

LEVEL ONE WATER-QUALITY INVENTORY AND MONITORING
STONES RIVER NATIONAL BATTLEFIELD, TENNESSEE



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INTRODUCTION

The U.S. Geological Survey (USGS) conducted a Level 1 Water-Quality Inventory for Stones River National Battlefield from August 2000 through June 2001. The primary objective of the inventory was to provide the National Park Service (NPS) and the National Battlefield with water-quality information for “key” water bodies at the National Battlefield. Water-quality data (physical, chemical, and biological) were collected from 5 key water bodies during four different sampling periods to provide data over a range of hydrologic conditions.

Stones River National Battlefield comprises approximately 600 acres and is located on the northwest side of Murfreesboro, Tennessee (fig. 1). The West Fork Stones River flows through or borders two units of the park (fig. 1) and is classified by the State of Tennessee for the following uses: domestic water supply, industrial water supply, fish and aquatic life, recreation, irrigation, and livestock watering and wildlife (Tennessee Department of Environment and Conservation, 1999b). Other “key” water bodies in the National Battlefield include McFadden spring, King pond, and a cave stream in Rebel Yell Cave.

Potential sources of ground water and surface water contamination at the National Battlefield are numerous and varied due to the proximity of the battlefield to a rapidly growing urban area. Two inactive landfills are located adjacent to or near the National Battlefield and several illegal dumps along the banks of the West Fork Stones River were encountered during the construction of the Stones River Greenway, which connects several of the different units of the National Battlefield (fig. 1).

DESCRIPTION OF INVENTORY PROCESS

Site Descriptions

The water-quality inventory for Stones River National Battlefield included the periodic collection of physical, chemical, and microbiological data from: (1) West Fork Stones River at West College Street, (2) West Fork Stones River at Thompson Lane, (3) McFadden Spring, (4) King Pond, and (5) Rebel Yell Cave.

West Fork Stones River at West College Street (USGS site number 03428080) is located on the northwest side of the Redoubt Brannon unit of the National Battlefield, which is approximately 1.5 miles southeast of the main unit of the National Battlefield (fig. 1). Redoubt Brannon is part of the remnants of Fortress Rosecrans, a large earthen fort constructed after the battle. The Stones River Greenway runs along the west bank of the River. The inactive Rosebank landfill is located along the east bank of the River just south of and adjacent to Redoubt Brannon. The surrounding area includes residential, commercial, and industrial development.

West Fork Stones River at Thompson Lane (USGS site number 03428125) is located in the northern most section of the National Battlefield near the historic location of McFadden's Ford (fig. 1). McFadden Spring (USGS site number 03428126) is located on the west bank of West Fork Stones River approximately 300 feet downstream from Thompson Lane (fig 1).

King Pond (USGS site number 03428123) is a shallow spring-fed pond located in the northern most section of the National Battlefield near the artillery monument (fig. 1). The pond drains into a small stream flowing north. The stream quickly loses water and normally disappears within a few hundred feet of the pond. The area east of the northern most section of National Battlefield is predominantly residential. The area to west and south includes commercial and industrial development along New Nashville Highway (fig. 1).

Rebel Yell Cave (USGS site number 355216086255301) is located in the main unit of the National Battlefield near the historic trace of McFadden's Lane (fig. 1). The cave is approximately 5 feet in diameter at land surface, approximately 25 feet deep, and often dry except during wetter periods. The surrounding area is wooded. The Murfreesboro Old City Dump is located between the main section of the National Battlefield and Redoubt Brannon (fig. 1). Dye trace results identified direct subsurface connections between sinkholes near the Old City Dump and Rebel Yell Cave (Ogden, 1997).

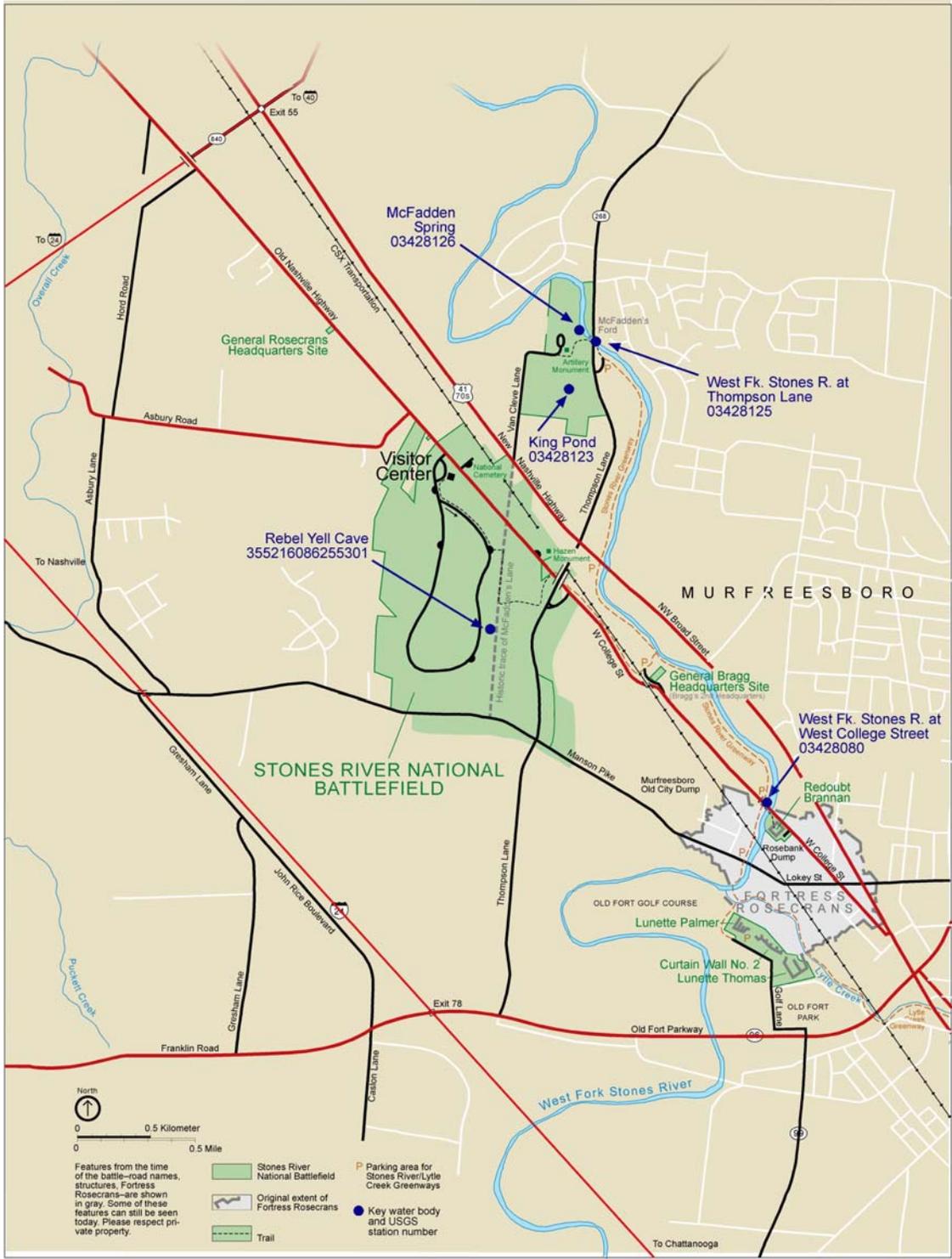


Figure 1. Location of key water bodies and water-quality sampling stations at Stones River National Battlefield near Murfreesboro, Tennessee. (base map obtained from National Park Service Cartographic Resources home page)

Data Collection

Data-collection activities were conducted in August 2000 and January, March, and June 2001. Field measurement, fecal indicator bacteria, inorganic constituent, and organic constituent data were collected during each of the four sampling periods at all 5 key water bodies, except for Rebel Yell Cave which contained enough water for data collection only during the March 2000 sampling period. A summary of analytical methods used for field measurements and fecal indicator bacteria is presented in table 1.

Properties such as temperature, specific conductance, and pH were measured directly in the water body using water-quality meters. Samples for the remaining analysis were collected using hand-held open-mouth bottle sampling methods following guidelines and standard procedures described by Wilde and others (1998). Water flow data were obtained using equipment and standard procedures described by Buchanan and Somers (1969). Dissolved oxygen and alkalinity were measured in the field using Hach titration kits and turbidity was measured using a Hach turbidimeter. Samples for fecal indicator bacteria were chilled on ice to approximately 4°C and transported to the Nashville USGS Office for analysis. Bacteria plate counts were performed using membrane filtration techniques.

Table 1. Analytical methods used for field measurements and fecal indicator bacteria.

Property/constituent	Method/reference	Description	Equivalent methods
Dissolved oxygen	Hach, 1992 (method 8332)	Winkler titration	Standard method 4500-O-C
Alkalinity	Hach, 1992 (method 8221)	Titration	Standard method 2320-B
pH	Wilde and Radtke, 1998	Electrode	Standard method 4500-H USEPA method 150.1
Temperature	Wilde and Radtke, 1998	Thermistor	Standard method 2550
Specific conductance	Wilde and Radtke, 1998	Electrode	Standard method 2510-B
Turbidity	Wilde and Radtke, 1998	Electrode	Standard method 2130-B USEPA method 180.1
Fecal indicator bacteria	Britton and Gresson, 1989	Membrane filtration	Standard method 9222-B, Standard method 9230-B

The remaining samples were chilled on ice to approximately 4°C and shipped overnight to USGS laboratories. Samples for inorganic constituents were analyzed at the USGS Water Quality and Research Laboratory in Ocala, Florida using methods described by Fishman (1993) and by Garbarino and Struzesk (1998). Samples for organic constituents (table 2) were analyzed at the USGS National Water Quality Laboratory in Denver, Colorado using purge and trap capillary gas chromatography/mass spectrometry (Rose and Schroeder, 1995). Quality assurance/quality control activities included meter calibrations, field trip blanks for organic constituents, and equipment blanks.

Table 2. Organic Constituents.

Constituent	CAS Number	Method Reporting Limit (micrograms per liter)
1,1,1-Trichloroethane	71-55-6	0.1
1,1,2-Trichlorotrifluoroethane	76-13-1	0.1
1,1-Dichloroethane	75-34-3	0.1
1,1-Dichloroethylene	75-35-4	0.1
1,2-Dichlorobenzene	95-50-1	0.1
1,2-Dichloroethane	107-06-2	0.2
1,2-Dichloropropane	78-87-5	0.1
1,3-Dichlorobenzene	541-73-1	0.1
1,4-Dichlorobenzene	106-46-7	0.1
Benzene	71-43-2	0.1
Bromodichloromethane	75-27-4	0.1
Bromoform	75-25-2	0.2
Chlorobenzene	108-90-7	0.1
Chloroform	67-66-3	0.1
cis-1,2-Dichloroethylene	156-59-2	0.1
Dibromochloromethane	124-48-1	0.2
Dichlorodifluoromethane	75-71-8	0.2
Dichloromethane	75-09-2	0.2
Diethyl ether	60-29-7	0.2
Diisopropyl ether	108-20-3	0.2
Ethyl tert-butyl ether	637-92-3	0.1
Ethylbenzene	100-41-4	0.1
m- and p-Xylene	-	0.2
o-Xylene	95-47-6	0.1
Styrene	100-42-5	0.1
tert-Butyl methyl ether	1634-04-4	0.2
tert-Pentyl methyl ether	994-05-8	0.2
Tetrachloroethylene	127-18-4	0.1
Tetrachloromethane	56-23-5	0.2
Toluene	108-88-3	0.1
trans-1,2-Dichloroethylene	156-60-5	0.1
Trichloroethylene	79-01-6	0.1
Trichlorofluoromethane	75-69-4	0.2
Vinyl chloride	75-01-4	0.2

WATER-QUALITY RESULTS

Field measurement, fecal indicator bacteria, major ion and nutrient, trace element, and organic constituent data are presented in tables 3-7. All data are also provided in a Microsoft Excel spreadsheet (STONES Data.xls). In addition to the water-quality data spreadsheet, three additional supporting documents are included on the attached 3.5-inch diskette: (1) STONES Parameters.doc; (2) STONES Sites.xls; and (3) README.doc. "STONES Parameters.doc" is a Microsoft Word file that explicitly defines each water-quality parameter included in the following tables and in the water-quality data spreadsheet. "STONES Sites.xls" is a Microsoft Excel file that contains specific location data for each site where water-quality data was collected. "README.doc" is a Microsoft Word file that contains basic information related to the project such as contact information for those who conducted the work and analyzed the samples.

Applicable State of Tennessee water quality criteria (Tennessee Department of Environment and Conservation, 1999a) are provided in table 8. Dissolved oxygen concentrations of 2.5 and 1.8 mg/L were detected in samples collected from the two West Fork Stones River sites on 1/5/01 (table 3). These concentrations are lower than the dissolved oxygen criterion of 5.0 mg/L for the protection of fish and aquatic life (table 8). Dissolved oxygen concentrations less than 5.0 milligrams per liter were also detected in samples collected from King Pond on 1/5/01 and 6/13/01 (table 3).

Elevated *Escherichia coli* (*E. Coli*) and fecal streptococcus concentrations were detected in samples collected from the two West Fork Stones River sites (table 4). The *E. Coli* criterion for recreational waters is a maximum of 126 colonies per 100 milliliters (col/100 ml) as a geometric mean based on a minimum of 10 samples collected from a given sampling site over a period of not more than 30 consecutive days with samples collected at least 12 hours apart (table 8). The state of Tennessee criteria do not include a single-sample maximum; however, the U.S. Environmental Protection Agency (U.S. EPA) has recommended a single-sample maximum of 235 col/100 ml for *E. Coli* (U.S. EPA, 1986). One sample exceeded this recommended criterion. A concentration of 400 col/100 ml was detected in a sample collected from West Fork Stones River at Thompson Lane on 1/5/01 (table 4).

Arsenic, cadmium, chromium, copper, lead, nickel, selenium, and thalium concentrations detected in key water bodies at Stones River National Battlefield (table 6) did not exceed any of their respective criteria (table 8). VOCs were detected in several water samples collected from key water bodies at Stones River National Battlefield (table 7). Chloroform, tetrachloroethylene, trichloroethylene, and cis-1,2-dichloroethylene were detected in all key water bodies except for Rebel Yell Cave. Trichloroethylene concentrations as great as 8.9 and 32 micrograms per liter ($\mu\text{g/L}$) were detected in samples collected from McFadden Spring and King Pond, respectively. None of the VOC detections exceeded applicable State of Tennessee water quality criteria; however, trichloroethylene concentrations detected in McFadden Spring and King Pond were greater than drinking water standards (table 8).

Table 3. Field measurement data

[ft³/s, cubic feet per second; °C, degrees Celsius; μS/cm, microsiemens per centimeter at 25 °C; mg/L, milligrams per liter; mg/L as CaCO₃, milligrams per liter as calcium carbonate; NTU, Nephelometric turbidity units; --, no data]

Date	Time	Discharge (ft ³ /s)	Water temperature (°C)	pH (standard units)	Specific conduct- ance (μS/cm)	Dissolved oxygen (mg/L)	Alkalinity (mg/L as CaCO ₃)	Turbidity (NTU)
West Fork Stones River at West College Street (03428080)								
8/10/00	1400	36.7	28.5	8.0	298	7.8	132	11
1/5/01	1045	47.6	3.5	7.9	445	2.5	203	2.4
3/26/01	1030	260	10.5	8.3	345	9.8	171	5.8
6/13/01	1030	27.8	25.5	8.0	385	7.1	170	--
West Fork Stones River at Thompson Lane (03428125)								
8/09/00	1310	12.0	29.0	7.8	352	8.3	160	5.3
1/5/01	1330	48.8	4.0	7.8	440	1.8	199	2.2
3/26/01	1430	--	12.0	8.5	335	6.9	164	5.7
6/13/01	1500	30.2	27.0	8.3	376	6.0	163	6.3
McFadden Spring (03428126)								
8/09/00	1405	0.001	17.5	6.6	580	1.2	286	1.0
1/5/01	1345	0.050	14.5	7.0	503	1.9	227	1.4
3/26/01	1500	0.147	12.5	7.1	411	1.7	188	1.9
6/13/01	1430	0.016	15.5	7.0	542	3.0	255	7.6
King Pond (03428123)								
8/10/00	1130	--	24.5	7.4	384	5.2	176	5.1
1/5/01	1230	--	4.5	7.0	422	4.9	182	3.5
3/26/01	1530	--	17.0	8.0	350	5.6	164	1.6
6/13/01	1300	--	25.0	7.9	213	4.1	80	8.4
Rebel Yell Cave (355216086255301)								
3/26/01	0930	--	14.0	7.5	355	3.3	179	1.8

Table 4. Fecal indicator bacteria data

[col/100 ml, colonies per 100 milliliters; <, less than; E, non-ideal colony count]

Date	Time	<i>E. Coli</i> (col/100ml)	Fecal streptococcus (col/100ml)
West Fork Stones River at West College Street (03428080)			
8/10/00	1400	120	380
1/5/01	1045	43	34
3/26/01	1030	E25	33
6/13/01	1030	50	110
West Fork Stones River at Thompson Lane (03428125)			
8/09/00	1310	45	150
1/5/01	1330	400	450
3/26/01	1430	26	32
6/13/01	1500	170	130
McFadden Spring (03428126)			
8/09/00	1405	E6	23
1/5/01	1345	E2	E4
3/26/01	1500	E12	23
6/13/01	1430	E3	E5
King Pond (03428123)			
8/10/00	1130	30	600
1/5/01	1230	E6	E12
3/26/01	1530	E14	21
6/13/01	1300	27	44
Rebel Yell Cave (355216086255301)			
3/26/01	0930	<1	E18

Table 5. Major ion and nutrient data[mg/L, milligrams per liter; Cl, chloride; F, Fluoride; SO₄, sulfate; P, phosphorus]

Date	Time	Chloride, dissolved (mg/L as Cl)	Fluoride, dissolved (mg/L as F)	Sulfate, dissolved (mg/L as SO ₄)	Nitrogen, ammonia, dissolved (mg/L as N)	Nitrogen, nitrate + nitrite, dissolved (mg/L as N)	Nitrogen, nitrite, dissolved (mg/L as N)	Phosphorus ortho, dissolved (mg/L as P)
West Fork Stones River at West College Street (03428080)								
8/10/00	1400	5.9	0.1	13	0.03	0.5	0.03	<.010
1/5/01	1045	8.2	<.1	17	<.010	1.6	<.010	0.02
3/26/01	1030	5.6	<.1	13	0.014	0.92	<.010	<.010
6/13/01	1030	9.7	0.1	16	0.01	0.31	<.010	0.01
West Fork Stones River at Thompson Lane (03428125)								
8/09/00	1310	8.2	0.1	14	0.014	0.14	<.010	<.010
1/5/01	1330	8.9	<.1	17	<.010	1.5	<.010	<.010
3/26/01	1430	5.7	<.1	13	0.014	0.83	<.010	<.010
6/13/01	1500	9.5	0.1	16	0.02	0.19	<.010	0.01
McFadden Spring (03428126)								
8/09/00	1405	6.2	<.1	19	<.010	0.79	<.010	<.010
1/5/01	1345	6.4	<.1	26	0.02	0.83	<.010	<.010
3/26/01	1500	6.3	<.1	26	<.010	0.87	<.010	0.01
6/13/01	1430	12	<.1	19	<.010	0.79	<.010	0.01
King Pond (03428123)								
8/10/00	1130	4.0	0.1	16	0.039	0.48	0.03	<.010
1/5/01	1230	6.7	0.1	25	0.044	0.48	<.010	<.010
3/26/01	1530	4.8	0.1	15	0.028	0.59	<.010	<.010
6/13/01	1300	6.0	0.2	12	0.104	<.020	<.010	0.02
Rebel Yell Cave (355216086255301)								
3/26/01	0930	5.9	<.1	9.5	0.015	1.2	<.010	0.03

Table 6. Trace element data

[(µg/L, micrograms per liter; Al, aluminum; Sb, antimony; As, arsenic; Cd, cadmium; Cr, chromium; Co, cobalt; Cu, copper; <, less than, --, no data]

Date	Time	Aluminum, dissolved (µg/L as Al)	Antimony, dissolved (µg/L as Sb)	Arsenic, dissolved (µg/L as As)	Cadmium dissolved (µg/L as Cd)	Chromium, dissolved (µg/L as Cr)	Cobalt, dissolved (µg/L as Co)	Copper, dissolved (µg/L as Cu)
West Fork Stones River at West College Street (03428080)								
8/10/00	1400	4	<.10	<.8	<.05	1.4	0.2	2.9
1/5/01	1045	<.5	<.10	0.2	<.05	3.4	0.2	0.5
3/26/01	1030	--	<.10	0.2	<.05	2.0	<.05	0.3
6/13/01	1030	2	<.10	0.5	<.05	4.0	0.2	0.8
West Fork Stones River at Thompson Lane (03428125)								
8/09/00	1310	2	<.10	<.8	<.05	1.8	0.2	4.4
1/5/01	1330	<.5	<.10	0.2	<.05	3.2	0.2	0.7
3/26/01	1430	--	<.10	<.2	<.05	2.0	<.10	0.7
6/13/01	1500	2	<.10	0.5	<.05	3.3	0.2	0.8
McFadden Spring (03428126)								
8/09/00	1405	<.5	<.10	<.2	<.05	3.2	0.1	2.6
1/5/01	1345	<.5	<.10	0.2	<.05	4.0	0.1	0.7
3/26/01	1500	<.5	<.10	0.1	<.05	2.0	0.1	0.3
6/13/01	1430	<.5	0.2	0.1	<.05	<.5	0.1	0.4
King Pond (03428123)								
8/10/00	1130	1	<.10	<.5	<.05	2.2	0.3	5.3
1/5/01	1230	<.5	<.10	0.5	<.05	2.6	<.05	0.2
3/26/01	1530	2	<.10	0.2	<.05	2.0	0.2	0.4
6/13/01	1300	11	1	1.2	0.1	<.5	0.4	2.0
Rebel Yell Cave (355216086255301)								
3/26/01	0930	--	<.10	<.1	<.05	<.5	<.05	0.3

Table 6. Trace element data – Continued.

[(µg/L, micrograms per liter; Pb, lead; Mo, molybdenum; Ni, nickel; Se, selenium; Ag, silver; Tl, thallium; V, vanadium; <, less than]

Date	Time	Lead, dissolved (µg/L as Pb)	Molybdenum, dissolved (µg/L as Mo)	Nickel, dissolved (µg/L as Ni)	Selenium, dissolved (µg/L as Se)	Silver, dissolved (µg/L as Ag)	Thallium, dissolved (µg/L as Tl)	Vanadium, dissolved (µg/L as V)
West Fork Stones River at West College Street (03428080)								
8/10/00	1400	0.1	0.9	0.4	<.5	0.1	<.02	1.3
1/5/01	1045	<.05	0.2	1.1	<.5	<.1	<.02	1.6
3/26/01	1030	0.1	0.3	0.3	<.5	<.1	0.02	<.5
6/13/01	1030	<.05	0.3	2.1	<.5	<.1	<.02	1.2
West Fork Stones River at Thompson Lane (03428125)								
8/09/00	1310	0.5	2.2	0.4	<.5	0.1	0.30	1.7
1/5/01	1330	<.05	0.3	1.2	<.5	<.1	<.02	1.5
3/26/01	1430	<.05	0.2	0.4	<.5	<.1	<.02	1.1
6/13/01	1500	<.05	0.7	2.0	<.5	<.1	<.02	1.1
McFadden Spring (03428126)								
8/09/00	1405	<.05	0.6	<.20	<.5	<.1	<.02	1.2
1/5/01	1345	<.05	2.6	1.1	0.6	<.1	<.02	1.7
3/26/01	1500	0.7	1.9	0.4	<.5	<.1	<.02	1.1
6/13/01	1430	<.05	3.7	2.7	<.5	<.1	<.02	<.5
King Pond (03428123)								
8/10/00	1130	<.09	3.4	0.2	<.5	<.1	<.02	1.1
1/5/01	1230	<.05	68	1.1	1	<.1	<.02	1.2
3/26/01	1530	<.05	19	0.5	<.5	<.1	<.02	0.8
6/13/01	1300	<.05	92	1.5	<.5	<.1	<.02	1.7
Rebel Yell Cave (355216086255301)								
3/26/01	0930	0.2	<.1	1.0	<.5	<.1	<.02	<.5

Table 7. Organic constituents detected in samples collected at Stones River National Battlefield.

[samples were analyzed for all organic constituents listed in table 2; µg/L, micrograms per liter; <, less than]

Date	Time	Chloroform (µg/L)	cis-1,2- Dichloroethylene (µg/L)	1,1,2- Trichloro- trifluoroethane (µg/L)	Tetrachloro- ethylene (µg/L)	Trichloroethylene (µg/L)
West Fork Stones River at West College Street (03428080)						
8/10/00	1400	0.24	0.14	<.10	0.8	0.30
1/5/01	1045	<.10	0.11	<.10	0.2	0.20
3/26/01	1030	<.10	<.10	<.10	<.10	<0.10
6/13/01	1030	0.13	<.10	<.10	0.3	0.29
West Fork Stones River at Thompson Lane (03428125)						
8/09/00	1310	0.37	0.17	<.10	<.10	<0.10
1/5/01	1330	<.10	0.13	<.10	0.1	0.13
3/26/01	1430	<.10	<.10	<.10	0.1	<0.10
6/13/01	1500	0.24	<.10	<.10	<.10	<0.10
McFadden Spring (03428126)						
8/09/00	1405	0.11	0.22	<.10	<.10	5.33
1/5/01	1345	<.10	0.27	<.10	<.10	8.91
3/26/01	1500	<.10	<.10	<.10	<.10	1.06
6/13/01	1430	0.13	0.12	<.10	<.10	7.01
King Pond (03428123)						
8/10/00	1130	0.14	0.55	<.10	<.10	7.15
1/5/01	1230	<.10	2.21	<.10	<.10	32.6
3/26/01	1530	<.10	0.23	0.14	<.10	4.82
6/13/01	1300	<.10	<.10	<.10	<.10	0.41
Rebel Yell Cave (355216086255301)						
3/26/01	0930	<.10	<.10	<.10	<.10	<0.10

Table 8. Applicable Tennessee Department of Environment and Conservation, Division of Water Pollution Control General Water Quality Criteria

[conc., concentration; col/100 ml, colonies per 100 milliliters; --, numerical criteria does not exist; mg/L, milligrams per liter; µg/L, micrograms per liter; *, geometric mean based on a minimum of 10 samples over a period of not more than 30 consecutive days with samples collected at least 12 hours apart; **, expressed as a function of total hardness (50, 100, and 200 mg/L, respectively)]

Constituent and type of criteria	Domestic water supply	Fish and Aquatic life	Consumption of water and organisms	Consumption of organisms only	General use ground water
<i>E. Coli</i> (maximum conc. in col/100 mL)	--	--	126*	126*	--
Dissolved oxygen (minimum conc. in mg/L)	--	5.0	--	--	--
pH (acceptable range)	6.0 to 9.0	6.5 to 9.0	6.0 to 9.0	6.0 to 9.0	--
Chloride (maximum conc. in mg/L)	--	--	--	--	250
Fluoride (maximum conc. in mg/L)	--	--	--	--	4
Nitrate (maximum conc. in mg/L as nitrogen)	--	--	--	--	10
Nitrite (maximum conc. in mg/L as nitrogen)	--	--	--	--	1
Arsenic (maximum conc. in µg/L)	50	360	50	50	50
Arsenic (continuous conc. in µg/L)	--	190	--	--	--
Cadmium (maximum conc. in µg/L)	5	1.8 / 3.9 / 8.6**	--	--	5
Cadmium (continuous conc. in µg/L)	--	0.7 / 1.1 / 2.0**	--	--	--
Chromium, total (maximum conc. in µg/L)	100	--	--	--	100
Chromium, total (continuous conc. in µg/L)	--	100	--	--	--
Chromium, VI (maximum conc. in µg/L)	--	16	--	--	--
Chromium, VI (continuous conc. in µg/L)	--	11	--	--	--
Copper (maximum conc. in µg/L)	--	9.2 / 17.7 / 34.1**	--	--	1000
Copper (continuous conc. in µg/L)	--	6.5 / 11.8 / 21.4**	--	--	--
Lead (maximum conc. in µg/L)	5	33.8 / 81.7 / 197**	--	--	50
Lead (continuous conc. in µg/L)	--	1.3 / 3.2 / 7.7**	--	--	--
Nickel (maximum conc. in µg/L)	100	789 / 1418 / 2549**	610	4600	--
Nickel (continuous conc. in µg/L)	--	87.7 / 158 / 283**	--	--	--
Selenium (maximum conc. in µg/L)	50	20	--	--	50
Selenium (continuous conc. in µg/L)	--	5	--	--	--
Silver (maximum conc. in µg/L)	--	--	--	--	100
Thalium (maximum conc. in µg/L)	2	--	1.7	6.3	--
Chloroform (maximum conc. in µg/L)	--	--	57	4700	--
cis-1,2-Dichloroethylene (maximum conc. in µg/L)	70	--	--	--	--
Tetrachloroethylene (maximum conc. in µg/L)	5	--	8	88.5	--
Trichloroethylene (maximum conc. in µg/L)	5	--	27	810	--

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