	572	729								
11189	9/0	8/18/1999– 7/18/2000	460	1,040	1,130	1,230	1,360								
09089000															
11185	10/0	10/2/1995– 8/15/1996	120	165	245	288	320								
09089500	20/0	5/1/1986– 8/23/1990	104	127	161	187	298	5/2	5/30/1986– 5/17/1990	0.01	0.01	0.01	0.01	0.035	0.05
LANG6ST	116/0	4/13/2004– 9/29/2008	100	334	500	545	700								
LANG5ST	126/0	4/13/2004– 9/29/2008	100	348	500	543	3,090								
LANG4ST	126/0	4/13/2004– 9/29/2008	100	346	500	544	700								
LANG3ST	116/0	4/13/2004– 9/29/2008	100	330	501	600	700								
LANG7ST	118/0	4/13/2004– 9/29/2008	100	333	500	528	700								
LANG8ST	115/0	4/13/2004– 9/29/2008	100	358	500	524	700								
LANG9ST	81/0	12/9/2004– 9/29/2008	100	336	500	557	700								
LANG10ST	81/0	12/9/2004– 9/29/2008	100	332	500	560	6,000								
09090700															
09090800															
DUNC1ST	29/0	4/14/2004– 6/6/2006	288	479	785	825	942								
COS-INTAKE	13/0	5/25/2006– 5/14/2009	160	275	540	605	660								
09091100															
CDOWRW-550															
CDOWRW-559															
09092500															
704569	5/0	4/28/1995– 10/4/2007	132	205	246	265	5,550								
09091500															
09092000															
000147	79/0	5/31/1979– 4/15/1992	10	370	540	630	790								
09092600															
09092830	59/0	2/9/1976– 5/5/1983	218	293	313	326	351								
09092850	64/0	2/9/1976– 7/29/1983	222	301	321	331	362								
ENPR13ST	6/0	3/11/2003– 6/11/2008	260	290	290	310	2,870								
ENPR12ST	12/0	5/5/2005– 3/19/2009	260	415	495	520	540								
ENPR4ST	8/0	5/19/2005– 10/10/2008	310	350	390	455	500								
ENPR1ST	13/0	10/27/2004– 3/26/2009	340	360	400	475	550								

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Dissolved solids, water, filtered, mg/L							Ammonia, water, filtered, mg/L as nitrogen							
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max
ENPR2ST	13/0	10/27/2004– 3/26/2009	350	350	380	425	490								
ENPR10ST	6/0	8/17/2005– 9/16/2008	380	388	410	448	560								
ENPR9ST	6/0	8/17/2005– 9/15/2008	280	333	410	450	450								
ENPR5ST	7/0	5/4/2005– 9/16/2008	320	330	360	430	480								
ENPR6ST	10/0	5/4/2005– 3/26/2009	120	320	365	423	490								
09092800 ENPR3ST	13/0	10/27/2004 3/26/2009	350	430	470	500	520								
11145A	12/0	9/30/1999– 9/20/2000	430	460	470	490	530								
11145B	12/0	9/30/1999– 9/20/2000	400	450	490	528	550								
09092960	52/0	2/8/1976– 9/7/1983	225	277	292	310	355								
09092970	51/0	4/21/1977– 9/9/1983	155	262	277	295	353								
ENPR16ST	5/0	5/6/2005– 6/19/2008	250	255	260	270	280								
09092980	41/0	4/21/1978– 9/12/1983	256	339	362	376	395								
ENPR18ST	5/0	8/24/2005– 9/24/2008	320	340	390	395	400								
ENPR17ST	5/0	5/6/2005– 6/19/2008	250	250	280	350	370								
ENPR14ST	11/0	10/27/2004– 3/30/2009	290	388	425	515	540								
ENPR15ST	12/0	10/27/2004– 3/30/2009	240	383	440	488	530								
ENPR11ST	13/0	10/27/2004– 3/26/2009	290	350	400	490	530								
09093000	51/0	4/21/1975– 9/24/1981	288	441	487	521	628								
11210	10/0	10/18/1995– 8/21/1996	520	628	680	710	790								
09093500	69/0	11/21/1974– 10/13/1982	334	730	819	966	1,640								
09093700	85/0	8/31/1973– 10/25/1982	154	324	578	642	865								
11205	7/0	8/16/1999– 8/2/2000	600	640	730	760	800								
09094200 09094400 09095000	58/0	2/24/1975– 11/15/1983	407	730	812	915	1,090								
09095300	54/0	10/19/1995– 8/2/2002	321	1,420	1,755	2,540	3,400	74/50	10/19/1995– 9/7/2004	0.015 0.02 0.04 0.041	0.015	0.015	0.015	0.02	0.14
09095400	16/0	8/5/1975– 11/15/1983	684	1,265	1,555	1,965	3,300								
11202	10/0	10/12/1995– 8/15/1996	750	1,175	1,250	2,625	3,000								
000148	88/0	5/31/1979– 8/2/2000	480	1,035	1,205	1,420	4,900								

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Dissolved solids, water, filtered, mg/L							Ammonia, water, filtered, mg/L as nitrogen							
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max
CDOWRW-560 09106500	31/0	7/1/1994– 7/31/2002	168	578	724	760	906								
390337108342800 CDOWRW-563 11135A CDOWRW-749 09152650	77/0	8/7/1973– 8/9/1999	578	879	1,450	3,350	3,740								
11135 390449108364101 390514108373201 390521108373300	16/0	7/20/1994– 8/1/2002	184	364	684	754	806								
390607108384201	9/0	7/17/1997– 3/23/2000	359	472	531	601	631								
390609108384701 390613108385603 390625108390402 390617108391001 390632108392101 390624108394701 390859108364101 390645108390101	18/0	3/21/1991– 11/21/2004	627	840	1,190	3,890	4,680								
390717108400501	7/0	3/20/1991– 5/12/1998	692	797	1,110	3,560	3,630								
390718108415701 09152900	46/0	8/7/1973– 5/12/1998	701	1,050	2,305	3,730	4,240								
11133 390741108424001 390741108424301 390741108425301 09153000	16/0	7/20/1994– 8/1/2002	184	369	713	801	835								
000049	63/0	1/9/1968– 12/4/1978	137	641	732	900	1,690								
390938108443101 11110	10/0	10/12/1995– 7/18/1996	320	1,425	2,800	3,325	3,400								
391509108433001	7/0	5/2/1991– 12/26/1999	2,740	17,000	22,100	24,300	26,000								
09153270	61/0	8/7/1973– 3/8/1999	587	1,120	1,580	2,660	3,120	3/0							
09095526 09106104 09095529								20/8	7/14/2000– 9/16/2003	0.008	0.002	0.009	0.015	0.017	0.042
090955285 09095528 09153290	55/0	9/10/1991– 9/8/1998	524	753	1,050	3,570	4,000	55/11	9/10/1991– 9/8/1998	0.015 0.02	0.015	0.02	0.055	0.08	0.473
09153300	101/0	8/7/1973– 3/8/1999	650	1,100	1,430	3,810	4,360								

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Dissolved solids, water, filtered, mg/L							Ammonia, water, filtered, mg/L as nitrogen							
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max
10505A WSWF2CR WSEF2CR WSTWOCR WSKCINTK	17/0	7/15/1987– 8/29/2006	24	76	87	106	212								
10575	9/0	9/14/1995– 10/25/2004	54	88	110	130	160								
09152000	13/0	7/25/2000– 5/23/2002	46	72	81	121	132								
WSKCBLCG	12/0	10/22/1987– 7/15/1991	60	88	132	150	272								
WSJUNNLT	12/0	3/11/2002– 10/8/2007	53	69	87	99	130								
WSJUNNLTLO 10572	8/0	9/14/1995– 10/25/2004	630	695	1,200	2,150	2,400								
WSNFKCWR	12/0	7/15/1987– 7/15/1991	68	85	108	128	232								
WSNFKCDV	34/0	7/15/1987– 10/8/2007	80	96	127	150	300								
WSNFKCSR WSNFKCINLT															
385600108250301	9/0	8/21/2000– 3/12/2002	256	1,760	2,700	2,910	3,170								
10530 WSLOCKDRW	6/0	10/6/2003– 10/8/2007	90	98	164	192	197								
WSWHITCR	31/0	7/15/1991– 8/8/2006	256	328	447	480	660								
385839108264401	16/0	6/29/1999– 5/23/2002	783	1,455	2,475	3,055	5,120								
10505	55/0	1/12/1999– 12/9/2004	210	480	600	750	1,080								
CDOWRW-562 09152500	715/0	10/1/1958– 9/28/2009	166	448	673	1,040	2,100	144/36	10/18/1979– 9/24/2002	0.015 0.02	0	0.01	0.03	0.06	0.14
000054	173/0	1/11/1968– 4/5/1979	216	506	703	1,110	1,803								
09152520	9/0	8/21/2000– 5/23/2002	639	910	1,060	1,385	4,460								
09152600	32/0	8/7/1973– 5/7/1998	552	1,310	2,965	3,405	3,580								

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	Nitrite + Nitrate, dissolved, mg/L as nitrogen									Orthophosphate, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	
09302450 09304100 395643107461200 09304200	91/45	8/27/1981– 7/22/2009	0.04 0.09	0.006	0.008	0.014	0.047	0.447	59/0	8/30/1973– 7/22/2009	0	0.028	0.031	0.06	0.126	
0.014 0.0107																
0.0197 0.058																
0.01491 0.01432																
09304480 09304300 09304500									8/0	12/15/1970– 8/27/1981	0.03	0.03	0.05	0.09	0.09	
09304550									5/0	8/30/1973– 8/26/1981	0.03	0.03	0.06	0.09	0.25	
09304600 4000001075434 400113107574500 000043	56/0	10/15/1968– 5/9/1979		0	0	0.16	0.235	11.5	29/0	10/15/1968– 9/26/1973	0	0.05	0.1	0.15	0.9	
400206108005901 09304800	103/55	8/26/1981– 9/29/2009	0.04 0.09 0.052 0.038 0.08 0.058 0.042 0.05859 0.0389 0.03885 0.004	0.004	0.028	0.034	0.08	0.23	62/0	8/26/1981– 9/29/2009	0.012	0.031	0.055	0.067	0.153	
ENPR20ST ENPR21ST ENPR19ST	6/0	11/22/2005– 9/17/2008		0.113	0.127	0.189	0.232	0.248								
09306007	90/5	12/4/1974– 9/3/1998	0.09 0.04	0.01	0.22	0.47	0.85	2.79	128/0	4/23/1974– 4/29/1998	0	0.03	0.06	0.09	1.1	
09306025	11/1	5/9/1975– 10/7/1975	0.09	0	0.01	0.01	0.1	1.29	40/0	5/3/1974– 10/5/1976	0	0	0.03	0.06	0.8	
09306028 09306022	57/0	12/4/1974– 9/3/1998		0.31	1.19	1.49	1.79	3.69	90/0	9/12/1974– 9/3/1998	0	0.03	0.03	0.06	0.215	
09306033 09306039 09306042	24/3	7/1/1981– 6/18/1991	0.09	0.09	0.25	0.47	0.73	1.23	12/0	3/17/1977– 6/21/1990	0	0.031	0.061	0.091	0.153	
09306050 09306052 09306058	62/2	4/15/1975– 9/3/1998	0.09 0.04	0.02	0.14	0.225	0.38	1.49	82/0	4/23/1974– 9/3/1998	0	0.03	0.03	0.061	0.52	
09306061	53/2	12/6/1974– 11/19/1991	0.09 0.04	0.04	0.34	0.58	0.79	2.69	107/0	4/23/1974– 11/19/1991	0	0.03	0.061	0.09	0.25	
11625 09306175	59/0	1/25/1977– 8/17/1983		0	0.15	0.22	0.38	3.67	85/0	1/15/1975– 8/17/1983	0	0	0.03	0.09	1.1	
09306200	166/25	1/27/1977– 7/8/2009	0.09 0.052 0.08 0.04 0.058 0.042 0.05861 0.047 0.044 0.038	–0.02	0.069	0.419	0.7	2.98	230/0	12/15/1970– 7/8/2009	0	0.06	0.09	0.123	0.95	

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Nitrite + Nitrate, dissolved, mg/L as nitrogen								Orthophosphate, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
000047	174/1	9/16/1968– 5/15/1979		0	0.1	0.23	0.4	4.8	40/0	9/16/1968– 12/17/1973	0	0.05	0.1	0.1	7
CDOWRW-546															
09086470															
11190H															
09086000															
09086970															
11195															
CDOWRW-547															
09087600															
11189															
09089000															
11185															
09089500	20/19	5/1/1986– 8/23/1990	Proportion of censored values exceeds 0.90												
LANG6ST															
LANG5ST															
LANG4ST															
LANG3ST															
LANG7ST															
LANG8ST															
LANG9ST															
LANG10ST															
09090700															
09090800															
DUNC1ST	21/0	7/7/2004– 6/6/2006		0	0.120	0.190	0.287	2.1							
COS-INTAKE	13/5	5/25/2006– 5/14/2009	0.023	0.023	0.023	0.032	0.046	0.063							
09091100															
CDOWRW-550															
CDOWRW-559															
09092500															
704569															
09091500															
09092000															
000147															
09092600															
09092830									58/0	2/9/1976– 5/5/1983	0	0.06	0.12	0.18	1.2
09092850									60/0	2/9/1976– 7/29/1983	0	0.061	0.12	0.15	1
ENPR13ST															
ENPR12ST	9/0	11/22/2005– 3/19/2009		0.138	0.190	0.271	0.282	0.316							
ENPR4ST															
ENPR1ST															
ENPR2ST															
ENPR10ST															
ENPR9ST															
ENPR5ST															
ENPR6ST	5/0	2/28/2006– 3/26/2009		0	0.026	0.045	0.052	0.052							

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Site identification number	Nitrite + Nitrate, dissolved, mg/L as nitrogen								Orthophosphate, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09152900									36/0	8/7/1973– 5/12/1998	0	0.03	0.09	0.18	0.83
11133															
390741108424001															
390741108424301															
390741108425301															
09153000															
000049	57/0	9/17/1968– 12/4/1978		0	0.6	0.9	1.3	4.5	32/0	9/17/1968– 8/16/1973	0	0.063	0.1	0.2	4.9
390938108443101															
11110															
391509108433001															
09153270	2/0								31/0	8/7/1973– 5/13/1998	0	0	0.03	0.15	0.43
09095526															
09106104															
09095529	20/5	7/14/2000– 9/16/2003	0.004 0.0107 0.0197	0.004	0.008	0.020	0.164	0.257	9/0	7/14/2000– 9/16/2003	0.009	0.011	0.018	0.026	0.049
090955285															
09095528															
09153290	54/0	3/12/1992– 9/8/1998		0.359	1.303	1.737	6.485	11.91	43/0	10/24/1995– 9/8/1998	0.031	0.092	0.159	0.3	0.865
09153300									35/0	8/7/1973– 5/13/1998	0	0.03	0.06	0.15	0.678
391038108475601															
000050	166/0	9/17/1968– 5/7/1979		0	0.6	0.885	1.1	18.4	36/0	2/20/1968– 12/17/1973	0	0.015	0.1	0.2	0.8
391029108480200															
11101															
09163310									35/0	8/8/1973– 3/13/1979	0	0.03	0.06	0.15	1
09163340									33/0	8/8/1973– 3/13/1979	0	0	0.03	0.06	0.18
09153330	5/0	7/14/1981– 8/30/1981		0.66	0.23	0.43	3.03	2.04	5/0	7/14/1981– 8/30/1981	0	0	0	0.03	0.03
09153400									11/0	9/12/1973– 4/11/1979	0	0.03	0.03	0.12	0.31
391646108572301															
09161000									19/0	10/2/1976– 8/22/1978	0	0	0.03	0.03	0.18
09160500									42/0	7/4/1977– 7/12/1981	0	0	0.03	0.03	0.25
09163050									18/0	8/8/1973– 10/23/1978	0	0	0.015	0.06	0.18
09163490									36/0	8/8/1973– 5/13/1998	0	0	0.03	0.09	1.1
09163500	197/0	1/20/1970– 9/10/2008		0.16	0.36	0.505	0.677	2.01	161/0	1/20/1970– 9/10/2008	0	0.031	0.052	0.061	0.74
10485															
09132050															
09129800															
09130600															

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	Nitrite + Nitrate, dissolved, mg/L as nitrogen								Orthophosphate, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
WSEF2CR															
WSTWOCR															
WSKCINTK															
10575															
09152000															
WSKCBLCG															
WSJUNNLT															
WSJUNNLTLO															
10572															
WSNFKCWR															
WSNFKCDV															
WSNFKCSR															
WSNFKCINLT															
385600108250301															
10530															
WSLOCKDRW															
WSWHITCR															
385839108264401															
10505															
CDOWRW-562															
09152500	313/0	10/1/1958– 9/24/2002		0.045	0.497	0.84	1.24	2.26	210/0	10/1/1967– 9/11/1998	0	0.010	0.031	0.06	0.34
000054	162/1	9/17/1968– 4/30/1979		0	0.64	1	1.5	4.9	32/0	9/17/1968– 11/12/1973	0	0	0.1	0.175	0.8
09152520															
09152600									30/0	8/7/1973– 5/7/1998	0	0.06	0.105	0.21	0.83

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	No. of samples/ No. of censored	Phosphorus, water, unfiltered, mg/L as phosphorus							Phosphorus, EPA standard	
		Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
09302450	10/0	8/17/1999– 6/11/2007		0.02	0.02	0.025	0.03	0.52	1	4/27/2000– 4/27/2000
09304100										
395643107461200										
09304200	78/15	3/25/1991– 7/22/2009	0.01 0.03	0.004	0.011	0.02	0.035	0.128	1	5/28/1999– 5/28/1999
09304480	4/0									
09304300										
09304500										
09304550										
09304600										
4000001075434	10/0	10/19/1999– 6/11/2007		0.01	0.02	0.055	0.13	0.78		
400113107574500										
000043	94/34	4/3/1974– 4/21/1992	0.05 0.03 0.1	0	0.02	0.05	0.088	0.84	18	7/7/1975– 5/20/1991
400206108005901	4/0									
09304800	170/13	4/3/1974– 9/29/2009	0.01 0.03	0	0.024	0.04	0.07	1.065	26	4/24/1974– 4/23/2008
ENPR20ST										
ENPR21ST										
ENPR19ST										
09306007	108/1	12/4/1974– 9/4/1985	0.01	0.01	0.03	0.055	0.15	1.7	31	2/3/1975– 6/26/1985
09306025	20/3	5/9/1975– 2/18/1980	0.01	0.01	0.01	0.02	0.038	2.5	2	2/12/1976– 2/18/1980
09306028										
09306022	102/10	12/4/1974– 9/4/1985	0.01	0	0.01	0.025	0.05	0.14	4	2/3/1975– 5/22/1985
09306033										
09306039	5/0	12/5/1974– 5/31/1984		0.12	0.4	0.98	1.2	6	5	12/5/1974– 5/31/1984
09306042	43/1	8/7/1979– 9/4/1985	0.01	0.01	0.05	0.09	0.24	4.6	16	8/7/1979– 7/25/1984
09306050										
09306052										
09306058	94/6	4/15/1975– 9/4/1985	0.01	0.01	0.02	0.04	0.1	0.47	23	5/7/1975– 3/27/1985
09306061	116/2	12/6/1974– 9/4/1985	0.01	0.01	0.04	0.08	0.17	1.8	48	12/6/1974– 6/26/1985
11625	9/1	8/18/1999– 6/21/2007	0.01	0.01	0.05	0.08	0.1	0.19	1	4/11/2007– 4/11/2007
09306175	37/0	1/25/1977– 11/24/1981		0.01	0.03	0.05	0.11	3.9	9	1/23/1979– 6/12/1980
09306200	38/0	10/24/1978– 9/11/2002		0.03	0.060	0.115	0.2	2.3	21	12/11/1978– 7/9/1981
09306210										
09306222	37/0	10/24/1978– 7/31/2002		0.02	0.1	0.23	0.56	4.7	27	10/24/1978– 9/8/1981
000117	93/28	4/3/1974– 4/21/1992	0.05 0.03 0.1	0	0.03	0.06	0.15	1	33	11/19/1974– 5/20/1991
09306224	10/0	10/19/2007– 9/29/2009		0.019	0.026	0.061	0.258	0.389	3	3/27/2008– 6/11/2008

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	No. of samples/ No. of censored	Phosphorus, water, unfiltered, mg/L as phosphorus							Phosphorus, EPA standard	
		Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
09306240	9/0	5/14/1975– 4/20/1978		0.01	0.03	0.28	0.695	8	6	5/14/1975– 4/20/1978
09306241										
09306235	25/2	1/8/1975– 9/18/1979	0.01	0.01	0.01	0.03	0.08	1.3	4	4/9/1975– 5/24/1978
09306242	42/2	12/11/1974– 9/11/2002	0.01	0.01	0.03	0.04	0.198	1.4	12	3/12/1975– 9/11/2002
09306244	24/6	6/12/1975– 10/24/1978	0.01	0.01	0.01	0.02	0.048	0.85	2	6/25/1975– 5/13/1976
11702	32/3	9/14/1999– 6/12/2007	0.01	0.01	0.02	0.03	0.045	0.23	1	5/24/2005– 5/24/2005
09306255	43/2	12/11/1974– 7/31/2002	0.01	0.01	0.024	0.07	0.13	1	14	12/11/1974– 8/16/1979
09306290	113/11	11/9/1982– 9/30/2009	0.01 0.03	0.005	0.028	0.06	0.14	1.6	34	3/7/1983– 4/24/2008
09306300	75/3	8/6/1975– 9/22/1982	0.01	0.01	0.04	0.06	0.21	3.3	32	9/11/1975– 8/4/1982
09306305	72/8	4/21/1995– 7/28/2009	0.01 0.03	0.005	0.013	0.028	0.043	0.086		
09306380	6/0	2/8/1977– 10/7/1977		0.15	0.353	5.045	15.25	16	6	2/8/1977– 10/7/1977
400535108485700	8/0	4/2/2008– 7/28/2009		0.019	0.030	0.05	0.086	0.261	1	5/2/2008– 5/2/2008
000044	40/6	4/3/1974– 6/7/1982	0.05 0.03	0	0.05	0.1	0.27	1.3	19	11/19/1974– 6/7/1982
09072500										
CDOWRW-46	8/0	2/22/2001– 12/12/2007		0.03	0.036	0.103	0.245	0.591	4	5/22/2001– 5/23/2005
12100	10/1	2/14/2001– 8/20/2002	0.01	0.01	0.018	0.03	0.033	0.04		
CDOWRW-47	9/0	2/22/2001– 12/12/2007		0.006	0.04	0.04	0.08	0.615	1	5/23/2005– 5/23/2005
09085100										
11109A	5/4	10/23/2000– 4/18/2007	0.01							
CDOWRW-197										
09085150										
09085200										
09085400										
09085300										
000047	383/111	1/8/1974– 4/18/2007	0.05 0.01 0.03 0.1 0.02	0	0	0.037	0.07	0.61	51	5/29/1974– 4/13/2004
CDOWRW-546										
09086470										
11190H	5/5	11/30/2000– 4/18/2007	0.01							
09086000										
09086970										
11195	11/3	10/2/1995– 8/21/1996	0.01	0.01	0.01	0.01	0.01	0.05		
CDOWRW-547										
09087600										
11189	10/3	8/18/1999– 10/17/2006	0.01	0.01	0.01	0.015	0.03	1.2	1	10/17/2006– 10/17/2006

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Phosphorus, water, unfiltered, mg/L as phosphorus								Phosphorus, EPA standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
11110	10/0	10/12/1995– 7/18/1996		0.02	0.045	0.07	2.948	12	3	10/12/1995– 7/18/1996
391509108433001 09153270 09095526 09106104 09095529	4/0									
090955285 09095528 09153290	20/0	7/14/2000– 9/16/2003		0.024	0.060	0.101	0.145	0.289	10	7/17/2001– 9/16/2003
09153300 391038108475601 000050	53/9	10/24/1995– 9/8/1998	0.01	0.01	0.092	0.6	1.072	6.466	40	10/24/1995– 9/8/1998
391029108480200	369/48	4/1/1974– 7/29/1996	0.05 0.03 0.9 0.1	0	0.05	0.1	0.22	5.1	172	4/30/1974– 5/1/1996
11101	7/0	11/10/1976– 11/11/1976		0.03	0.03	0.03	0.03	0.05		
09163310 09163340 09153330 09153400 391646108572301 09161000 09160500 09163050 09163490 09163500	43/2	8/11/1999– 4/11/2007	0.01	0.01	0.03	0.062	0.14	2	13	8/11/1999– 7/24/2006
10485	238/4	10/17/1979– 9/10/2008	0.03 0.01	0	0.05	0.105	0.207	6.485	122	12/7/1979– 8/12/2008
09132050	14/1	10/11/1995– 3/17/2005	0.01	0.01	0.01	0.02	0.07	0.24	2	5/13/1996– 9/28/2004
09129800	34/5	12/16/1977– 9/1/1981	0.01	0	0.01	0.015	0.023	0.16	2	8/20/1979– 5/5/1981
09130600 09130800 09131100	6/1	5/19/1982– 7/20/1983	0.01	0.005	0.011	0.026	0.051	0.113	1	6/21/1983– 6/21/1983
09131200 10490	7/0	6/8/1982– 7/20/1983		0.009	0.015	0.025	0.029	0.034		
09132500	13/0	10/11/1995– 3/17/2005		0.02	0.05	0.13	0.32	0.79	7	2/12/1996– 3/17/2005
000152	47/4	10/20/1977– 8/24/1982	0.01	0	0.01	0.03	0.05	0.13	3	4/24/1979– 5/4/1982
09132700 09132800 09132900 09132920 09132940 10406H	37/14	5/14/1979– 5/25/2006	0.05 0.5 0.01	0.01	0.02	0.03	0.08	0.44	6	11/26/1979– 5/25/2006

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Phosphorus, water, unfiltered, mg/L as phosphorus								Phosphorus, EPA standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
09132960 09132985 09132995 09134000	3/0									
10436 09134050 385144107371701	6/0	3/31/1998– 3/16/2005		0.02	0.021	0.1	0.33	0.35	3	3/31/1998– 3/16/2005
09134100 385049107372402 384922107402001 09134200 384822107411201	6/0	3/31/1998– 5/24/2005		0.02	0.03	0.058	0.14	0.28	2	3/31/1998– 5/24/2005
	5/0	3/31/1998– 5/24/2005		0.021	0.028	0.045	0.05	0.14		
10212 384747107430501 09134500 09134700 10415	38/13	10/24/1995– 5/25/2006	0.01 0.05	0.01	0.01	0.02	0.03	0.23	1	5/13/1998– 5/13/1998
09135900 10411	9/0	10/11/1995– 8/6/1996		0.03	0.05	0.07	0.08	0.11	1	6/10/1996– 6/10/1996
384732107434801 09135950 000100	20/2	4/1/1998– 3/15/2005	0.01	0.01	0.015	0.02	0.050	0.09		
384434107432701 384610107455001 231275 231272 231273 231274 09136100 10400	158/36	4/1/1974– 2/1/2001	0.05 0.01 0.03	0	0.04	0.06	0.11	21	48	5/8/1975– 2/8/2000
09136200 384643107540301 10587	18/1	11/13/2003– 5/15/2007	0.01	0.01	0.031	0.061	0.165	1.6	7	3/29/2004– 5/15/2007
09137050 384649107570501 384624107570701 384604107570701 000056	5/1	4/1/1998– 5/11/2005	0.01	0.01	0.031	0.033	0.18	0.32	2	4/1/1998– 5/11/2005
09137300 384551107591901 09137500 09143000 09143500	100/39	1/13/1974– 8/8/1994	0.05 0.03	0	0	0.05	0.1	0.54	23	1/13/1974– 4/2/1992

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Site identification number	Phosphorus, water, unfiltered, mg/L as phosphorus								Phosphorus, EPA standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
WSTWOCR WSKCINTK 10575	10/0	9/14/1995– 5/2/2005		0.025	0.029	0.055	0.09	0.32	2	3/6/1996– 5/1/1996
09152000 WSKCBLCG WSJUNNLT WSJUNNLTLO 10572	9/0	9/14/1995– 5/2/2005		0.012	0.024	0.05	0.05	0.06		
WSNFKCWR WSNFKCDV WSNFKCSR WSNFKCINLT 385600108250301 10530	5/2	3/9/1999– 4/26/2006	0.01	0.01	0.01	0.01	0.014	0.033		
WSLOCKDRW WSWHITCR 385839108264401 10505	65/5	1/12/1999– 5/15/2007	0.01 0.05	0.007	0.02	0.04	0.13	3.1	22	5/24/1999– 5/15/2007
CDOWRW-562 09152500	193/10	6/17/1975– 9/24/2002	0.01	0	0.03	0.06	0.15	2.3	64	6/17/1975– 9/24/2002
000054 09152520 09152600	114/4	4/1/1974– 4/30/1979	0.01	0	0	0.05	0.1	0.78	22	4/1/1974– 5/16/1978

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Organic carbon, water, filtered, mg/L							Calcium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09302450 09304100 395643107461200 09304200								336/0	3/20/1970– 7/30/2002	0	47.8	57	61	87.931
09304480 09304300 09304500								288/0	7/6/1978– 9/26/1984	58	88	111.1	140	210
09304550 09304600								11/0	12/15/1970– 3/7/1995	16	29	70	74	78
4000001075434 400113107574500 000043 400206108005901								296/0	8/30/1973– 9/23/2005	55	110	140	197.1	331
09304800	71/0	8/13/1975– 9/29/2009	0.7	2.6	3.4	4.9	29	292/0	7/6/1978– 9/24/2005	30	57	64	69	85.6
ENPR20ST								5/0	5/30/1974– 9/29/2009	31	60	68	75	110
ENPR21ST								5/0	5/19/2005– 9/23/2008	44	45	47	48.5	49
ENPR19ST								5/0	8/18/2005– 9/23/2008	35	36.5	42	46.5	47
09306007	83/0	11/17/1975– 9/4/1985	3.5	5.1	7	12	44	7/0	5/19/2005– 9/17/2008	37	37	44	46	49
09306025	9/0	11/17/1975– 2/18/1980	1	3.5	5.3	19	30	193/0	4/23/1974– 9/3/1998	22	68	72	77	93
09306028 09306022	75/0	11/17/1975– 9/4/1985	1.6	2.6	3.8	7.6	25	41/0	5/3/1974– 2/18/1980	16	78	92	96	130
09306033 09306039								155/0	9/12/1974– 9/3/1998	71	87	92	95	110
09306042	56/0	8/7/1979– 6/18/1991	2.7	4.15	5.15	9.45	49	8/0	12/5/1974– 3/11/1985	22	27	29.5	43	50
09306050 09306052 09306058	76/0	12/17/1975– 9/4/1985	2	3.75	5.05	7.25	36	71/0	3/17/1977– 6/18/1991	2.6	8.8	10	14	52
09306061	92/0	12/17/1975– 9/4/1985	2.7	4.55	6.3	9.05	42	153/0	4/23/1974– 9/3/1998	62	87	91	95	110
11625 09306175								159/0	4/23/1974– 11/19/1991	16	72	78	83	91
09306200	51/0	3/4/1981– 7/8/2009	3.224	4.166	4.9	6.083	9.555	91/0	1/15/1975– 8/17/1983	42	90	98	100	120
09306210								246/0	6/8/1965– 7/8/2009	36	76	82	87	100
09306222	56/0	8/26/1981– 7/7/2009	3.977	5.163	6.547	8.236	24	58/0	12/15/1970– 8/18/1976	42	74	81	87	94
000117								239/0	6/8/1965– 7/7/2009	13.55	48	64	72	89.29

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Organic carbon, water, filtered, mg/L							Calcium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
ENPR3ST								13/0	10/27/2004– 3/26/2009	49	50	54	61.5	120
11145A														
11145B														
09092960								52/0	2/8/1976– 9/7/1983	47	53.5	57	61	68
09092970								52/0	4/21/1977– 9/9/1983	43	50	52	55	69
ENPR16ST								5/0	5/6/2005– 6/19/2008	44	47	52	57.5	61
09092980								41/0	4/21/1978– 9/12/1983	37	44	46	50	68
ENPR18ST														
ENPR17ST								5/0	5/6/2005– 6/19/2008	50	50	52	58.5	64
ENPR14ST								11/0	10/27/2004– 3/30/2009	47	52.75	58.5	65.25	71
ENPR15ST								12/0	10/27/2004– 3/30/2009	47	53.25	59	63.5	64
ENPR11ST								13/0	10/27/2004– 3/26/2009	47	52.5	60	63	68
09093000	45/0	6/11/1975– 9/24/1981	1.8	2.8	3.6	6.8	18	53/0	4/21/1975– 9/24/1981	45	55	57	60	74
11210														
09093500	7/0	10/5/1979– 3/10/1982	3.3	4.3	4.7	9.5	22	69/0	11/21/1974– 10/13/1982	49	78	87	99	160
09093700								86/0	8/31/1973– 10/25/1982	29.0	49.0	68.0	75.0	100
11205														
09094200														
09094400														
09095000	6/0	10/4/1979– 9/21/1981	5.3	5.375	7.5	13.35	30	62/0	2/24/1975– 11/15/1983	26	70	76.5	83	94
09095300	42/0	10/19/1995– 9/9/1998	3.9	4.975	5.45	6.5	12	54/0	10/19/1995– 8/2/2002	25	86	101.145	119.11	170.5
09095400	7/0	10/9/1979– 3/9/1982	6	6.1	6.9	13	13	16/0	8/5/1975– 11/15/1983	66	79	91.5	105	200
11202														
000148														
09095500	46/0	9/2/1994– 9/9/1998	1.1	2	2.45	3.025	5.5	586/0	10/1/1958– 9/24/2009	10.4	51.7	65.5	73.0	100
09096800														
09097500														
11155														
09097600														
09095800														
09096500														
391507107550601														
CDOWRW-56														
CDOWRW-55														
09097900														
CDOWRW-54														
CDOWRW-53														
09105000								226/0	11/19/1968– 9/24/2009	18.8	43.3	51.8	57.2	72.0

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	No. of samples/ No. of censored	Organic carbon, water, filtered, mg/L					No. of samples/ No. of censored	Calcium, water, filtered, mg/L					
		Date range	Min	25th	50th	75th	Max	Date range	Min	25th	50th	75th	Max
11103							9/0	10/30/2002– 9/14/2004	54.2	58.4	61.9	76.2	78.1
UP RAPID CRK INTAKE RC-2 RC-3 LOWER RAPID CRK													
L COTTONWOOD INTAKE 11151 390622108205400	4/0						6/0	5/23/2007– 5/29/2008	7.90	30.6	39.1	49.6	51.5
09106150							10/0	7/19/1994– 4/19/1995	58.0	63.3	68.0	72.3	80.0
CDOWRW-553							28/0	1/16/1992– 7/31/2002	28.0	49.5	64.0	69.0	81.0
CDOWRW-555 390322108253401 390348108265601							15/0	11/25/2002– 10/23/2006	30.0	52.6	56.8	77.7	79.3
CDOWRW-556 390319108273200 390318108273200							5/0	3/22/1991– 9/23/1993	94.0	107	150	315	320
CDOWRW-557 09106200							11/0	7/19/1994– 7/31/2002	64.0	74.0	81.0	81.0	105.844
390324108291301 390326108291601							63/0	8/7/1973– 3/6/2006	34.2	70.0	100	458	530
390323108291601 390303108291601 390322108292301 390318108293301 390302108293801 390319108312501 390320108315901							18/0	2/25/1997– 4/9/1999	63.1	71.5	96.1	144	173
CDOWRW-558 CDOWRW-560							6/0	3/21/1991– 5/6/1998	42.5	100	380	450	460
09106500							8/0	11/8/2002– 6/20/2003	41.6	58.1	69.8	73.1	88.9
390337108342800 CDOWRW-563 11135A CDOWRW-749 09152650							16/0	7/20/1994– 7/31/2002	31.0	66.0	77.5	91.0	116
11135 390449108364101 390514108373201 390521108373300							74/0	8/7/1973– 8/9/1999	91.0	133	225	490	553
							16/0	7/20/1994– 8/1/2002	35.0	56.0	86.5	110	120

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Organic carbon, water, filtered, mg/L							Calcium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
390607108384201								9/0	7/17/1997– 3/23/2000	56.0	60.9	68.3	78.5	91.0
390609108384701														
390613108385603														
390625108390402														
390617108391001														
390632108392101														
390624108394701														
390859108364101														
390645108390101								17/0	3/21/1991– 11/21/2004	89.7	119	142	500	596
390717108400501								7/0	3/20/1991– 5/12/1998	113	130	180	400	490
390718108415701														
09152900								47/0	8/7/1973– 5/12/1998	100	140	200	450	510
11133														
390741108424001														
390741108424301														
390741108425301														
09153000								16/0	7/20/1994– 8/1/2002	34.0	56.5	89.0	115	121.171
000049														
390938108443101														
11110														
391509108433001								7/0	5/2/1991– 12/26/1999	110	340	376	445	460
09153270								62/0	8/7/1973– 11/9/2006	82.0	160	230	390	505
09095526														
09106104														
09095529	20/0	7/14/2000– 9/16/2003	2.108	2.255	2.411	2.707	3.577							
090955285														
09095528														
09153290	52/0	3/12/1992– 9/8/1998	2.2	3.5	4.6	4.95	6.4	55/0	9/10/1991– 9/8/1998	72.7	118	160	461	580
09153300								101/0	8/7/1973– 3/8/1999	89.2	165	210	508	591
391038108475601								9/0	7/9/1993– 7/14/1999	90.1	93.0	105	465	512
000050														
391029108480200														
11101														
09163310								50/0	8/8/1973– 2/4/1992	62.0	150	320	440	470
09163340								47/0	8/8/1973– 6/15/1982	78.0	120	510	520	550
09153330								21/0	6/12/1979– 9/14/1981	150	170	190	222.5	500
09153400								22/0	9/12/1973– 3/13/1997	75	130	260	410	530
391646108572301														
09161000								21/0	10/2/1976– 8/22/1978	61.0	79.5	100	165	330

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Organic carbon, water, filtered, mg/L							Calcium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09160500								79/0	7/4/1977– 9/27/1982	69.0	110	150	280	440
09163050								23/0	8/8/1973– 7/15/1980	36.0	59.0	72.0	78.0	500
09163490								86/0	8/8/1973– 5/13/1998	83.7	140	205	450	550
09163500	84/0	10/17/1979– 9/17/2002	2.2	2.6	3.1	3.684	10	327/0	9/10/1969– 9/23/2009	32.3	66.0	83.0	107.555	180
10485														
09132050	35/0	12/16/1977– 9/1/1981	1.2	2.1	3.1	3.9	10	38/0	12/16/1977– 9/1/1981	8.4	12	18	21	38
09129800								9/0	5/19/1982– 8/16/1983	13	17.5	25	35.5	42
09130600														
09130800														
09131100								11/0	6/8/1982– 8/16/1983	6.7	7.8	9.2	15	20
09131200														
10490														
09132500	44/0	10/20/1977– 8/24/1982	0.6	2.325	3.3	5.25	24	55/0	10/20/1977– 3/13/2000	10	15	19	23	34
000152														
09132700														
09132800														
09132900														
09132920														
09132940														
10406H														
09132960														
09132985														
09132995														
09134000														
10436														
09134050														
385144107371701														
09134100														
385049107372402								6/0	5/8/2008– 4/14/2009	79.7	94.07	124.55	149.25	150.9
384922107402001								7/0	6/23/1999– 4/14/2009	114.61	146.8	230.1	265	293.6
09134200								5/0	8/9/1977– 8/30/1999	239.6	240	291.88	337.91	440
384822107411201								6/0	5/19/2008– 4/14/2009	180	226.35	301.5	344.575	385.3
10212														
384747107430501														
09134500														
09134700														
10415														
09135900														
10411														
384732107434801														
09135950														
000100														
384434107432701								6/0	5/12/2008– 4/10/2009	154.6	215.425	263.1	305.425	305.8

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Organic carbon, water, filtered, mg/L							Calcium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
384610107455001														
231275														
231272														
231273														
231274														
09136100								44/0	2/15/1962– 9/3/2009	20.552	51.759	103.275	146.54	190
10400														
09136200														
384643107540301														
10587														
09137050														
384649107570501														
384624107570701								5/0	7/18/1991– 8/8/2002	43.147	45.314	46	46.985	61.068
384604107570701								6/0	7/22/1991– 5/19/1998	82.88	94	103.5	160	320
000056														
09137300								5/0	5/8/1962– 6/11/1963	26	43	75	98	115
384551107591901								101/0	7/22/1991– 3/25/2003	69.123	131.18	160	422.18	470
09137500								32/0	10/1/1959– 8/26/1961	28	33.25	67.5	92.5	171
09143000														
09143500														
000116														
09139200														
09140200														
09140700														
09141200														
09137800														
10582														
09144200								8/0	11/28/1978– 3/15/2000	66.314	85.225	137.155	150.345	200
10516														
09144250								30/0	11/19/1987– 8/6/2009	28	55	61.545	82.857	97
383404107534101								11/0	4/11/2001– 2/6/2009	65.034	67.146	183.935	206.31	283.1
383408107535101								49/0	3/10/1992– 10/8/2009	55.276	75.891	89.649	176.625	260
383528107552001								49/0	4/11/2001– 4/21/2003	75.391	136.500	209.62	244.945	307.77
383741107565701								8/0	7/30/2001– 12/13/2002	137.045	143.294	196.844	237.904	310.4
383728107572001								51/0	4/11/2001– 4/21/2003	141.57	179.64	234.346	474.71	503.99
10661														
383946107595301								83/0	7/23/1991– 8/28/2009	130	160	210.142	400.67	506.9
383953108001701														
384231108020301														
10602														
09149480	44/0	10/26/1995– 9/2/1998	2.4	2.8	3.4	4.05	5.8	44/0	10/26/1995– 9/2/1998	44.126	91.585	154.555	180	210

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Organic carbon, water, filtered, mg/L							Calcium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
384202108032001								17/0	11/28/1978– 5/21/1998	77.03	160	170	180	280
10611 000055 09149500								246/0	11/6/1958– 8/6/2009	78.912	150	190	229	327
384448108070301								10/0	7/15/1991– 5/14/1998	166.09	280	345	430	430
10515 384408108091501								5/0	1/29/1992– 5/14/1998	167.72	290	300	300	400
10562 384013108091401								6/0	7/15/1991– 7/20/1999	14.453	35.401	55.216	66	130
09150500								15/0	12/7/1977– 9/7/1999	30.65	164.13	200	240	260
384510108111801 384527108152701								6/0	11/19/1987– 5/20/1998	35.49	69	77	110	160
10555 10551 09151500 384813108184301 10505A WSWF2CR WSEF2CR WSTWOCR WSKCINTK 10575 09152000								2/0						
WSKCBLCG WSJUNNLT WSJUNNLTLO 10572 WSNFKCWR WSNFKCDV								8/0	3/11/2002– 10/27/2008	17.54	20.94	22.65	23.3	25.62
WSNFKCSR WSNFKCINLT 385600108250301								10/0	8/21/2000– 3/12/2002	40.367	204.927	275.645	357.245	359.26
10530 WSLOCKDRW WSWHITCR								5/0	3/11/2002– 8/8/2006	42.2	45.55	49.5	69.845	70.89
385839108264401								16/0	6/29/1999– 5/23/2002	80.045	167.775	201.43	273.190	339.96
10505 CDOWRW-562 09152500	62/0	10/18/1977– 9/24/2002	2.3	2.9	3.5	4.2	6	548/0	10/1/1958– 9/28/2009	30	67	95	133	283
000054 09152520								9/0	8/21/2000– 5/23/2002	77.271	124.161	146.46	187.878	298.53
09152600								33/0	8/7/1973– 5/7/1998	94.017	210	290	500	590

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Magnesium, water, filtered, mg/L							Sodium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09302450														
09304100														
395643107461200														
09304200	336/0	3/20/1970– 7/30/2002	0	9.4	11	11	18	327/0	3/20/1970– 7/30/2002	0	3	3.7	4.4	22.1
09304480	288/0	7/6/1978– 9/26/1984	22.9	35.55	61.5	84.5	130	288/0	7/6/1978– 9/26/1984	9.7	22	43.8	62.8	119.6
09304300														
09304500	11/0	12/15/1970– 3/7/1995	3.3	6.3	15	17	19	11/0	12/15/1970– 3/7/1995	3.8	7.8	15	23	53
09304550	296/0	8/30/1973– 9/23/2005	63	190	289	466.3	784	296/0	8/30/1973– 9/23/2005	1	306.8	506	830.85	1,230
09304600	292/0	7/6/1978– 9/24/2005	6.7	13	15	17	27	292/0	7/6/1978– 9/24/2005	3.4	11	19.8	29	46
4000001075434														
400113107574500														
000043														
400206108005901														
09304800	385/0	5/30/1974– 9/29/2009	7.4	16	18	22	40	364/0	5/30/1974– 9/29/2009	4.8	17	27.605	34	83
ENPR20ST	5/0	5/19/2005– 9/23/2008	20	22	25	28	29	5/0	5/19/2005– 9/23/2008	42	46	51	72	72
ENPR21ST	5/0	8/18/2005– 9/23/2008	13	13	15	16.5	17	5/0	8/18/2005– 9/23/2008	38	38	40	43.5	45
ENPR19ST	8/0	5/19/2005– 9/17/2008	19	19.25	22	23.75	25	8/0	5/19/2005– 9/17/2008	51	53.5	58	62.75	66
09306007	193/0	4/23/1974– 9/3/1998	27	44	47	52	63	193/0	4/23/1974– 9/3/1998	47	110	120	130	170
09306025	41/0	5/3/1974– 2/18/1980	2.4	94	99	100	120	41/0	5/3/1974– 2/18/1980	2.9	150	150	160	220
09306028														
09306022	155/0	9/12/1974– 9/3/1998	55	71	74	76	95	155/0	9/12/1974– 9/3/1998	24	120	120	130	250
09306033														
09306039	8/0	12/5/1974– 3/11/1985	3.1	4.8	11.45	26.5	43	8/0	12/5/1974– 3/11/1985	14	20	31	67.5	200
09306042	71/0	3/17/1977– 6/18/1991	1.9	6.8	7.5	8.4	23	71/0	3/17/1977– 6/18/1991	120	490	540	580	680
09306050														
09306052														
09306058	153/0	4/23/1974– 9/3/1998	55	68	72	77	87	153/0	4/23/1974– 9/3/1998	92	110	120	130	180
09306061	159/0	4/23/1974– 11/19/1991	29	57	64	71	89	159/0	4/23/1974– 11/19/1991	62	130	140	170	230
11625														
09306175	90/0	1/15/1975– 8/17/1983	17	86	94.5	100	120	90/0	1/15/1975– 8/17/1983	33	140	150	160	200
09306200	246/0	6/8/1965– 7/8/2009	21	72	81	93	135.5	245/0	12/15/1970– 7/8/2009	65	150	164.7	210	412.1
09306210	58/0	12/15/1970– 8/18/1976	23	77	83.5	96	120	58/0	12/15/1970– 8/18/1976	70	160	190	250	440
09306222	239/0	6/8/1965– 7/7/2009	18	72	83	93	110.055	238/0	12/15/1970– 7/7/2009	76	240	328.010	540	2,000
000117														
09306224	35/0	11/9/1982– 9/29/2009	10	17.33	23.81	29	37	35/0	11/9/1982– 9/29/2009	9	22	35	44	60

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Magnesium, water, filtered, mg/L							Sodium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09306240	29/0	4/27/1974– 3/11/1985	3.8	42	47	49	66	29/0	4/27/1974– 3/11/1985	2.7	49	54	59	93
09306241	88/0	3/14/1974– 11/8/1988	15	57	60	62	94	88/0	3/14/1974– 11/8/1988	22	83	86	89	150
09306235														
09306242														
09306244														
11702	24/0	6/12/1975– 10/24/1978	90	100	110	110	120	24/0	6/12/1975– 10/24/1978	170	180	185	190	200
09306255	169/0	4/8/1965– 7/7/2009	11	110	130	163.659	210	167/0	8/1/1973– 7/7/2009	72.75	567.55	700	800	1,200
09306290	101/0	11/9/1982– 9/30/2009	10.621	20.51	27.897	32	41	92/0	11/9/1982– 9/30/2009	12	32.855	46	57	82
09306300	76/0	8/6/1975– 9/22/1982	9.7	21	24	27	48	75/0	8/6/1975– 9/22/1982	12	47	60	69	140
09306305	17/0	4/21/1995– 7/31/2002	10.999	12	21	27.997	36.900	7/0	4/21/1995– 7/31/2002	13	16	40	53	74.163
09306380	12/0	2/8/1977– 11/8/1995	26	45.5	76	130	220	12/0	2/8/1977– 11/8/1995	72	104.5	170	290	580
400535108485700 000044														
09072500	52/0	11/29/1958– 3/24/1966	4.6	8.05	11	13.5	23	36/0	11/29/1958– 3/24/1966	16	41	95	121.5	198
CDOWRW-46	54/0	9/13/1999– 5/7/2007	2.114	8.828	11.768	13.349	14.954	5/0	11/15/2006– 4/17/2007	106.7	116.25	130.3	169.5	196.9
12100														
CDOWRW-47	51/0	9/13/1999– 5/7/2007	5.899	8.992	11.861	13.59	15.484							
09085100	251/0	12/6/1977– 6/19/1995	4.3	9.7	12	13	19	251/0	12/6/1977– 6/19/1995	5	53.7	104	129.9	200.1
11109A														
CDOWRW-197														
09085150	21/0	4/13/2006– 9/8/2009	5.711	7.336	10.78	12.995	14.21	21/0	4/13/2006– 9/8/2009	13.25	41.675	91.88	133.4	156.8
09085200														
09085400														
09085300														
000047														
CDOWRW-546	16/0	10/23/2002– 5/7/2004	6.952	10.578	13.229	14.654	16.255							
09086470														
11190H														
09086000														
09086970														
11195														
CDOWRW-547	12/0	10/23/2002– 5/7/2004	10.664	14.607	21.603	32.797	36.279							
09087600	18/0	7/31/2002– 11/7/2008	5.024	7.844	10.92	13.07	19.23	18/0	7/31/2002– 11/7/2008	16.07	40.63	92.46	124.1	160.152
11189														
09089000														
11185														
09089500	20/0	5/1/1986– 8/23/1990	3.8	4.4	5.85	8.175	16	20/0	5/1/1986– 8/23/1990	5.8	7.325	10.25	16.5	30
LANG6ST	24/0	6/2/2004– 5/9/2006	6.72	17.25	29.5	34.75	40	32/0	6/2/2004– 9/29/2008	14	46.5	79	89	110

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Magnesium, water, filtered, mg/L							Sodium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
LANG5ST	34/0	5/26/2004– 5/9/2006	6.71	15.75	30	37.25	45	42/0	5/26/2004– 9/29/2008	14.2	42	76	93	110
LANG4ST	33/0	6/2/2004– 5/9/2006	6.53	18	30	36	42	41/0	6/2/2004– 9/29/2008	13.9	42.75	80	93.5	110
LANG3ST	24/0	6/2/2004– 5/9/2006	6.56	16.5	30	35.75	39	31/0	6/2/2004– 9/29/2008	13.9	50	81	93.5	120
LANG7ST	25/0	5/26/2004– 5/9/2006	6.69	16	30.3	35	39	34/0	5/26/2004– 9/29/2008	14.1	46.5	75.4	86.25	110
LANG8ST	24/0	6/2/2004– 5/9/2006	6.76	18.25	31	35	41	32/0	6/2/2004– 9/29/2008	14.1	50	76	85.5	100
LANG9ST	18/0	12/9/2004– 5/9/2006	6.77	17	29.05	31.25	39	26/0	12/9/2004– 9/29/2008	14.1	51	76	84.2	100
LANG10ST	18/0	12/9/2004– 5/9/2006	6.86	16	30	31	38	26/0	12/9/2004– 9/29/2008	15.1	50	75	83.8	100
09090700 09090800 DUNC1ST	25/0	6/3/2004– 6/6/2006	10	24.5	39.2	42	780	25/0	6/3/2004– 6/6/2006	43	125	200	215	280
COS-INTAKE 09091100 CDOWRW-550 CDOWRW-559 09092500 704569 09091500 09092000 000147 09092600 09092830	12/0	1/17/2003– 4/13/2005	8.985	13.59	14.856	19.962	27.268							
09092850	62/0	2/9/1976– 5/5/1983	13	19	20	22	27	62/0	2/9/1976– 5/5/1983	21	31	33	36	51
ENPR13ST	64/0	2/9/1976– 7/29/1983	14	19.5	20	22	25	64/0	2/9/1976– 7/29/1983	22	33.5	35	37	43
ENPR12ST	6/0	3/11/2003– 6/11/2008	18	19	20.5	22	190	6/0	3/11/2003– 6/11/2008	29	30	33.5	37	250
ENPR4ST	12/0	5/5/2005– 3/19/2009	21	34	42.5	47.5	50	12/0	5/5/2005– 3/19/2009	33	47.25	62.5	65.75	68
ENPR1ST	8/0	5/19/2005– 10/10/2008	23	26.5	29.5	31	37	8/0	5/19/2005– 10/10/2008	39	46.25	51	55	72
ENPR2ST	13/0	10/27/2004– 3/26/2009	27	28.5	31	34.5	41	13/0	10/27/2004– 3/26/2009	43	46.5	54	59.5	68
ENPR10ST	13/0	10/27/2004– 3/26/2009	28	29	32	35	40	13/0	10/27/2004– 3/26/2009	42	46	55	60	64
ENPR9ST	6/0	8/17/2005– 9/16/2008	23	26	28	30.5	32	6/0	8/17/2005– 9/16/2008	36	42.75	46	53.25	63
ENPR5ST	6/0	8/17/2005– 9/15/2008	19	23.5	26.5	28	28	6/0	8/17/2005– 9/15/2008	31	38.5	42.5	48.25	52
ENPR6ST	7/0	5/4/2005– 9/16/2008	24	26	30	31	32	7/0	5/4/2005– 9/16/2008	41	42	45	48	53
09092800 ENPR3ST	10/0	5/4/2005– 3/26/2009	10	24.75	31.5	36	39	10/0	5/4/2005– 3/26/2009	13	39	48	58.5	61
11145A 11145B	13/0	10/27/2004– 3/26/2009	29	36	38	43	46	13/0	10/27/2004– 3/26/2009	48	59.5	76	82	120

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Magnesium, water, filtered, mg/L							Sodium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09092960	52/0	2/8/1976– 9/7/1983	15	20	22	23	28	52/0	2/8/1976– 9/7/1983	12	19	21	22	37
09092970	52/0	4/21/1977– 9/9/1983	15	20	21	23	29	52/0	4/21/1977– 9/9/1983	18	21	22.5	24	27
ENPR16ST								5/0	5/6/2005– 6/19/2008	19	20	22	24	24
09092980	41/0	4/21/1978– 9/12/1983	10	24	26	28	31	41/0	4/21/1978– 9/12/1983	19	44	47	49	53
ENPR18ST	5/0	8/24/2005– 9/24/2008	18	18.5	19	20.5	21	5/0	8/24/2005– 9/24/2008	47	48	52	58.5	60
ENPR17ST	5/0	5/6/2005– 6/19/2008	20	20.5	21	27	32	5/0	5/6/2005– 6/19/2008	21	21.5	22	44	46
ENPR14ST	11/0	10/27/2004– 3/30/2009	25	29.75	33	38.5	44	10/0	10/27/2004– 3/30/2009	28	41.5	47	53.5	58
ENPR15ST	12/0	10/27/2004– 3/30/2009	21	32.25	36.5	40.75	42	12/0	10/27/2004– 3/30/2009	25	41	50.5	57.5	70
ENPR11ST	13/0	10/27/2004– 3/26/2009	23	30.5	35	40.5	43	13/0	10/27/2004– 3/26/2009	28	39	46	54.5	59
09093000	53/0	4/21/1975– 9/24/1981	18	34	37	41	50	53/0	4/21/1975– 9/24/1981	29	55	61	70	120
11210														
09093500	69/0	11/21/1974– 10/13/1982	19	57	62	72	100	69/0	11/21/1974– 10/13/1982	38	98	110	130	280
09093700	86/0	8/31/1973– 10/25/1982	6.1	11	16	18	24	86/0	8/31/1973– 10/25/1982	13	52	110	130	190
11205														
09094200														
09094400														
09095000	61/0	2/24/1975– 11/15/1983	17	55	66	73	86	62/0	2/24/1975– 11/15/1983	39	99	115	130	160
09095300	54/0	10/19/1995– 8/2/2002	15	96.462	122.545	170.98	238.78	54/0	10/19/1995– 8/2/2002	62	230	298.44	457.61	606.02
09095400	16/0	8/5/1975– 11/15/1983	52	86.5	105	135	190	16/0	8/5/1975– 11/15/1983	85	205	265	360	590
11202														
000148														
09095500	584/0	10/1/1958– 9/24/2009	1.6	12	16	18.7	33	494/0	10/1/1958– 9/24/2009	10.3	57	102	130	200
09096800														
09097500														
11155														
09097600														
09095800														
09096500														
391507107550601														
CDOWRW-56														
CDOWRW-55														
09097900														
CDOWRW-54														
CDOWRW-53														
09105000	226/0	11/19/1968– 9/24/2009	5.55	23.84	31.18	36.96	48	218/0	11/19/1968– 9/24/2009	6.84	36.1	51.2	61	218
11103	9/0	10/30/2002– 9/14/2004	14.809	17.342	18.183	22.959	23.635							
UP RAPID CRK INTAKE RC-2														

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Magnesium, water, filtered, mg/L							Sodium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
RC-3 LOWER RAPID CRK L COTTONWOOD INTAKE 11151 390622108205400	6/0	5/23/2007– 5/29/2008	2.8	11.2	15.7	19.3	20							
09106150	10/0	7/19/1994– 4/19/1995	16	17	18.5	20	23	10/0	7/19/1994– 4/19/1995	82	99	120	132.5	140
CDOWRW-553	28/0	1/16/1992– 7/31/2002	5.6	12.5	15.075	17.5	21	28/0	1/16/1992– 7/31/2002	16	55.5	100	122.549	150
CDOWRW-555 390322108253401 390348108265601	15/0	11/25/2002– 10/23/2006	7.39	13.217	15.041	21.783	22.081							
CDOWRW-556 390319108273200 390318108273200	5/0	3/22/1991– 9/23/1993	75	81	130	380	380	5/0	3/22/1991– 9/23/1993	150	180	280	670	690
CDOWRW-557 09106200	11/0	7/19/1994– 7/31/2002	16	19	21	23	27.381	11/0	7/19/1994– 7/31/2002	93	110	130	134.655	150
390324108291301 390326108291601	63/0	8/7/1973– 3/6/2006	7	20.235	31	291.17	380	62/0	8/7/1973– 3/6/2006	18.968	88	152.977	360	440
390323108291601 390303108291601 390322108292301 390318108293301 390302108293801 390319108312501 390320108315901	18/0	2/25/1997– 4/9/1999	27.429	39.156	49.888	92.957	137.62	18/0	2/25/1997– 4/9/1999	62.986	94.353	128.295	191.07	253.48
CDOWRW-558 CDOWRW-560	6/0	3/21/1991– 5/6/1998	14.803	34	245	290	320	6/0	3/21/1991– 5/6/1998	41.253	120	395	470	500
09106500	8/0	11/8/2002– 6/20/2003	10.228	15.631	20.265	20.693	26.041							
390337108342800 CDOWRW-563 11135A CDOWRW-749 09152650	16/0	7/20/1994– 7/31/2002	6.5	18.5	22	24.5	34.912	16/0	7/20/1994– 7/31/2002	16	80.5	120	135	150
11135 390449108364101 390514108373201 390521108373300	74/0	8/7/1973– 8/9/1999	27	42.26	73.5	200	240	74/0	8/7/1973– 8/9/1999	48	89	180	280	330
390607108384201	16/0	7/20/1994– 8/1/2002	8.2	15.5	28	32.137	36	16/0	7/20/1994– 8/1/2002	15	41.5	84.668	100.5	120
390609108384701 390613108385603 390625108390402 390617108391001	9/0	7/17/1997– 3/23/2000	14.489	19.161	21.95	24.517	26.337	9/0	7/17/1997– 3/23/2000	45.128	62	72.952	89.440	102.59

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Magnesium, water, filtered, mg/L							Sodium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09132050	37/0	12/16/1977– 9/1/1981	0.88	1.75	2.6	3.1	9.9	36/0	12/16/1977– 9/1/1981	1.5	2.625	3.6	4.175	8.6
09129800	9/0	5/19/1982– 8/16/1983	1.8	2.25	3.1	4.1	4.8	9/0	5/19/1982– 8/16/1983	2.7	3.15	3.7	5.65	5.8
09130600	11/0	6/8/1982– 8/16/1983	1.6	1.8	1.9	3.9	4.7	11/0	6/8/1982– 8/16/1983	1.1	1.1	2.1	2.5	3.2
09130800														
09131100														
09131200 10490	55/0	10/20/1977– 3/13/2000	1.8	2.5	3.5	4	5.8	55/0	10/20/1977– 3/13/2000	2.9	4.6	7.1	8.4	11
09132500														
000152 09132700 09132800 09132900 09132920 09132940 10406H 09132960 09132985 09132995 09134000 10436 09134050 385144107371701 09134100 385049107372402														
384922107402001	6/0	5/8/2008– 4/14/2009	76.81	83.163	105.42	144.875	191.3	6/0	5/8/2008– 4/14/2009	87	87.773	108.24	172.3	217.9
09134200	7/0	6/23/1999– 4/14/2009	41.084	65.09	71.08	149.8	163	7/0	6/23/1999– 4/14/2009	38.731	56.44	77.98	164	235.5
384822107411201	5/0	8/9/1977– 8/30/1999	109.26	131.36	161.39	260	280	5/0	8/9/1977– 8/30/1999	150.7	170.18	226.13	410	480
10212 384747107430501 09134500 09134700 10415 09135900 10411 384732107434801 09135950 000100	6/0	5/19/2008– 4/14/2009	81.78	97.17	173.55	201.65	237.2	6/0	5/19/2008– 4/14/2009	106.3	128.725	232.35	292.925	346.7
384434107432701	6/0	5/12/2008– 4/10/2009	67.35	103.088	140.45	148.625	159.5	6/0	5/12/2008– 4/10/2009	39.63	61.358	81.98	87.58	89.59
384610107455001 231275 231272 231273 231274	44/0	2/15/1962– 9/3/2009	5.632	21.449	52.408	65.361	85	44/0	2/15/1962– 9/3/2009	7.215	25.275	57.968	68.621	93
09136100														
10400														

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Magnesium, water, filtered, mg/L							Sodium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09136200														
384643107540301														
10587														
09137050														
384649107570501														
384624107570701	5/0	7/18/1991– 8/8/2002	14.673	15	15.793	16.884	19.622	5/0	7/18/1991– 8/8/2002	17.428	18	19.168	20.01	21.601
384604107570701	6/0	7/22/1991– 5/19/1998	22	25.23	29.5	44	160	6/0	7/22/1991– 5/19/1998	53	68.7	80.5	140	720
000056														
09137300	5/0	5/8/1962– 6/11/1963	4.1	9.55	26	38	41	5/0	5/8/1962– 6/11/1963	6	14	36	58.5	72
384551107591901	101/0	7/22/1991– 3/25/2003	24.073	44	60.232	262.12	330	101/0	7/22/1991– 3/25/2003	63	122.57	167.201	1,138.154	1,685.6
09137500	32/0	10/1/1959– 8/26/1961	6.6	8.3	23.5	39.75	85	32/0	10/1/1959– 8/26/1961	8.8	14	52.5	81.75	198
09143000														
09143500														
000116														
09139200														
09140200														
09140700														
09141200														
09137800														
10582														
09144200	8/0	11/28/1978– 3/15/2000	33.932	47.436	75.520	80.953	120	8/0	11/28/1978– 3/15/2000	40.734	58.498	86.702	101.532	190
10516														
09144250	30/0	11/19/1987– 8/6/2009	8.4	19	22	26	41	30/0	11/19/1987– 8/6/2009	11	28	32.008	44	66
383404107534101	11/0	4/11/2001– 2/6/2009	19.561	22.4	103.47	108.4	131.4	11/0	4/11/2001– 2/6/2009	52.108	54.875	253.152	304.35	410
383408107535101	49/0	3/10/1992– 10/8/2009	16.304	20.36	28.622	96.92	123.29	49/0	3/10/1992– 10/8/2009	26.399	46.32	69.18	251.8	490
383528107552001	49/0	4/11/2001– 4/21/2003	28.407	63.441	109.62	150.35	174.82	49/0	4/11/2001– 4/21/2003	73.107	182.512	320.33	470.42	564.3
383741107565701	8/0	7/30/2001– 12/13/2002	56.006	58.570	93.651	108.884	186.26	8/0	7/30/2001– 12/13/2002	141.832	166.975	256.406	321.880	567.19
383728107572001	51/0	4/11/2001– 4/21/2003	43.295	57.070	77.088	236.98	295.46	51/0	4/11/2001– 4/21/2003	77.37	114.048	150.889	527.25	690.4
10661														
383946107595301	83/0	7/23/1991– 8/28/2009	39	53	68.481	218.74	310	83/0	7/23/1991– 8/28/2009	89	114.15	163.097	548.33	824.5
383953108001701														
384231108020301														
10602														
09149480	44/0	10/26/1995– 9/2/1998	11.926	24	35	52.257	62	44/0	10/26/1995– 9/2/1998	13.543	29.187	44.407	60.669	73
384202108032001	17/0	11/28/1978– 5/21/1998	18.5	39	43	48	78	17/0	11/28/1978– 5/21/1998	24.751	52	64	70	110
10611														
000055														
09149500	246/0	11/6/1958– 8/6/2009	13	43.423	56.612	75	170	229/0	11/6/1958– 8/6/2009	39	82.960	110	160	328

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Magnesium, water, filtered, mg/L							Sodium, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
384448108070301	10/0	7/15/1991–5/14/1998	29.401	48	62.5	83	89	10/0	7/15/1991–5/14/1998	36.191	61	89.5	120	130
10515														
384408108091501	5/0	1/29/1992–5/14/1998	34.222	65	70	70	130	5/0	1/29/1992–5/14/1998	51.652	120	130	130	290
10562														
384013108091401	6/0	7/15/1991–7/20/1999	3.907	8.966	13.67	15	28	6/0	7/15/1991–7/20/1999	22.006	23.271	54.479	78	160
09150500	15/0	12/7/1977–9/7/1999	7.477	41.929	57	75	93	15/0	12/7/1977–9/7/1999	8.73	51	69	97	110
384510108111801														
384527108152701	6/0	11/19/1987–5/20/1998	9.783	22	27	30	49	6/0	11/19/1987–5/20/1998	15.97	33	42.5	49	83
10555														
10551														
09151500	2/0							2/0						
384813108184301														
10505A														
WSWF2CR														
WSEF2CR														
WSTWOCR														
WSKCINTK														
10575														
09152000	13/0	7/25/2000–5/23/2002	2.498	4.046	4.588	7.135	8.941	13/0	7/25/2000–5/23/2002	1.573	2.558	3.128	5.452	6.562
WSKCBLCG														
WSJUNNLT														
WSJUNNLTLO														
10572														
WSNFKCWR														
WSNFKCDV	8/0	3/11/2002–10/27/2008	5.348	6.344	6.824	7.15	8.121	11/1	3/11/2002–10/27/2008	2.4	3.185	3.4	4.3	5.1
WSNFKCSR														
WSNFKCINLT														
385600108250301	10/0	8/21/2000–3/12/2002	14.686	112.378	150.555	185.315	207.47	10/0	8/21/2000–3/12/2002	18.803	187.457	226.01	274.555	321.48
10530														
WSLOCKDRW								5/0	10/6/2003–10/27/2008	8.527	10.57	12	13.1	14.11
WSWHITCR	5/0	3/11/2002–8/8/2006	16.92	17.61	22.7	28.8	34.5	8/0	3/11/2002–8/8/2006	13.77	19.25	32.9	47.425	77.5
385839108264401	16/0	6/29/1999–5/23/2002	44.873	83.475	137.395	176.85	275.88	16/0	6/29/1999–5/23/2002	104.78	150.634	363.17	436.498	810.2
10505														
CDOWRW-562														
09152500	548/0	10/1/1958–9/28/2009	7.8	22.877	33	48	86	509/0	10/1/1958–9/28/2009	11.762	38	57	84.020	172
000054														
09152520	9/0	8/21/2000–5/23/2002	32.872	54.098	61.835	77.965	219.04	9/0	8/21/2000–5/23/2002	70.804	80.071	84.194	124.940	773.53
09152600	33/0	8/7/1973–5/7/1998	25.283	56	140	160	220	32/0	8/7/1973–5/7/1998	52.64	135	250	310	360

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Potassium, water, filtered, mg/L							Chloride, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09302450														
09304100														
395643107461200														
09304200	327/0	3/20/1970– 7/30/2002	0	0.8	1	1.2	4.3	366/7	3/20/1970– 7/22/2009	0	1.1	1.4	2.1	12.4
09304480	288/0	7/6/1978– 9/26/1984	0.4	2	3	4	13	288/0	7/6/1978– 9/26/1984	2.5	8.7	16	25	49.7
09304300														
09304500	11/0	12/15/1970– 3/7/1995	1.1	1.1	1.5	1.7	2.3	11/0	12/15/1970– 3/7/1995	1.4	3.2	11	26	62
09304550	296/0	8/30/1973– 9/23/2005	2	9	12.5	17	31.3	295/0	8/30/1973– 9/23/2005	20	110	165.1	262.7	436.6
09304600	292/0	7/6/1978– 9/24/2005	0.8	1.2	2	2	9.4	292/0	7/6/1978– 9/24/2005	1.8	7.8	16.5	34.55	57
4000001075434														
400113107574500														
000043														
400206108005901														
09304800	363/0	5/30/1974– 9/29/2009	0.8	1.3	2	2	9	400/0	5/30/1974– 9/29/2009	1.5	7.681	20	34	66
ENPR20ST	5/0	5/19/2005– 9/23/2008	1	1	1.1	1.4	1.4							
ENPR21ST	5/0	8/18/2005– 9/23/2008	0.6	0.74	0.96	1.55	1.6							
ENPR19ST	8/0	5/19/2005– 9/17/2008	0.65	0.728	0.835	0.915	1.2							
09306007	195/0	4/23/1974– 9/3/1998	1.6	2.4	2.8	3.3	19	193/0	4/23/1974– 9/3/1998	7.7	13	15	17	49
09306025	41/0	5/3/1974– 2/18/1980	0.9	1.9	2.8	4	12	41/0	5/3/1974– 2/18/1980	3.1	8.4	9.4	11	29
09306028														
09306022	156/0	9/12/1974– 9/3/1998	1	1.2	1.315	1.6	4.8	154/0	9/12/1974– 9/3/1998	5.2	6.4	7.05	8.9	19
09306033														
09306039	8/0	12/5/1974– 3/11/1985	1.3	1.6	2	3.6	4.8	8/0	12/5/1974– 3/11/1985	1.5	3.05	4.8	11.05	30
09306042	71/0	3/17/1977– 6/18/1991	1.3	1.6	1.9	3.7	6.7	71/0	3/17/1977– 6/18/1991	4.8	7.2	8.2	9.2	37
09306050														
09306052														
09306058	153/0	4/23/1974– 9/3/1998	0.7	1.5	1.7	2.2	6.7	153/1	4/23/1974– 9/3/1998	0.1	11	12	13	30
09306061	160/0	4/23/1974– 11/19/1991	0.7	2.5	3	3.65	13	159/0	4/23/1974– 11/19/1991	7.5	12	14	15	27
11625														
09306175	90/0	1/15/1975– 8/17/1983	0.1	2	2.3	2.8	13	91/0	1/15/1975– 8/17/1983	5.6	8.6	9.7	11	23
09306200	245/0	12/15/1970– 7/8/2009	0.3	2.5	2.916	3.5	8.4	246/0	6/8/1965– 7/8/2009	6.6	13	15.793	18.62	35
09306210	58/0	12/15/1970– 8/18/1976	2	2.8	3.3	4.3	7.8	58/0	12/15/1970– 8/18/1976	11	14	17	21	32
09306222	238/0	12/15/1970– 7/7/2009	2.1	2.946	3.6	4.6	8.8	238/0	6/8/1965– 7/7/2009	10	29.039	40.407	68	1,000
000117														
09306224	35/0	11/9/1982– 9/29/2009	0.926	1.356	1.5	1.7	2.314	35/0	11/9/1982– 9/29/2009	2.2	5.9	9.5	12	19

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Potassium, water, filtered, mg/L							Chloride, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09306240	28/0	4/27/1974–3/11/1985	0.7	0.9	1.05	1.8	11	29/0	4/27/1974–3/11/1985	3	5.2	5.8	6.4	18
09306241														
09306235	88/0	3/14/1974–11/8/1988	0.6	1.15	1.4	1.6	56	88/0	3/14/1974–11/8/1988	3.8	7	7.65	8.85	150
09306242	196/0	3/14/1974–7/8/2009	0.5	1.279	1.431	1.7	4.4	196/0	3/14/1974–7/8/2009	4	9.7	11	14	30
09306244	24/0	6/12/1975–10/24/1978	1.9	2.6	2.8	3	4.4	24/0	6/12/1975–10/24/1978	15	18	19	20	23
11702														
09306255	167/0	8/1/1973–7/7/2009	1.15	3.2	3.84	4.4	8.6	169/0	4/8/1965–7/7/2009	9.1	85	110	130.222	260
09306290	92/0	11/9/1982–9/30/2009	0.894	1.4	1.6	1.9	3.7	93/0	11/9/1982–9/30/2009	2.4	8.8	12	14.413	20
09306300	76/0	8/6/1975–9/22/1982	1	1.7	1.9	2.3	6.4	77/0	8/6/1975–9/22/1982	4.9	24	35	41	75
09306305	7/0	4/21/1995–7/31/2002	0.9	1.3	1.7	1.9	2.84	8/0	4/21/1995–7/31/2002	3.1	5.95	11.5	14.5	22.73
09306380	12/0	2/8/1977–11/8/1995	3	4.3	4.8	8.5	12	12/0	2/8/1977–11/8/1995	11	15	28	39	82
400535108485700 000044														
09072500	17/0	11/29/1958–3/24/1966	1	1.7	3.5	4.6	5.4	52/0	11/29/1958–3/24/1966	20	51.5	124.5	164	305
CDOWRW-46	5/0	11/15/2006–4/17/2007	5.516	5.713	6.065	8.385	8.707							
12100														
CDOWRW-47														
09085100	251/0	12/6/1977–6/19/1995	0.8	2.7	3.8	4.7	9.8	251/0	12/6/1977–6/19/1995	7.8	74	151.9	184.2	300
11109A														
CDOWRW-197														
09085150	21/0	4/13/2006–9/8/2009	1.279	1.771	3.074	3.846	4.584	21/0	4/13/2006–9/8/2009	15.828	59.644	133.312	200.607	226.211
09085200														
09085400														
09085300														
000047														
CDOWRW-546														
09086470														
11190H														
09086000														
09086970														
11195														
CDOWRW-547														
09087600	18/0	7/31/2002–11/7/2008	1.106	1.921	3.012	3.672	4.197	18/0	7/31/2002–11/7/2008	21.211	57.578	134.181	188.37	236.71
11189														
09089000														
11185														
09089500	20/0	5/1/1986–8/23/1990	0.8	1	1.3	1.575	2.2	20/0	5/1/1986–8/23/1990	1.1	1.8	2.7	5.85	12
LANG6ST	24/0	6/2/2004–5/9/2006	1.79	2.625	2.85	3.75	11							
LANG5ST	34/0	5/26/2004–5/9/2006	1.93	2.675	3	3.925	11							

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Potassium, water, filtered, mg/L							Chloride, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
LANG4ST	33/0	6/2/2004– 5/9/2006	1.84	2.55	2.9	3.75	11							
LANG3ST	24/0	6/2/2004– 5/9/2006	1.85	2.7	2.8	3.5	12							
LANG7ST	25/0	5/26/2004– 5/9/2006	1.83	2.65	2.9	3.85	11							
LANG8ST	24/0	6/2/2004– 5/9/2006	1.83	2.7	3	3.8	10							
LANG9ST	18/0	12/9/2004– 5/9/2006	1.83	2.5	2.9	3.118	8.8							
LANG10ST	18/0	12/9/2004– 5/9/2006	1.96	2.6	2.85	3.105	8.1							
09090700														
09090800														
DUNC1ST	25/0	6/3/2004– 6/6/2006	1.9	2.4	3	4.6	73							
COS-INTAKE														
09091100														
CDOWRW-550														
CDOWRW-559														
09092500														
704569														
09091500														
09092000														
000147														
09092600														
09092830	62/0	2/9/1976– 5/5/1983	0.4	0.6	0.7	0.8	1.1	62/0	2/9/1976– 5/5/1983	1.2	1.7	1.8	2.2	5.5
09092850	64/0	2/9/1976– 7/29/1983	0.5	0.7	0.8	0.95	1.4	64/0	2/9/1976– 7/29/1983	1.4	1.95	2.1	2.3	4.4
ENPR13ST	5/0	3/11/2003– 5/31/2007	0.5	0.615	0.86	2.87	4.8							
ENPR12ST	12/0	5/5/2005– 3/19/2009	1.3	1.85	3.15	3.4	3.7							
ENPR4ST	8/0	5/19/2005– 10/10/2008	0.52	0.843	0.95	1.3	2.3							
ENPR1ST	12/0	10/27/2004– 3/26/2009	0.71	0.843	0.995	1.475	1.8							
ENPR2ST	13/0	10/27/2004– 3/26/2009	0.53	0.905	0.96	1.45	2.9							
ENPR10ST	6/0	8/17/2005– 9/16/2008	0.83	0.853	1.2	1.775	2							
ENPR9ST	6/0	8/17/2005– 9/15/2008	0.66	0.66	0.8	1.05	1.2							
ENPR5ST	7/0	5/4/2005– 9/16/2008	0.98	1.3	1.8	3	8.2							
ENPR6ST	10/0	5/4/2005– 3/26/2009	0.9	1.075	1.4	4.225	8.7							
09092800														
ENPR3ST	13/0	10/27/2004– 3/26/2009	2.3	2.4	2.8	5.15	35							
11145A														
11145B														
09092960	52/0	2/8/1976– 9/7/1983	0.4	0.6	0.7	0.8	1.6	52/1	2/8/1976– 9/7/1983	0.1	1.3	1.4	1.65	6
09092970	52/0	4/21/1977– 9/9/1983	0.5	0.6	0.7	0.8	2	51/0	4/21/1977– 9/9/1983	0.7	1.4	1.5	1.8	10

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Potassium, water, filtered, mg/L							Chloride, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
390622108205400	10/0	7/19/1994– 4/19/1995	3.4	3.65	3.85	4.425	4.6	10/0	7/19/1994– 4/19/1995	94	130	155	180	180
09106150	28/0	1/16/1992– 7/31/2002	1.2	2.75	3.35	3.85	4.5	28/0	1/16/1992– 7/31/2002	16	67	140	170	200
CDOWRW-553 CDOWRW-555 390322108253401 390348108265601	5/0	3/22/1991– 9/23/1993	3.8	4.85	6.7	11	11	5/0	3/22/1991– 9/23/1993	75	107.5	160	225	230
CDOWRW-556 390319108273200 390318108273200	11/0	7/19/1994– 7/31/2002	2.8	3.6	3.8	4.2	4.6	11/0	7/19/1994– 7/31/2002	120	140	160	182.07	200
CDOWRW-557 09106200	63/0	8/7/1973– 3/6/2006	1.368	3.510	4.89	8.9	18	63/0	8/7/1973– 3/6/2006	22.38	117.68	190	230	270
390324108291301								7/0	12/14/1998– 8/17/1999	65.155	95.89	160.07	179.5	192.6
390326108291601	18/0	2/25/1997– 4/9/1999	2.47	3.365	4.13	4.98	6.37	25/0	2/25/1997– 8/17/1999	49.619	75.796	122.12	150.635	180.45
390323108291601								8/0	12/14/1998– 8/17/1999	34.467	68.271	120.85	157.115	171.71
390303108291601 390322108292301 390318108293301 390302108293801 390319108312501 390320108315901	6/0	3/21/1991– 5/6/1998	3.77	4.5	9.65	11	47	6/0	3/21/1991– 5/6/1998	37.512	130	225	240	330
CDOWRW-558 CDOWRW-560 09106500	16/0	7/20/1994– 7/31/2002	1.2	3	3.75	4.15	4.89	16/0	7/20/1994– 7/31/2002	14	94.5	155	180	200
390337108342800 CDOWRW-563 11135A CDOWRW-749 09152650	74/0	8/7/1973– 8/9/1999	2.55	4.2	6.35	8.6	38	74/0	8/7/1973– 8/9/1999	38	91	160	180	210
11135 390449108364101 390514108373201 390521108373300	16/0	7/20/1994– 8/1/2002	1.4	2.45	3.4	3.95	4.1	16/0	7/20/1994– 8/1/2002	10	37	62.44	91.5	140
390607108384201	9/0	7/17/1997– 3/23/2000	2.02	2.855	3.17	3.49	3.61	9/0	7/17/1997– 3/23/2000	44.226	56.424	66.864	102.022	107.35
390609108384701 390613108385603 390625108390402 390617108391001 390632108392101 390624108394701 390859108364101 390645108390101	17/0	3/21/1991– 11/21/2004	3	3.93	4.89	8.59	9.3	17/0	3/21/1991– 11/21/2004	57.343	90.977	150	222.31	290
390717108400501	7/0	3/20/1991– 5/12/1998	3.6	3.88	5	7.9	8.6	7/0	3/20/1991– 5/12/1998	52.955	64	140	200	230

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Potassium, water, filtered, mg/L							Chloride, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
390718108415701 09152900 11133 390741108424001 390741108424301 390741108425301 09153000 000049 390938108443101 11110 391509108433001	47/0	8/7/1973– 5/12/1998	2.9	4.6	6.3	8.7	12	47/0	8/7/1973– 5/12/1998	56	110	200	220	260
09153270 09095526 09106104 09095529 090955285 09095528 09153290	16/0	7/20/1994– 8/1/2002	1.4	2.5	3.55	4.1	5	16/0	7/20/1994– 8/1/2002	9.6	38	71.5	89	120
09153270	62/0	8/7/1973– 11/9/2006	3.27	4.65	5.99	6.65	10.88	59/0	8/7/1973– 3/8/1999	42.097	93	150	170	220
09153300	55/0	9/10/1991– 9/8/1998	2.91	3.78	4.5	8.5	10.25	55/0	9/10/1991– 9/8/1998	41.515	64.62	104.16	200	240
391038108475601	101/0	8/7/1973– 3/8/1999	3.23	4.7	6.9	9.89	14	101/0	8/7/1973– 3/8/1999	43.831	100	180	210	270
000050 391029108480200 11101 09163310	9/0	7/9/1993– 7/14/1999	3.6	4.23	5.5	11.45	13.35	9/0	7/9/1993– 7/14/1999	54	77.156	132.97	208.54	213.88
09163340	50/0	8/8/1973– 2/4/1992	2.5	5.3	5.95	6.9	13	50/0	8/8/1973– 2/4/1992	10	100	215	280	380
09153330	47/0	8/8/1973– 6/15/1982	2.9	4.2	6.6	7.2	8.5	47/0	8/8/1973– 6/15/1982	70	140	160	170	220
09153400	21/0	6/12/1979– 9/14/1981	6.1	10	12	14	76	21/0	6/12/1979– 9/14/1981	7.5	13	20	26.5	36
391646108572301 09161000	22/0	9/12/1973– 3/13/1997	3.9	8.4	9.7	13	27	22/0	9/12/1973– 3/13/1997	3.3	12	22.5	47	150
09160500	21/0	10/2/1976– 8/22/1978	3.3	4.15	5	7.1	14	21/0	10/2/1976– 8/22/1978	0.8	2.1	3.6	5.45	37
09163050	79/0	7/4/1977– 9/27/1982	2.4	3.6	5.1	8.7	16	79/0	7/4/1977– 9/27/1982	0.2	1.3	2.6	4.6	52
09163490	23/0	8/8/1973– 7/15/1980	1.5	2.5	3.7	4.5	9.1	23/0	8/8/1973– 7/15/1980	28	63	110	180	250
09163500	86/0	8/8/1973– 5/13/1998	2.1	4.2	6.05	8.3	12	86/0	8/8/1973– 5/13/1998	38.132	98	155	200	540
10485 09132050	326/0	9/10/1969– 9/23/2009	1.4	2.69	3.5	4.1	7.7	333/0	9/10/1969– 9/23/2009	9.7	47	78.786	95	182.39
09129800	37/0	12/16/1977– 9/1/1981	0.3	0.4	0.5	0.6	1.9	37/0	12/16/1977– 9/1/1981	0.3	0.6	1.1	1.3	2.8
09130600 09130800	9/0	5/19/1982– 8/16/1983	0.6	0.7	0.8	1	1.1	9/0	5/19/1982– 8/16/1983	0.5	0.85	1	1.3	1.5

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Potassium, water, filtered, mg/L							Chloride, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09131100	11/0	6/8/1982– 8/16/1983	0.5	0.6	0.7	1.1	2.2	11/0	6/8/1982– 8/16/1983	0.5	0.6	0.8	1.2	1.3
09131200														
10490														
09132500	55/0	10/20/1977– 3/13/2000	0.4	0.6	0.7	0.9	1.6	55/0	10/20/1977– 3/13/2000	0.5	0.9	1.6	2.2	3.6
000152														
09132700														
09132800														
09132900														
09132920														
09132940														
10406H														
09132960														
09132985														
09132995														
09134000														
10436														
09134050														
385144107371701														
09134100														
385049107372402	6/0	5/8/2008– 4/14/2009	3.063	3.444	4.103	8.520	9.53	6/0	5/8/2008– 4/14/2009	7.023	9.005	12.648	20.460	27.607
384922107402001	7/0	6/23/1999– 4/14/2009	3.11	4.1	5.5	6.363	12.87	7/0	6/23/1999– 4/14/2009	6.769	8.166	15.372	32.104	57.287
09134200	5/0	8/9/1977– 8/30/1999	5.22	5.51	7.74	9.9	11	5/0	8/9/1977– 8/30/1999	11.7	15.27	22.057	38	45
384822107411201	6/0	5/19/2008– 4/14/2009	5.983	5.983	7.506	11.512	16.78	6/0	5/19/2008– 4/14/2009	10.385	10.860	19.022	28.927	36.401
10212														
384747107430501														
09134500														
09134700														
10415														
09135900														
10411														
384732107434801														
09135950														
000100														
384434107432701	6/0	5/12/2008– 4/10/2009	4.157	4.986	6.053	7.280	7.65	6/0	5/12/2008– 4/10/2009	7.807	9.506	15.980	16.577	16.603
384610107455001														
231275														
231272														
231273														
231274														
09136100	44/0	2/15/1962– 9/3/2009	1.07	2.07	4.725	5.67	8.1	60/1	2/15/1962– 9/3/2009	0.29	4.2	8.992	10.55	19
10400														
09136200														
384643107540301														
10587														
09137050														
384649107570501														
384624107570701	5/0	7/18/1991– 8/8/2002	2.16	2.22	2.32	2.49	2.5	5/0	7/18/1991– 8/8/2002	3.99	4.82	5.15	6	6

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Potassium, water, filtered, mg/L							Chloride, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
384604107570701	6/0	7/22/1991–5/19/1998	3.06	3.4	3.8	4.1	8.9	6/0	7/22/1991–5/19/1998	4.846	6.1	6.55	8.3	35
000056														
09137300	5/0	5/8/1962–6/11/1963	1.4	1.7	2.7	3.7	4.5	47/0	5/8/1962–6/26/1963	1	6	11	14	20
384551107591901	100/0	7/22/1991–3/25/2003	2.7	4.545	5.27	13.95	19	100/0	7/22/1991–3/25/2003	5.56	8.56	11.18	61.605	94.3
09137500								32/0	10/1/1959–8/26/1961	2	3.5	9	18	32
09143000														
09143500														
000116														
09139200														
09140200														
09140700														
09141200														
09137800														
10582														
09144200	8/0	11/28/1978–3/15/2000	3.87	5.03	8.415	8.94	13	8/0	11/28/1978–3/15/2000	3.142	5.63	7.366	10.494	14
10516														
09144250	30/0	11/19/1987–8/6/2009	0.65	2.5	2.8	3.36	4.5	30/0	11/19/1987–8/6/2009	1.6	4.571	5.95	7.1	17
383404107534101	11/0	4/11/2001–2/6/2009	2.35	2.8	4.81	6.3	8.286	12/0	4/11/2001–2/6/2009	6.07	7.59	29.135	30.5	36.6
383408107535101	49/0	3/10/1992–10/8/2009	2.168	2.65	3.35	6.01	13	49/0	3/10/1992–10/8/2009	3.79	5.26	8.422	28.6	55
383528107552001	49/0	4/11/2001–4/21/2003	2.75	5.615	7.97	8.655	13.1	49/0	4/11/2001–4/21/2003	7.82	18.439	31.56	42.05	47.745
383741107565701	8/0	7/30/2001–12/13/2002	4.47	5.36	8.17	9	9.55	8/0	7/30/2001–12/13/2002	13.4	15.623	24.46	26.953	46.04
383728107572001	51/0	4/11/2001–4/21/2003	4.25	5.6	6.51	11.2	22.4	51/0	4/11/2001–4/21/2003	8.53	11.78	14.586	40.95	59.17
10661														
383946107595301	83/0	7/23/1991–8/28/2009	1.2	5.02	6.59	10.95	15	83/0	7/23/1991–8/28/2009	8.8	12	17.067	47.41	70
383953108001701														
384231108020301														
10602														
09149480	44/0	10/26/1995–9/2/1998	1.82	2.258	2.55	3.075	3.6	44/0	10/26/1995–9/2/1998	2.436	4.368	6.55	8.290	9.8
384202108032001	17/0	11/28/1978–5/21/1998	2.21	2.9	3.3	3.7	4.8	17/0	11/28/1978–5/21/1998	3	7.2	9.3	13	15
10611														
000055														
09149500	203/0	6/11/1959–8/6/2009	0.5	3.48	3.84	4.6	8.7	244/0	11/6/1958–8/6/2009	4.8	9.5	12.505	17	47.63
384448108070301	10/0	7/15/1991–5/14/1998	2.1	2.3	2.7	3.01	4.2	10/0	7/15/1991–5/14/1998	7.067	9	12	21	26
10515														
384408108091501	5/0	1/29/1992–5/14/1998	3.38	3.8	4.1	4.8	5.9	5/0	1/29/1992–5/14/1998	6.461	8.8	9.1	11	14
10562														
384013108091401	6/0	7/15/1991–7/20/1999	2.12	2.86	3.435	4.3	4.3	6/0	7/15/1991–7/20/1999	2.746	11.464	32.61	38	120
09150500	15/0	12/7/1977–9/7/1999	1.3	2.9	3.3	3.7	5.3	15/0	12/7/1977–9/7/1999	1.733	6.2	9.3	15	21

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Potassium, water, filtered, mg/L							Chloride, water, filtered, mg/L						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
384510108111801														
384527108152701	6/0	11/19/1987– 5/20/1998	1.61	2.4	2.9	3.4	4.2	6/0	11/19/1987– 5/20/1998	0.3	2.083	6.8	8.6	11
10555														
10551														
09151500	2/0							2/0						
384813108184301														
10505A														
WSWF2CR														
WSEF2CR														
WSTWOCR														
WSKCINTK														
10575														
09152000	13/0	7/25/2000– 5/23/2002	0.66	0.905	1.05	1.295	1.44	13/0	7/25/2000– 5/23/2002	0.39	0.45	0.56	0.745	1.45
WSKCBLCG														
WSJUNNLT								13/9	3/11/2002– 10/8/2007	0.641	0.016	0.085	0.641	10.6
WSJUNNLTLO														
10572														
WSNFKCWR														
WSNFKCDV	8/2	3/11/2002– 10/27/2008	0.812	1.058	1.162	1.2	2.15	13/9	3/11/2002– 10/8/2007	0.5	0.197	0.368	0.5	1.148
WSNFKCSR														
WSNFKCINLT														
385600108250301	10/1	8/21/2000– 3/12/2002	0.1	1.45	5.375	6.01	6.53	10/0	8/21/2000– 3/12/2002	2.92	22.218	26.919	32.533	40.54
10530														
WSLOCKDRW								6/4	10/6/2003– 10/8/2007					
WSWHITCR	5/2	3/11/2002– 8/8/2006	1.46	1.499	1.9	3	3	8/0	3/11/2002– 5/2/2006	1.316	2.026	2.772	3.808	5.1
385839108264401	16/0	6/29/1999– 5/23/2002	3.76	4.503	5.965	7.065	10.15	16/0	6/29/1999– 5/23/2002	11.78	19.066	40.61	52.7	95.120
10505														
CDOWRW-562														
09152500	437/0	10/1/1958– 9/28/2009	1.5	2.6	3.3	4	8.7	715/0	10/1/1958– 9/28/2009	1	6.3	9.5	15	58
000054														
09152520	9/0	8/21/2000– 5/23/2002	3.01	3.46	3.87	5.41	14.25	9/0	8/21/2000– 5/23/2002	6.87	8.11	10.55	15.57	129.41
09152600	33/0	8/7/1973– 5/7/1998	2.28	4.6	5.5	6.9	11	33/0	8/7/1973– 5/7/1998	45.487	130	190	210	240

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Chloride, 30-day drinking WS standard		Sulfate, water, filtered, mg/L							Sulfate, 30-day drinking WS standard	
	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	Count	Date range
09302450											
09304100											
395643107461200											
09304200			327/0	3/20/1970– 7/30/2002	0	62.9	82.6	91	121.4		
09304480			288/0	7/6/1978– 9/26/1984	137.3	220	380	532.1	880	196	10/17/1978– 9/26/1984
09304300											
09304500			11/0	12/15/1970– 3/7/1995	7.5	22	110	120	150		
09304550	83	5/29/1974– 4/4/1984	296/0	8/30/1973– 9/23/2005	209	1,100	1,776.1	3,183.15	5,245	294	8/30/1973– 9/23/2005
09304600			292/0	7/6/1978– 9/24/2005	1.13	86.2	109.9	120	190		
4000001075434											
400113107574500											
000043											
400206108005901											
09304800			365/0	5/30/1974– 9/29/2009	28	102	130	150	273.6	2	7/21/1977– 10/3/1980
ENPR20ST											
ENPR21ST											
ENPR19ST											
09306007			193/0	4/23/1974– 9/3/1998	95	160	180	220	330		
09306025			41/0	5/3/1974– 2/18/1980	3.1	470	480	510	590		
09306028											
09306022			154/0	9/12/1974– 9/3/1998	290	350	360	380	490		
09306033											
09306039			8/0	12/5/1974– 3/11/1985	11	27.5	57.5	129.5	230		
09306042			71/0	3/17/1977– 6/18/1991	21	29	65	260	590		
09306050											
09306052											
09306058			153/0	4/23/1974– 9/3/1998	240	310	340	360	500		
09306061			160/0	4/23/1974– 11/19/1991	120	260	290	330	420		
11625											
09306175			91/0	1/15/1975– 8/17/1983	87	410	470	510	610		
09306200			245/0	12/15/1970– 7/8/2009	110	340	390	449.08	660		
09306210			58/0	12/15/1970– 8/18/1976	120	360	410	480	710		
09306222	3	6/15/1971– 7/26/1972	236/0	12/15/1970– 7/7/2009	50	350	420	500	770		
000117											
09306224			35/0	11/9/1982– 9/29/2009	48.745	103.993	140	180	250		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Chloride, 30-day drinking WS standard		Sulfate, water, filtered, mg/L							Sulfate, 30-day drinking WS standard	
	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	Count	Date range
LANG3ST											
LANG7ST											
LANG8ST											
LANG9ST											
LANG10ST											
09090700											
09090800											
DUNC1ST											
COS-INTAKE											
09091100											
CDOWRW-550											
CDOWRW-559											
09092500											
704569											
09091500											
09092000											
000147											
09092600											
09092830			61/0	2/9/1976– 5/5/1983	5	30	34	37	91		
09092850			64/0	2/9/1976– 7/29/1983	6	35	39	43	63		
ENPR13ST											
ENPR12ST											
ENPR4ST											
ENPR1ST											
ENPR2ST											
ENPR10ST											
ENPR9ST											
ENPR5ST											
ENPR6ST											
09092800											
ENPR3ST											
11145A											
11145B											
09092960			52/0	2/8/1976– 9/7/1983	1	20	23	26	34		
09092970			52/0	4/21/1977– 9/9/1983	0.7	21.5	25	28.5	33		
ENPR16ST											
09092980			41/0	4/21/1978– 9/12/1983	10	52	59	66	93		
ENPR18ST											
ENPR17ST											
ENPR14ST											
ENPR15ST											
ENPR11ST											
09093000			53/0	4/21/1975– 9/24/1981	39	100	120	140	200		
11210											
09093500			69/0	11/21/1974– 10/13/1982	64	250	300	380	800		
09093700	5	1/10/1977– 4/6/1981	86/0	8/31/1973– 10/25/1982	33	80	130	140	190		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Chloride, 30-day drinking WS standard		Sulfate, water, filtered, mg/L							Sulfate, 30-day drinking WS standard	
	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	Count	Date range
09132900											
09132920											
09132940											
10406H											
09132960											
09132985											
09132995											
09134000											
10436											
09134050											
385144107371701											
09134100											
385049107372402			6/0	5/8/2008– 4/14/2009	490.735	505.161	692.862	934.026	1,304.386	6	5/8/2008– 4/14/2009
384922107402001			7/0	6/23/1999– 4/14/2009	347.63	587.606	745.851	1,336.187	1,371.992	7	6/23/1999– 4/14/2009
09134200			5/0	8/9/1977– 8/30/1999	1,134.8	1,354.3	1,589.1	2,200	2,700	5	8/9/1977– 8/30/1999
384822107411201			6/0	5/19/2008– 4/14/2009	773.211	995.870	1,682.924	1,872.640	2,054.132	6	5/19/2008– 4/14/2009
10212											
384747107430501											
09134500											
09134700											
10415											
09135900											
10411											
384732107434801											
09135950											
000100											
384434107432701			6/0	5/12/2008– 4/10/2009	523.401	785.336	1,181.111	1,231.434	1,278.487	6	5/12/2008– 4/10/2009
384610107455001											
231275											
231272											
231273											
231274											
09136100			59/0	2/15/1962– 9/3/2009	31.347	150.12	388.87	572	958		
10400											
09136200											
384643107540301											
10587											
09137050											
384649107570501											
384624107570701			5/0	7/18/1991– 8/8/2002	93.81	99.46	110	110.65	149.4		
384604107570701			6/0	7/22/1991– 5/19/1998	300	320.85	420	610	2,700	6	7/22/1991– 5/19/1998
000056											
09137300			47/0	5/8/1962– 6/26/1963	26	110	234	314	529	21	8/8/1962– 6/26/1963
384551107591901			100/0	7/22/1991– 3/25/2003	290.36	585.465	798.928	4,123.519	5,417.9	100	7/22/1991– 3/25/2003

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

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Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Chloride, 30-day drinking WS standard		Sulfate, water, filtered, mg/L							Sulfate, 30-day drinking WS standard	
	Count	Date range	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	Count	Date range
10551											
09151500			2/0								
384813108184301											
10505A											
WSWF2CR											
WSEF2CR											
WSTWOCR											
WSKCINTK											
10575											
09152000			13/0	7/25/2000– 5/23/2002	2.36	3.81	4.57	14.28	32.64		
WSKCBLCG											
WSJUNNLT			13/8	3/11/2002– 10/8/2007	5.264	4.306	4.868	5.3	6.65		
WSJUNNLTLO											
10572											
WSNFKCWR											
WSNFKCDV			13/6	3/11/2002– 10/8/2007	5	5	5.105	5.542	6.831		
WSNFKCSR											
WSNFKCINLT											
385600108250301			10/0	8/21/2000– 3/12/2002	127.04	1,116.238	1,511.9	1,872.335	2,039.3	9	8/21/2000– 3/12/2002
10530											
WSLOCKDRW			6/1	10/6/2003– 10/8/2007	5	7.996	11.191	14.336	15.4		
WSWHITCR			8/0	3/11/2002– 5/2/2006	28.971	67.085	76.795	106.5	187		
385839108264401			16/0	6/29/1999– 5/23/2002	432.65	890.83	1,518.25	1,966.89	3,356.27	16	6/29/1999– 5/23/2002
10505											
CDOWRW-562											
09152500			715/0	10/1/1958– 9/28/2009	60	218	357	578	1,140	245	10/1/1958– 12/11/2003
000054											
09152520			9/0	8/21/2000– 5/23/2002	329.12	530.075	632.52	837.545	2,823.8	9	8/21/2000– 5/23/2002
09152600			33/0	8/7/1973– 5/7/1998	227.69	660	1,600	2,000	2,100		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Fluoride, water, filtered, mg/L								Silica, water, filtered, mg/L as SiO ₂						
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09302450 09304100 395643107461200 09304200	39/8	8/30/1973– 9/5/1996	0.1	0.100	0.100	0.100	0.200	0.500	40/0	8/30/1973– 7/30/2002	9.8	13.5	16	16	18
09304480 09304300 09304500	11/0	12/15/1970– 3/7/1995		0.100	0.100	0.200	0.300	0.800	11/0	12/15/1970– 3/7/1995	4.4	12	16	17	18
09304550 09304600 4000001075434 400113107574500 000043 400206108005901	6/0	8/30/1973– 9/23/2005		0.200	0.200	0.250	0.407	1.000	6/0	8/30/1973– 9/23/2005	7.8	9	11.905	16	26
09304800 ENPR20ST ENPR21ST ENPR19ST	126/3	8/13/1975– 9/29/2009	0.1	0.084	0.152	0.200	0.200	0.500	132/0	5/30/1974– 9/29/2009	5.8	13.36	15	15	20
09306007	193/0	4/23/1974– 9/3/1998		0.200	0.700	0.900	1.000	1.700	192/0	4/23/1974– 9/3/1998	8.4	14	15	16	18
09306025	41/1	5/3/1974– 2/18/1980	0.1	0.100	0.200	0.200	0.200	1.200	39/0	5/3/1974– 2/18/1980	3	12	15	16	18
09306028 09306022	154/0	9/12/1974– 9/3/1998		0.000	0.200	0.300	0.300	1.200	155/0	9/12/1974– 9/3/1998	11	15	15	16	17
09306033 09306039	8/0	12/5/1974– 3/11/1985		0.100	0.200	0.350	0.700	5.200	8/0	12/5/1974– 3/11/1985	6.1	7.4	11	16	17
09306042 09306050 09306052 09306058	66/0	3/17/1977– 6/18/1991		0.600	15.000	18.000	20.000	25.000	70/0	3/17/1977– 6/18/1991	7	11	13	30	62
09306061	153/0	4/23/1974– 9/3/1998		0.000	0.300	0.400	0.400	1.300	153/0	4/23/1974– 9/3/1998	8	15	16	17	20
11625 09306175	159/0	4/23/1974– 11/19/1991		0.000	0.600	0.700	0.800	4.800	159/0	4/23/1974– 11/19/1991	11	15	16	17	23
09306200	91/1	1/15/1975– 8/17/1983	0.1	0.000	0.400	0.500	0.500	0.700	89/0	3/18/1975– 8/17/1983	9	17	18	19	21
09306210	245/2	12/15/1970– 7/8/2009	0.1 0.17	0.100	0.600	0.700	0.800	2.000	242/0	12/15/1970– 7/8/2009	8.635	15	17	18	21
09306222	58/0	12/15/1970– 8/18/1976		0.400	0.600	0.700	0.800	1.100	57/0	12/15/1970– 8/18/1976	8.3	17	18	19	28
000117 09306224	238/0	12/15/1970– 7/7/2009		0.200	0.852	1.100	1.600	19.000	238/0	12/15/1970– 7/7/2009	0.568	13	15.806	17	23
09306240	35/0	11/9/1982– 9/29/2009		0.100	0.200	0.200	0.300	0.400	35/0	11/9/1982– 9/29/2009	11	12.72	13.04	14.64	16
09306241 09306235	29/1	4/27/1974– 3/11/1985	0.1	0.000	0.200	0.300	0.300	0.700	29/0	4/27/1974– 3/11/1985	3.1	20	22	23	24
	88/1	3/14/1974– 11/8/1988	0.1	0.100	0.200	0.300	0.300	2.100	86/0	3/14/1974– 11/8/1988	5.8	20	21	22	24

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Fluoride, water, filtered, mg/L								Silica, water, filtered, mg/L as SiO ₂						
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09306242	196/0	3/14/1974– 7/8/2009		0.000	0.332	0.400	0.500	6.900	195/0	3/14/1974– 7/8/2009	7.5	20	22	23	31
09306244	24/0	6/12/1975– 10/24/1978		0.300	0.300	0.300	0.375	0.400	24/0	6/12/1975– 10/24/1978	15	17	18	19.75	22
11702 09306255	166/0	8/1/1973– 7/7/2009		0.262	1.349	1.800	2.252	3.000	166/1	8/1/1973– 7/7/2009	1.1	7.6	11	14	20.2
09306290	92/1	11/9/1982– 9/30/2009	0.1	0.100	0.200	0.222	0.300	0.700	92/0	11/9/1982– 9/30/2009	8.3	12	13	14	16
09306300	77/0	8/6/1975– 9/22/1982		0.000	0.200	0.300	0.300	0.500	76/0	8/6/1975– 9/22/1982	1.3	12	13	15	18
09306305	7/1	4/21/1995– 8/28/1996	0.1	0.100	0.100	0.200	0.300	0.300	7/0	4/21/1995– 7/31/2002	9.918	11	12	13	13
09306380	12/0	2/8/1977– 11/8/1995		0.300	0.400	0.450	0.550	0.600	12/0	2/8/1977– 11/8/1995	5.4	8.25	9.5	11	18
400535108485700 000044															
09072500	16/0	6/12/1959– 3/24/1966		0.100	0.250	0.300	0.400	0.500	52/0	11/29/1958– 3/24/1966	7.9	9	9.95	12	13
CDOWRW-46 12100															
CDOWRW-47 09085100															
11109A															
CDOWRW-197															
09085150	21/0	4/13/2006– 9/8/2009		0.116	0.190	0.258	0.278	0.295	21/0	4/13/2006– 9/8/2009	6.361	7.113	7.836	8.847	10.03
09085200															
09085400															
09085300															
000047															
CDOWRW-546															
09086470															
11190H															
09086000															
09086970															
11195															
CDOWRW-547															
09087600	16/0	4/18/2006– 11/7/2008		0.133	0.201	0.242	0.270	0.280	18/0	7/31/2002– 11/7/2008	6.081	6.561	7.530	8.352	9.125
11189															
09089000															
11185															
09089500	20/3	5/1/1986– 8/23/1990	0.1	0.100	0.100	0.150	0.200	0.700	20/0	5/1/1986– 8/23/1990	5.8	8.55	9.25	9.825	12
LANG6ST															
LANG5ST															
LANG4ST															
LANG3ST															
LANG7ST															
LANG8ST															
LANG9ST															
LANG10ST															
09090700															
09090800															
DUNC1ST															
COS-INTAKE															

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	No. of samples/ No. of censored	Date range	Fluoride, water, filtered, mg/L						No. of samples/ No. of censored	Silica, water, filtered, mg/L as SiO ₂					
			Censoring levels	Min	25th	50th	75th	Max		Date range	Min	25th	50th	75th	Max
09095500	356/11	2/15/1962–9/24/2009	0.1 0.17	0.100	0.200	0.300	0.300	0.800	469/0	10/1/1958–9/24/2009	3.713	7.2	8.2	9.2	14
09096800															
09097500															
11155															
09097600															
09095800															
09096500															
391507107550601															
CDOWRW-56															
CDOWRW-55															
09097900															
CDOWRW-54															
CDOWRW-53															
09105000	213/2	8/27/1969–9/24/2009	0.1	0.093	0.375	0.500	0.600	0.849	215/0	11/19/1968–9/24/2009	11	19.96	25	28	36.618
11103															
UP RAPID CRK INTAKE	5/0	5/22/2007–5/29/2008		0.200	0.200	0.200	0.250	0.300							
RC-2															
RC-3															
LOWER RAPID CRK	5/0	5/22/2007–5/29/2008		0.200	0.200	0.300	0.300	0.300							
L COTTONWOOD INTAKE	5/1	5/23/2007–5/29/2008	0.1	0.100	0.100	0.200	0.400	0.500							
11151															
390622108205400	10/0	7/19/1994–4/19/1995		0.300	0.300	0.300	0.400	0.400	10/0	7/19/1994–4/19/1995	8	9.35	11	11.25	13
09106150	27/0	1/16/1992–8/13/1996		0.200	0.300	0.300	0.300	0.400	28/0	1/16/1992–7/31/2002	6.8	7.655	8.55	9.5	11
CDOWRW-553															
CDOWRW-555															
390322108253401															
390348108265601	5/0	3/22/1991–9/23/1993		0.400	0.400	0.600	1.100	1.200	5/0	3/22/1991–9/23/1993	10	11	13	16.5	17
CDOWRW-556															
390319108273200															
390318108273200	10/0	7/19/1994–4/18/1995		0.300	0.300	0.300	0.400	0.500	11/0	7/19/1994–7/31/2002	7.6	8	9.1	10	11
CDOWRW-557															
09106200	63/1	8/7/1973–3/6/2006	0.17	0.141	0.300	0.400	0.499	0.700	62/0	8/7/1973–3/6/2006	2.19	7.675	8.9	11	16
390324108291301															
390326108291601	18/0	2/25/1997–4/9/1999		0.233	0.289	0.366	0.431	0.552	18/0	2/25/1997–4/9/1999	0.76	3.319	4.418	6.591	7.53
390323108291601															
390303108291601															
390322108292301															
390318108293301															
390302108293801															
390319108312501															
390320108315901	6/0	3/21/1991–5/6/1998		0.111	0.200	0.750	0.900	1.200	6/0	3/21/1991–5/6/1998	7.208	9.2	13	15	15
CDOWRW-558															
CDOWRW-560															
09106500	15/0	7/20/1994–9/7/1995		0.200	0.300	0.300	0.400	0.400	16/0	7/20/1994–7/31/2002	7.1	7.654	8.55	9.5	11

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Fluoride, water, filtered, mg/L								Silica, water, filtered, mg/L as SiO ₂						
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
390337108342800 CDOWRW-563 11135A CDOWRW-749 09152650	73/0	8/7/1973– 8/9/1999		0.200	0.300	0.300	0.400	0.700	73/0	8/7/1973– 8/9/1999	7.4	9.363	11	13	24
11135 390449108364101 390514108373201 390521108373300	15/0	7/20/1994– 9/8/1995		0.200	0.200	0.300	0.400	0.500	16/0	7/20/1994– 8/1/2002	8.225	9.6	11	12.5	14
390607108384201	9/0	7/17/1997– 3/23/2000		0.226	0.272	0.300	0.334	0.379	9/0	7/17/1997– 3/23/2000	8.486	9.695	9.958	10.7	11.452
390609108384701 390613108385603 390625108390402 390617108391001 390632108392101 390624108394701 390859108364101 390645108390101	17/0	3/21/1991– 11/21/2004		0.224	0.285	0.300	0.300	0.500	17/0	3/21/1991– 11/21/2004	7.497	8.9	9.8	11.178	13.69
390717108400501	7/0	3/20/1991– 5/12/1998		0.300	0.300	0.300	0.300	0.300	7/0	3/20/1991– 5/12/1998	9.5	9.9	11	12	13
390718108415701 09152900	47/0	8/7/1973– 5/12/1998		0.200	0.300	0.300	0.300	0.500	47/0	8/7/1973– 5/12/1998	6.8	8.8	9.8	11	13
11133 390741108424001 390741108424301 390741108425301 09153000	15/0	7/20/1994– 9/8/1995		0.200	0.300	0.300	0.400	0.500	16/0	7/20/1994– 8/1/2002	8.138	9.75	10.5	12	14
000049 390938108443101 11110 391509108433001	7/0	5/2/1991– 12/26/1999		0.200	0.500	0.697	0.800	2.600	7/0	5/2/1991– 12/26/1999	6.4	8.962	12	12.36	13
09153270	59/0	8/7/1973– 3/8/1999		0.198	0.300	0.300	0.300	0.500	58/0	8/7/1973– 3/8/1999	7.8	9.5	11	13	17.355
09095526 09106104 09095529 090955285 09095528 09153290	55/0	9/10/1991– 9/8/1998		0.193	0.226	0.295	0.300	0.400	55/0	9/10/1991– 9/8/1998	0.3	8.386	9.168	9.947	11
09153300	101/0	8/7/1973– 3/8/1999		0.100	0.300	0.300	0.300	1.000	101/0	8/7/1973– 3/8/1999	6.3	8.5	9.2	10	14.597
391038108475601	9/0	7/9/1993– 7/14/1999		0.238	0.283	0.289	0.300	0.354	9/0	7/9/1993– 7/14/1999	6.258	9.393	10.671	11	12.589
000050 391029108480200 11101 09163310	50/0	8/8/1973– 2/4/1992		0.200	0.300	0.400	0.400	0.600	48/0	8/8/1973– 2/4/1992	5.6	12	15	17	19
09163340	46/0	8/8/1973– 6/15/1982		0.200	0.300	0.300	0.300	0.700	45/0	11/27/1973– 6/15/1982	4.9	8	9.4	11	13

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Fluoride, water, filtered, mg/L								Silica, water, filtered, mg/L as SiO ₂						
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
384231108020301 10602															
09149480	44/0	10/26/1995– 9/2/1998		0.244	0.479	0.849	0.993	1.300	44/0	10/26/1995– 9/2/1998	8.564	13.170	17	19.830	22
384202108032001 10611 000055	17/0	11/28/1978– 5/21/1998		0.300	0.600	0.700	0.800	1.300	17/0	11/28/1978– 5/21/1998	11.64	14	16	17	23
09149500	199/0	11/6/1958– 8/6/2009		0.300	0.555	0.656	0.761	2.400	241/0	11/6/1958– 8/6/2009	9.8	14	15.807	17.478	26
384448108070301 10515	10/0	7/15/1991– 5/14/1998		0.863	1.300	1.600	1.600	2.000	10/0	7/15/1991– 5/14/1998	15	17	23	24	26
384408108091501 10562	5/0	1/29/1992– 5/14/1998		0.748	1.000	1.000	1.100	1.100	5/0	1/29/1992– 5/14/1998	14.859	17	20	20	21
384013108091401	6/0	7/15/1991– 7/20/1999		0.186	0.188	0.329	0.500	0.500	6/0	7/15/1991– 7/20/1999	5.583	6.357	7.4	7.573	8.9
09150500 384510108111801 384527108152701 10555 10551	15/0	12/7/1977– 9/7/1999		0.155	1.000	1.200	1.300	1.400	15/0	12/7/1977– 9/7/1999	6.572	18.778	22	22.454	24
09151500 384813108184301 10505A WSWF2CR WSEF2CR WSTWOCR WSKCINTK 10575	2/0								2/0						
09152000 WSKCBLCG WSJUNNLT WSJUNNLTLO 10572 WSNFKCWR WSNFKCDV WSNFKCSR WSNFKCINLT	13/5	7/25/2000– 5/23/2002	0.1	0.081	0.095	0.117	0.177	0.228	13/0	7/25/2000– 5/23/2002	11.582	15.176	17.427	18.981	20.262
385600108250301 10530 WSLOCKDRW WSWHITCR	10/0	8/21/2000– 3/12/2002		0.176	0.476	0.552	0.598	0.642	10/0	8/21/2000– 3/12/2002	12.269	15.847	20.219	22.709	23.915
385839108264401 10505	16/0	6/29/1999– 5/23/2002		0.290	0.434	0.539	0.580	0.786	16/0	6/29/1999– 5/23/2002	15.436	16.615	19.283	20.542	28.119
CDOWRW-562 09152500 000054	373/2	6/2/1960– 9/28/2009	0.1	0.100	0.300	0.388	0.500	1.700	546/0	10/1/1958– 9/28/2009	5.9	12	13	15	26
09152520 09152600	9/0	8/21/2000– 5/23/2002		0.270	0.303	0.378	0.458	0.494	9/0	8/21/2000– 5/23/2002	9.031	15.177	16.945	18.091	20.351
	33/0	8/7/1973– 5/7/1998		0.290	0.700	0.900	1.400	1.600	33/0	8/7/1973– 5/7/1998	3.9	13	15	20	25

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	Copper, water, filtered, µg/L								Copper, aq life, 30-day chronic standard		Copper, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range
09302450	10/10	8/17/1999– 6/11/2007	4 5 8 40						1	10/19/1999– 10/19/1999	1	10/19/1999– 10/19/1999
09304100 395643107461200												
09304200	7/2	8/27/1981– 9/14/1992	1	1	1	1	2	3				
09304480	5/5	8/26/1981– 6/11/2007	5									
09304300 09304500 09304550 09304600												
4000001075434	10/10	10/19/1999– 6/11/2007	40 20 5 4									
400113107574500 000043	20/20	6/20/1988– 4/21/1992	4 5									
400206108005901 09304800	46/14	4/24/1974– 9/29/2009	0.5 1 2	0.22	0.569	0.896	1.834	78.142	2	6/7/2005– 9/12/2005	2	6/7/2005– 9/12/2005
ENPR20ST ENPR21ST ENPR19ST												
09306007	67/19	5/22/1974– 5/22/1985	1 2 4	0	1	2	4	15				
09306025	29/10	5/22/1974– 2/18/1980	2 5	2	2	2	4	8				
09306028 09306022	47/17	9/12/1974– 5/22/1985	1 2 5	0	0	1	3	8				
09306033 09306039	7/2	12/5/1974– 5/31/1984	20	3	3	4	9	37	4	7/19/1977– 5/31/1984	3	7/19/1977– 5/31/1984
09306042	29/2	3/17/1977– 6/18/1991	1	0	1	2	3	24	2	11/2/1982– 3/9/1989	2	11/2/1982– 3/9/1989
09306050 09306052 09306058	49/15	5/22/1974– 5/22/1985	1 2 4	0	1	2	3	17				
09306061	69/16	5/22/1974– 5/23/1985	1 2 4 5 20	0	2	2	3	20				
11625	9/9	8/18/1999– 6/21/2007	5 4 20									
09306175	66/14	1/15/1975– 11/24/1981	2 20	0	1	2	3	13.5				
09306200	93/6	6/10/1974– 7/8/2009	0.5 1 2	0	1	2	3	13				
09306210 09306222	95/6	6/10/1974– 7/7/2009	2	0	1.601	2.101	3.132	24				
000117	17/17	6/29/1988– 4/21/1992	4 5									
09306224	15/9	11/9/1982– 9/29/2009	0.5	0.5	0.5	0.5	2	5				
09306240	12/1	5/17/1974– 4/18/1979	2	2	2	4.5	14.5	22	2	3/18/1976– 8/25/1977	1	3/18/1976– 3/18/1976

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	Copper, water, filtered, µg/L								Copper, aq life, 30-day chronic standard		Copper, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range
09306241												
09306235	39/9	5/17/1974– 11/6/1985	2	2	2	3	5	17				
09306242	54/18	5/17/1974– 7/8/2009	2 20 10 3	0.670	1.089	2	4	16.5				
09306244	14/7	6/12/1975– 10/24/1978	2	2	0.628	2	3.5	7				
11702	32/29	9/14/1999– 6/12/2007	3 4 5 8 20						1	9/14/1999– 9/14/1999		
09306255	48/16	5/16/1972– 7/7/2009	0.5 2 4 20	1.022	2	3	4	14.5				
09306290	30/7	11/9/1982– 9/30/2009	0.5 1	0.500	0.566	1.784	3	11				
09306300	12/4	9/11/1975– 8/25/1981	10	2	2	2	4	7				
09306305												
09306380												
400535108485700												
000044												
09072500												
CDOWRW-46	81/0	3/6/1991– 1/22/2007		1	1.2	1.5	2.4	6.8				
12100	9/7	2/14/2001– 8/20/2002	4 3									
CDOWRW-47	88/0	3/6/1991– 6/27/2006		1	1.25	1.55	2.55	20.8	2	4/22/1996– 5/21/1996		
09085100	12/4	12/18/1990– 8/11/1993	1	1	1	1	1.75	8				
11109A	5/5	10/23/2000– 4/18/2007	5 4									
CDOWRW-197												
09085150												
09085200												
09085400												
09085300												
000047	148/125	4/18/1989– 4/18/2007	3 4 5 8 20	0.8	0.8	1.7	3	15.5	9	4/11/2000– 4/19/2001		
CDOWRW-546												
09086470												
11190H	5/5	11/30/2000– 4/18/2007	5 4									
09086000												
09086970												
11195	11/10	10/2/1995– 8/21/1996	4									
CDOWRW-547												
09087600												
11189	10/9	8/18/1999– 10/17/2006	4 20									
09089000												
11185	10/6	10/2/1995– 8/15/1996	4	4	3.073	3.746	5	6				

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Copper, water, filtered, µg/L								Copper, aq life, 30-day chronic standard		Copper, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range
390741108425301 09153000 000049 390938108443101 11110	10/3	10/12/1995– 7/18/1996	4 20	4	4	6	8.25	12				
391509108433001 09153270 09095526 09106104 09095529 090955285 09095528 09153290 09153300 391038108475601 000050	43/37	4/24/1989– 7/29/1996	4 5									
391029108480200 11101	43/39	8/11/1999– 4/11/2007	5 20 4 3 40 8						1	10/12/1999– 10/12/1999	1	10/12/1999– 10/12/1999
09163310 09163340 09153330 09153400 391646108572301 09161000 09160500 09163050 09163490 09163500	53/2	10/17/1979– 9/17/2002	10 1	0	2	4	6	20	1	5/30/1983– 5/30/1983		
10485	14/14	10/11/1995– 3/17/2005	4 5						5	4/8/1996– 3/17/2005	2	5/13/1996– 6/10/1996
09132050	13/9	4/4/1978– 7/14/1981	10 2						6	3/25/1980– 7/14/1981	6	3/25/1980– 7/14/1981
09129800	6/0	5/19/1982– 7/20/1983		1	1	1.5	3.5	8	1	7/6/1983– 7/6/1983	1	7/6/1983– 7/6/1983
09130600 09130800 09131100	7/0	4/12/1982– 7/20/1983		1	1	2	4	6	1	7/6/1983– 7/6/1983	1	7/6/1983– 7/6/1983
09131200 10490	13/11	10/11/1995– 3/17/2005	4 5									
09132500	14/5	10/20/1977– 8/19/1982	2	0	0	2	2	2				
000152 09132700 09132800 09132900 09132920	17/15	10/11/1995– 5/25/2006	5 4						3	6/10/1996– 5/25/2006	1	5/25/2006– 5/25/2006

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Iron, water, filtered, µg/L								Iron, 30-day drinking WS standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
09302450	10/1	8/17/1999– 6/11/2007	10	20	48	78	81	150		
09304100 395643107461200 09304200	17/3	8/30/1973– 7/30/2002	3 10	3	8	18.212	40	380	1	11/11/1974– 11/11/1974
09304480	5/1	8/26/1981– 6/11/2007	10	NA	18	22	31	38		
09304300 09304500	7/2	8/30/1973– 8/27/1981	10	10	10	20	210	230		
09304550	5/0	8/30/1973– 8/26/1981		40	40	60	80	90		
09304600 4000001075434	10/5	10/19/1999– 6/11/2007	100 50 10	13	10.09	20.396	93	120		
400113107574500 000043	21/16	6/20/1988– 4/21/1992	10 100	11	4.904	11	23.177	73		
400206108005901 09304800	4/0 106/10	8/13/1975– 9/29/2009	10	6	13.43	20	40	270		
ENPR20ST ENPR21ST ENPR19ST 09306007	163/19	4/23/1974– 9/3/1998	10	3	10	20	40	480		
09306025	41/2	5/3/1974– 2/18/1980	10	10	30	50	90	480		
09306028 09306022	114/45	9/12/1974– 9/4/1985	3 9 10 20	3	5	9	20	130		
09306033 09306039	7/1	12/5/1974– 5/31/1984	10	10	17	71	140	180		
09306042	60/3	3/17/1977– 6/18/1991	10	10	20	30	60	330		
09306050 09306052 09306058	115/33	4/23/1974– 9/4/1985	3 9 10	3	8	20	30	190		
09306061	140/26	4/23/1974– 5/4/1987	3 10	2	9	20	30	150		
11625	9/2	8/18/1999– 6/21/2007	10	10	19	23	71	160		
09306175	82/16	1/15/1975– 5/19/1982	10	10	10	30	50	1,300		
09306200	197/21	12/15/1970– 7/8/2009	3 5 10	3	10	20	40	160		
09306210	58/1	12/15/1970– 8/18/1976	10	10	30	60	80	480		
09306222	193/23	12/15/1970– 7/7/2009	3 5 10	3	10.3	35.29	70	910		
000117	21/16	6/29/1988– 4/21/1992	10 100	15	11.720	17.793	27.012	43		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Iron, water, filtered, µg/L								Iron, 30-day drinking WS standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
11185										
09089500	20/0	5/1/1986– 8/23/1990		8	24.25	45	87.75	860	2	5/30/1986– 5/10/1989
LANG6ST	22/0	6/2/2004– 4/10/2006		92.1	565	1,050	1,575	15,000	21	6/2/2004– 2/13/2006
LANG5ST	30/0	5/26/2004– 2/13/2006		320	450	960	1,775	37,000	30	5/26/2004– 2/13/2006
LANG4ST	29/0	6/2/2004– 2/13/2006		260	425	910	2,050	26,000	27	6/9/2004– 2/13/2006
LANG3ST	21/0	6/2/2004– 2/13/2006		210	455	820	1,750	25,000	20	6/2/2004– 2/13/2006
LANG7ST	22/0	5/26/2004– 2/13/2006		340	517.5	1,010	1,850	16,000	22	5/26/2004– 2/13/2006
LANG8ST	21/0	6/2/2004– 2/13/2006		270	515	1,100	1,500	14,000	20	6/2/2004– 2/13/2006
LANG9ST	16/0	12/9/2004– 4/10/2006		96.8	665	1,100	1,800	13,000	15	12/9/2004– 2/13/2006
LANG10ST	16/0	12/9/2004– 4/10/2006		70.8	652.5	1,100	1,975	12,000	15	12/9/2004– 2/13/2006
09090700										
09090800										
DUNC1ST	17/0	6/3/2004– 2/8/2006		210	420	770	1,100	5,100	15	7/7/2004– 2/8/2006
COS-INTAKE										
09091100										
CDOWRW-550	11/0	1/17/2003– 4/13/2005		13	17	23	63	2,922	1	5/23/2003– 5/23/2003
CDOWRW-559										
09092500										
704569										
09091500										
09092000										
000147	22/14	8/8/1988– 4/15/1992	10 100	13	12.169	20.408	35.741	99		
09092600										
09092830	62/22	2/9/1976– 5/5/1983	3 9 10	3	4	10	20	310	1	2/28/1979– 2/28/1979
09092850	64/33	2/9/1976– 7/29/1983	3 10	3	3	7	20	100		
ENPR13ST										
ENPR12ST										
ENPR4ST										
ENPR1ST										
ENPR2ST										
ENPR10ST										
ENPR9ST										
ENPR5ST										
ENPR6ST										
09092800										
ENPR3ST	5/0	5/3/2005– 2/28/2006		120	225	440	18,500	19,000		
11145A	16/15	9/30/1999– 4/10/2007	10 20 50 100							
11145B	16/16	9/30/1999– 4/10/2007	10 20 50 100							

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Iron, water, filtered, µg/L								Iron, 30-day drinking WS standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
LOWER RAPID CRK L COTTONWOOD INTAKE 11151 390622108205400 09106150 CDOWRW-553	14/0	11/25/2002– 10/23/2006		10	15	23.5	32.75	61		
CDOWRW-555 390322108253401 390348108265601 CDOWRW-556 390319108273200 390318108273200 CDOWRW-557 09106200	28/4	2/19/1974– 8/12/1998	10	10	20	30	50	140		
390324108291301 390326108291601 390323108291601 390303108291601 390322108292301 390318108293301 390302108293801 390319108312501 390320108315901 CDOWRW-558 CDOWRW-560	8/0	11/8/2002– 6/20/2003		11	13.5	18	20.5	30		
09106500 390337108342800 CDOWRW-563 11135A	8/1	7/26/2005– 1/9/2007	50	11	13	19.5	30.75	50		
CDOWRW-749 09152650	29/12	11/27/1973– 5/6/1998	3 10	3	3	20	30	70		
11135 390449108364101 390514108373201 390521108373300 390607108384201 390609108384701 390613108385603 390625108390402 390617108391001 390632108392101 390624108394701 390859108364101 390645108390101 390717108400501 390718108415701	7/1	7/26/2005– 10/11/2006	50	13	13	26	50	51		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	No. of samples/ No. of censored	Date range	Iron, water, filtered, µg/L						Iron, 30-day drinking WS standard	
			Censoring levels	Min	25th	50th	75th	Max	Count	Date range
09152900	41/4	8/7/1973– 5/12/1998	10	10	20	30	50	190		
11133	9/3	7/26/2005– 4/11/2007	10	10	10	23	34.5	40		
390741108424001										
390741108424301										
390741108425301										
09153000										
000049										
390938108443101										
11110										
391509108433001										
09153270	33/9	11/27/1973– 11/9/2006	10 3	20	NA	30	40	262		
09095526										
09106104										
09095529										
090955285										
09095528										
09153290	55/32	9/10/1991– 9/8/1998	3 10	3	3.025	4.266	6.014	14.677		
09153300	50/13	11/27/1973– 5/13/1998	3 10	3	3	30	43	2,300		
391038108475601										
000050	86/67	6/28/1988– 4/15/1992	10 100	10	5.841	10.664	19.469	130		
391029108480200										
11101	43/12	8/11/1999– 4/11/2007	10 50	10	12	20	25	120		
09163310	47/2	11/27/1973– 6/15/1982	10	10	40	60	90	190		
09163340	46/14	11/27/1973– 6/15/1982	3 10	3	3	20	40	90		
09153330	21/0	6/12/1979– 9/14/1981		10	50	120	240	880		
09153400	20/0	9/12/1973– 10/5/1981		30	50	80	140	540		
391646108572301										
09161000	21/3	10/2/1976– 8/22/1978	10	10	30	110	120	660		
09160500	79/12	7/4/1977– 9/27/1982	10	8	20	30	60	840		
09163050	23/4	8/8/1973– 7/15/1980	10	10	20	40	50	80		
09163490	53/12	11/28/1973– 5/13/1998	3 10	3	7	30	50	130		
09163500	161/53	2/14/1973– 9/17/2002	3 5 10	3	5	8	18	200		
10485										
09132050	38/10	12/16/1977– 9/1/1981	10	10	10	24.5	40	74		
09129800	6/0	5/19/1982– 7/20/1983		21	22.5	43.5	55	58		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	No. of samples/ No. of censored	Date range	Iron, water, filtered, µg/L						Iron, 30-day drinking WS standard	
			Censoring levels	Min	25th	50th	75th	Max	Count	Date range
10551										
09151500	6/0	12/7/1977– 5/2/2005		19	20	32	51	59		
384813108184301										
10505A	12/5	3/10/1999– 4/19/2007	10	10	10	12	20.5	38		
WSWF2CR										
WSEF2CR										
WSTWOCR										
WSKCINTK										
10575										
09152000										
WSKCBLCG										
WSJUNNLT										
WSJUNNLTLO										
10572										
WSNFKCWR										
WSNFKCDV	7/5	5/5/2003– 10/27/2008	100							
WSNFKCSR										
WSNFKCINLT										
385600108250301										
10530	5/1	3/9/1999– 4/26/2006	10	10	11	11	16	47		
WSLOCKDRW	5/4	10/6/2003– 10/27/2008	100							
WSWHITCR										
385839108264401										
10505	60/24	3/10/1999– 5/15/2007	10 50 100	10	10	16	23	130		
CDOWRW-562										
09152500	181/38	4/9/1961– 9/24/2002	3 5 10	3	5.242	13	35	1,500	3	7/16/1986– 11/20/1986
000054										
09152520										
09152600	29/5	8/7/1973– 5/7/1998	10	10	20	30	60	150		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Iron, total recoverable, µg/L								Iron, aq life, 30-day chronic standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
09302450	10/0	8/17/1999– 6/11/2007		65	100	295	380	9,100	1	4/27/2000– 4/27/2000
09304100 395643107461200 09304200	29/0	8/27/1981– 6/5/2001		26	70	149.96	273	1,900	3	5/16/1987– 5/28/1999
09304480	5/0	8/26/1981– 6/11/2007		310	350	530	570	1,400		
09304300 09304500 09304550 09304600 4000001075434	10/0	10/19/1999– 6/11/2007		200	600	985	1,400	24,000		
400113107574500 000043	109/10	10/15/1968– 6/20/1988	100	0	50	150	270	5,100	8	6/15/1976– 5/20/1985
400206108005901 09304800	4/0 38/0	9/10/1975– 6/25/2002		60	140	350	580	5,300	6	8/31/1977– 5/26/2000
ENPR20ST ENPR21ST ENPR19ST 09306007 09306025 09306028 09306022 09306033 09306039 09306042 09306050 09306052 09306058 09306061 11625	9/0	8/18/1999– 6/21/2007		11	570	580	2,400	3,700	3	1/6/2000– 4/11/2007
09306175	6/0	4/18/1979– 11/24/1981		150	397.5	1,045	30,750	57,000	3	2/19/1980– 4/15/1981
09306200	7/0	4/18/1979– 12/2/1981		390	420	1,400	27,000	81,000	4	4/18/1979– 12/2/1981
09306210 09306222	9/0	7/17/1973– 12/2/1981		360	990	2,300	27,000	65,000	6	7/17/1973– 8/26/1981
000117	89/2	11/2/1971– 6/29/1988	100	0	280	510	1,300	6,800	26	3/4/1975– 4/19/1988
09306224	5/0	11/17/1986– 5/17/1988		190	345	820	7,750	8,100	2	5/16/1987– 5/17/1988
09306240 09306241 09306235 09306242 09306244 11702	32/0	9/14/1999– 6/12/2007		67	104.5	245	410	11,000	3	5/23/2001– 4/24/2006

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Iron, total recoverable, µg/L								Iron, aq life, 30-day chronic standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
LANG7ST										
LANG8ST										
LANG9ST										
LANG10ST										
09090700										
09090800										
DUNC1ST										
COS-INTAKE	13/0	5/25/2006– 5/14/2009		120	190	310	1,900	3,000	4	5/25/2006– 5/14/2009
09091100										
CDOWRW-550	27/0	11/19/1995– 4/13/2005		11	60	166	1,053	4,172	7	4/26/1996– 4/13/2005
CDOWRW-559										
09092500										
704569										
09091500										
09092000										
000147	61/6	7/9/1979– 4/26/1996	100	100	140	320	840	5,300	14	4/28/1980– 4/26/1996
09092600										
09092830										
09092850										
ENPR13ST										
ENPR12ST										
ENPR4ST										
ENPR1ST										
ENPR2ST										
ENPR10ST										
ENPR9ST										
ENPR5ST										
ENPR6ST										
09092800										
ENPR3ST										
11145A	16/4	9/30/1999– 4/10/2007	10 50	10	20	47	135	2,600		
11145B	16/10	9/30/1999– 4/10/2007	10 20 50 100	10	1.097	11.619	42.722	13,000	1	4/27/2000– 4/27/2000
09092960										
09092970										
ENPR16ST										
09092980										
ENPR18ST										
ENPR17ST										
ENPR14ST										
ENPR15ST										
ENPR11ST										
09093000	6/0	11/20/1975– 7/7/1977		20	87.5	290	1,095	1,800	1	4/14/1977– 4/14/1977
11210	10/0	10/18/1995 – 8/21/1996		13	47	99	192.5	5,700	1	4/3/1996– 4/3/1996
09093500										
09093700										
11205	9/1	8/16/1999– 10/10/2006	50	26	40	50	170	1,100	1	10/10/2006– 10/10/2006

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Iron, total recoverable, µg/L								Iron, aq life, 30-day chronic standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
390318108273200 CDOWRW-557 09106200 390324108291301 390326108291601 390323108291601 390303108291601 390322108292301 390318108293301 390302108293801 390319108312501 390320108315901 CDOWRW-558	56/0	12/5/1995– 1/26/1999		114	264	1,010.5	2,791	14,340	29	3/12/1996– 1/26/1999
CDOWRW-560 09106500 390337108342800 CDOWRW-563	124/0	11/3/1995– 6/20/2003		104	351	854	2,180	22,690	58	11/3/1995– 6/20/2003
11135A CDOWRW-749	99/0	12/12/1995– 5/7/2002		113	427	1,132	2,579	41,410	59	3/12/1996– 10/10/2001
09152650 11135	8/0	7/26/2005– 1/9/2007		260	437.5	1,120	2,475	9,000	4	7/26/2005– 10/11/2006
390449108364101 390514108373201 390521108373300 390607108384201 390609108384701 390613108385603 390625108390402 390617108391001 390632108392101 390624108394701 390859108364101 390645108390101 390717108400501 390718108415701 09152900 11133	9/0	1/29/1999– 10/27/2000		530	548.5	790	2,122	14,557	4	2/26/1999– 8/20/1999
390741108424001 390741108424301 390741108425301 09153000 000049	7/0	7/26/2005– 10/11/2006		240	940	3,300	14,000	30,000	5	7/26/2005– 10/11/2006
390938108443101 11110	9/1	7/26/2005– 4/11/2007	10	10	1,480	3,800	6,250	18,000	7	7/26/2005– 4/11/2007
391509108433001	59/0	2/20/1968– 12/4/1978		0	100	250	880	11,200	14	3/11/1970– 4/12/1978
	10/0	10/12/1995– 7/18/1996		36	67	190	65,000	360,000		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Iron, total recoverable, µg/L								Iron, aq life, 30-day chronic standard	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range
385144107371701 09134100 385049107372402 384922107402001 09134200 384822107411201	6/0	3/31/1998– 5/24/2005		71	120	595	1,400	14,000	2	3/31/1998– 5/24/2005
10212 384747107430501 09134500 09134700 10415	5/0	3/31/1998– 5/24/2005		680	1,300	1,900	6,500	7,100		
09135900 10411	40/1	10/24/1995– 5/25/2006	50	34	61.5	99	255	1,200	1	5/16/1996– 5/16/1996
384732107434801 09135950 000100	9/1	10/11/1995– 8/6/1996	10	10	21	110	385	900		
384434107432701 384610107455001 231275 231272 231273 231274 09136100 10400	12/0	12/18/1990– 8/11/1993		100	155	195	245	1,300	1	6/16/1993– 6/16/1993
384643107540301 10587	20/4	4/1/1998– 3/15/2005	50 100	50	77	104.5	190	3,200	1	3/15/2005– 3/15/2005
09137050 384649107570501 384624107570701 384604107570701 000056	165/15	8/11/1971– 2/1/2001	50 100	0	140	300	810	27,000	34	3/7/1972– 4/24/2000
09137300 384551107591901 09137500 09143000 09143500 000116	18/0	11/13/2003– 5/15/2007		62	507.5	1,200	4,250	7,500	11	2/19/2004– 5/15/2007
09139200 09140200 09140700 09141200 09137800	5/0	4/1/1998– 5/11/2005		210	360	2,900	4,700	16,000	3	4/1/1998– 5/11/2005
	128/12	2/20/1968– 8/8/1994	100	0	100	235	530	22,000	17	9/3/1969– 6/1/1994
	53/5	8/11/1971– 6/14/1982	100	0	100	170	350	1,700	1	8/3/1976– 8/3/1976

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Zinc, water, filtered, µg/L								Zinc, aq life, 30-day chronic, sculpin standard		Zinc, aq life, 30-day chronic standard		Zinc, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range	Count	Date range
09302450	10/4	8/17/1999– 6/11/2007	10 500	10	10	12	25	293	1	10/19/1999– 10/19/1999	1	10/19/1999– 10/19/1999	1	10/19/1999– 10/19/1999
09304100 395643107461200														
09304200	7/3	8/27/1981– 9/14/1992	3 10	3	3	4	14	17						
09304480	5/3	8/26/1981– 6/11/2007	10 3	3	3	3	11	13						
09304300 09304500 09304550 09304600														
4000001075434	10/2	10/19/1999– 6/11/2007	50 10	NA	16	39.5	64	150						
400113107574500 000043	21/20	6/20/1988– 4/21/1992	8 10											
400206108005901 09304800	4/2 44/21	4/24/1974– 9/29/2009	0.3 0.9 1 3 10 12 20	0.3	0.604	1.36	5	60						
ENPR20ST ENPR21ST ENPR19ST														
09306007	90/39	5/22/1974– 9/3/1998	3 12 15 20	3	3	7	20	60						
09306025	28/12	5/22/1974– 2/18/1980	20	4	4	20	20	260						
09306028 09306022	53/24	9/12/1974– 5/22/1985	3 12 20	3	3	7	20	370						
09306033 09306039	7/3	12/5/1974– 5/31/1984	3 20	3	3	4	20	30						
09306042	29/17	3/17/1977– 6/18/1991	3 10 20	0	0	0	10	25			1	3/9/1989– 3/9/1989		
09306050 09306052 09306058	49/19	5/22/1974– 5/22/1985	3 12 20	2	4	9	20	60						
09306061	66/26	5/22/1974– 5/4/1987	3 10 20	0	5	8	20	50						
11625	9/4	8/18/1999– 6/21/2007	10 50	10	10	17.5	22	37						
09306175	69/27	1/15/1975– 5/19/1982	3 12 20	2	4	9	20	70						
09306200	127/38	6/10/1974– 7/8/2009	0.3 0.9 1 3 10 12 20	0.3	1.428	4	9	30						
09306210 09306222	119/40	6/10/1974– 7/7/2009	0.3 0.9 1 3 7 10 20	0	1.432	2.117	10	50						
000117	21/18	6/29/1988– 4/21/1992	8 10	10	8	10	10	20						
09306224	15/9	11/9/1982– 9/29/2009	1.8 2 5 6	0.9	0.9	0.9	6	8						

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Zinc, water, filtered, µg/L								Zinc, aq life, 30-day chronic, sculpin standard		Zinc, aq life, 30-day chronic standard		Zinc, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range	Count	Date range
09306240	7/4	5/17/1974– 4/18/1979	20	20	20	20	40	65						
09306241														
09306235	32/20	5/17/1974– 11/6/1985	3 5 6 20	3	3	5	20	340						
09306242	63/22	5/17/1974– 7/8/2009	0.9 3 20	0.9	3	9	20	100						
09306244	12/8	6/12/1975– 10/24/1978	3 20											
11702	32/18	9/14/1999– 6/12/2007	10 50	10	10	10	23	110						
09306255	74/44	5/16/1972– 7/7/2009	0.9 1 1.6 3 7 10 12 20 60	0.9	0.9	2.94	9.273	140						
09306290	30/14	11/9/1982– 9/30/2009	0.9 1 3 10	0.9	0.9	1.505	7	34						
09306300	10/8	9/11/1975– 8/25/1981	3 4 20	3	3	3	4	12.5						
09306305														
09306380	5/4	3/29/1994– 11/8/1995	3 10											
400535108485700														
000044														
09072500														
CDOWRW-46	92/0	2/25/1991– 5/7/2007		3.6	10	14.5	21.5	72						
12100	9/5	2/14/2001– 8/20/2002	10	16	10	10	27.5	45						
CDOWRW-47	89/0	11/26/1990– 5/7/2007		2.8	10	13	20	49						
09085100	12/9	12/18/1990– 8/11/1993	10	8	10	10	10	20						
11109A	5/3	10/23/2000– 4/18/2007	10											
CDOWRW-197														
09085150														
09085200														
09085400														
09085300														
000047	165/121	8/29/1988– 4/18/2007	8 10 50	3.9	3.9	5.2	9	200						
CDOWRW-546	10/0	1/31/2003– 2/27/2004		11.7	12.325	13.75	16.65	21.7						
09086470														
11190H	5/5	11/30/2000– 4/18/2007	10											
09086000														
09086970														
11195	11/11	10/2/1995– 8/21/1996	8											
CDOWRW-547	8/0	1/31/2003– 2/27/2004		10	10.275	12.1	16.55	19.2						

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Zinc, water, filtered, µg/L								Zinc, aq life, 30-day chronic, sculpin standard		Zinc, aq life, 30-day chronic standard		Zinc, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range	Count	Date range
09087600 11189	10/1	8/18/1999– 10/17/2006	100	16	23	26	55	14,000						
09089000 11185	10/10	10/2/1995– 8/15/1996	8											
09089500 LANG6ST LANG5ST LANG4ST LANG3ST LANG7ST LANG8ST LANG9ST LANG10ST 09090700 09090800 DUNC1ST COS-INTAKE 09091100 CDOWRW-550	6/0	1/17/2003– 4/13/2005		2.6	4.025	8.2	43.625	79.4						
CDOWRW-559 09092500 704569 09091500 09092000 000147	22/20	8/8/1988– 4/15/1992	8 10 50											
09092600 09092830	58/31	2/9/1976– 5/5/1983	3 4 12 20	3	3	4	7	80						
09092850	61/27	2/9/1976– 7/29/1983	3 4 12 20	2	2	4	9	64						
ENPR13ST ENPR12ST ENPR4ST ENPR1ST ENPR2ST ENPR10ST ENPR9ST ENPR5ST ENPR6ST 09092800 ENPR3ST 11145A	16/7	9/30/1999– 4/10/2007	10 50 100	10	10	16	24	81						
11145B	16/9	9/30/1999– 4/10/2007	10 50 100	10	10	11	20	80.5						
09092960	50/21	2/8/1976– 9/7/1983	3 20	3	3	5	10	99						

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Zinc, water, filtered, µg/L								Zinc, aq life, 30-day chronic, sculpin standard		Zinc, aq life, 30-day chronic standard		Zinc, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range	Count	Date range
390718108415701 09152900 11133	9/7	7/26/2005– 4/11/2007	10	11	10	10	10.5	16						
390741108424001 390741108424301 390741108425301 09153000 000049 390938108443101 11110	10/10	10/12/1995– 7/18/1996	8 40											
391509108433001 09153270	6/1	3/20/1991– 11/9/2006	10	4.4	8	9.5	10.2	18						
09095526 09106104 09095529 090955285 09095528 09153290 09153300 391038108475601 000050	90/85	6/28/1988– 7/29/1996	8 10 25	8	8	8	8	42						
391029108480200 11101	43/27	8/11/1999– 4/11/2007	10 50 100	10	10	10	18	94						
09163310 09163340 09153330 09153400 391646108572301 09161000 09160500 09163050 09163490 09163500	53/10	10/17/1979– 9/17/2002	3	1.168	3	9	15	42						
10485	14/14	10/11/1995– 3/17/2005	8 10						2	5/13/1996– 6/10/1996				
09132050	13/6	4/4/1978– 7/14/1981	3 20	3	3	4	18.5	170	3	4/4/1978– 7/14/1981	1	7/14/1981– 7/14/1981	1	7/14/1981– 7/14/1981
09129800	6/0	5/19/1982– 7/20/1983		4	4.75	12	15.25	19						
09130600 09130800 09131100	7/0	4/12/1982– 7/20/1983		7	8	17	27	100			1	6/8/1982– 6/8/1982	1	6/8/1982– 6/8/1982
09131200 10490	12/12	11/8/1995– 3/17/2005	8 10											
09132500	12/7	10/3/1978– 8/19/1982	3	10	3	3	7	50	1	6/17/1982– 6/17/1982				

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

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Site identification number	Selenium, water, filtered, µg/L								Selenium, aq life, 30-day chronic standard		Selenium, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range
11185	6/5	10/2/1995– 7/24/1996	1									
09089500												
LANG6ST	9/0	6/2/2004– 2/13/2006		2	5.35	5.7	6.55	6.6	8	6/2/2004– 10/10/2005		
LANG5ST	13/0	6/2/2004– 2/13/2006		2	5.2	5.5	5.85	6.6	12	6/2/2004– 10/10/2005		
LANG4ST	11/0	6/2/2004– 2/13/2006		2	5.1	5.8	6.1	6.5	10	6/2/2004– 10/10/2005		
LANG3ST	11/0	6/2/2004– 2/13/2006		1.9	5.2	5.8	6.1	6.5	10	6/2/2004– 10/10/2005		
LANG7ST	7/0	7/8/2004– 2/13/2006		1.8	5.1	5.4	5.8	6.2	6	7/8/2004– 10/10/2005		
LANG8ST	8/0	6/2/2004– 2/13/2006		1.9	5.3	5.95	6.275	6.3	7	6/2/2004– 10/10/2005		
LANG9ST	6/0	1/10/2005– 2/13/2006		1.7	4.4	5.35	6.425	7.1	5	1/10/2005– 10/10/2005		
LANG10ST	5/0	1/10/2005– 2/13/2006		2.1	3.6	5.3	6.5	6.7	4	1/10/2005– 10/10/2005		
09090700												
09090800												
DUNC1ST	22/0	6/3/2004– 6/6/2006		5.2	8.8	9.8	12	220	22	6/3/2004– 6/6/2006	1	2/3/2005– 2/3/2005
COS-INTAKE												
09091100												
CDOWRW-550	5/0	2/21/2003– 9/14/2004		4.6	4.6	6.6	8.65	9.8	3	2/21/2003– 9/14/2004		
CDOWRW-559												
09092500												
704569												
09091500												
09092000												
000147												
09092600												
09092830	62/20	2/9/1976– 5/5/1983	1	0	0	0	1	2				
09092850	64/21	2/9/1976– 7/29/1983	1	0	0	0	1	2				
ENPR13ST												
ENPR12ST												
ENPR4ST												
ENPR1ST												
ENPR2ST												
ENPR10ST												
ENPR9ST												
ENPR5ST												
ENPR6ST												
09092800												
ENPR3ST												
11145A	16/0	9/30/1999– 4/10/2007		1	1.05	2	2	3.2				
11145B	16/0	9/30/1999– 4/10/2007		2	2.8	3	4	4.2				
09092960	52/12	2/8/1976– 9/7/1983	1	0	0	1	1	2				

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Selenium, water, filtered, µg/L								Selenium, aq life, 30-day chronic standard		Selenium, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range
390521108373300	16/2	7/20/1994–8/1/2002	1	1	2	3.5	4.5	6	4	7/20/1994–8/1/2002		
390607108384201	34/5	3/5/1997–6/6/2002	1	1	1.316	2	2.91	7.66	1	8/6/1997–8/6/1997		
390609108384701	14/0	10/6/1994–6/6/2002		0.932	2	2.971	3.34	9.281	2	7/27/2000–6/6/2002		
390613108385603	10/2	12/2/1998–4/18/2002	1 1.2	1	1.341	2.795	5.885	8.91	3	4/8/1999–4/18/2002		
390625108390402	14/0	3/5/1997–4/18/2002		1.386	2.6	4.15	44.56	92.71	7	2/24/1999–4/18/2002	4	2/24/1999–3/23/2000
390617108391001	9/0	2/24/1999–6/6/2002		1.557	1.935	9.191	11.65	14.962	5	10/21/1999–6/6/2002		
390632108392101	8/0	3/5/1997–7/22/1999		1.35	3.25	4.185	12.478	37.77	3	2/24/1999–7/22/1999	1	2/24/1999–2/24/1999
390624108394701	9/0	3/12/1997–9/4/2001		3.6	5.796	6.333	8.489	13.096	8	3/12/1997–9/4/2001		
390859108364101	5/0	2/3/1992–11/21/2004		6	6	8	65.22	74	5	2/3/1992–11/21/2004	2	2/3/1992–11/21/2004
390645108390101	19/0	3/21/1991–3/7/2006		7	10.51	33.6	65.75	94.06	19	3/21/1991–3/7/2006	11	3/21/1991–3/7/2006
390717108400501	6/0	3/20/1991–9/22/1993		6	6.75	10.5	31.25	35	6	3/20/1991–9/22/1993	2	3/20/1991–2/3/1992
390718108415701	5/1	3/14/1995–7/31/1996	1	1	3.5	14	45	48	4	3/14/1995–7/31/1996	2	3/14/1995–3/12/1996
09152900	6/0	3/20/1991–9/22/1993		9	9.75	46	83	92	6	3/20/1991–9/22/1993	3	3/20/1991–3/24/1992
11133	9/0	7/26/2005–4/11/2007		9.5	10.5	13	26	44	9	7/26/2005–4/11/2007	2	12/6/2005–1/9/2007
390741108424001	7/0	7/24/2000–7/2/2003		2.09	2.506	4.335	16.03	16.57	3	7/24/2000–3/15/2001		
390741108424301	13/0	7/24/2000–3/8/2006		10.341	11.088	32.54	40.34	59.95	13	7/24/2000–3/8/2006	7	12/1/2000–3/8/2006
390741108425301	9/0	7/24/2000–7/2/2003		2.801	10.215	14.89	39.46	58.11	8	7/24/2000–7/2/2003	4	12/1/2000–4/1/2003
09153000	16/3	7/20/1994–8/1/2002	1	1	2.5	3.5	5	6.343	7	7/20/1994–8/1/2002		
000049												
390938108443101												
11110	6/4	10/12/1995–7/18/1996	1 5									
391509108433001	8/0	5/2/1991–5/3/2000		2	2	2.85	6.02	15.9				
09153270	33/0	3/20/1991–11/9/2006		3.97	12	19	32	84	29	3/20/1991–3/8/1999	16	3/20/1991–3/8/1999
09095526												
09106104												
09095529												
090955285												
09095528												
09153290	54/0	9/10/1991–9/8/1998		4.3	13.1	18	52	170	53	9/10/1991–9/8/1998	25	9/10/1991–9/8/1998
09153300	54/0	8/27/1991–3/8/1999		6.7	17	24	80	150	54	8/27/1991–3/8/1999	37	8/27/1991–3/8/1999
391038108475601	9/0	7/9/1993–7/14/1999		1.63	2	2.02	11.5	13.83	3	11/19/1998–1/20/1999		

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Selenium, water, filtered, µg/L								Selenium, aq life, 30-day chronic standard		Selenium, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range
000050	39/2	8/1/1988– 9/27/2000	2 5	1.1	3	4.2	6.1	8.4	16	8/1/1988– 10/3/1990		
391029108480200 11101	43/4	8/11/1999– 4/11/2007	1	1	3	3.6	4.5	8.2	8	8/2/2000– 10/3/2006		
09163310 09163340 09153330 09153400 391646108572301	5/0	5/2/1991– 5/3/2000		2	6	8.26	9	10	4	5/2/1991– 5/3/2000		
09161000 09160500 09163050 09163490	37/0	3/20/1991– 8/13/1997		4	7	10	49	120	36	3/20/1991– 8/13/1997	15	3/20/1991– 3/10/1997
09163500	230/2	10/17/1979– 9/23/2009	1	1	2.7	4	5.087	16	87	10/17/1979– 9/23/2009		
10485	9/9	10/11/1995– 3/17/2005	1									
09132050	14/6	4/4/1978– 7/14/1981	1	0	0	0	1	1				
09129800	6/6	5/19/1982– 7/20/1983	1									
09130600 09130800 09131100	7/7	4/12/1982– 7/20/1983	1									
09131200 10490	8/7	10/11/1995– 3/17/2005	1									
09132500	18/13	10/20/1977– 3/13/2000	0.7 1									
000152	14/12	3/20/1996– 5/25/2006	1									
09132700 09132800 09132900 09132920 09132940 10406H	6/6	7/24/2000– 3/16/2005	1									
09132960 09132985 09132995	10/9	5/10/1999– 3/16/2005	1	0.455								
09134000 10436	8/3	3/31/1998– 3/16/2005	1	1	1	1.4	2	2				
09134050	5/2	5/11/1999– 3/13/2000	1 1.2	1	1.155	1.439	1.945	2.4				
385144107371701	10/4	3/31/1998– 5/24/2005	2.4 1.0	NA	NA	2	3	4.94				
09134100 385049107372402	6/0	5/8/2008– 4/14/2009		5.088	5.274	9.382	11.073	11.86				

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

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[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Selenium, water, filtered, µg/L								Selenium, aq life, 30-day chronic standard		Selenium, aq life, acute	
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	Count	Date range	Count	Date range
09139200												
09140200												
09140700												
09141200												
09137800												
10582	5/1	4/1/1998– 4/13/2005	1	1	1.8	3	3.6	6				
09144200	8/0	7/19/1991– 6/5/2000		4.04	4.305	4.735	5.685	9.824	1	6/5/2000– 6/5/2000		
10516	22/1	1/3/2001– 9/10/2003	1	1	2.575	3.2	4.475	6.2	5	1/3/2001– 9/10/2003		
09144250	46/2	11/19/1987– 8/6/2009	1	1	2.83	3.839	5	13	14	11/19/1987– 9/11/2002		
383404107534101	20/0	2/29/2000– 2/6/2009		13.382	15.18	52.120	103.199	188.41			14	2/29/2000– 2/6/2009
383408107535101	53/0	3/10/1992– 10/8/2009		1.946	9.716	19.958	125.64	220			30	3/10/1992– 10/8/2009
383528107552001	50/0	2/29/2000– 4/21/2003		24.306	82.182	181.39	241.28	333.36			50	2/29/2000– 4/21/2003
383741107565701	13/0	2/29/2000– 12/13/2002		51.641	59.043	129.49	278.865	318.33			13	2/29/2000– 12/13/2002
383728107572001	52/0	2/29/2000– 4/21/2003		19.522	29.783	36.78	160.748	274.64			52	2/29/2000– 4/21/2003
10661	16/0	4/1/1998– 4/19/2007		18	30	33	51.5	213			15	4/1/1998– 10/3/2006
383946107595301	93/0	7/23/1991– 8/28/2009		16	29.82	46.977	160	250.01			91	7/23/1991– 8/28/2009
383953108001701												
384231108020301	9/1	11/17/1987– 9/17/2007	0.04	0.08	7.775	8.757	13.78	163.44			2	11/17/1987– 10/26/2006
10602	9/2	12/2/1998– 6/16/2005	1	1	8.1	9.7	12	17				
09149480	37/1	3/23/1996– 9/2/1998	1	1	2.375	4	5.25	8.05				
384202108032001	17/0	7/10/1991– 2/13/2001		3	5	6	8	10				
10611	5/2	4/1/1998– 4/14/2005	1	1	1	1	3	7				
000055	109/2	8/16/1988– 6/13/2007	1	0.012	8.7	13	16.4	30	16	12/13/1988– 8/17/2006	19	12/13/1988– 8/17/2006
09149500	126/0	7/5/1977– 8/6/2009		2	9.700	12	16	34	11	11/18/1987– 1/7/2000	16	11/18/1987– 2/20/2003
384448108070301	13/0	7/15/1991– 3/20/2000		3.4	7	8.4	12.7	16				
10515	30/1	1/12/1999– 6/13/2007	1	1	3.6	4	5	12	2	7/12/2005– 10/2/2006		
384408108091501												
10562	10/10	10/30/1995– 7/22/1996	1									
384013108091401	6/6	7/15/1991– 7/20/1999	1									
09150500	15/1	7/15/1991– 3/20/2000	1	1	2.12	3	3.65	5	1	1/30/1992– 1/30/1992		
384510108111801	10/0	11/24/1995– 4/4/2000		18	30.323	88.66	115.625	150			9	2/14/1996– 4/4/2000

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Suspended sediment concentration, mg/L							Suspended sediment discharge, tons per day						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09302450														
09304100														
395643107461200														
09304200	94/0	4/14/1975– 7/30/2001	1	9	23	59	1,880	94/0	4/14/1975– 7/30/2001	0.392	9.61	32.55	222	19,700
09304480														
09304300														
09304500														
09304550														
09304600														
4000001075434														
400113107574500														
000043														
400206108005901														
09304800	198/0	3/3/1975– 7/23/2009	2	24	47	112	2,689	198/0	3/3/1975– 7/23/2009	0.4	27.9	61.5	269	4,210
ENPR20ST														
ENPR21ST														
ENPR19ST														
09306007	439/0	4/23/1974– 9/3/1998	4	53	131	445	17,000	439/0	4/23/1974– 9/3/1998	0.04	0.97	3.8	20.4	18,900
09306025	45/0	5/3/1974– 9/28/1976	2	18	41	98	2,935	45/0	5/3/1974– 9/28/1976	0	0	0	0.02	1.2
09306028	24/0	3/3/1975– 9/19/1980	97	231	287	434	2,650	37/2	3/3/1975– 9/19/1980	0.01	0.02	0.12	0.79	11
09306022	68/0	3/16/1976– 9/3/1998	2	10	31	106	766	67/0	3/16/1976– 9/3/1998	0	0.04	0.266	0.745	19.4
09306033	23/0	3/1/1975– 4/22/1980	7	110	550	2,000	66,450	31/2	3/1/1975– 4/22/1980	0	0.02	0.1	1	135
09306039	12/0	12/1/1974– 8/1/1984	51	874	8,615	35,875	915,000	17/5	12/1/1974– 8/1/1984	0.01	0.01	0.63	5.7	18,300
09306042	134/0	3/17/1977– 6/18/1991	8	81	236	2,710	129,000	131/0	3/17/1977– 6/18/1991	0	0.13	0.61	2.8	13,200
09306050	10/2	1/6/1975– 3/25/1976	0	375	3,790	7,088	15,200	15/2	1/6/1975– 3/25/1976	0.01	0.05	0.5	2	197
09306052	26/0	10/19/1974– 3/10/1983	0	0	606	2,500	27,200	32/3	10/19/1974– 3/10/1983	0	0	0.035	5.335	360
09306058	364/0	4/23/1974– 9/3/1998	0	37	115	249	2,450	364/0	4/23/1974– 9/3/1998	0	0.09	0.44	1.78	42.9
09306061	467/0	4/23/1974– 7/11/1991	6	59	180	496	14,200	466/0	4/23/1974– 7/11/1991	0.05	1.3	7.25	32	16,800
11625														
09306175	260/0	12/20/1974– 8/17/1983	8	46	110	276	50,200	260/0	12/20/1974– 8/17/1983	0.01	0.37	1.65	5.35	1,080
09306200	432/0	9/6/1974– 7/8/2009	3	69	200	483	21,300	428/0	9/6/1974– 5/5/2009	0.026	1.35	9.7	36	17,300
09306210														
09306222	366/0	9/29/1972– 7/7/2009	4	71	235	684	8,150	362/0	9/29/1972– 5/5/2009	0.01	1.4	17	65	10,100
000117														
09306224	45/0	11/9/1982– 7/24/2009	13	52	115	554	3,300	45/0	11/9/1982– 7/24/2009	15.9	99.6	352	2,410	49,900
09306240	96/0	4/27/1974– 3/11/1985	5	90	635	2,400	29,500	96/0	4/27/1974– 3/11/1985	0	0.1	2.05	12.5	4,380

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Suspended sediment concentration, mg/L							Suspended sediment discharge, tons per day						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
LANG10ST														
09090700														
09090800														
DUNC1ST														
COS-INTAKE														
09091100														
CDOWRW-550														
CDOWRW-559														
09092500														
704569														
09091500														
09092000														
000147														
09092600														
09092830	8/0	10/9/1977– 12/7/1979	0	10	17	22	61	6/0	10/9/1977– 9/10/1979	0.01	0.018	0.045	0.303	1
09092850	6/0	5/5/1982– 7/29/1982	10	15	77	368	654	6/0	5/5/1982– 7/29/1982	0.1	0.13	6.39	55.75	127
ENPR13ST														
ENPR12ST														
ENPR4ST														
ENPR1ST														
ENPR2ST														
ENPR10ST														
ENPR9ST														
ENPR5ST														
ENPR6ST														
09092800														
ENPR3ST														
11145A														
11145B														
09092960														
09092970	40/0	10/11/1978– 9/9/1983	0	4	12	61	7,180	40/0	10/11/1978– 9/9/1983	0	0.01	0.095	3.175	8,650
ENPR16ST														
09092980														
ENPR18ST														
ENPR17ST														
ENPR14ST														
ENPR15ST														
ENPR11ST														
09093000	57/0	4/1/1976– 9/24/1981	1	6	15	58	2,940	54/0	4/1/1976– 9/24/1981	0.01	0.05	0.18	1.2	4,170
11210														
09093500	32/0	11/21/1974– 9/21/1982	10	75	156	363	15,900	14/0	4/17/1979– 9/21/1982	0.44	1.65	3.9	591.5	4,850
09093700	54/0	10/2/1973– 9/8/1982	6	32	81	262	3,710	54/0	10/2/1973– 9/8/1982	26	151	485.5	4,220	50,000
11205														
09094200														
09094400														
09095000	9/0	4/24/1980– 9/21/1981	2	121	1,680	4,810	5,840	9/0	4/24/1980– 9/21/1981	0.12	4.9	1,300	10,430	14,400
09095300	104/0	10/19/1995– 9/7/2004	0	46	123	743	18,900	103/0	10/19/1995– 9/7/2004	0	0.045	0.244	4.79	2,570

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Suspended sediment concentration, mg/L							Suspended sediment discharge, tons per day						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
11135A CDOWRW-749 09152650 11135 390449108364101 390514108373201 390521108373300 390607108384201	18/0	12/11/1996– 5/4/1998	22	202	417	864	2,750							
390609108384701 390613108385603 390625108390402 390617108391001 390632108392101 390624108394701 390859108364101 390645108390101 390717108400501 390718108415701 09152900 11133 390741108424001 390741108424301 390741108425301 09153000 000049 390938108443101 11110 391509108433001 09153270 09095526 09106104 09095529														
090955285 09095528 09153290	20/0	7/14/2000– 9/16/2003	21	73	118	235	490	20/0	7/14/2000– 9/16/2003	0.73	8.393	17.45	34.05	94.7
09153300 391038108475601 000050 391029108480200 11101 09163310 09163340 09153330	67/0	10/24/1995– 9/8/1998	4	294	717	1,040	9,370	67/0	10/24/1995– 9/8/1998	0.064	55.7	123	172	1,550
09153400 391646108572301 09161000 09160500	20/0	8/12/1981– 9/11/1981	140,000	145,500	191,000	258,000	320,000	20/0	8/12/1981– 9/11/1981	2,460	5,287.5	7,155	13,077.5	83,100
09163050	39/0	7/9/1981– 9/27/1982	2,840	5,030	12,900	18,100	79,100	39/0	7/9/1981– 9/27/1982	3.4	10	59	88	404

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

Site identification number	Suspended sediment concentration, mg/L							Suspended sediment discharge, tons per day						
	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Min	25th	50th	75th	Max
09136200														
384643107540301														
10587														
09137050														
384649107570501														
384624107570701														
384604107570701														
000056														
09137300														
384551107591901														
09137500														
09143000	8/0	11/12/1985– 8/27/1986	3	12	24	38	46	8/0	11/12/1985– 8/27/1986	0.083	3.428	8.165	14.675	44.2
09143500														
000116														
09139200														
09140200														
09140700														
09141200														
09137800														
10582														
09144200														
10516														
09144250														
383404107534101														
383408107535101														
383528107552001														
383741107565701														
383728107572001														
10661														
383946107595301														
383953108001701														
384231108020301														
10602														
09149480	51/0	10/26/1995– 9/2/1998	4	56	131	328	1,030	51/0	10/26/1995– 9/2/1998	0.454	3.28	22.9	122	676
384202108032001														
10611														
000055														
09149500	41/0	10/2/1959– 5/14/1998	52	157	316	586	2,000	41/0	10/2/1959– 5/14/1998	18	76	166	625	2,890
384448108070301														
10515														
384408108091501														
10562														
384013108091401														
09150500														
384510108111801														
384527108152701														
10555														
10551														
09151500														
384813108184301														

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

[illegible]

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

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Site identification number	Ethylbenzene, water, unfiltered, recoverable, mg/L									Xylene (all isomers), water, unfiltered, recoverable, mg/L							
	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	No. of samples/ No. of censored	Date range	Censoring levels	Min	25th	50th	75th	Max	
09095529																	
090955285																	
09095528																	
09153290																	
09153300																	
391038108475601																	
000050																	
391029108480200																	
11101																	
09163310																	
09163340																	
09153330																	
09153400																	
391646108572301																	
09161000																	
09160500																	
09163050																	
09163490																	
09163500																	
10485																	
09132050																	
09129800																	
09130600																	
09130800																	
09131100																	
09131200																	
10490																	
09132500																	
000152																	
09132700																	
09132800																	
09132900																	
09132920																	
09132940																	
10406H																	
09132960																	
09132985																	
09132995																	
09134000																	
10436																	
09134050																	
385144107371701																	
09134100																	
385049107372402																	
384922107402001																	
09134200																	
384822107411201																	
10212																	
384747107430501																	
09134500																	
09134700																	
10415																	
09135900																	

Appendix 1. Summary of surface-water-quality data and comparison to water-quality standards by site, by constituent, Piceance study area, western Colorado. Water-quality standards comparisons follow data summaries and are in blue text; standards are provided in table 3.—Continued

[CDPHE segment, Colorado Department of Health and the Environment stream segment as referred to in tables 2 and 3; latitude and longitude are in North American Datum of 1983; downstream order number assigned as part of analysis. µg/L, micrograms per liter; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter; mL, milliliters; aq, aquatic; CO, Colorado; EPA, U.S. Environmental Protection Agency; Max, maximum; Min, minimum; NA, not applicable; No., number; NTU, nephelometric turbidity units; WS, water supply; dates given in month/day/year format]

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Appendix 2. Model coefficients and statistical diagnostics from regression models used for trend analysis in the Piceance study area, Colorado.

[ERV, estimated residual variance; R², coefficient of determination; SCR, serial correlation of residual; Ln, natural logarithm; Q, streamflow; t, decimal time in decimal years; Sin, sine function; Cos, cosine function; VIF, variation inflation factor; *, centered values; N, number of data points. Empty cells indicate variables not used in the regression because they were not statistically significant (p-value > 0.05). Shaded cells indicate variables not statistically significant but included in the final regression. All constituents are dissolved unless otherwise stated]

U.S. Geological Survey streamflow- gaging stations (all figures)	Constituents	ERV	R ²	SCR	Y-axis intercept (Ln load)	Ln Streamflow		t	t ²	Sin	Cos	Maximum VIF	Q* central value	t* central value	N
						Q (Ln load)	Q ²								
09085150	Selenium	0.101	82.5	-0.418	2.118	0.878				0.213	0.172	3.320	4,158	2008	21
09095300	Alkalinity	0.059	98.6	0.217	-0.498	0.913	-0.030	-0.035	-0.013	-0.018	0.061	1.892	0.44	2000	74
	Chloride	0.074	97.7	-0.015	-3.997	0.819	-0.028					1.000	0.44	2000	74
	Nitrate	0.960	90.0	0.423	-6.713	0.930	-0.092	-0.368	-0.107	0.101	0.508	1.900	0.44	2000	73
	Orthophosphate	0.293	93.0	0.009	-7.737	1.280				0.091	0.384	1.223	3.04	2000	25
	Sulfate	0.060	98.1	0.081	0.776	0.776	-0.043	-0.021	-0.020	0.000	-0.028	1.890	0.44	2000	74
09095500	Alkalinity	0.010	97.3	0.319	7.229	0.778				0.033	0.038	1.857	4,742	2002	119
	Calcium	0.005	97.9	0.286	6.416	0.668	0.011	-0.002	0.000	-0.040	0.035	2.130	4,596	1999	198
	Chloride	0.008	23.4	0.356	6.814	0.051	-0.065	0.002		-0.037	0.045	2.097	4,596	1999	198
	Dissolved solids	0.007	92.9	0.421	8.374	0.436	0.017	-0.003		-0.028	0.054	2.000	4,602	1999	212
	Iron, dissolved	0.330	86.5	0.078	5.584	1.758	-0.123	-0.162	0.097	-0.121	0.138	4.776	5,746	1998	53
	Magnesium	0.014	93.5	0.411	4.975	0.652				0.008	0.113	1.902	4,596	1999	198
	Potassium	0.015	90.4	0.211	3.335	0.495	0.033					1.000	4,596	1999	198
	Selenium	0.113	76.2	0.311	2.544	0.772				0.311	0.236	1.727	4,604	2000	76
	Silica	0.031	95.0	0.269	4.592	1.083	-0.047	-0.007		0.024	0.101	2.089	4,596	1999	196
	Sodium	0.009	47.2	0.411	6.541	0.150	-0.032			-0.019	0.056	2.096	4,596	1999	198
	Sulfate	0.013	87.2	0.350	6.896	0.451	-0.031	-0.011		-0.037	0.107	2.097	4,596	1999	197
09105000	Alkalinity	0.011	98.3	-0.015	4.462	0.742	-0.065	0.006	0.002	-0.071	0.087	1.373	128.50	2004	87
	Calcium	0.017	98.0	0.050	3.183	0.894	-0.084			-0.038	0.121	1.229	178.40	2000	151
	Chloride	0.038	90.6	0.079	0.763	0.560	-0.064	-0.016	0.002	0.004	0.172	1.235	178.40	2000	151
	Dissolved solids	0.024	95.7	0.116	5.106	0.719	-0.051	-0.008		-0.081	0.107	1.232	178.40	2000	151
	Fluoride	0.058	87.1	0.100	-1.566	0.666	-0.051			-0.216	0.064	1.218	199.80	2000	149
	Magnesium	0.030	92.7	0.034	2.447	0.634	-0.051			-0.165	0.129	1.229	178.40	2000	151
	Potassium	0.021	95.8	0.130	0.545	0.699	-0.023			-0.158	-0.015	1.229	178.40	2000	151
	Silica	0.015	98.0	0.175	2.401	0.868	-0.032	0.004		-0.186	0.051	1.229	178.20	2000	150
	Sodium	0.057	84.7	0.022	2.874	0.546	-0.053	-0.016		-0.070	0.126	1.232	178.40	2000	151
	Sulfate	0.078	81.7	0.007	3.220	0.542	-0.070	-0.025	-0.002	-0.009	0.186	1.235	178.40	2000	151
09106150	Calcium	0.007	99.3	0.229	5.694	0.821	-0.029			-0.034	0.164	1.588	1,845	1998	28
	Chloride	0.019	96.4	-0.101	6.332	0.472	-0.090			0.041	0.356	1.588	1,845	1998	28
	Dissolved solids	0.008	98.8	0.037	7.797	0.689	-0.052			0.030	0.234	1.341	1,843	1997	43
	Magnesium	0.017	98.4	0.171	4.306	0.796	-0.040			0.039	0.233	1.588	1,845	1998	28
	Potassium	0.021	97.7	-0.207	2.748	0.728	-0.038			0.046	0.201	1.588	1,845	1998	28
	Silica	0.018	98.9	0.191	3.769	0.980				0.083	0.024	1.246	1,845	1998	28
	Sodium	0.018	96.9	0.023	6.066	0.534	-0.078			0.058	0.328	1.588	1,845	1998	28
	Sulfate	0.015	98.2	-0.210	6.307	0.698	-0.062			0.002	0.286	1.588	1,845	1998	28
09106200	Alkalinity	0.023	99.5	-0.195	-0.527	0.934				-0.054	0.294	3.856	1.21	2002	23
	Calcium	0.147	92.1	-0.031	-0.655	0.706				-0.074	0.454	3.560	1.27	1998	34
	Dissolved solids	0.105	93.6	0.004	1.447	0.689				-0.054	0.509	3.560	1.27	1998	34
	Fluoride	0.069	98.1	-0.026	-6.779	0.891				-0.114	0.151	3.560	1.27	1998	34
	Magnesium	0.149	86.0	-0.026	-1.509	0.564		-0.033		0.018	0.586	3.579	1.27	1998	34
	Potassium	0.097	97.0	-0.109	-4.082	0.881				-0.091	0.324	3.560	1.27	1998	34
	Selenium	0.134	75.0	0.316	-3.307	0.447	-0.054	-0.039	0.012	0.107	0.681	4.938	1.40	1999	40
	Silica	0.103	98.1	-0.128	-3.575	1.076		-0.024		-0.166	0.264	3.579	1.27	1998	34
	Sodium	0.228	91.3	-0.062	-0.669	0.795				-0.121	0.407	3.560	1.27	1998	34
	Sulfate	0.107	86.9	0.184	0.578	0.509		-0.031		-0.059	0.618	3.579	1.27	1998	34

Appendix 2. Model coefficients and statistical diagnostics from regression models used for trend analysis in the Piceance study area, Colorado.—Continued

[ERV, estimated residual variance; R², coefficient of determination; SCR, serial correlation of residual; Ln, natural logarithm; Q, streamflow; t, decimal time in decimal years; Sin, sine function; Cos, cosine function; VIF, variation inflation factor; *, centered values; N, number of data points. Empty cells indicate variables not used in the regression because they were not statistically significant (p-value > 0.05). Shaded cells indicate variables not statistically significant but included in the final regression. All constituents are dissolved unless otherwise stated]

U.S. Geological Survey streamflow- gaging stations (all figures)	Constituents	ERV	R ²	SCR	Y-axis intercept (Ln load)	Ln Streamflow		t	t ²	Sin	Cos	Maximum VIF	Q* central value	t* central value	N	
						Q (Ln load)	Q ²									
09136100	Alkalinity	0.013	98.0	-0.076	4.758	0.565	-0.033	0.017	0.030	-0.109	0.051	2.766	522.30	2005	24	
	Calicium	0.033	89.3	0.355	4.493	0.551		-0.024		-0.263	-0.056	1.983	497	2001	40	
	Dissolved solids	0.040	83.2	0.251	6.337	0.487		-0.031		-0.224	-0.015	1.983	497	2001	40	
	Fluoride	0.036	89.1	0.386	-0.996	0.571				-0.237	0.023	1.673	497	2001	40	
	Magnesium	0.049	73.5	0.206	3.569	0.428		-0.039		-0.228	0.020	1.983	497	2001	40	
	Potassium	0.040	86.1	0.078	1.402	0.511				-0.176	0.005	1.673	497	2001	40	
	Selenium	0.124	61.3	-0.124	1.428	0.441	-0.068			-0.169	0.087	1.456	441	2001	45	
	Silica	0.010	98.7	0.361	2.956	0.795	0.030	0.011	-0.001	-0.125	0.034	2.232	497	2001	40	
	Sodium	0.048	77.2	0.201	3.707	0.449		-0.030		-0.137	0.067	1.983	497	2001	40	
	Sulfate	0.073	61.7	0.171	5.464	0.375		-0.056		-0.276	-0.045	1.983	497	2001	40	
	09144250	Magnesium	0.013	92.5	-0.235	4.548	0.585	-0.081	-0.019		-0.110	-0.001	1.166	1,865	1999	26
		Potassium	0.084	61.7	-0.047	2.479	0.621						1,865	1999	26	
Selenium		0.071	67.5	0.136	3.153	0.396	-0.166	-0.024		-0.132	-0.118	1.161	1,418	1999	42	
Silica		0.005	98.8	-0.085	4.171	1.047						1,865	1999	26		
09149500	Alkalinity	0.017	93.9	0.321	4.927	0.797				-0.084	0.015	1.077	271	2004	58	
	Calicium	0.011	94.7	0.141	4.839	0.663	0.022	-0.005	0.001	-0.166	0.010	1.272	313	1998	120	
	Chloride	0.051	75.1	0.080	2.062	0.665	0.035	-0.011	0.003	0.057	0.180	1.270	313	1998	119	
	Dissolved solids	0.028	84.5	-0.079	6.679	0.599	-0.052	-0.008	0.002	-0.112	0.083	1.270	313	1998	119	
	Fluoride	0.020	92.1	-0.019	-0.734	0.691		0.007		-0.188	-0.083	1.181	315	1998	118	
	Magnesium	0.015	91.4	0.022	3.599	0.651	0.022	-0.004	0.002	-0.091	0.169	1.272	313	1998	120	
	Potassium	0.018	93.7	0.039	1.125	0.872				0.017	0.041	1.120	313	1998	120	
	Selenium	0.045	81.7	0.104	2.997	0.728	-0.089	-0.013	0.002	-0.014	0.253	1.275	313	1998	121	
	Silica	0.009	97.8	0.210	2.520	0.931	-0.022	0.008	-0.001	-0.122	-0.081	1.270	313	1998	119	
	Sodium	0.022	86.4	-0.081	4.242	0.620	0.010	-0.007	0.002	-0.057	0.178	1.272	313	1998	120	
	Sulfate	0.019	88.8	0.002	6.080	0.609	0.014	-0.007	0.002	-0.118	0.102	1.277	313	1998	120	
	09152500	Alkalinity	0.014	94.5	0.125	6.739	0.698	-0.019	0.001	0.001	-0.080	0.024	1.242	2,699	2000	152
Calicium		0.017	91.2	0.063	6.226	0.536	0.005	-0.004	0.001	-0.260	-0.075	1.236	2,734	2000	169	
Chloride		0.021	77.4	0.090	3.618	0.394	-0.004	-0.006	0.001	-0.068	0.040	1.236	2,734	2000	169	
Dissolved solids		0.018	87.7	0.027	8.043	0.478	0.001	-0.008	0.001	-0.223	-0.016	1.236	2,734	2000	169	
Fluoride		0.034	86.9	0.015	0.822	0.646		0.005		-0.262	-0.055	1.223	2,754	2000	167	
Iron, dissolved		0.491	77.8	0.309	4.770	1.862	0.396	-0.216	0.032	0.033	0.280	1.838	3,306	1995	71	
Magnesium		0.018	85.9	0.026	5.077	0.484	0.002	-0.006	0.001	-0.187	0.063	1.236	2,734	2000	169	
Nitrate		0.051	73.6	0.076	1.510	0.347				-0.397	-0.224	1.334	3,109	1995	75	
Organic carbon		0.016	97.5	0.029	3.444	1.150	0.086	0.026		-0.062	-0.146	1.704	3,518	1999	46	
Orthophosphate		0.159	73.9	-0.015	-0.549	0.979						4,305	1995	74		
Potassium		0.021	91.9	0.124	2.933	0.703	0.049	-0.001	0.001	-0.122	-0.009	1.236	2,734	2000	169	
Selenium		0.056	52.2	0.181	3.963	0.315	0.064	-0.014		-0.194	0.052	1.229	2,784	2000	159	
Silica		0.014	97.5	0.163	4.538	1.030	-0.054	-0.003		-0.082	-0.020	1.226	2,734	2000	169	
Sodium		0.024	75.7	0.015	5.518	0.384	0.016	-0.008	0.001	-0.176	0.055	1.236	2,734	2000	169	
Sulfate		0.027	78.1	0.021	7.326	0.350		-0.012		-0.278	-0.029	1.219	2,734	2000	169	

Appendix 2. Model coefficients and statistical diagnostics from regression models used for trend analysis in the Piceance study area, Colorado.—Continued

[ERV, estimated residual variance; R², coefficient of determination; SCR, serial correlation of residual; Ln, natural logarithm; Q, streamflow; t, decimal time in decimal years; Sin, sine function; Cos, cosine function; VIF, variation inflation factor; *, centered values; N, number of data points. Empty cells indicate variables not used in the regression because they were not statistically significant (p-value > 0.05). Shaded cells indicate variables not statistically significant but included in the final regression. All constituents are dissolved unless otherwise stated]

U.S. Geological Survey streamflow- gaging stations (all figures)	Constituents	ERV	R ²	SCR	Y-axis intercept (Ln load)	Ln Streamflow		t	t ²	Sin	Cos	Maximum VIF	Q* central value	t* central value	N
						Q (Ln load)	Q ²								
09163500	Alkalinity	0.009	96.7	0.247	7.731	0.765	0.002	−0.002	0.001	−0.064	0.076	1.527	7,237	2000	190
	Ammonia	0.953	53.0	0.232	−1.144	1.015	−0.149	−0.039	0.007	0.773	0.055	1.506	7,101	1999	168
	Calcium	0.007	95.8	0.093	7.144	0.552	0.007	−0.003	0.001	−0.204	−0.046	1.499	7,097	1999	214
	Chloride	0.012	57.8	0.122	6.889	0.200	−0.065	0.002	0.000	−0.048	0.167	1.499	7,128	1999	219
	Dissolved solids	0.007	92.5	0.049	9.068	0.449	−0.002	−0.007	0.001	−0.159	0.039	1.499	7,100	1999	213
	Fluoride	0.059	79.6	0.057	1.730	0.740	−0.058			−0.179	0.056	1.521	7,235	1999	212
	Iron, dissolved	0.345	79.4	0.425	5.449	1.830	0.240	−0.023	0.029	0.133	0.311	2.200	7,907	1996	114
	Magnesium	0.010	91.3	0.170	5.942	0.488	−0.005	−0.006	0.001	−0.159	0.045	1.499	7,097	1999	214
	Nitrate	0.069	72.9	0.030	2.103	0.560		−0.014		−0.263	−0.069	1.483	7,096	1999	169
	Organic carbon	0.016	97.7	−0.060	4.186	1.040	0.080	0.024		0.020	−0.160	2.077	8,532	1999	76
	Orthophosphate	0.187	78.4	0.115	−0.126	0.884	−0.153	−0.017		0.145	−0.282	1.549	7,570	2000	113
	Potassium	0.017	90.4	0.010	3.947	0.611	0.007	0.000	0.001	−0.084	0.041	1.499	7,097	1999	214
	Selenium	0.048	59.8	0.172	4.616	0.263		−0.010		−0.253	−0.079	1.496	7,193	2000	188
	Sodium	0.011	74.6	0.060	6.976	0.308	−0.034	−0.004	0.001	−0.081	0.142	1.499	7,097	1999	214
	Sulfate	0.011	87.5	0.045	8.093	0.337	−0.032	−0.012	0.001	−0.242	−0.021	1.499	7,128	1999	219
	Total phosphorus	0.835	65.1	0.201	0.652	1.139		0.024		0.101	−0.862	1.466	7,116	1999	166
09304200	Calcium	0.009	99.0	0.078	4.051	0.797				−0.010	0.192	1.714	372.00	1996	30
	Chloride	0.067	83.5	0.007	0.455	0.473				0.050	−0.198	1.499	415.30	2000	60
	Dissolved solids	0.006	99.4	−0.133	5.294	0.770	−0.024	0.009		0.011	0.113	2.250	294.70	1995	21
	Ecoli	0.848	82.9	0.206	10.143	1.143		0.166		−0.042	−1.612	1.380	170.60	1997	21
	Iron, total	0.307	93.4	−0.156	5.751	1.763	0.256	−0.085				1.079	551.00	1996	23
	recoverable														
	Magnesium	0.006	99.4	0.017	2.351	0.807				−0.020	0.127	1.714	372.00	1996	30
	Nitrate	0.902	85.9	−0.050	−4.293	1.910	0.155	0.082	−0.022	0.432	0.646	1.276	294.80	2000	81
	Orthophosphate	0.182	89.2	0.246	−3.845	0.894	0.046	−0.041				1.000	241.00	2001	45
	Silica	0.004	99.7	−0.142	2.511	0.900	−0.015			0.014	0.057	2.152	294.70	1995	21
	Sodium	0.004	99.3	−0.048	1.122	0.521	0.041	−0.029	−0.005	−0.006	−0.085	3.063	294.70	1995	21
	Sulfate	0.013	98.1	−0.031	4.213	0.627	−0.091			0.031	0.200	2.152	294.70	1995	21
	Suspended	0.561	87.0	0.127	2.908	1.640	0.405			0.446	0.566	1.880	506.80	1996	32
09304800	sediment														
	Total phosphorus	0.640	74.8	0.262	−4.598	1.177	0.214	0.076				1.007	300.30	2001	78
	Calcium	0.005	98.6	−0.135	4.871	0.670							836.30	2000	52
	Chloride	0.025	80.9	0.035	2.231	0.296	−0.046	−0.021		0.070	−0.054	1.845	828.00	2000	66
	Dissolved solids	0.010	95.6	−0.109	6.309	0.547				0.025	−0.087	1.807	745.40	2001	32
	Fluoride	0.178	63.2	−0.007	−1.328	0.638				−0.195	−0.139	1.807	745.20	2001	32
	Iron, dissolved	0.093	92.3	−0.332	3.833	0.904	0.190			−0.132	−0.490	1.605	792.30	2002	28
	Iron, total	0.571	85.7	0.091	7.370	1.898							883.00	1997	24
	recoverable														
	Magnesium	0.017	94.7	−0.090	3.491	0.551				0.010	−0.126	1.979	836.30	2000	52
	Orthophosphate	0.226	83.0	−0.088	−2.497	0.845	0.190	−0.030	−0.004	0.174	−0.258	1.628	802.90	2001	50
	Potassium	0.025	92.6	0.022	0.744	0.590	0.086			0.030	−0.183	1.825	745.20	2001	31
	Silica	0.004	99.2	−0.045	3.309	0.896		−0.003				1.009	745.20	2001	31
	Sodium	0.035	73.9	−0.028	3.059	0.261		−0.008		0.103	−0.179	1.840	745.20	2001	31
	Sulfate	0.017	83.2	0.061	5.178	0.324				0.090	−0.052	1.807	745.20	2001	32

Appendix 2. Model coefficients and statistical diagnostics from regression models used for trend analysis in the Piceance study area, Colorado.—Continued

[ERV, estimated residual variance; R², coefficient of determination; SCR, serial correlation of residual; Ln, natural logarithm; Q, streamflow; t, decimal time in decimal years; Sin, sine function; Cos, cosine function; VIF, variation inflation factor; *, centered values; N, number of data points. Empty cells indicate variables not used in the regression because they were not statistically significant (p-value > 0.05). Shaded cells indicate variables not statistically significant but included in the final regression. All constituents are dissolved unless otherwise stated]

U.S. Geological Survey streamflow- gaging stations (all figures)	Constituents	ERV	R ²	SCR	Y-axis intercept (Ln load)	Ln Streamflow		t	t ²	Sin	Cos	Maximum VIF	Q* central value	t* central value	N
						Q (Ln load)	Q ²								
09306200	Alkalinity	0.025	97.2	0.252	2.386	0.888	0.024					1.000	8.56	2004	38
	Ammonia	0.991	70.5	−0.090	−7.071	1.173	0.124			0.432	0.869	1.155	14.00	1999	70
	Calcium	0.011	99.0	0.210	1.121	0.986	−0.014	0.005	0.001	0.005	0.088	1.182	14.01	1999	72
	Chloride	0.016	98.0	0.208	−0.468	0.816	0.000	−0.014	0.002	−0.062	−0.036	1.168	14.01	1999	72
	Copper	0.240	83.2	−0.011	−2.463	1.069	−0.029	−0.184	−0.045	0.202	−0.413	1.627	8.56	2004	38
	Dissolved solids	0.009	98.9	0.234	3.663	0.834	−0.004	−0.007	0.001	−0.053	0.003	1.128	14.01	1999	72
	Fluoride	0.031	96.3	−0.071	−3.668	0.862				−0.077	−0.032	1.077	14.01	1999	72
	Iron, dissolved	0.381	59.3	0.555	−0.261	0.636	0.075					1.000	14.00	2000	54
	Magnesium	0.011	98.5	0.271	1.149	0.815	−0.017			−0.047	0.005	1.157	14.01	1999	72
	Nitrate	0.675	92.2	−0.192	−4.910	2.352	−0.202	−0.026		0.359	0.807	1.157	14.00	1999	70
	Organic carbon	0.025	98.2	−0.166	−1.764	0.924	0.046	−0.012		−0.038	−0.183	1.204	13.80	2002	47
	Orthophosphate	0.203	80.8	0.032	−5.773	0.793	0.071	−0.029				1.059	14.20	1999	65
	Potassium	0.024	97.5	0.122	−2.244	0.914		−0.005				1.043	14.01	1999	72
	Selenium	0.044	97.1	0.138	−2.946	1.176							8.57	2004	38
	Silica	0.025	97.9	0.078	−0.555	0.996				0.012	0.076	1.077	14.01	1999	72
	Sodium	0.013	98.0	−0.001	1.830	0.742	−0.003	−0.011	0.001	−0.080	−0.043	1.128	14.01	1999	72
	Sulfate	0.010	98.8	0.307	2.740	0.811	−0.021	−0.008		−0.059	0.020	1.158	14.01	1999	72
	Suspended sediment	0.578	89.9	0.079	1.266	1.824	0.142	−0.050		0.635	0.555	1.158	14.01	1999	72
	Zinc	0.515	80.1	0.309	−1.850	0.905		−0.138				1.070	14.00	2000	54
09306222	Alkalinity	0.028	94.5	0.015	3.343	0.630	0.048					1.000	13.18	2004	40
	Ammonia	0.800	88.2	−0.175	−6.806	1.354	−0.041	−0.029	0.012	0.581	1.291	1.432	16.20	2000	57
	Calcium	0.037	98.7	0.103	0.817	1.206	−0.037	−0.001	0.002	0.061	0.279	1.655	15.69	2000	73
	Chloride	0.027	93.4	−0.004	0.749	0.473	0.029	−0.009				1.050	15.69	2000	73
	Copper	0.169	83.9	0.103	−1.707	1.064	−0.073	−0.156	−0.045	0.043	−0.482	2.537	12.98	2004	38
	Dissolved solids	0.008	99.0	0.046	4.177	0.709		−0.005				1.016	15.69	2000	73
	Fluoride	0.022	96.8	−0.044	−3.006	0.633	0.027	0.005				1.050	15.69	2000	73
	Iron, dissolved	0.510	63.7	0.181	−0.191	0.553	0.105	−0.009	0.011	0.072	0.290	1.432	18.42	2001	52
	Lead	0.369	63.3	0.269	−5.312	0.693	−0.547			0.087	−0.522	1.867	12.98	2004	38
	Magnesium	0.008	99.4	0.196	1.278	0.860	−0.017	0.001	0.001	−0.041	0.090	1.655	15.69	2000	73
	Organic carbon	0.046	96.8	0.385	−1.243	0.913	0.033			−0.037	−0.182	1.352	18.29	2001	52
	Orthophosphate	0.221	88.8	0.259	−5.366	0.923				0.192	0.161	1.189	16.20	2000	56
	Potassium	0.022	98.1	0.230	−1.987	0.847	0.030					1.000	15.69	2000	73
	Selenium	0.097	94.5	0.339	−2.634	1.210				0.187	−0.189	1.303	12.98	2004	38
	Silica	0.180	93.4	0.030	−0.691	1.178				0.089	0.263	1.270	15.69	2000	73
	Sodium	0.016	96.7	0.056	2.779	0.544		−0.004				1.016	15.69	2000	73
	Sulfate	0.011	99.2	0.196	2.897	0.841	−0.014	−0.007	0.001	−0.055	0.066	1.655	15.69	2000	73
	Suspended sediment	0.735	90.7	−0.144	1.226	1.825	0.066	−0.065	0.012	0.634	0.181	1.596	15.30	2000	75
	Zinc	0.492	79.0	0.258	−1.621	0.881		−0.102				1.061	18.42	2001	52

Appendix 2. Model coefficients and statistical diagnostics from regression models used for trend analysis in the Piceance study area, Colorado.—Continued

[ERV, estimated residual variance; R², coefficient of determination; SCR, serial correlation of residual; Ln, natural logarithm; Q, streamflow; t, decimal time in decimal years; Sin, sine function; Cos, cosine function; VIF, variation inflation factor; *, centered values; N, number of data points. Empty cells indicate variables not used in the regression because they were not statistically significant (p-value > 0.05). Shaded cells indicate variables not statistically significant but included in the final regression. All constituents are dissolved unless otherwise stated]

U.S. Geological Survey streamflow- gaging stations (all figures)	Constituents	ERV	R ²	SCR	Y-axis intercept (Ln load)	Ln Streamflow		t	t ²	Sin	Cos	Maximum VIF	Q* central value	t* central value	N
						Q (Ln load)	Q ²								
09306242	Alkalinity	0.011	98.24	-0.229	-0.717	0.879		-0.022				1.382	0.47	2004	29
	Calcium	0.003	99.8	0.025	-1.385	0.956	0.010	-0.004	-0.001	0.041	0.057	1.444	0.92	1999	58
	Chloride	0.014	98.7	0.278	-3.428	0.954	-0.014	-0.007	0.001	-0.041	-0.039	1.444	0.92	1999	58
	Dissolved solids	0.004	99.6	0.335	0.863	0.934	-0.004	-0.009	-0.001	0.014	0.045	1.444	0.92	1999	58
	Fluoride												0.92	1999	58
	Magnesium	0.005	99.6	0.370	-1.649	0.936	-0.004	-0.005	-0.001	0.019	0.052	1.444	0.92	1999	58
	Nitrate	0.781	89.4	0.120	-6.090	2.285	-0.177			-0.220	1.193	1.286	1.09	1999	41
	Orthophosphate	0.139	89.5	-0.236	-8.899	0.950							1.10	2000	28
	Potassium	0.051	95.2	0.106	-5.737	0.946		0.008				1.048	0.92	1999	58
	Silica	0.006	99.54	-0.052	-2.908	0.981	0.006	-0.001	-0.002	0.061	0.044	1.444	0.92	1999	58
09306255	Sodium	0.008	99.2	0.305	-1.264	0.903	-0.018	-0.010		0.012	0.052	1.233	0.92	1999	58
	Calcium	0.045	96.75	0.242	-0.622	1.157	-0.129			0.004	0.279	1.172	3.57	1999	75
	Chloride	0.010	96.89	-0.003	-0.295	0.611	-0.051	0.003	0.001	-0.010	-0.040	2.249	3.57	1999	75
	Fluoride	0.030	92.52	0.197	-4.336	0.617	-0.023	0.003	-0.003	-0.032	0.006	2.249	3.57	1999	75
	Iron, dissolved	0.203	84.39	-0.029	-0.972	0.995	0.093	0.039				1.654	4.76	2000	36
	Organic carbon	0.017	97.97	-0.131	-2.259	0.826	-0.023			-0.007	-0.140	1.126	4.69	2000	37
	Potassium	0.043	94.12	0.014	-3.504	0.912	0.047					1.000	3.57	1999	75
	Silica	0.172	88.16	0.245	-2.117	1.131	-0.083			0.031	0.298	1.172	3.57	1999	75
	Sodium	0.008	98.08	0.174	1.687	0.676	-0.062					1.000	3.57	1999	75
	Sulfate	0.031	96.18	0.348	2.155	0.927	-0.140					1.000	3.57	1999	75
09306290	Calcium	0.005	98.82	-0.324	4.935	0.724	-0.051			0.026	0.038	1.693	854.60	2000	44
	Chloride	0.021	80.8	0.044	2.724	0.287		-0.015		0.196	0.119	1.448	758	2000	35
	Dissolved solids	0.011	95.4	-0.163	6.704	0.601	-0.037	-0.007	-0.001	0.103	0.108	1.473	758.20	2000	35
	Fluoride	0.142	56.64	-0.023	-1.095	0.577	0.243					1.000	804	2000	34
	Iron, dissolved	0.662	68.6	-0.201	4.364	1.548	-0.448					1.000	762.50	2000	32
	Iron, total	0.964	80.46	-0.066	9.532	1.747				1.083	1.211	3.142	962.00	1997	23
	recoverable														
	Magnesium	0.021	92.47	-0.065	3.930	0.564	-0.029	-0.005	-0.002	0.070	0.097	1.839	854.60	2000	44
	Organic carbon	0.034	95.37	-0.091	1.940	0.940	0.093	-0.014	-0.005	0.159	-0.259	1.769	720.70	2000	27
	Orthophosphate	0.182	90	-0.114	-2.240	1.308	-0.244	-0.054				1.118	958.30	2001	40
	Potassium	0.025	92.65	0.159	1.190	0.645	-0.022	-0.005	-0.003	0.127	-0.016	1.481	757	2000	34
	Selenium	0.346	57.37	0.048	1.573	0.607	-0.580			0.354	0.354	2.200	958.00	2001	35
	Silica	0.012	97.78	-0.408	3.287	0.986	-0.060					1.000	757	2000	34
	Sodium	0.040	80.28	-0.112	4.355	0.404	-0.034	-0.013	-0.003	0.211	0.283	1.481	757	2000	34
	Sulfate	0.020	86.45	-0.126	5.634	0.401	-0.059	-0.011	-0.001	0.157	0.157	1.473	758	2000	35
	Suspended sediment	0.989	68.6	0.141	5.419	1.814	1.814	-0.041		0.244	0.106	1.440	750	2000	208

Appendix 2. Model coefficients and statistical diagnostics from regression models used for trend analysis in the Piceance study area, Colorado.—Continued

[ERV, estimated residual variance; R², coefficient of determination; SCR, serial correlation of residual; Ln, natural logarithm; Q, streamflow; t, decimal time in decimal years; Sin, sine function; Cos, cosine function; VIF, variation inflation factor; *, centered values; N, number of data points. Empty cells indicate variables not used in the regression because they were not statistically significant (p-value > 0.05). Shaded cells indicate variables not statistically significant but included in the final regression. All constituents are dissolved unless otherwise stated]

U.S. Geological Survey streamflow- gaging stations (all figures)	Constituents	ERV	R ²	SCR	Y-axis intercept (Ln load)	Ln Streamflow		t	t ²	Sin	Cos	Maximum VIF	Q* central value	t* central value	N
						Q (Ln load)	Q ²								
383946107595301	Alkalinity	0.008	97.9	−0.119	3.056	0.650				−0.144	−0.042		32	2006	35
	Calcium	0.014	95.2	0.215	3.209	0.458				−0.186	−0.055	4.806	34	2000	83
	Chloride	0.026	74.8	−0.093	0.846	0.325		−0.006		−0.084	0.117	4.873	34	2000	83
	Dissolved solids	0.015	88.8	−0.022	5.338	0.320				−0.174	0.033	4.729	34.14	2000	84
	Fluoride	0.033	96.0	0.067	−3.092	0.820	−0.116	−0.007	0.001	−0.043	−0.114	5.108	34	2000	83
	Magnesium	0.017	82.6	−0.051	2.343	0.269				−0.181	0.077	4.806	34	2000	83
	Potassium	0.046	86.1	−0.048	−0.280	0.568	−0.076					1.000	34	2000	83
	Selenium	0.050	38.2	0.227	2.620	0.120		0.013		−0.159	0.063	4.491	34	2000	92
	Silica	0.018	98.4	0.305	0.101	1.096		0.011		−0.086	−0.009	4.873	34	2000	83
	Sodium	0.024	65.1	−0.120	3.205	0.246				−0.131	0.148	4.806	34	2000	83
	Sulfate	0.017	85.1	−0.024	4.855	0.273				−0.190	0.038	4.806	34	2000	83
	Calcium	0.032	95.7	0.250	1.855	0.543	0.070			−0.232	−0.021	3.519	12.02	1998	101
	Chloride	0.051	81.2	0.221	−0.503	0.390	0.086			−0.082	0.220	3.475	12.02	1998	100
	Dissolved solids	0.045	86.9	0.234	4.178	0.379	0.089			−0.198	0.109	3.505	12.05	1998	103
	Fluoride	0.022	98.9	−0.030	−4.535	0.951	0.021	0.014	0.003	−0.091	−0.137	3.564	12.02	1998	100
384551107591901	Magnesium	0.046	87.6	0.180	1.043	0.386	0.084			−0.231	0.119	3.519	12.02	1998	101
	Potassium	0.060	92.2	0.232	−1.503	0.597	0.052			−0.102	0.012	3.475	12.02	1998	101
	Selenium	0.119	64.1	0.217	0.892	0.274	0.094	−0.024		−0.271	0.144	3.542	12.02	1998	106
	Silica	0.016	99.4	0.252	−1.030	1.127	−0.051	0.015		−0.110	−0.138	3.476	12.02	1998	100
	Sodium	0.061	68.8	0.162	2.288	0.282	0.080			−0.151	0.222	3.519	12.02	1998	101
	Sulfate	0.052	82.8	0.215	3.684	0.332	0.089			−0.227	0.118	3.475	12.02	1998	100

Appendix 3. Schematic diagrams of the model line without streamflow or seasonality terms to facilitate the determination of zero-slope year, net trend direction, and direction of the trend before and after the zero-slope year, (A) illustrates net, downward trends where quadratic term (t^2) is either positive or negative, and (B) illustrates a net, upward trend where quadratic term (t^2) is either positive or negative. [t , t^2 , and t^* central value available in appendix 2; time, years from period of record available in tables 5, 6, and 7; centered time value = time – t^* central value]

Plates

Plate 1. Water-quality sites with downstream order number from Appendix 1 in the Piceance study area, western Colorado.

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Plate 2. Exceedances of water-quality standards for temperature, pH, and dissolved oxygen from Appendix 1 in the Piceance study area, western Colorado.

Plate 3. Exceedances of water- quality standards for nitrate and phosphorus from Appendix 1 in the Piceance study area, western Colorado.

Plate 4. Exceedances of water-quality standards for chloride and sulfate from Appendix 1 in the Piceance study area, western Colorado.

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Denver, CO 80225
(303) 236-4882

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