

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)						
			433843096450500 Big Sioux River near Renner, SD (site US1, fig. 1)		433600096442400 Sioux Falls pump station intake from Big Sioux River at Sioux Falls, SD (site US2, fig. 1)				
Date of sample collection (month–day–year)			05–18– 2004	05–31– 2004	08–15– 2001	09–09– 2002	01–22– 2003	03–19– 2003	06–26– 2003
Time of sample collection (24-hour)			1500	1800	1405	1200	1105	1130	0930
Compound									
Amoxicillin, dissolved	2	0.01	<0.01	<0.01	--	--	--	--	--
Ampicillin, dissolved	2	.01	<.01	<.01	--	--	--	--	--
Anhd-Cl-tetracycline, dissolved	2	.3	<.01	<.01	<0.10	--	--	--	--
Anhydrotetracycline, dissolved	2	.15	<.01	<.01	<.10	--	--	--	--
Azithromycin, dissolved	1	ND	<.004	<.004	<.004	<.004	<.004	<.004	<.004
Carbadox, dissolved	2	.05	<.005	<.005	<.05	<.05	<.05	<.05	<.05
Cefotaxime, dissolved	2	.01	<.01	<.01	--	--	--	--	--
Chlorotetracycline, dissolved	2	.056	<.01	<.01	<.02	<.02	<.02	<.02	<.02
Ciprofloxacin, dissolved	2	.033	<.005	<.005	<.01	<.01	<.01	<.01	<.01
Clinafloxacin, dissolved	2	.005	<.005	<.005	--	--	--	--	--
Cloxacillin, dissolved	2	.01	<.01	<.01	--	--	--	--	--
Demeclocycline, dissolved	2	.02	<.01	<.01	<.02	<.02	<.02	<.02	<.02
Doxycycline, dissolved	2	.05	<.01	<.01	<.05	<.05	<.05	<.05	<.05
Enrofloxacin, dissolved	2	.01	--	--	<.01	<.01	<.01	<.01	<.01
Erythromycin, dissolved	1	ND	<.009	<.009	<.009	<.009	<.009	<.009	<.009
Erythromycin, dissolved	2	.025	.019	<.01	<.02	--	--	--	--
Erythromycin-H <sub>2</sub> O, dissolved	2	.046	.055	<.01	--	<.02	<.02	<.02	<.02
Flumequine, dissolved	2	.05	<.005	<.005	<.05	--	--	--	--
Lincomycin, dissolved	2	.01	<.005	<.01	<.01	<.01	<.01	<.01	<.01
Lomefloxacin, dissolved	2	.005	<.005	<.005	--	--	--	--	--
Methotrexate, dissolved	2	.02	--	--	<.02	<.02	<.02	<.02	<.02
Minocycline, dissolved	2	.02	<.01	<.01	<.02	<.02	<.02	<.02	<.02
Norfloxacin, dissolved	2	.01	<.005	<.005	<.01	<.01	<.01	<.01	<.01
Ofloxacin, dissolved	2	.15	<.005	<.005	--	--	--	--	--
Ormetoprim, dissolved	2	.01	<.005	<.01	--	--	--	--	--
Oxacillin, dissolved	2	.01	<.01	<.01	--	--	--	--	--
Oxolinic acid, dissolved	2	.005	<.005	<.005	<.05	--	--	--	--
Oxytetracycline, dissolved	2	.05	<.01	<.01	<.05	<.05	<.05	<.05	<.05
Penicillin G, dissolved	2	.01	<.01	<.01	--	--	--	--	--
Penicillin V, dissolved	2	.01	<.01	<.01	--	--	--	--	--

**84 Organic Wastewater Compounds in Drinking Water, Wastewater Effluent, and the Big Sioux River, 2001–2004**

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)						
			433843096450500 Big Sioux River near Renner, SD (site US1, fig. 1)		433600096442400 Sioux Falls pump station intake from Big Sioux River at Sioux Falls, SD (site US2, fig. 1)				
Compound—Continued									
Roxarsone, dissolved	2	0.5	--	--	<0.5	--	--	--	--
Roxithromycin, dissolved	2	.01	<0.005	<0.01	<.01	<.01	<.01	<.01	<.01
Sarafloxacin, dissolved	2	.01	<.005	<.005	<.01	<.01	<.01	<.01	<.01
Sulfachlorpyridazine, dissolved	2	.05	<.005	<.005	<.05	<.05	<.05	<.05	<.05
Sulfadiazine, dissolved	2	.005	<.005	<.005	--	--	--	--	--
Sulfadimethoxine, dissolved	2	.01	<.005	<.005	<.01	<.01	<.01	<.01	<.01
Sulfamerazine, dissolved	2	.02	<.005	<.005	<.02	<.02	<.02	<.02	<.02
Sulfamethazine, dissolved	2	.01	<.005	<.005	<.01	<.01	<.01	<.01	<.01
Sulfamethizole, dissolved	2	.05	--	--	<.05	<.05	<.05	<.05	<.05
Sulfamethoxazole, dissolved	1	ND	<.064	<.064	<.064	<.064	e.027	<.064	<.064
Sulfamethoxazole, dissolved	2	.014	.026	<.005	<.05	<.05	<.05	<.05	<.05
Sulfathiazole, dissolved	2	.05	<.005	<.005	<.05	<.05	<.05	<.05	<.05
Tetracycline, dissolved	2	1.6	<.01	<.01	<.02	<.02	<.02	<.02	<.02
Trimethoprim, dissolved	1	ND	<.013	<.013	<.013	<.013	<.013	<.013	<.013
Trimethoprim, dissolved	2	.02	<.005	<.01	<.01	<.01	<.01	<.01	<.01
Tylosin, dissolved	2	.07	<.005	<.01	<.02	<.02	<.02	<.02	<.02
Virginiamycin, dissolved	2	.1	<.005	<.01	<.1	<.1	<.1	<.1	<.1

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)				
			433419096434200 Sioux Falls water treatment plant finished drinking water at Sioux Falls, SD (site FDW, fig. 1)				
Date of sample collection (month–day–year)			08–15–2001	09–09–2002	01–22–2003	03–19–2003	06–27–2003
Time of sample collection (24-hour)			1100	1440	1330	1445	0915
			Compound				
Amoxicillin, dissolved	2	0.01	--	--	--	--	--
Ampicillin, dissolved	2	.01	--	--	--	--	--
Anhd-Cl-tetracycline, dissolved	2	.3	--	--	--	--	--
Anhydrotetracycline, dissolved	2	.15	--	--	--	--	--
Azithromycin, dissolved	1	ND	<0.004	<0.004	<0.004	<0.004	<0.004
Carbadox, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05
Cefotaxime, dissolved	2	.01	--	--	--	--	--
Chlorotetracycline, dissolved	2	.056	<.02	<.02	<.02	<.02	<.02
Ciprofloxacin, dissolved	2	.033	<.01	<.01	<.01	<.01	<.01
Clinafloxacin, dissolved	2	.005	--	--	--	--	--
Cloxacillin, dissolved	2	.01	--	--	--	--	--
Demeclocycline, dissolved	2	.02	<.02	<.02	<.02	<.02	<.02
Doxycycline, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05
Enrofloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01
Erythromycin, dissolved	1	ND	<.009	<.009	<.009	<.009	<.009
Erythromycin, dissolved	2	.025	<.02	--	--	--	--
Erythromycin-H <sub>2</sub> O, dissolved	2	.046	--	<.02	<.02	<.02	<.02
Flumequine, dissolved	2	.05	--	--	--	--	--
Lincomycin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01
Lomefloxacin, dissolved	2	.005	--	--	--	--	--
Methotrexate, dissolved	2	.02	<.02	<.02	<.02	<.02	<.02
Minocycline, dissolved	2	.02	<.02	<.02	<.02	<.02	<.02
Norfloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01
Ofloxacin, dissolved	2	.15	--	--	--	--	--
Ormetoprim, dissolved	2	.01	--	--	--	--	--
Oxacillin, dissolved	2	.01	--	--	--	--	--
Oxolinic acid, dissolved	2	.005	<.05	--	--	--	--
Oxytetracycline, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05
Penicillin G, dissolved	2	.01	--	--	--	--	--
Penicillin V, dissolved	2	.01	--	--	--	--	--

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)				
			433419096434200 Sioux Falls water treatment plant finished drinking water at Sioux Falls, SD (site FDW, fig. 1)				
Compound—Continued							
Roxarsone, dissolved	2	0.5	<0.5	--	--	--	--
Roxithromycin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01
Sarafloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01
Sulfachlorpyridazine, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05
Sulfadiazine, dissolved	2	.005	--	--	--	--	--
Sulfadimethoxine, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01
Sulfamerazine, dissolved	2	.02	<.02	<.02	<.02	<.02	<.02
Sulfamethazine, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01
Sulfamethizole, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05
Sulfamethoxazole, dissolved	1	ND	<.064	<.064	<.064	<.064	<.064
Sulfamethoxazole, dissolved	2	.014	<.05	<.05	<.05	<.05	<.05
Sulfathiazole, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05
Tetracycline, dissolved	2	1.6	<.02	<.02	<.02	<.02	<.02
Trimethoprim, dissolved	1	ND	<.013	<.013	<.013	<.013	<.013
Trimethoprim, dissolved	2	.02	<.01	<.01	<.01	<.01	<.01
Tylosin, dissolved	2	.07	<.02	<.02	<.02	<.02	<.02
Virginiamycin, dissolved	2	.1	<.1	<.1	<.1	<.1	<.1

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)			
			433408096432000 Big Sioux River diversion channel at North Drive, at Sioux Falls, SD (site US3, fig. 1)		06482020 Big Sioux River at North Cliff Avenue, at Sioux Falls, SD (site US4, fig. 1)	
Date of sample collection (month–day–year)			05–18–2004	05–31–2004	05–17–2004	05–30–2004
Time of sample collection (24-hour)			1130	1145	1000	1530
			Compound			
Amoxicillin, dissolved	2	0.01	<0.01	<0.01	<0.01	<0.01
Ampicillin, dissolved	2	.01	<.01	<.01	<.01	<.01
Anhd-Cl-tetracycline, dissolved	2	.3	<.01	<.01	<.01	<.01
Anhydrotetracycline, dissolved	2	.15	<.01	<.01	<.01	<.01
Azithromycin, dissolved	1	ND	<.004	<.004	<.004	--
Carbadox, dissolved	2	.05	<.005	<.005	<.005	<.005
Cefotaxime, dissolved	2	.01	<.01	<.01	<.01	<.01
Chlorotetracycline, dissolved	2	.056	<.01	<.01	<.01	<.01
Ciprofloxacin, dissolved	2	.033	<.005	<.005	<.005	<.005
Clinafloxacin, dissolved	2	.005	<.005	<.005	<.005	<.005
Cloxacillin, dissolved	2	.01	<.01	<.01	<.01	<.01
Demeclocycline, dissolved	2	.02	<.01	<.01	<.01	<.01
Doxycycline, dissolved	2	.05	<.01	<.01	<.01	<.01
Enrofloxacin, dissolved	2	.01	--	--	--	--
Erythromycin, dissolved	1	ND	<.009	<.009	<.009	--
Erythromycin, dissolved	2	.025	.018	<.005	.010	<.01
Erythromycin-H <sub>2</sub> O, dissolved	2	.046	<.01	.041	<.01	<.01
Flumequine, dissolved	2	.05	<.005	<.005	<.005	<.005
Lincomycin, dissolved	2	.01	<.01	<.005	<.01	<.01
Lomefloxacin, dissolved	2	.005	<.005	<.005	<.005	<.005
Methotrexate, dissolved	2	.02	--	--	--	--
Minocycline, dissolved	2	.02	<.01	<.01	<.01	<.01
Norfloxacin, dissolved	2	.01	<.005	<.005	<.005	<.005
Ofloxacin, dissolved	2	.15	<.005	<.005	<.005	<.005
Ormetoprim, dissolved	2	.01	<.01	<.005	<.01	<.01
Oxacillin, dissolved	2	.01	<.01	<.01	<.01	<.01
Oxolinic acid, dissolved	2	.005	<.005	<.005	<.005	<.005
Oxytetracycline, dissolved	2	.05	<.01	<.01	<.01	<.01
Penicillin G, dissolved	2	.01	<.01	<.01	<.01	<.01
Penicillin V, dissolved	2	.01	<.01	<.01	<.01	<.01

**88 Organic Wastewater Compounds in Drinking Water, Wastewater Effluent, and the Big Sioux River, 2001–2004**

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)			
			433408096432000 Big Sioux River diversion channel at North Drive, at Sioux Falls, SD (site US3, fig. 1)		06482020 Big Sioux River at North Cliff Avenue, at Sioux Falls, SD (site US4, fig. 1)	
Compound—Continued						
Roxarsone, dissolved	2	0.5	--	--	--	--
Roxithromycin, dissolved	2	.01	<0.01	<0.005	<0.01	<0.01
Sarafloxacin, dissolved	2	.01	<.005	<.005	<.005	<.005
Sulfachlorpyridazine, dissolved	2	.05	<.005	<.005	<.005	<.005
Sulfadiazine, dissolved	2	.005	<.005	<.005	<.005	<.005
Sulfadimethoxine, dissolved	2	.01	<.005	<.005	<.005	<.005
Sulfamerazine, dissolved	2	.02	<.005	<.005	<.005	<.005
Sulfamethazine, dissolved	2	.01	<.005	<.005	<.005	<.005
Sulfamethizole, dissolved	2	.05	--	--	--	--
Sulfamethoxazole, dissolved	1	ND	<.064	<.064	<.064	--
Sulfamethoxazole, dissolved	2	.014	.018	<.005	<.005	<.005
Sulfathiazole, dissolved	2	.05	<.005	<.005	<.005	<.005
Tetracycline, dissolved	2	1.6	<.01	<.01	<.01	<.01
Trimethoprim, dissolved	1	ND	<.013	<.013	<.013	--
Trimethoprim, dissolved	2	.02	<.01	<.005	<.01	<.01
Tylosin, dissolved	2	.07	<.01	<.005	<.01	<.01
Virginiamycin, dissolved	2	.1	<.01	<.005	<.01	<.01

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)					
			433531096394200 Sioux Falls wastewater treatment plant effluent (site WWE, fig. 1)					
Date of sample collection (month–day–year)			09–10–2002	01–24–2003	03–21–2003	06–26–2003	05–18–2004	05–30–2004
Time of sample collection (24-hour)			1400	0930	1045	1135	1020	2020
			Compound					
Amoxicillin, dissolved	2	0.01	--	--	--	--	<0.01	<0.01
Ampicillin, dissolved	2	.01	--	--	--	--	<.01	<.01
Anhd-Cl-tetracycline, dissolved	2	.3	--	--	--	--	<.01	<.01
Anhydrotetracycline, dissolved	2	.15	--	--	--	--	<.01	<.01
Azithromycin, dissolved	1	ND	<0.004	<0.004	<0.004	<0.004	<.004	<.004
Carbadox, dissolved	2	.05	<.05	<.05	<.05	<.05	<.005	<.005
Cefotaxime, dissolved	2	.01	--	--	--	--	<.01	<.01
Chlorotetracycline, dissolved	2	.056	<.02	3.7	<.02	<.02	<.01	<.01
Ciprofloxacin, dissolved	2	.033	<.01	.62	<.01	<.01	<.005	.072
Clinafloxacin, dissolved	2	.005	--	--	--	--	<.005	<.005
Cloxacillin, dissolved	2	.01	--	--	--	--	<.01	<.01
Demeclocycline, dissolved	2	.02	<.02	<.02	<.02	<.02	<.01	<.01
Doxycycline, dissolved	2	.05	<.05	<.05	<.05	<.05	<.01	<.01
Enrofloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	--	--
Erythromycin, dissolved	1	ND	<.009	<.009	<.009	<.009	<.009	<.009
Erythromycin, dissolved	2	.025	--	--	--	--	1.1	.16
Erythromycin-H <sub>2</sub> O, dissolved	2	.046	.050	.92	<.02	.20	.38	.55
Flumequine, dissolved	2	.05	--	--	--	--	<.005	<.005
Lincomycin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01	<.005
Lomefloxacin, dissolved	2	.005	--	--	--	--	<.005	<.005
Methotrexate, dissolved	2	.02	<.02	<.02	<.02	<.02	--	--
Minocycline, dissolved	2	.02	<.02	<.02	<.02	<.02	<.01	<.01
Norfloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.005	<.005
Ofloxacin, dissolved	2	.15	--	--	--	--	.16	.015
Ormetoprim, dissolved	2	.01	--	--	--	--	<.01	<.005
Oxacillin, dissolved	2	.01	--	--	--	--	<.01	<.01
Oxolinic acid, dissolved	2	.005	--	--	--	--	<.005	<.005
Oxytetracycline, dissolved	2	.05	<.05	<.05	<.05	<.05	<.01	<.01
Penicillin G, dissolved	2	.01	--	--	--	--	<.01	<.01
Penicillin V, dissolved	2	.01	--	--	--	--	<.01	<.01

**90 Organic Wastewater Compounds in Drinking Water, Wastewater Effluent, and the Big Sioux River, 2001–2004**

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)					
			433531096394200 Sioux Falls wastewater treatment plant effluent (site WWE, fig. 1)					
Compound—Continued								
Roxarsone, dissolved	2	0.5	--	--	--	--	--	--
Roxithromycin, dissolved	2	.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Sarafloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.005	<.005
Sulfachlorpyridazine, dissolved	2	.05	<.05	<.05	<.05	<.05	<.005	<.005
Sulfadiazine, dissolved	2	.005	--	--	--	--	<.005	<.005
Sulfadimethoxine, dissolved	2	.01	<.01	<.01	<.01	<.01	<.005	<.005
Sulfamerazine, dissolved	2	.02	<.02	<.02	<.02	<.02	<.005	<.005
Sulfamethazine, dissolved	2	.01	<.01	<.01	<.01	<.01	<.005	<.005
Sulfamethizole, dissolved	2	.05	<.05	<.05	<.05	<.05	--	--
Sulfamethoxazole, dissolved	1	ND	.15	<.064	<.064	e.042	.34	<.064
Sulfamethoxazole, dissolved	2	.014	<.05	1.1	<.05	.15	.099	.016
Sulfathiazole, dissolved	2	.05	<.05	<.05	<.05	<.05	<.005	<.005
Tetracycline, dissolved	2	1.6	<.02	17	<.02	<.02	<.01	<.01
Trimethoprim, dissolved	1	ND	<.013	.21	.13	e.018	.11	.021
Trimethoprim, dissolved	2	.02	<.01	.39	.090	.050	.10	.028
Tylosin, dissolved	2	.07	<.02	<.02	<.02	<.02	.070	<.005
Virginiamycin, dissolved	2	.1	<.1	<.1	<.1	<.1	<.01	<.005



**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)		
			433559096390700 Big Sioux River downstream from Sioux Falls wastewater discharge (site DS1, fig. 1)		
Date of sample collection (month–day–year)			09–10–2002	05–17–2004	05–30–2004
Time of sample collection (24-hour)			1030	1100	1630
		Compound			
Amoxicillin, dissolved	2	0.01	--	<0.01	<0.01
Ampicillin, dissolved	2	.01	--	<.01	<.01
Anhd-Cl-tetracycline, dissolved	2	.3	--	<.01	<.01
Anhydrotetracycline, dissolved	2	.15	--	<.01	<.01
Azithromycin, dissolved	1	ND	<0.004	<.004	<.004
Carbadox, dissolved	2	.05	<.05	<.005	<.005
Cefotaxime, dissolved	2	.01	--	<.01	<.01
Chlorotetracycline, dissolved	2	.056	<.02	<.01	<.01
Ciprofloxacin, dissolved	2	.033	<.01	<.005	<.005
Clinafloxacin, dissolved	2	.005	--	<.005	<.005
Cloxacillin, dissolved	2	.01	--	<.01	<.01
Demeclocycline, dissolved	2	.02	<.02	<.01	<.01
Doxycycline, dissolved	2	.05	<.05	<.01	<.01
Enrofloxacin, dissolved	2	.01	<.01	--	--
Erythromycin, dissolved	1	ND	<.009	<.009	<.009
Erythromycin, dissolved	2	.025	--	.088	<.01
Erythromycin-H <sub>2</sub> O, dissolved	2	.046	<.02	.042	<.01
Flumequine, dissolved	2	.05	--	<.005	<.005
Lincomycin, dissolved	2	.01	<.01	<.01	<.01
Lomefloxacin, dissolved	2	.005	--	<.005	<.005
Methotrexate, dissolved	2	.02	<.02	--	--
Minocycline, dissolved	2	.02	<.02	<.01	<.01
Norfloxacin, dissolved	2	.01	<.01	<.005	<.005
Ofloxacin, dissolved	2	.15	--	.010	<.005
Ormetoprim, dissolved	2	.01	--	<.01	<.01
Oxacillin, dissolved	2	.01	--	<.01	<.01
Oxolinic acid, dissolved	2	.005	--	<.005	<.005
Oxytetracycline, dissolved	2	.05	<.05	<.01	<.01
Penicillin G, dissolved	2	.01	--	<.01	<.01
Penicillin V, dissolved	2	.01	--	<.01	<.01

92 Organic Wastewater Compounds in Drinking Water, Wastewater Effluent, and the Big Sioux River, 2001–2004

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)		
			433559096390700 Big Sioux River downstream from Sioux Falls wastewater discharge (site DS1, fig. 1)		
Compound—Continued					
Roxarsone, dissolved	2	0.05	--	--	--
Roxithromycin, dissolved	2	.01	<0.01	<0.01	<0.01
Sarafloxacin, dissolved	2	.01	<.01	<.005	<.005
Sulfachlorpyridazine, dissolved	2	.05	<.05	<.005	<.005
Sulfadiazine, dissolved	2	.005	--	<.005	<.005
Sulfadimethoxine, dissolved	2	.01	<.01	<.005	<.005
Sulfamerazine, dissolved	2	.02	<.02	<.005	<.005
Sulfamethazine, dissolved	2	.01	<.01	<.005	<.005
Sulfamethizole, dissolved	2	.05	<.05	--	--
Sulfamethoxazole, dissolved	1	ND	e.036	<.064	<.064
Sulfamethoxazole, dissolved	2	.014	<.05	.047	<.005
Sulfathiazole, dissolved	2	.05	<.05	<.005	<.005
Tetracycline, dissolved	2	1.6	<.02	<.01	<.01
Trimethoprim, dissolved	1	ND	<.013	e.0062	<.013
Trimethoprim, dissolved	2	.02	<.01	.020	<.01
Tylosin, dissolved	2	.07	<.02	<.01	<.01
Virginiamycin, dissolved	2	.1	<.1	<.01	<.01

**Table 16.** Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)						
			433541096355800 Big Sioux River at Brandon, SD (site DS2, fig. 1)						
Date of sample collection (month–day–year)			08–16–2001	09–11–2002	01–23–2003	03–20–2003	06–25–2003	05–17–2004	05–31–2004
Time of sample collection (24-hour)			0930	1030	1125	1315	1630	1730	1230
			Compound						
Amoxicillin, dissolved	2	0.01	--	--	--	--	--	<0.01	<0.01
Ampicillin, dissolved	2	.01	--	--	--	--	--	<.01	<.01
Anhd-Cl-tetracycline, dissolved	2	.3	<0.10	--	--	--	--	<.01	<.01
Anhydrotetracycline, dissolved	2	.15	<.10	--	--	--	--	<.01	<.01
Azithromycin, dissolved	1	ND	<.004	<.004	<.004	<.004	<.004	<.004	<.004
Carbadox, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05	<.005	<.005
Cefotaxime, dissolved	2	.01	--	--	--	--	--	<.01	<.01
Chlorotetracycline, dissolved	2	.056	<.02	<.02	.53	<.02	<.02	<.01	<.01
Ciprofloxacin, dissolved	2	.033	<.01	<.01	<.01	<.01	<.01	<.005	<.005
Clinafloxacin, dissolved	2	.005	--	--	--	--	--	<.005	<.005
Cloxacillin, dissolved	2	.01	--	--	--	--	--	<.01	<.01
Demeclocycline, dissolved	2	.02	<.02	<.02	<.02	<.02	<.02	<.01	<.01
Doxycycline, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05	<.01	<.01
Enrofloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01	--	--
Erythromycin, dissolved	1	ND	e.018	<.009	<.009	<.009	<.009	<.009	<.009
Erythromycin, dissolved	2	.025	<.02	--	--	--	--	.096	<.01
Erythromycin-H <sub>2</sub> O, dissolved	2	.046	--	<.02	.27	<.02	<.02	.038	<.01
Flumequine, dissolved	2	.05	<.05	--	--	--	--	<.005	<.005
Lincomycin, dissolved	2	.01	<.01	<.01	.030	<.01	<.01	<.01	<.01
Lomefloxacin, dissolved	2	.005	--	--	--	--	--	<.005	<.005
Methotrexate, dissolved	2	.02	<.02	<.02	<.02	<.02	<.02	--	--
Minocycline, dissolved	2	.02	<.02	<.02	<.02	<.02	<.02	<.01	<.01
Norfloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01	<.005	<.005
Ofloxacin, dissolved	2	.15	--	--	--	--	--	.0080	<.005
Ormetoprim, dissolved	2	.01	--	--	--	--	--	<.01	<.01

94 Organic Wastewater Compounds in Drinking Water, Wastewater Effluent, and the Big Sioux River, 2001–2004

Table 16. Analytical results for human and veterinary antibiotic compounds (HVACs) in water samples.—Continued

[Shaded cells indicate concentrations greater than study reporting levels for compounds with acceptable quality assurance/quality control, and concentrations were used in analyses related to occurrence of organic wastewater compounds. Units are micrograms per liter. Analytical method number: 1, Cahill and others (2004); 2, U.S. Geological Survey Organic Geochemistry Research Laboratory. ND, not determined; e, estimated; <, less than; --, no data collected]

	Analytical method number	Study reporting level for data summary and analysis	Station identification number and name (site label)						
			433541096355800 Big Sioux River at Brandon, SD (site DS2, fig. 1)						
Compound—Continued									
Oxacillin, dissolved	2	0.01	--	--	--	--	--	<0.01	<0.01
Oxolinic acid, dissolved	2	.005	<0.05	--	--	--	--	<.005	<.005
Oxytetracycline, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05	<.01	<.01
Penicillin G, dissolved	2	.01	--	--	--	--	--	<.01	<.01
Penicillin V, dissolved	2	.01	--	--	--	--	--	<.01	<.01
Roxarsone, dissolved	2	.5	<.5	--	--	--	--	--	--
Roxithromycin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
Sarafloxacin, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01	<.005	<.005
Sulfachlorpyridazine, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05	<.005	<.005
Sulfadiazine, dissolved	2	.005	--	--	--	--	--	<.005	<.005
Sulfadimethoxine, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01	<.005	<.005
Sulfamerazine, dissolved	2	.02	<.02	<.02	<.02	<.02	<.02	<.005	<.005
Sulfamethazine, dissolved	2	.01	<.01	<.01	<.01	<.01	<.01	<.005	<.005
Sulfamethizole, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05	--	--
Sulfamethoxazole, dissolved	1	ND	<.064	e.023	.20	<.064	.064	<.064	<.064
Sulfamethoxazole, dissolved	2	.014	<.05	<.05	.31	<.05	<.05	.061	<.005
Sulfathiazole, dissolved	2	.05	<.05	<.05	<.05	<.05	<.05	<.005	<.005
Tetracycline, dissolved	2	1.6	<.02	<.02	2.50	<.02	<.02	<.01	<.01
Trimethoprim, dissolved	1	ND	<.013	<.013	.11	<.013	.029	e.0042	<.013
Trimethoprim, dissolved	2	.02	<.01	<.01	.12	<.01	<.01	<.01	<.01
Tylosin, dissolved	2	.07	<.02	<.02	<.02	<.02	<.02	<.01	<.01
Virginiamycin, dissolved	2	.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01