

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT**

**EVALUATION OF LIMESTONE TREATMENT OF ACIDIC MINE DRAINAGE  
IN SWATARA CREEK BASIN, SCHUYLKILL COUNTY, PENNSYLVANIA**

Acidic mine drainage (AMD) from abandoned anthracite mines has degraded water resources in the 48 mi<sup>2</sup> northern Swatara Creek Basin. To neutralize the AMD, with a goal of remediating approximately 25 miles (67 percent) of degraded streams in the basin, a variety of limestone treatment systems have been constructed (fig. 8). Most of the limestone treatment systems were installed during fall 1996 and spring 1997. The type and size of the treatment system was based on streamflow rates and chemistry determined by preliminary monitoring and field trials. The treatments, which include limestone-sand dosing, open limestone channels, anoxic and oxic limestone drains, and limestone diversion wells, were constructed by the Schuylkill County Conservation District and the Northern Swatara Creek Watershed Association, with technical assistance from the USGS and the Pennsylvania Department of Environmental Protection (PaDEP). Each treatment has different advantages and disadvantages; however, all suffer from possible complication associated with variability of flow rates and chemistry of the AMD-contaminated water and from uncertainties about efficiency and longevity of the treatment.

To resolve uncertainties about treatment designs (efficiency and longevity), limestone dissolution in response to variations in water chemistry and coating (armoring) by iron and aluminum hydroxides, and appropriate uses of the various limestone treatments, the USGS has established monitoring stations upstream and downstream of each treatment. During base-flow and high-flow conditions in 1995-2003, data on discharge rate and water quality at 48 stations in the Swatara Creek basin and 5 stations in adjacent watersheds (table 5) were collected to characterize untreated mine drainage, treatment-system performance, and cumulative downstream effects. In spring-summer 1996, two streamflow stations on Swatara Creek, Site C3, at Newtown (station 0157155014) and Swatara Creek near Ravine (station 01571820) were installed for continuous streamflow and water-quality monitoring. The data for these stations indicate cumulative effects of AMD remediation throughout the northern Swatara Creek basin.

Limestone sand dosing and open limestone channels are the simplest treatment systems where limestone is added directly to the stream channel semiannually or less frequently. Limestone sand, which can dissolve rapidly because of its small size (<1/8 inch), was dumped into Coal Run (14 tons) between stations C4 and C6 on September 4, 1996, and into Lorberry Creek (150 tons) below station E2 on February 13-14, 1997 (fig. 8). An open limestone channel was constructed within a 110-ft long segment of Swatara Creek at station B2 (fig. 8) on March 21, 1997. A total of 44 tons of sand-size fragments and 70 tons of larger fragments (1-4 inches) were installed as a series of alternating berms extending part way across the 15-ft-wide channel from opposite sides of the stream.

A limestone drain is another relatively simple treatment method, which involves the burial of limestone in air-tight trenches that intercept acidic discharge water. Keeping oxygen out of contact with the discharge water minimizes the potential for oxidation of ferrous iron and the consequent precipitation of ferric-iron armoring as iron hydroxides. Furthermore, keeping carbon dioxide within the drain can enhance limestone dissolution and alkalinity production. Limestone drains were constructed on March 15, 1995, at station E3 to treat a small acidic discharge (10-30 gpm, oxic inflow; 44 tons limestone) along Lower Rausch Creek May 21, 1997, at station A1 to treat a large discharge (50-200 gpm, anoxic inflow; 400 tons limestone) at the headwaters of Swatara Creek; and on May 20, 2000, at station C0-1 to treat a large discharge (50-500 gpm; oxic inflow; 880 tons limestone) near the headwaters of Swatara Creek (fig. 8).

In a limestone diversion well, acidic water is diverted from upstream points and the hydraulic force of the piped flow is deflected upward through limestone fragments inside 4-ft diameter "wells." Hydraulic churning abrades limestone forming fine particles and preventing the buildup of iron or aluminum hydroxides armoring. On November 14, 1995, a pair of diversion wells was installed to treat water diverted from Swatara Creek at station C2; on July 13, 1997, a single diversion well was installed to treat water from Martin Run at station C8 (fig. 8); and, on November 18-19, 1998, another pair of diversion wells was installed to treat water diverted from Lorberry Creek above station E2-0. Approximately 1 ton of limestone is consumed weekly by each operating diversion well.

Constructed wetlands for treatment of mine drainage can attenuate the transport of dissolved and suspended pollutants by promoting the production of alkalinity and the precipitation and deposition of iron and other metals. For net acidic water (acidity > alkalinity), wetlands that have compost and/or limestone substrates can be appropriate. The organic matter in the compost provides a substrate for plant rooting and for microbial reduction of sulfate. In December 1998, a 3-acre aerobic wetland system with limestone and compost substrate was installed near the mouth of Lower Rausch Creek between stations E3-1 and E3-2, and in December 2001, a 3-acre aerobic wetland system that intercepts outflow from the limestone diversion wells on Lorberry Creek below station E2-0 began operation. At the inflow to the Lorberry wetlands, a hopper with water-powered auger was installed to deliver pelletized lime or limestone as needed. The main objective for these wetlands is to reduce the downstream transport of metals, with a secondary objective of providing additional alkalinity.

Additional data for this project can be found in this report on pages 252-317. For additional information, contact Charles Cravotta at the U.S. Geological Survey, 215 Limekiln Road, New Cumberland, PA 17070; 717-730-6963 (email: cravotta@usgs.gov).

ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
 SWATARA CREEK PROJECT--Continued

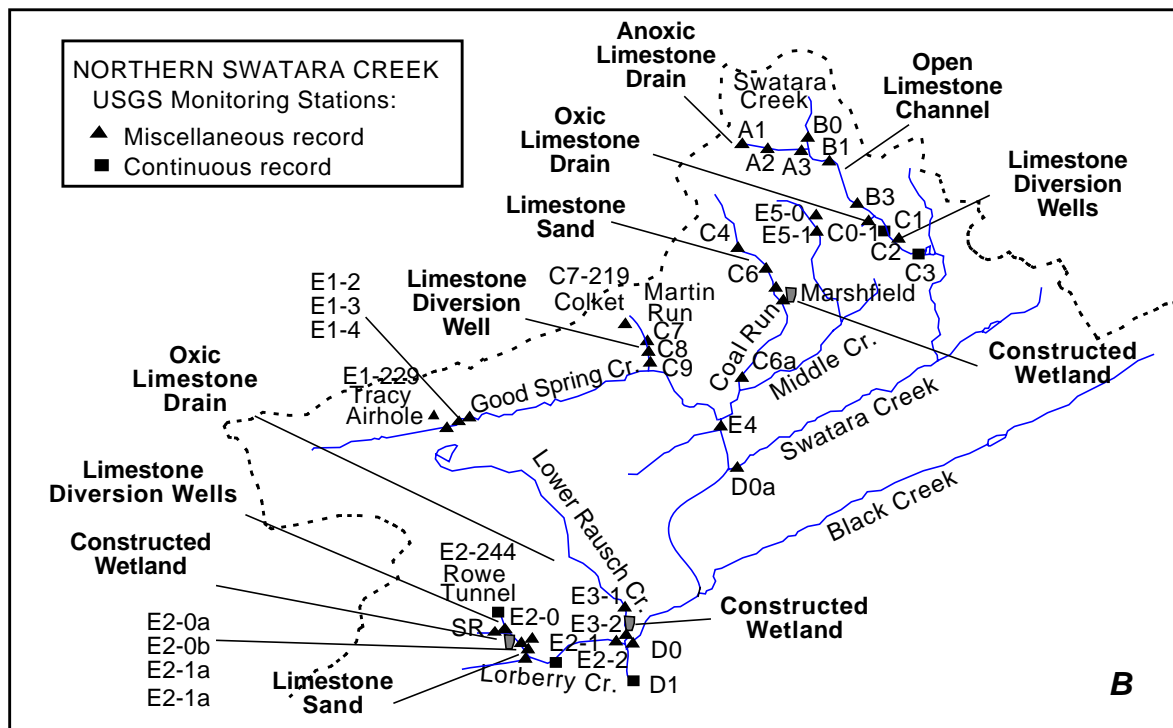
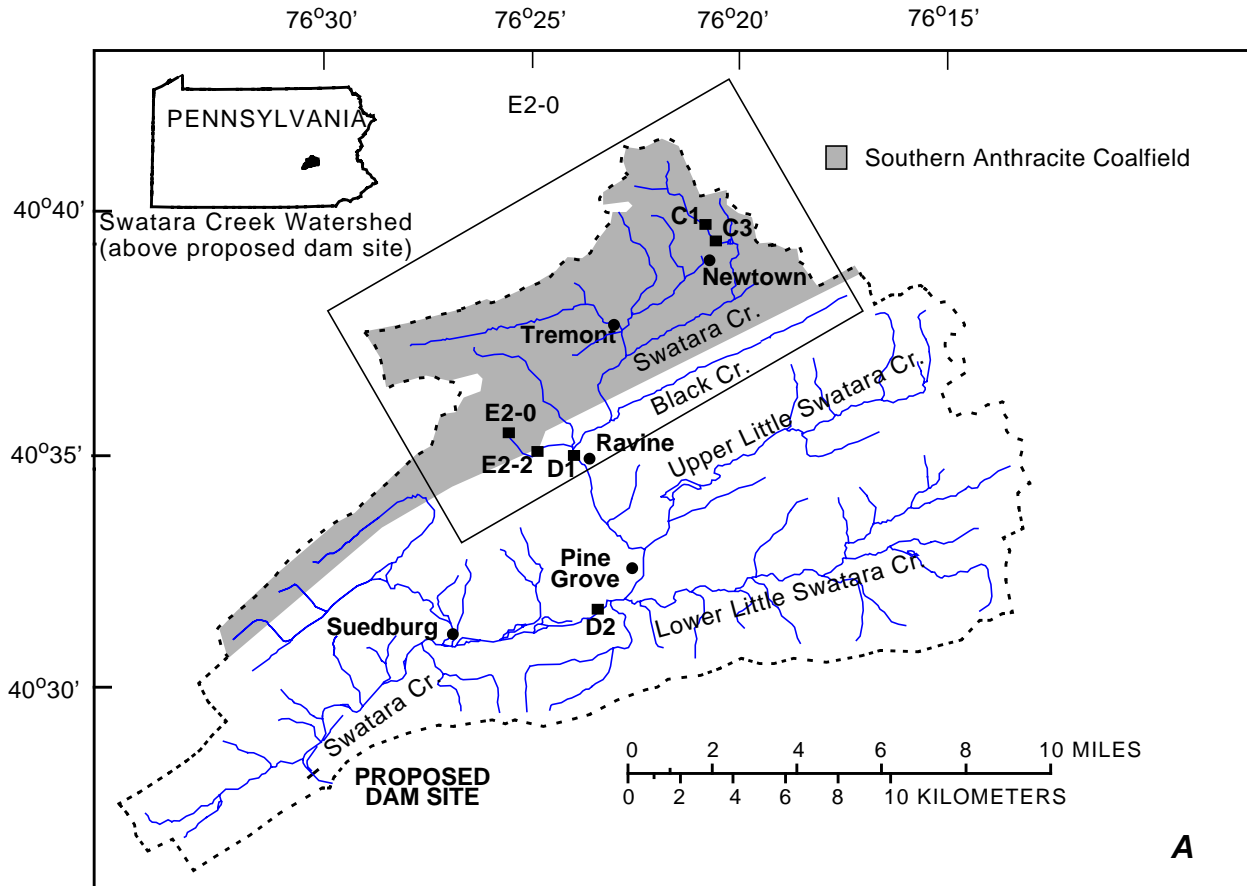


Figure 8.--Locations of water-quality and streamflow monitoring stations in the Swatara Creek Basin, Lebanon and Schuylkill Counties, Pennsylvania: A, continuous monitoring stations on Swatara Creek above the proposed dam for Swatara State Park Reservoir; B, monitoring stations within the Southern Anthracite Coalfield, above Ravine (area denoted in A).

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES**  
**SWATARA CREEK PROJECT--Continued**

**TABLE 5.--**Swatara Creek project station list.

**REMARKS.--**All samples collected by the U.S. Geological Survey. Abbreviations used in the following table include: AB-above; BL-below; NR-near; DS-downstream, US-upstream, ALD-anoxic limestone drain; OLD-oxic limestone drain; OLC-open limestone channel; LS-limestone sand; LDW-limestone diversion well; n.a.-not applicable.

LOCAL ID	STATION NUMBER	STATION NAME	LATITUDE	LONGITUDE	DRAINAGE AREA
CONTINUOUS-RECORD STATIONS					
C1	0157155010	SWATARA CREEK, SITE C1, 350 FT AB LDW, AB SR209 BRIDGE AT NEWTOWN, PA	40°39'34"	76°20'50"	2.58
C3	0157155014	SWATARA CREEK, SITE C3, 350 FT BL LDW, BL SR209 BRIDGE AT NEWTOWN, PA	40°39'28"	76°20'43"	2.92
E2-244	403542076263201	ROWE DRAINAGE TUNNEL, SITE E2-244, NEAR JOLIETT	40°35'42"	76°26'32"	n.a.
E2-1	01571778	LORBERRY CREEK NEAR LORBERRY JUNCTION, PA	40°35'15"	76°25'35"	3.59
D1	01571820	SWATARA CREEK NEAR RAVINE, PA	40°34'50"	76°24'18"	43.3
D2	01572025	SWATARA CREEK NEAR PINE GROVE, PA	40°31'57"	76°24'09"	116
MISCELLANEOUS-RECORD STATIONS					
A1-199	404032076222901	WM CARL BUCK MTN MINE, SITE A1-199, NEAR NEWTOWN	40°40'32"	76°22'29"	n.a.
A2	0157154970	NORTHWEST TRIBUTARY TO SWATARA CREEK, SITE A2, AT ALD OUTFLOW, NEAR NEWTOWN, PA	40°40'32"	76°22'25"	.25
A3	0157154972	NORTHWEST TRIBUTARY TO SWATARA CREEK, SITE A3, 1500 FT BELOW ALD, NEAR NEWTOWN, PA	40°40'32"	76°21'59"	.40
B0	0157154960	SWATARA CREEK, ABOVE NORTHWEST TRIBUTARY, SITE B0, NEAR NEWTOWN, PA	40°40'34"	76°21'57"	1.14
B3	0157154984	SWATARA CREEK, BELOW NORTHWEST TRIBUTARY, SITE B3, 400 FT BELOW OLC, NEAR NEWTOWN, PA	40°40'22"	76°21'36"	1.90
C0-1	403955076211801	HEGINS MINE DISCHARGE, SITE C0-1, AT NEWTOWN, PA	40°39'55"	76°21'18"	n.a.
	403955076211802	HEGINS MINE DISCHARGE, TREATED, AT NEWTOWN, PA	40°39'55"	76°21'18"	n.a.
C2	0157155012	SWATARA CREEK, SITE C2, AT LDW OUTFLOW, AT NEWTOWN, PA	40°39'31"	76°20'47"	2.65
E1-229	403745076271901	TRACY AIRHOLE, SITE E1-229, NEAR DONALDSON, PA	40°37'45"	76°27'19"	n.a.
D0a	01571552	SWATARA CREEK AT TREMONT, PA	40°37'08"	76°23'09"	9.81
E4	01571593	GOOD SPRING CREEK BL MIDDLE CREEK AT TREMONT, PA	40°37'35"	76°23'15"	14.0
E3-1	01571758	LOWER RAUSCH CREEK, SITE E3-1 ABOVE WETLAND, NEAR LORBERRY JUNCTION, PA	40°35'34"	76°24'40"	4.65
E3-2	01571760	LOWER RAUSCH CREEK, SITE E3-2 BELOW WETLAND, AT LORBERRY JUNCTION, PA	40°35'22"	76°24'42"	4.65
E2-0b	01571773	LORBERRY CREEK DIV WELLS OUTFLOW NR LORBERRY, PA	40°35'36"	76°26'25"	1.01
E2-0	01571774	LORBERRY CREEK, SITE E2-0, AT LORBERRY, PA	40°35'32"	76°26'22"	1.15
SR	01571776	STUMPS RUN AT LORBERRY, PA	40°35'30"	76°26'23"	.65
	0157177610	LORBERRY CREEK WETLANDS INFLOW AT LORBERRY, PA	40°35'29"	76°26'23"	
	0157177612	LORBERRY CR WETLANDS CELL 1 OUTFLOW AT LORBERRY	40°35'27"	76°26'25"	
	0157177614	LORBERRY CR WETLANDS CELL 2 OUTFLOW AT LORBERRY	40°35'28"	76°26'20"	
	0157177616	LORBERRY CR WETLANDS CELL 3 OUTFLOW AT LORBERRY	40°35'26"	76°26'24"	
	0157177618	LORBERRY CR WETLANDS CELL 4 OUTFLOW AT LORBERRY	40°35'27"	76°26'19"	
	403530076262601	PIPED DISCHARGE NEAR CELL 1, PA	40°35'30"	76°26'26"	
	0157177620	LORBERRY CREEK BELOW WETLANDS AT LORBERRY, PA	40°35'27"	76°26'17"	1.80
SH	403521076260601	SHADLE MINE SHAFT AT LORBERRY, PA	40°35'21"	76°26'06"	n.a.
	0157177680	SHADLE MINE DISCHARGE, 250 FT BL SHAFT NEAR LORBERRY, PA	40°35'15"	76°25'59"	
	01571777	LORBERRY CREEK ABOVE PANTHER HEAD DISCHARGE NEAR LORBERRY JUNCTION, PA	40°35'11"	76°25'55"	2.11
	0157177780	PANTHER HEAD, 500 FT BELOW DISCHARGE TO LORBERRY CREEK NEAR LORBERRY JUNCTION, PA	40°35'10"	76°25'56"	.01
	0157177790	UNNAMED TRIBUTARY TO LORBERRY CREEK NEAR LORBERRY JUNCTION, PA	40°35'07"	76°25'48"	1.14
E2-2	01571780	LORBERRY CREEK ABOVE LOWER RAUSCH CREEK AT LORBERRY JUNCTION, PA	40°35'20"	76°24'43"	4.17
D0	01571798	SWATARA CREEK BELOW TR412 BRIDGE AT LORBERRY JUNCTION, PA	40°35'18"	76°24'37"	42.3

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**404032076222901 -- WM Carl Buck Mtn Mine, Site A1-199, nr Newtown, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 21...	1345	1028	89203	.02	466	1.0	1.8	5.0	4.8	283
FEB 27...	1515	1028	89203	.02	444	.0	2.2	5.0	4.7	240
APR 29...	1345	1028	89203	.01	392	.0	1.8	4.8	4.5	276
JUN 26...	1445	1028	89203	.01	426	1.0	4.1	4.6	4.8	237
AUG 25...	1300	1028	89203	.01	435	--	1.7	4.8	4.8	231

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium unfltrd recover-able, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 21...	10.3	5.70	7.1	11.0	12.6	2.00	2.0	12.1	15.8	3
FEB 27...	.0	5.00	4.7	9.70	9.7	1.70	1.6	14.0	14.3	3
APR 29...	9.4	4.50	4.2	8.60	9.0	1.70	1.4	16.9	15.5	.0
JUN 26...	10.2	4.50	4.3	9.20	9.7	1.60	1.6	16.5	18.1	2
AUG 25...	11.0	4.10	3.9	8.30	7.9	1.50	1.4	14.2	15.1	2

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recover-able, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recover-able, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recover-able, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recover-able, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recover-able, $\mu$ g/L (01092)
NOV 21...	800	900	20500	20500	2000	2170	139	148	299	293
FEB 27...	800	700	17700	15600	1650	1530	118	111	284	243
APR 29...	800	800	12900	12800	1470	1390	112	103	259	261
JUN 26...	800	800	13100	13800	1440	1400	108	101	269	248
AUG 25...	700	600	12000	12300	1310	1270	97.0	92.0	253	227

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157154970 -- NW Trib to Swatara Cr, Site A2, near Newtown, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd lab, std units (00095)
NOV 21...	1400	1028	89203	.71	466	.0	4.0	5.2	6.8	280
FEB 27...	1500	1028	89203	.14	328	.0	.7	6.7	6.6	317
APR 29...	1330	1028	89203	.04	340	.0	1.0	6.5	6.6	323
JUN 26...	1430	1028	89203	.09	316	.0	1.0	6.1	6.3	361
AUG 25...	1245	1028	89203	.07	272	--	.6	6.2	6.5	313

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water unfltrd recover-able, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 21...	10.4	31.2	--	8.20	--	1.84	--	12.7	--	63
FEB 27...	8.0	32.1	--	6.70	--	1.60	--	14.1	--	65
APR 29...	7.4	26.8	27.7	5.90	6.7	1.40	1.5	18.4	17.2	6
JUN 26...	9.8	32.2	33.0	8.90	9.5	1.60	1.6	17.4	17.6	69
AUG 25...	11.7	35.6	34.3	6.50	6.3	1.70	1.6	13.9	15.2	59

Date	Aluminum, water, fltrd, µg/L (01106)	Aluminum, water, unfltrd recover-able, µg/L (01105)	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover-able, µg/L (01045)	Manganese, water, fltrd, µg/L (01056)	Manganese, water, unfltrd recover-able, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover-able, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover-able, µg/L (01092)
NOV 21...	<100	--	10100	--	1650	--	85.1	--	176	--
FEB 27...	<100	--	6890	--	1320	--	74.0	--	160	--
APR 29...	<100	<100	6610	6770	1150	1190	77.0	63.0	154	161
JUN 26...	100	100	12800	13300	1460	1430	96.0	91.0	263	245
AUG 25...	<100	<100	8140	8220	1140	1110	67.0	64.0	178	149

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157154972 -- NW Trib to Swatara Cr, Site A3, near Newtown, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 21...	1245	1028	89203	.46	387	9.0	10.8	7.2	6.5	248
FEB 27...	1430	1028	89203	1.1	319	16	12.8	7.0	6.8	247
APR 29...	1245	1028	89203	.86	375	9.0	11.1	6.5	6.7	198
JUN 26...	1345	1028	89203	1.1	218	8.0	10.1	6.6	6.4	245
AUG 25...	1215	1028	89203	1.1	241	--	10.1	6.2	7.0	203

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium unfltrd recover-able, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 21...	9.6	18.8	23.6	7.80	9.0	1.90	2.1	11.3	12.7	19
FEB 27...	3.4	21.4	--	6.90	--	1.90	--	11.6	--	26
APR 29...	9.3	18.4	19.1	6.60	7.4	1.50	1.5	16.8	14.2	2
JUN 26...	13.9	14.3	14.8	6.90	7.4	1.50	1.5	14.9	16.9	13
AUG 25...	13.4	21.0	20.0	7.10	7.2	1.50	1.6	13.5	14.4	22

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recover-able, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recover-able, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recover-able, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recover-able, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recover-able, $\mu$ g/L (01092)
NOV 21...	<100	200	4350	5470	1370	1480	74.0	87.0	134	143
FEB 27...	<100	--	2070	--	1080	--	46.0	--	98.0	--
APR 29...	<100	300	2990	4530	1080	1090	65.0	59.0	110	131
JUN 26...	<100	300	4230	5710	1100	1130	78.0	66.0	147	163
AUG 25...	<100	200	1690	4100	1060	1070	66.0	64.0	88.0	112

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157154960 -- Swatara Creek, ab NW Trib, Site B0, nr Newtown, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unf μS/cm 25 degC (00095)
NOV 21...	1230	1028	89203	4.3	613	1.0	11.5	4.2	4.2	92
FEB 27...	1415	1028	89203	2.7	525	.0	13.8	4.4	4.4	108
APR 29...	1230	1028	89203	1.3	516	2.0	11.0	4.2	4.4	104
JUN 26...	1330	1028	89203	3.6	503	4.0	9.9	4.1	4.2	82
AUG 25...	1200	1028	89203	.90	602	--	9.4	4.1	4.3	71

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium unfltrd recover-able, mg/L (00929)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 21...	7.1	1.10	7.9	1.10	1.5	.50	.8	6.10	7.4	.0
FEB 27...	.8	1.40	1.3	1.10	1.1	.40	.5	7.70	8.3	.0
APR 29...	9.9	1.30	1.2	1.00	1.1	.50	.5	8.00	6.7	.0
JUN 26...	15.0	1.30	1.0	1.10	1.1	.40	.4	6.10	5.7	.0
AUG 25...	15.6	1.00	1.0	1.10	1.0	.50	.5	4.40	5.0	.0

Date	Aluminum, water, fltrd, μg/L (01106)	Aluminum, water, unfltrd recover-able, μg/L (01105)	Iron, water, fltrd, μg/L (01046)	Iron, water, unfltrd recover-able, μg/L (01045)	Manganese, water, fltrd, μg/L (01056)	Manganese, water, unfltrd recover-able, μg/L (01055)	Nickel, water, fltrd, μg/L (01065)	Nickel, water, unfltrd recover-able, μg/L (01067)	Zinc, water, fltrd, μg/L (01090)	Zinc, water, unfltrd recover-able, μg/L (01092)
NOV 21...	1000	1100	220	310	180	220	9.00	20.0	50.0	160
FEB 27...	1000	900	110	130	210	210	<5.00	14.0	54.0	43.0
APR 29...	900	900	160	130	190	190	9.00	9.00	46.0	43.0
JUN 26...	1000	1000	90.0	150	170	150	8.00	17.0	45.0	40.0
AUG 25...	1000	1000	310	260	190	190	15.0	14.0	44.0	40.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157154984 -- Swatara Cr, bl NW Trib, Site B3, near Newtown, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 21...	1145	1028	89203	4.7	391	7.0	11.4	6.1	6.0	119
APR 29...	1145	1028	89203	2.2	406	8.0	11.1	6.2	6.2	138
JUN 26...	1230	1028	89203	4.7	422	14	10.0	5.6	6.5	112
AUG 25...	1145	1028	89203	2.0	299	--	9.8	6.0	6.7	119

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recover-able, mg/L (00929)	ANC, wat fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 21...	7.5	6.10	6.7	3.00	3.2	1.00	1.1	8.20	7.8	3
APR 29...	9.8	6.60	6.6	2.80	3.0	.90	.8	10.3	8.2	3
JUN 26...	15.1	5.20	5.3	2.90	3.1	.80	.7	8.40	9.8	15
AUG 25...	15.1	8.40	8.8	3.40	3.4	.90	.9	8.00	8.7	6

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recover-able, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recover-able, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recover-able, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recover-able, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recover-able, $\mu$ g/L (01092)
NOV 21...	<100	800	1060	1500	490	520	23.0	26.0	77.0	72.0
APR 29...	<100	700	750	1470	450	450	35.0	26.0	67.0	71.0
JUN 26...	100	800	1270	1760	470	460	29.0	37.0	79.0	81.0
AUG 25...	100	600	510	1610	490	530	24.0	32.0	59.0	69.0





**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403955076211801 -- Hegins Mine Discharge Site C0-1, at Newtown, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Chromium, water, fltrd, µg/L (01030)	Cobalt water, fltrd, µg/L (01035)	Copper, water, fltrd, µg/L (01040)	Dyspros- ium, water, fltrd, µg/L (82331)	Erbium, water, fltrd, µg/L (50573)	Euro- pium, water, fltrd, µg/L (50574)	Gado- linium, water, fltrd, µg/L (50575)	Gallium water, fltrd, µg/L (01120)	German- ium, water, fltrd, µg/L (01125)	Gold, water, fltrd, µg/L (82334)
NOV 21...	--	--	--	--	--	--	--	--	--	--
APR 29...	--	--	--	--	--	--	--	--	--	--
JUN 04...	1.50	66.0	24.5	1.00	.580	.260	1.20	.055	.067	.094
26...	--	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	--	--	--	--	--

Date	Holmium water, fltrd, µg/L (50577)	Indium water, fltrd, µg/L (62843)	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Lantha- num, water, fltrd, µg/L (01180)	Lead, water, fltrd, µg/L (01049)	Lithium water, fltrd, µg/L (01130)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)	Molyb- denum, water, fltrd, µg/L (01060)
NOV 21...	--	--	190	290	--	--	--	1650	1720	--
APR 29...	--	--	210	140	--	--	--	1340	1290	--
JUN 04...	.210	<.010	200	--	6.60	3.40	16.0	1060	--	.120
26...	--	--	210	170	--	--	--	1200	1140	--
AUG 25...	--	--	150	190	--	--	--	1250	1330	--

Date	Neodym- ium, water, fltrd, µg/L (50579)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Praseo- dymium, water, fltrd, µg/L (50582)	Rhenium water, fltrd, µg/L (50583)	Rubid- ium, water, fltrd, µg/L (01135)	Samar- ium, water, fltrd, µg/L (82323)	Selen- ium, water, fltrd, µg/L (01145)	Silver, water, fltrd, µg/L (01075)	Stront- ium, water, fltrd, µg/L (01080)
NOV 21...	--	167	177	--	--	--	--	--	--	--
APR 29...	--	138	118	--	--	--	--	--	--	--
JUN 04...	6.50	102	--	1.60	<.020	3.10	1.30	.790	.071	55.5
26...	--	117	105	--	--	--	--	--	--	--
AUG 25...	--	121	117	--	--	--	--	--	--	--

Date	Terbium water, fltrd, µg/L (50586)	Thall- ium, water, fltrd, µg/L (01057)	Thorium water, fltrd, µg/L (82365)	Thulium water, fltrd, µg/L (50587)	Tung- sten, water, fltrd, µg/L (01155)	Vanad- ium, water, fltrd, µg/L (01085)	Ytterb- ium, water, fltrd, µg/L (01194)	Yttrium water, fltrd, µg/L (01201)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)	Uranium natural water, fltrd, µg/L (22703)
NOV 21...	--	--	--	--	--	--	--	--	435	406	--
APR 29...	--	--	--	--	--	--	--	--	337	341	--
JUN 04...	.160	<.050	.010	.087	.031	<.100	.550	4.40	285	--	.490
26...	--	--	--	--	--	--	--	--	326	299	--
AUG 25...	--	--	--	--	--	--	--	--	346	327	--



**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403955076211802 -- Hegins Mine Discharge, Treated, at Newtown, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Chromium, water, fltrd, µg/L (01030)	Cobalt water, fltrd, µg/L (01035)	Copper, water, fltrd, µg/L (01040)	Dyspros- ium, water, fltrd, µg/L (82331)	Erbium, water, fltrd, µg/L (50573)	Euro- pium, water, fltrd, µg/L (50574)	Gado- linium, water, fltrd, µg/L (50575)	Gallium water, fltrd, µg/L (01120)	German- ium, water, fltrd, µg/L (01125)	Gold, water, fltrd, µg/L (82334)
NOV 21...	--	--	--	--	--	--	--	--	--	--
APR 29...	--	--	--	--	--	--	--	--	--	--
JUN 04...	<1.00	65.0	21.5	.940	.560	.260	1.10	<.020	.025	.077
26...	--	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	--	--	--	--	--

Date	Holmium water, fltrd, µg/L (50577)	Indium water, fltrd, µg/L (62843)	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover -able, µg/L (01045)	Lantha- num, water, fltrd, µg/L (01180)	Lead, water, fltrd, µg/L (01049)	Lithium water, fltrd, µg/L (01130)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover -able, µg/L (01055)	Molyb- denum, water, fltrd, µg/L (01060)
NOV 21...	--	--	240	230	--	--	--	1650	1880	--
APR 29...	--	--	90.0	60.0	--	--	--	1300	1240	--
JUN 04...	.190	<.010	155	--	6.50	3.20	16.0	1050	--	.150
26...	--	--	260	100	--	--	--	1120	1100	--
AUG 25...	--	--	160	60.0	--	--	--	1240	1280	--

Date	Neodym- ium, water, fltrd, µg/L (50579)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover -able, µg/L (01067)	Praseo- dymium, water, fltrd, µg/L (50582)	Rhenium water, fltrd, µg/L (50583)	Rubid- ium, water, fltrd, µg/L (01135)	Samar- ium, water, fltrd, µg/L (82323)	Selen- ium, water, fltrd, µg/L (01145)	Silver, water, fltrd, µg/L (01075)	Stront- ium, water, fltrd, µg/L (01080)
NOV 21...	--	158	169	--	--	--	--	--	--	--
APR 29...	--	130	112	--	--	--	--	--	--	--
JUN 04...	6.20	99.5	--	1.60	<.020	3.10	1.30	.740	.036	59.0
26...	--	114	114	--	--	--	--	--	--	--
AUG 25...	--	120	118	--	--	--	--	--	--	--

Date	Terbium water, fltrd, µg/L (50586)	Thall- ium, water, fltrd, µg/L (01057)	Thorium water, fltrd, µg/L (82365)	Thulium water, fltrd, µg/L (50587)	Tung- sten, water, fltrd, µg/L (01155)	Vanad- ium, water, fltrd, µg/L (01085)	Ytterb- ium, water, fltrd, µg/L (01194)	Yttrium water, fltrd, µg/L (01201)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover -able, µg/L (01092)	Uranium natural water, fltrd, µg/L (22703)
NOV 21...	--	--	--	--	--	--	--	--	449	411	--
APR 29...	--	--	--	--	--	--	--	--	333	327	--
JUN 04...	.160	<.050	<.010	.087	.020	<.100	.530	4.20	286	--	.470
26...	--	--	--	--	--	--	--	--	310	292	--
AUG 25...	--	--	--	--	--	--	--	--	333	314	--

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157155012 -- Swatara Creek, Site C2, at Newtown, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unf μS/cm 25 degC (00095)
NOV 21...	1015	1028	89203	.11	483	16	10.9	5.3	5.2	158
FEB 27...	1315	1028	89203	.38	410	1.0	14.3	5.8	5.3	153
APR 29...	1015	1028	89203	.42	436	4.0	10.8	5.8	5.9	364
JUN 26...	1115	1028	89203	1.6	453	17	10.1	5.3	6.4	145
AUG 25...	1015	1028	89203	.41	353	--	9.8	6.2	6.4	154

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recover-able, mg/L (00929)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 21...	6.8	7.40	8.1	6.90	7.1	1.10	.9	5.90	7.1	2
FEB 27...	1.3	7.90	7.9	5.70	6.0	.90	.9	7.80	8.3	2
APR 29...	10.0	8.50	8.4	5.70	6.0	.90	.9	9.00	7.4	3
JUN 26...	14.8	7.50	10.7	6.00	6.8	.90	.8	7.10	7.3	5
AUG 25...	14.3	10.0	10.2	6.70	6.7	.90	1.0	6.60	7.4	4

Date	Aluminum, water, fltrd, μg/L (01106)	Aluminum, water, unfltrd recover-able, μg/L (01105)	Iron, water, fltrd, μg/L (01046)	Iron, water, unfltrd recover-able, μg/L (01045)	Manganese, water, fltrd, μg/L (01056)	Manganese, water, unfltrd recover-able, μg/L (01055)	Nickel, water, fltrd, μg/L (01065)	Nickel, water, unfltrd recover-able, μg/L (01067)	Zinc, water, fltrd, μg/L (01090)	Zinc, water, unfltrd recover-able, μg/L (01092)
NOV 21...	800	1100	580	740	570	550	44.0	68.0	111	117
FEB 27...	300	800	370	420	450	410	32.0	36.0	90.0	75.0
APR 29...	200	800	390	680	450	430	29.0	31.0	82.0	85.0
JUN 26...	300	1000	640	1080	480	480	32.0	35.0	98.0	98.0
AUG 25...	<100	700	210	640	490	490	31.0	37.0	84.0	79.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403745076271901 -- Tracy Airhole, Site E1-229, near Donaldson, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	
JUN 04...	1100	1028	1028	3.4	310	32	1.8	18	5.9	6.5	
Date	Specif. conductance, $\mu$ S/cm 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recover, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recover, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recover, mg/L (00929)	
JUN 04...	540	10.9	32.9	--	32.5	--	1.85	--	8.35	--	
Date	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)	Acidity water, unfltrd heated, mg/L as CaCO3 (70508)	Acidity water, unfltrd, mg/L as CaCO3 (00435)	Chloride water, fltrd, mg/L (00940)	Fluoride water, fltrd, mg/L (00950)	Silica water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Orthophosphate water, fltrd, mg/L as P (00671)	Phosphorus water, fltrd, mg/L (00666)	
JUN 04...	41.0	<22.7	55.0	16.2	.10	8.15	202	.20	<.040	<.001	
Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recover, $\mu$ g/L (01105)	Antimony, water, fltrd, $\mu$ g/L (01095)	Arsenic water, fltrd, $\mu$ g/L (01000)	Barium, water, fltrd, $\mu$ g/L (01005)	Beryllium, water, fltrd, $\mu$ g/L (01010)	Bismuth water, fltrd, $\mu$ g/L (01015)	Bromine water, unfltrd, mg/L (71871)	Cadmium water, fltrd, $\mu$ g/L (01025)	Cerium, water, fltrd, $\mu$ g/L (01110)	Cesium, water, fltrd, $\mu$ g/L (01115)
JUN 04...	9.30	--	.030	<1.00	22.0	.250	<.020	<.06	.140	.180	.072

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403745076271901 -- Tracy Airhole, Site E1-229, near Donaldson, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Chrom- ium, water, fltrd, µg/L (01030)	Cobalt water, fltrd, µg/L (01035)	Copper, water, fltrd, µg/L (01040)	Dyspros- ium, water, fltrd, µg/L (82331)	Erbium, water, fltrd, µg/L (50573)	Euro- pium, water, fltrd, µg/L (50574)	Gado- linium, water, fltrd, µg/L (50575)	Gallium water, fltrd, µg/L (01120)	German- ium, water, fltrd, µg/L (01125)	Gold, water, fltrd, µg/L (82334)	
JUN 04...	<1.00	36.0	.780	.025	.015	<.005	.023	.039	<.020	<.010	
Date	Holmium water, fltrd, µg/L (50577)	Indium water, fltrd, µg/L (62843)	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Lantha- num, water, fltrd, µg/L (01180)	Lead, water, fltrd, µg/L (01049)	Lithium water, fltrd, µg/L (01130)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)	Molyb- denum, water, fltrd, µg/L (01060)	
JUN 04...	.007	<.010	10200	--	.120	<.050	23.0	1860	--	.071	
Date	Neodym- ium, water, fltrd, µg/L (50579)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Praseo- dymium, water, fltrd, µg/L (50582)	Rhenium water, fltrd, µg/L (50583)	Rubid- ium, water, fltrd, µg/L (01135)	Samar- ium, water, fltrd, µg/L (82323)	Selen- ium, water, fltrd, µg/L (01145)	Silver, water, fltrd, µg/L (01075)	Stront- ium, water, fltrd, µg/L (01080)	
JUN 04...	.073	44.0	--	.017	<.020	2.90	.014	<.200	.015	150	
Date	Terbium water, fltrd, µg/L (50586)	Thall- ium, water, fltrd, µg/L (01057)	Thorium water, fltrd, µg/L (82365)	Thulium water, fltrd, µg/L (50587)	Tung- sten, water, fltrd, µg/L (01155)	Vanad- ium, water, fltrd, µg/L (01085)	Ytterb- ium, water, fltrd, µg/L (01194)	Yttrium water, fltrd, µg/L (01201)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)	Uranium natural water, fltrd, µg/L (22703)
JUN 04...	<.005	<.050	<.010	<.005	<.020	<.100	.014	.280	31.5	--	.016

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571593 -- Good Spring Creek bl Middle Creek at Tremont, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)
OCT 02...	1400	1028	9801	9.1	360	--	10.1	105	6.9	6.2
NOV 21...	0930	1028	89203	15	429	4.0	11.7	93	5.9	6.4
FEB 27...	1015	1028	89203	15	423	3.0	13.9	100	6.7	6.6
APR 29...	0915	1028	89203	28	388	10	11.1	98	6.6	6.6
JUN 26...	1030	1028	89203	15	359	20	10.2	100	6.2	6.1
AUG 25...	0930	1028	89203	15	272	--	10.0	98	6.7	6.7

Date	Specific conductance, wat unfltrd, $\mu$ S/cm 25 degC (00095)	Temperature, water, deg C (00010)	Calcium, water, fltrd, mg/L (00915)	Calcium, water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)
OCT 02...	340	15.7	23.2	23.0	17.5	17.4	2.15	2.2	9.80	9.8
NOV 21...	148	5.7	12.8	--	6.40	--	1.20	--	3.70	--
FEB 27...	294	2.1	10.6	--	6.20	--	.90	--	4.80	--
APR 29...	321	10.1	11.6	12.0	7.00	7.6	.90	1.1	5.20	3.9
JUN 26...	238	14.2	14.4	16.0	12.1	13.8	1.60	1.7	8.00	8.2
AUG 25...	338	14.2	25.6	24.2	20.3	20.7	1.80	1.8	9.00	9.6

Date	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)	Acidity, water, unfltrd, mg/L as CaCO3 (00435)	Silica, water, fltrd, mg/L (00955)	Silica, water, unfltrd, mg/L (00956)	Sulfate, water, fltrd, mg/L (00945)	Sulfate, water, unfltrd, mg/L (00946)	Phosphorus, water, fltrd, mg/L (00666)	Phosphorus, water, unfltrd, mg/L (00665)	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)
OCT 02...	9.00	.000	8.39	8.64	110	120	<.003	<.003	34.5	405
NOV 21...	5.80	--	--	--	--	--	--	--	200	--
FEB 27...	19.0	.000	--	--	--	--	--	--	100	--
APR 29...	7.50	--	--	--	--	--	--	--	<100	400
JUN 26...	3.80	--	--	--	--	--	--	--	<100	1200
AUG 25...	11.5	.000	--	--	--	--	--	--	<100	600





**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571593 -- Good Spring Creek bl Middle Creek at Tremont, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Gallium water, fltrd, µg/L (01120)	Gallium water, unfltrd µg/L (01122)	German- ium, water, fltrd, µg/L (01125)	German- ium, water, unfltrd µg/L (01127)	Gold, water, fltrd, µg/L (82334)	Gold, water, unfltrd µg/L (71910)	Holmium water, fltrd, µg/L (50577)	Holmium water, unfltrd µg/L (01247)	Indium water, fltrd, µg/L (62843)	Indium, water, unfltrd µg/L (01168)
OCT 02...	<.020	<.020	<.020	<.020	<.010	<.010	.010	.030	<.010	<.010
NOV 21...	--	--	--	--	--	--	--	--	--	--
FEB 27...	--	--	--	--	--	--	--	--	--	--
APR 29...	--	--	--	--	--	--	--	--	--	--
JUN 26...	--	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	--	--	--	--	--

Date	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Lantha- num, water, fltrd, µg/L (01180)	Lantha- num, water, unfltrd µg/L (01182)	Lead, water, fltrd, µg/L (01049)	Lead, water, unfltrd recover- able, µg/L (01051)	Lithium water, fltrd, µg/L (01130)	Lithium water, unfltrd recover- able, µg/L (01132)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)
OCT 02...	400	935	.500	.670	<.050	.400	17.5	17.0	1000	1010
NOV 21...	190	--	--	--	--	--	--	--	710	--
FEB 27...	300	--	--	--	--	--	--	--	650	--
APR 29...	100	260	--	--	--	--	--	--	560	570
JUN 26...	1220	2220	--	--	--	--	--	--	820	870
AUG 25...	480	1940	--	--	--	--	--	--	1230	1250

Date	Molyb- denum, water, fltrd, µg/L (01060)	Molyb- denum, water, unfltrd recover- able, µg/L (01062)	Neodym- ium, water, fltrd, µg/L (50579)	Neodym- ium, water, unfltrd µg/L (01237)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Praseo- dymium, water, fltrd, µg/L (50582)	Praseo- dymium, water, unfltrd µg/L (01238)	Rhenium water, fltrd, µg/L (50583)	Rhenium water, unfltrd µg/L (01242)
OCT 02...	.090	.090	.310	.660	35.5	36.5	.080	.200	<.020	<.020
NOV 21...	--	--	--	--	22.0	--	--	--	--	--
FEB 27...	--	--	--	--	29.0	--	--	--	--	--
APR 29...	--	--	--	--	31.0	34.0	--	--	--	--
JUN 26...	--	--	--	--	45.0	54.0	--	--	--	--
AUG 25...	--	--	--	--	43.0	40.0	--	--	--	--

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571593 -- Good Spring Creek bl Middle Creek at Tremont, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Rubidium, water, fltrd, µg/L (01135)	Rubidium, water, unfltrd µg/L (01137)	Samarium, water, fltrd, µg/L (82323)	Samarium, water, unfltrd µg/L (82322)	Selenium, water, fltrd, µg/L (01145)	Selenium, water, unfltrd µg/L (01147)	Silver, water, fltrd, µg/L (01075)	Silver, water, unfltrd recover- able, µg/L (01077)	Strontium, water, fltrd, µg/L (01080)	Strontium, water, unfltrd recover- able, µg/L (01082)
OCT 02...	2.50	2.40	.050	.100	<.200	<.200	.060	.100	126	124
NOV 21...	--	--	--	--	--	--	--	--	--	--
FEB 27...	--	--	--	--	--	--	--	--	--	--
APR 29...	--	--	--	--	--	--	--	--	--	--
JUN 26...	--	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	--	--	--	--	--

Date	Terbium water, fltrd, µg/L (50586)	Terbium water, unfltrd µg/L (01218)	Thallium, water, fltrd, µg/L (01057)	Thallium, water, unfltrd µg/L (01059)	Thorium water, fltrd, µg/L (82365)	Thorium water, unfltrd µg/L (82364)	Thulium water, fltrd, µg/L (50587)	Thulium water, unfltrd µg/L (01245)	Tungsten, water, fltrd, µg/L (01155)	Tungsten, water, unfltrd µg/L (01154)
OCT 02...	.010	.030	<.050	<.050	<.040	<.040	<.005	.010	.070	.070
NOV 21...	--	--	--	--	--	--	--	--	--	--
FEB 27...	--	--	--	--	--	--	--	--	--	--
APR 29...	--	--	--	--	--	--	--	--	--	--
JUN 26...	--	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	--	--	--	--	--

Date	Vanadium, water, fltrd, µg/L (01085)	Vanadium, water, unfltrd µg/L (01087)	Ytterbium, water, fltrd, µg/L (01194)	Ytterbium, water, unfltrd µg/L (01196)	Yttrium water, fltrd, µg/L (01201)	Yttrium water, unfltrd µg/L (01203)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover- able, µg/L (01092)	Uranium natural water, fltrd, µg/L (22703)	Uranium natural water, unfltrd µg/L (28011)
OCT 02...	<.100	<.100	.020	.080	.500	.950	77.0	78.0	.020	.060
NOV 21...	--	--	--	--	--	--	149	--	--	--
FEB 27...	--	--	--	--	--	--	212	--	--	--
APR 29...	--	--	--	--	--	--	94.0	76.0	--	--
JUN 26...	--	--	--	--	--	--	134	132	--	--
AUG 25...	--	--	--	--	--	--	96.0	93.0	--	--

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571552 -- Swatara Creek at Tremont, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 21...	0830	1028	89203	2.2	363	7.0	11.6	6.5	5.9	212
FEB 27...	0915	1028	89203	15	458	2.0	14.6	6.4	6.2	170
APR 29...	0900	1028	89203	19	378	7.0	10.6	6.6	6.6	177
JUN 26...	0915	1028	89203	36	369	7.0	9.8	6.9	6.3	150
AUG 25...	0915	1028	89203	12	319	--	9.5	6.5	6.5	194

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recoverable, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water unfltrd recoverable, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water unfltrd recoverable, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 21...	7.1	14.2	13.0	10.0	10.0	2.20	1.9	7.80	8.9	3
FEB 27...	.3	18.3	19.4	14.2	14.5	2.00	1.9	11.1	11.6	15
APR 29...	11.2	20.0	20.0	16.7	18.0	1.70	1.7	10.5	8.7	7
JUN 26...	15.6	10.3	10.9	6.70	7.5	.80	.9	3.90	4.8	5
AUG 25...	15.7	16.8	16.0	9.40	9.3	1.30	1.4	5.60	6.4	6

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 21...	<100	600	710	1230	730	720	31.0	42.0	86.0	86.0
FEB 27...	<100	500	1560	2030	980	900	32.0	36.0	85.0	71.0
APR 29...	<100	700	850	1750	990	990	47.0	50.0	97.0	105
JUN 26...	<100	600	190	520	550	580	36.0	35.0	90.0	79.0
AUG 25...	<100	100	260	200	810	810	41.0	40.0	102	89.0



**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571774 -- Lorberry Creek, Site E2-0, at Lorberry, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	1330	1028	89203	1.9	403	12	10.1	5.7	5.3	374
DEC 19...	1345	1028	89203	7.1	447	22	10.2	6.1	6.0	303
MAR 05...	1530	1028	89203	1.5	252	6.0	10.7	6.9	6.5	307
APR 03...	1400	1028	89203	8.4	462	31	10.5	5.3	5.0	260
MAY 01...	1415	1028	89203	3.0	346	34	10.3	6.4	6.3	251
JUN 03...	1330	1028	89203	7.6	368	35	10.6	6.2	6.0	268
JUL 23...	1445	1028	89203	7.0	416	25	10.7	5.6	5.0	287
AUG 19...	1345	1028	89203	8.1	281	38	10.3	6.4	6.3	266
SEP 24...	1430	1028	89203	8.1	456	34	10.8	5.8	5.5	290

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, recoverable, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, recoverable, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, recoverable, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	12.0	16.9	20.7	29.2	33.4	1.50	1.5	3.40	4.3	2
DEC 19...	11.3	13.3	13.2	23.3	23.4	1.50	1.2	4.30	3.4	4
MAR 05...	10.8	11.9	13.8	21.4	25.4	1.10	1.2	4.30	3.8	15
APR 03...	11.9	11.0	11.1	18.4	20.4	1.20	1.1	3.80	3.0	2
MAY 01...	12.8	11.1	10.5	18.8	19.5	1.20	1.0	4.10	3.2	6
JUN 03...	11.7	10.3	10.0	19.4	19.8	1.10	1.1	4.10	4.8	4
JUL 23...	13.1	13.6	14.9	21.2	23.1	1.20	1.3	2.90	3.7	1
AUG 19...	12.3	10.3	11.1	20.1	21.6	1.20	1.2	3.70	4.3	9
SEP 24...	12.2	11.5	12.3	22.6	24.2	1.10	1.3	3.50	4.8	4

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, fltrd, recoverable, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, fltrd, recoverable, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, fltrd, recoverable, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, fltrd, recoverable, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 14...	200	1600	7420	9500	2310	2630	106	112	285	261
DEC 19...	<100	1100	6470	8230	2030	1790	96.0	80.0	213	180
MAR 05...	<100	900	7710	8950	1700	1840	62.0	61.0	102	104
APR 03...	700	1000	2570	4540	1680	1680	87.0	73.0	230	225
MAY 01...	<100	800	4210	5880	1680	1590	66.0	64.0	163	161
JUN 03...	100	900	4220	5650	1630	1530	67.0	59.0	163	153
JUL 23...	200	1000	3960	6280	1760	1940	87.0	84.0	220	223
AUG 19...	<100	700	4580	6620	1650	1790	68.0	57.0	149	147
SEP 24...	200	1300	3840	7240	1600	1790	75.0	73.0	199	192

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571776 -- Stumps Run at Lorberry, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conductance, wat unfltrd, $\mu$ S/cm 25 degC (00095)
NOV 14...	1315	1028	89203	2.3	420	.0	10.5	5.8	5.8	75
DEC 19...	1330	1028	89203	4.5	445	.0	12.2	6.0	5.9	72
MAR 05...	1515	1028	89203	.72	405	.0	12.8	6.0	5.8	70
APR 03...	1345	1028	89203	2.3	432	.0	11.3	5.8	6.1	69
MAY 01...	1400	1028	89203	.71	500	1.0	10.3	5.8	6.0	46
JUN 03...	1315	1028	89203	2.3	430	.0	10.5	6.0	6.0	49
JUL 23...	1430	1028	89203	.56	435	14	9.5	5.8	5.8	39
AUG 19...	1330	1028	89203	1.1	339	11	9.1	6.8	6.1	49
SEP 24...	1415	1028	89203	4.2	417	1.3	9.8	6.3	6.3	44

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	9.9	4.80	5.8	3.00	3.3	.70	.8	.80	.7	3
DEC 19...	4.7	4.40	4.1	2.90	2.8	.70	.7	.60	.6	3
MAR 05...	4.1	3.90	4.1	2.40	2.7	.60	.6	.90	.4	4
APR 03...	9.0	3.70	3.9	2.40	2.5	.60	.7	.70	.6	3
MAY 01...	12.7	3.50	3.3	2.20	2.2	.70	.6	.90	.6	3
JUN 03...	11.5	3.90	3.8	2.20	2.3	.70	.5	.80	<.1	3
JUL 23...	16.0	3.20	2.8	1.90	1.7	.60	.7	.70	.7	4
AUG 19...	17.3	3.80	3.8	2.30	2.3	.80	.7	.70	.8	4
SEP 24...	16.0	7.30	4.0	4.00	2.0	.90	.9	1.00	.8	4

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 14...	<100	<100	150	<10.0	100	100	9.00	13.0	63.0	65.0
DEC 19...	<100	<100	80.0	30.0	70.0	50.0	18.0	10.0	54.0	44.0
MAR 05...	<100	<100	110	40.0	40.0	40.0	<5.00	9.00	37.0	36.0
APR 03...	<100	<100	60.0	40.0	50.0	50.0	6.00	12.0	40.0	40.0
MAY 01...	<100	<100	220	90.0	30.0	40.0	<5.00	10.0	42.0	41.0
JUN 03...	<100	<100	130	60.0	40.0	50.0	9.00	6.00	32.0	33.0
JUL 23...	<100	100	310	350	50.0	120	<5.00	13.0	37.0	30.0
AUG 19...	<100	<100	90.0	20.0	30.0	30.0	<5.00	11.0	30.0	25.0
SEP 24...	100	<100	360	80.0	160	100	19.0	9.00	58.0	36.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157177610 -- Lorberry Creek Wetlands Inflow at Lorberry, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	1255	1028	89203	1.9	427	13	9.9	5.4	5.3	393
DEC 19...	1320	1028	89203	1.9	414	26	9.8	5.9	6.0	312
MAR 05...	1510	1028	89203	1.3	337	8.0	10.6	6.4	6.2	316
APR 03...	1330	1028	89203	2.2	492	36	10.6	5.1	5.0	262
MAY 01...	1340	1028	89203	1.2	434	39	10.1	5.8	6.0	262
JUN 03...	1300	1028	89203	1.1	424	27	10.1	5.7	5.5	277
JUL 23...	1410	1028	89203	2.9	418	19	10.8	5.5	5.0	326
AUG 19...	1315	1028	89203	1.7	367	40	10.1	5.6	6.0	273
SEP 24...	1400	1028	89203	1.3	374	31	9.9	6.4	5.6	333

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, mg/L (00915)	Calcium water, unfltrd recover-able, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recover-able, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recover-able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover-able, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	12.4	17.3	20.9	30.6	35.1	1.40	1.4	3.90	3.9	2
DEC 19...	11.6	14.8	16.2	24.3	24.6	1.20	1.2	4.10	3.6	12
MAR 05...	11.6	12.5	13.2	24.2	27.3	1.20	1.2	3.60	3.0	14
APR 03...	12.0	11.5	12.7	19.3	21.9	1.30	1.2	3.80	3.6	3
MAY 01...	12.5	11.0	11.0	19.4	20.2	1.10	1.2	4.10	2.1	8
JUN 03...	11.9	11.2	11.1	20.8	21.4	1.30	1.2	5.00	4.2	5
JUL 23...	12.5	15.1	15.8	23.5	24.6	1.20	1.3	3.50	3.4	2
AUG 19...	12.4	11.4	12.0	22.4	21.8	1.15	1.2	4.19	4.1	10
SEP 24...	12.4	12.6	14.9	24.3	25.9	1.30	1.5	3.70	4.7	6

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recover-able, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recover-able, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recover-able, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recover-able, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recover-able, $\mu$ g/L (01092)
NOV 14...	700	1700	8220	10800	2480	2750	114	111	303	284
DEC 19...	200	1200	7150	9190	2120	1970	85.0	79.0	205	180
MAR 05...	<100	1000	9220	10600	1990	2010	66.0	70.0	120	114
APR 03...	900	1100	2910	5170	1860	1870	93.0	89.0	237	251
MAY 01...	300	800	4560	6300	1800	1690	70.0	67.0	169	165
JUN 03...	500	900	4770	6270	1810	1700	82.0	70.0	170	167
JUL 23...	500	1100	4630	6500	1990	2110	88.0	83.0	257	252
AUG 19...	254	770	5360	6790	1880	1830	60.7	63.5	137	137
SEP 24...	600	1300	4250	7010	1740	1850	92.0	76.0	209	204



**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157177612 -- Lorberry Cr Wetlands Cell 1 Outflow at Lorberry, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd μS/cm 25 degC (00095)
NOV 14...	1245	1028	89203	1.3	427	13	10.1	5.3	5.1	393
DEC 19...	1310	1028	89203	1.6	353	22	10.1	6.4	6.5	304
MAR 05...	1500	1028	89203	1.5	306	13	10.5	6.5	6.4	324
APR 03...	1320	1028	89203	1.8	483	32	10.6	5.2	5.1	273
MAY 01...	1330	1028	89203	1.7	425	47	10.2	5.8	6.0	263

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water unfltrd recover-able, mg/L (00929)	ANC, wat unfltrd fixed end pt, mg/L as CaCO3 (00417)
NOV 14...	13.5	17.7	21.8	30.7	35.7	1.30	1.5	4.00	3.9	2
DEC 19...	11.5	16.7	--	25.1	--	1.30	--	4.20	--	17
MAR 05...	12.3	12.6	12.6	25.6	27.1	1.20	1.3	3.10	3.3	13
APR 03...	13.2	12.3	12.9	19.5	22.1	1.30	1.3	3.90	3.7	2
MAY 01...	14.2	11.4	11.0	19.2	20.4	1.20	.9	3.80	3.4	7

Date	Aluminum, water, fltrd, μg/L (01106)	Aluminum, water, unfltrd recover-able, μg/L (01105)	Iron, water, fltrd, μg/L (01046)	Iron, water, unfltrd recover-able, μg/L (01045)	Manganese, water, fltrd, μg/L (01056)	Manganese, water, unfltrd recover-able, μg/L (01055)	Nickel, water, fltrd, μg/L (01065)	Nickel, water, unfltrd recover-able, μg/L (01067)	Zinc, water, fltrd, μg/L (01090)	Zinc, water, unfltrd recover-able, μg/L (01092)
NOV 14...	500	1900	8240	10900	2580	2910	118	131	313	307
DEC 19...	<100	--	7320	--	2030	--	75.0	--	144	--
MAR 05...	<100	900	9450	9550	2040	1890	70.0	69.0	126	110
APR 03...	600	1100	2630	4960	1830	1900	100	89.0	238	251
MAY 01...	<100	800	4010	7760	1780	1710	70.0	75.0	167	168

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157177614 -- Lorberry Cr Wetlands Cell 2 Outflow at Lorberry,PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	1235	1028	89203	1.3	429	16	10.3	5.3	5.2	394
DEC 19...	1300	1028	89203	1.5	326	22	10.3	6.6	6.7	304
MAR 05...	1450	1028	89203	1.3	297	10	10.3	6.6	6.4	323
APR 03...	1310	1028	89203	1.6	465	29	10.5	5.2	5.2	273
MAY 01...	1320	1028	89203	1.5	410	39	10.2	5.8	6.1	263
JUN 03...	1245	1028	89203	1.5	409	30	10.3	5.8	5.8	282
JUL 23...	1400	1028	89203	.95	411	21	10.6	5.2	5.0	316
AUG 19...	1300	1028	89203	1.9	378	29	10.0	5.4	5.8	286
SEP 24...	1345	1028	89203	.69	365	11	10.4	6.2	6.4	340

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, mg/L (00915)	Calcium water, unfltrd recover-able, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recover-able, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recover-able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover-able, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	13.7	--	21.3	--	35.1	--	1.6	--	3.8	2
DEC 19...	11.4	15.7	14.9	23.9	22.8	1.20	1.2	3.90	3.2	17
MAR 05...	12.9	12.6	12.8	25.7	26.8	1.30	1.1	3.30	3.4	16
APR 03...	15.8	12.9	13.1	20.8	22.5	1.40	1.3	3.90	2.9	2
MAY 01...	15.0	11.2	10.8	19.3	20.0	1.10	1.1	3.60	3.6	7
JUN 03...	12.7	11.7	11.0	21.0	21.4	1.20	1.0	5.50	4.3	5
JUL 23...	15.6	15.7	16.0	23.9	24.5	1.30	1.4	3.30	3.4	2
AUG 19...	16.9	12.8	13.6	22.8	23.0	1.19	1.3	4.00	4.0	6
SEP 24...	17.0	19.0	20.0	26.2	27.7	1.20	1.3	3.00	4.4	16

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recover-able, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recover-able, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recover-able, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recover-able, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recover-able, $\mu$ g/L (01092)
NOV 14...	--	1900	--	10700	--	2910	--	126	--	313
DEC 19...	<100	900	7060	7970	1950	1790	71.0	71.0	139	120
MAR 05...	<100	900	9060	9310	2030	1910	68.0	57.0	124	107
APR 03...	600	1000	2550	4790	1960	1920	100	86.0	253	250
MAY 01...	<100	700	4090	5660	1790	1670	71.0	68.0	168	172
JUN 03...	100	1100	3960	6700	1810	1640	76.0	66.0	165	164
JUL 23...	300	1000	3840	5920	2090	2100	99.0	88.0	273	255
AUG 19...	<100	740	3680	5430	1970	1990	69.1	68.5	182	178
SEP 24...	<100	700	2440	4630	1740	1850	70.0	87.0	183	187

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157177616 -- Lorberry Cr Wetlands Cell 3 Outflow at Lorberry, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	1225	1028	89203	1.4	403	13	10.3	5.6	5.3	384
DEC 19...	1250	1028	89203	1.7	297	20	10.8	6.7	6.7	304
MAR 05...	1440	1028	89203	1.4	277	13	10.1	6.6	6.5	322
APR 03...	1300	1028	89203	1.7	454	42	10.3	5.3	5.2	274
MAY 01...	1310	1028	89203	1.5	395	41	10.2	5.9	6.1	263

Date	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover-able, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water unfltrd recover-able, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water unfltrd recover-able, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water unfltrd recover-able, mg/L (00929)	ANC, wat unfltrd fixed end pt, mg/L as CaCO3 (00417)
NOV 14...	13.3	18.0	22.0	31.4	35.7	1.50	1.6	4.20	3.7	2
DEC 19...	11.4	15.4	16.2	22.7	23.7	1.20	1.3	4.30	3.4	17
MAR 05...	13.6	12.7	13.2	25.5	26.8	1.30	1.3	3.00	3.0	14
APR 03...	17.0	12.5	12.6	19.5	21.9	1.20	1.4	3.50	2.9	2
MAY 01...	15.3	11.8	11.2	19.8	20.4	1.30	1.1	4.00	2.2	7

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recover-able, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recover-able, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recover-able, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recover-able, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recover-able, $\mu$ g/L (01092)
NOV 14...	300	1800	7830	10600	2580	2990	134	119	312	297
DEC 19...	<100	900	6450	7800	1910	1890	70.0	61.0	133	121
MAR 05...	<100	900	8670	9110	2020	1940	64.0	63.0	117	107
APR 03...	400	1000	2430	4530	1840	1860	95.0	94.0	244	248
MAY 01...	<100	700	3720	5640	1810	1700	78.0	69.0	194	165

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157177618 -- Lorberry Cr Wetlands Cell 4 Outflow at Lorberry, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	1215	1028	89203	2.0	393	13	10.2	5.6	5.3	390
DEC 19...	1240	1028	89203	2.5	328	24	10.7	6.6	6.6	302
MAR 05...	1430	1028	89203	2.1	265	12	9.9	6.6	6.5	320
APR 03...	1250	1028	89203	2.5	438	27	10.2	5.3	5.2	272
MAY 01...	1300	1028	89203	2.5	378	44	10.2	6.0	6.2	263
JUN 03...	1230	1028	89203	1.9	392	34	10.3	6.0	5.9	282
JUL 23...	1350	1028	89203	2.1	409	14	10.2	5.2	5.1	319
AUG 19...	1250	1028	89203	2.2	366	26	9.7	5.5	5.8	279
SEP 24...	1330	1028	89203	1.2	349	6.2	10.0	6.3	6.3	329

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, mg/L (00915)	Calcium water, unfltrd recover-able, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recover-able, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recover-able, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recover-able, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	13.8	17.3	21.7	29.8	35.9	1.30	1.6	4.50	4.5	2
DEC 19...	11.0	16.2	--	24.1	--	1.20	--	3.80	--	16
MAR 05...	13.5	12.7	12.8	25.6	26.3	1.30	1.2	3.20	3.0	12
APR 03...	17.8	12.7	12.8	20.0	22.3	1.30	1.2	4.00	4.1	2
MAY 01...	15.8	11.5	11.5	19.7	21.2	1.10	1.1	3.60	3.0	6
JUN 03...	13.3	11.2	11.9	19.9	22.5	1.10	1.1	5.10	4.7	4
JUL 23...	17.5	15.4	15.5	23.5	24.0	1.30	1.3	3.50	3.2	2
AUG 19...	20.4	14.2	13.1	23.2	22.2	1.28	1.2	4.21	3.9	4
SEP 24...	19.0	16.2	17.4	26.9	28.7	1.20	1.5	3.30	4.3	8

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recover-able, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recover-able, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recover-able, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recover-able, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recover-able, $\mu$ g/L (01092)
NOV 14...	200	1700	7420	10200	2440	2820	127	122	305	293
DEC 19...	<100	--	6290	--	1980	--	70.0	--	131	--
MAR 05...	<100	900	8370	8950	2000	1880	65.0	63.0	118	105
APR 03...	300	1000	2770	4370	1890	1900	96.0	86.0	239	246
MAY 01...	<100	700	3610	5750	1820	1760	68.0	63.0	172	164
JUN 03...	<100	1000	3450	6010	1720	1750	74.0	68.0	165	168
JUL 23...	300	800	3430	5120	2000	2060	90.0	95.0	263	251
AUG 19...	<100	636	2840	4330	2020	1930	71.4	78.6	189	187
SEP 24...	<100	400	2680	3790	1830	1960	90.0	92.0	213	208

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403530076262601 -- Piped Discharge near Cell 1, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXID-ATION RED-UCTION POTENTIAL (MV) (00090)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, (PER-CENT SATURATION) (00301)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	PH WATER WHOLE LAB (STANDARD UNITS) (00403)	SPECIFIC CONDUCTANCE (µS/CM) (00095)
NOV 28...	1440	1028	930	<.01	530	9.1	82	4.9	6.0	52.0
DEC 18...	1410	1028	930	<.01	440	11	98	5.5	5.9	52.0
JAN 08...	1330	1028	930	<.01	530	10	86	5.3	5.8	49.0
JAN 29...	1445	1028	930	<.01	430	10	90	5.6	5.8	480
Date	TEMPERATURE WATER (DEG C) (00010)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	CALCIUM TOTAL RECOVERABLE (MG/L AS CA) (00916)	MAGNESIUM, DIS-SOLVED (MG/L AS MG) (00925)	MAGNESIUM, TOTAL RECOVERABLE (MG/L AS MG) (00927)	POTASSIUM, DIS-SOLVED (MG/L AS K) (00935)	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K) (00937)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM, TOTAL RECOVERABLE (MG/L AS NA) (00929)	ACIDITY TOTAL HEATED AS CAC03 (70508)
NOV 28...	10.5	3.5	3.3	2.2	2.0	.56	.6	.9	.8	--
DEC 18...	8.70	3.3	3.2	2.4	2.4	.48	.9	.9	.9	<5.0
JAN 08...	6.70	3.2	3.1	2.5	2.4	.44	.5	1.1	.9	--
JAN 29...	8.90	3.4	3.2	2.7	2.5	.46	.5	.89	.8	--
Date	ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	ALUMINUM, DIS-SOLVED (µG/L AS AL) (01106)	ALUMINUM, TOTAL RECOVERABLE (µG/L AS AL) (01105)	ARSENIC, DIS-SOLVED (µG/L AS AS) (01000)	ARSENIC, TOTAL (µG/L AS AS) (01002)	BARIUM, DIS-SOLVED (µG/L AS BA) (01005)	BARIUM, TOTAL RECOVERABLE (µG/L AS BA) (01007)	CADMIUM, DIS-SOLVED (µG/L AS CD) (01025)	CADMIUM, TOTAL UNFLTRD (µG/L AS CD) (01027)
NOV 28...	5.6	14	60	110	<40	<40	19	21	<3.0	<3.0
DEC 18...	--	14	80	1800	<40	<40	18	27	<3.0	<3.0
JAN 08...	5.7	13	50	70	<40	<40	14	14	<3.0	<3.0
JAN 29...	6.1	14	60	200	<40	<40	13	14	<3.0	<3.0
Date	CHROMIUM, DIS-SOLVED (µG/L AS CR) (01030)	CHROMIUM, TOTAL RECOVERABLE (µG/L AS CR) (01034)	COBALT, DIS-SOLVED (µG/L AS CO) (01035)	COBALT, TOTAL RECOVERABLE (µG/L AS CO) (01037)	COPPER, DIS-SOLVED (µG/L AS CU) (01040)	COPPER, TOTAL RECOVERABLE (µG/L AS CU) (01042)	IRON, DIS-SOLVED (µG/L AS FE) (01046)	IRON, TOTAL RECOVERABLE (µG/L AS FE) (01045)	LEAD, DIS-SOLVED (µG/L AS PB) (01049)	LEAD, TOTAL RECOVERABLE (µG/L AS PB) (01051)
NOV 28...	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	20	100	<40	<40
DEC 18...	<3.0	3.0	<3.0	3.0	<3.0	<3.0	120	1900	<40	<40
JAN 08...	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	20	20	<40	<40
JAN 29...	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	290	470	<40	<40
Date	MANGANESE, DIS-SOLVED (µG/L AS MN) (01056)	MANGANESE, TOTAL RECOVERABLE (µG/L AS MN) (01055)	NICKEL, DIS-SOLVED (µG/L AS NI) (01065)	NICKEL, TOTAL RECOVERABLE (µG/L AS NI) (01067)	SELENIUM, DIS-SOLVED (µG/L AS SE) (01145)	SELENIUM, TOTAL (µG/L AS SE) (01147)	ZINC, DIS-SOLVED (µG/L AS ZN) (01090)	ZINC, TOTAL RECOVERABLE (µG/L AS ZN) (01092)		
NOV 28...	100	110	6.0	<5.0	<100	<100	16	17		
DEC 18...	140	240	<5.0	<5.0	<100	<100	15	19		
JAN 08...	100	100	<5.0	<5.0	<100	<100	<3.0	5.0		
JAN 29...	110	110	<5.0	<5.0	<100	<100	25	15		

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157177620 -- Lorberry Creek below Wetlands at Lorberry, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	1045	1028	89203	6.2	366	12	10.4	5.6	5.4	352
DEC 19...	1145	1028	89203	10	295	19	10.7	6.6	6.6	274
MAR 05...	1415	1028	89203	5.4	291	7.0	10.4	6.3	6.5	281
APR 03...	1130	1028	89203	13	408	27	10.4	5.3	5.0	253
MAY 01...	1230	1028	89203	6.1	324	32	10.2	6.3	6.4	240
JUN 03...	1130	1028	89203	11	320	25	10.6	6.1	6.0	259
JUL 23...	1345	1028	89203	9.7	385	14	10.3	5.4	5.0	296
AUG 19...	1215	1028	89203	8.8	281	30	10.0	5.9	6.3	263
SEP 24...	1215	1028	89203	17	398	24	10.6	5.9	5.8	275

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, recoverable, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, recoverable, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, recoverable, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	11.5	16.8	17.7	27.9	30.5	1.30	1.4	3.90	3.6	2
DEC 19...	10.4	13.6	13.1	21.9	21.2	1.20	1.2	3.50	3.0	11
MAR 05...	11.0	11.7	12.0	21.8	23.1	1.20	1.1	3.10	3.6	9
APR 03...	13.3	12.2	11.5	18.8	20.0	1.30	1.1	3.90	3.9	2
MAY 01...	13.0	10.7	10.3	17.7	18.9	1.20	.9	3.70	2.8	6
JUN 03...	12.2	11.2	10.4	18.7	19.8	1.20	1.1	4.70	5.8	4
JUL 23...	15.0	14.0	14.2	21.3	21.9	1.20	1.3	3.10	3.3	2
AUG 19...	15.1	11.0	11.1	19.9	20.6	1.10	1.2	3.70	3.8	7
SEP 24...	13.5	11.6	12.2	20.9	22.7	1.10	1.4	3.50	4.2	4

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, fltrd, recoverable, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, fltrd, recoverable, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, fltrd, recoverable, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, fltrd, recoverable, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 14...	200	1400	7200	9060	2190	2270	104	101	271	246
DEC 19...	<100	900	7280	7530	1790	1640	63.0	69.0	133	112
MAR 05...	<100	800	7610	7720	1660	1590	49.0	51.0	110	93.0
APR 03...	600	1000	3670	4610	1710	1670	73.0	79.0	229	218
MAY 01...	<100	700	3990	5330	1590	1510	60.0	59.0	151	150
JUN 03...	<100	900	5100	6400	1600	1500	68.0	52.0	153	150
JUL 23...	200	800	7310	5290	1780	1850	76.0	78.0	226	220
AUG 19...	<100	700	4650	5610	1640	1710	68.0	63.0	153	156
SEP 24...	200	1000	4460	5870	1450	1590	69.0	74.0	173	174



**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403521076260601 -- Shadle Mine Shaft at Lorberry, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Alum- inum, water, fltrd, µg/L (01106)	Alum- inum, water, unfltrd recover- able, µg/L (01105)	Anti- mony, water, fltrd, µg/L (01095)	Arsenic water, fltrd, µg/L (01000)	Barium, water, fltrd, µg/L (01005)	Beryll- ium, water, fltrd, µg/L (01010)	Bismuth water, fltrd, µg/L (01015)	Bromine water, unfltrd µg/L (71871)	Cadmium water, fltrd, µg/L (01025)	Cerium, water, fltrd, µg/L (01110)	Cesium, water, fltrd, µg/L (01115)
NOV 14...	4400	4300	--	--	--	--	--	--	--	--	--
DEC 19...	4000	3800	--	--	--	--	--	--	--	--	--
MAR 05...	5200	5100	--	--	--	--	--	--	--	--	--
APR 03...	4100	4100	--	--	--	--	--	--	--	--	--
MAY 01...	5200	5300	--	--	--	--	--	--	--	--	--
JUN 03...	4700	4500	--	--	--	--	--	--	--	--	--
JUN 04...	4150	--	.040	<1.00	16.5	2.70	<.020	<.30	2.79	12.0	.670
JUL 23...	5800	5800	--	--	--	--	--	--	--	--	--
AUG 19...	5300	5000	--	--	--	--	--	--	--	--	--
SEP 24...	4000	3800	--	--	--	--	--	--	--	--	--

Date	Chrom- ium, water, fltrd, µg/L (01030)	Cobalt water, fltrd, µg/L (01035)	Copper, water, fltrd, µg/L (01040)	Dyspros- ium, water, fltrd, µg/L (82331)	Erbium, water, fltrd, µg/L (50573)	Euro- pium, water, fltrd, µg/L (50574)	Gado- linium, water, fltrd, µg/L (50575)	Gallium water, fltrd, µg/L (01120)	German- ium, water, fltrd, µg/L (01125)	Gold, water, fltrd, µg/L (82334)
NOV 14...	--	--	--	--	--	--	--	--	--	--
DEC 19...	--	--	--	--	--	--	--	--	--	--
MAR 05...	--	--	--	--	--	--	--	--	--	--
APR 03...	--	--	--	--	--	--	--	--	--	--
MAY 01...	--	--	--	--	--	--	--	--	--	--
JUN 03...	--	--	--	--	--	--	--	--	--	--
JUN 04...	<1.00	205	2.60	2.40	1.40	.330	2.00	.130	.120	.160
JUL 23...	--	--	--	--	--	--	--	--	--	--
AUG 19...	--	--	--	--	--	--	--	--	--	--
SEP 24...	--	--	--	--	--	--	--	--	--	--

Date	Neodym- ium, water, fltrd, µg/L (50579)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Praseo- dymium, water, fltrd, µg/L (50582)	Rhenium water, fltrd, µg/L (50583)	Rubid- ium, water, fltrd, µg/L (01135)	Samar- ium, water, fltrd, µg/L (82323)	Selen- ium, water, fltrd, µg/L (01145)	Silver, water, fltrd, µg/L (01075)	Stront- ium, water, fltrd, µg/L (01080)
NOV 14...	--	115	119	--	--	--	--	--	--	--
DEC 19...	--	96.0	96.0	--	--	--	--	--	--	--
MAR 05...	--	113	106	--	--	--	--	--	--	--
APR 03...	--	69.0	97.0	--	--	--	--	--	--	--
MAY 01...	--	93.0	116	--	--	--	--	--	--	--
JUN 03...	--	80.0	90.0	--	--	--	--	--	--	--
JUN 04...	6.20	178	--	1.50	<.020	14.0	1.30	<.200	.024	678
JUL 23...	--	82.0	63.0	--	--	--	--	--	--	--
AUG 19...	--	48.0	36.0	--	--	--	--	--	--	--
SEP 24...	--	6.00	<5.00	--	--	--	--	--	--	--





**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571777 -- Lorberry Cr ab Panther Head Disch nr Lorberry Jct, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	0945	1028	89203	12	441	12	10.8	5.2	5.2	328
DEC 19...	1030	1028	89203	18	333	15	11.1	6.8	6.5	257
MAR 05...	1300	1028	89203	5.8	324	6.0	10.9	6.9	6.4	268
APR 03...	1015	1028	89203	16	311	26	10.8	4.8	4.9	247
MAY 01...	1115	1028	89203	7.3	366	27	10.5	6.3	6.3	223
JUN 03...	1030	1028	89203	18	377	19	10.7	6.2	5.8	237
JUL 23...	1245	1028	89203	4.7	485	14	10.3	4.7	4.9	287
AUG 19...	1100	1028	89203	12	378	30	10.3	5.8	5.9	262
SEP 24...	1100	1028	89203	21	479	24	10.8	5.6	5.3	248

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, recoverable, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, recoverable, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, recoverable, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	9.9	15.1	17.6	23.2	26.3	1.30	1.2	3.30	3.7	2
DEC 19...	9.0	12.7	13.5	19.9	21.2	1.20	1.2	3.70	3.5	6
MAR 05...	9.1	11.7	13.6	19.0	22.6	1.10	1.1	3.10	3.8	8
APR 03...	11.3	10.9	11.6	16.3	18.4	1.20	1.1	3.30	2.7	2
MAY 01...	11.9	10.5	10.7	15.8	17.1	1.00	.9	3.30	2.5	4
JUN 03...	11.8	10.5	10.4	16.0	17.5	1.10	1.0	4.30	3.7	2
JUL 23...	14.3	14.3	14.7	20.1	20.9	1.10	1.2	3.40	3.1	1
AUG 19...	13.3	11.7	12.7	18.6	20.3	1.10	1.2	3.40	3.7	3
SEP 24...	12.8	11.0	12.2	18.4	19.4	1.20	1.2	3.00	3.8	3

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, fltrd, recoverable, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, fltrd, recoverable, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, fltrd, recoverable, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, fltrd, recoverable, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 14...	300	1500	5770	7670	1940	2040	96.0	97.0	243	228
DEC 19...	<100	1100	5040	7020	1610	1680	66.0	65.0	132	129
MAR 05...	<100	900	5700	6910	1500	1600	56.0	54.0	99.0	96.0
APR 03...	500	1000	2230	4170	1490	1490	76.0	85.0	206	199
MAY 01...	<100	800	3040	4840	1420	1400	60.0	66.0	143	148
JUN 03...	<100	900	3200	4890	1360	1350	63.0	55.0	140	141
JUL 23...	300	900	3390	5010	1730	1800	81.0	79.0	222	212
AUG 19...	<100	900	3280	5390	1590	1740	75.0	66.0	185	187
SEP 24...	200	1100	2960	5440	1280	1410	58.0	61.0	160	156

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157177780 -- Panther Head Disch to Lorberry Cr nr Lorberry Jct, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	1000	1028	89203	.04	702	.0	8.3	3.2	3.2	426
DEC 19...	1045	1028	89203	.27	564	.0	10.2	3.1	3.1	364
MAR 05...	1315	1028	89203	.01	502	.0	11.0	3.5	3.5	226
APR 03...	1030	1028	89203	.13	400	.0	10.5	3.2	3.2	385
MAY 01...	1130	1028	89203	.11	663	.0	9.6	3.3	3.4	368
JUN 03...	1045	1028	89203	.13	575	.0	9.6	3.3	3.4	375
JUL 23...	1300	1028	89203	.01	562	.0	5.7	3.4	3.4	377
AUG 19...	1115	1028	89203	.07	539	.0	7.5	3.0	3.4	393
SEP 24...	1115	1028	89203	.46	608	.0	8.8	3.4	3.5	288

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	8.6	9.40	10.8	10.2	11.5	.90	1.0	.70	1.3	.0
DEC 19...	6.7	7.40	8.4	8.00	9.0	1.00	.9	.80	.9	.0
MAR 05...	4.6	4.70	5.1	4.70	4.9	.70	.8	.70	.6	.0
APR 03...	7.3	8.70	8.6	8.30	9.3	1.10	1.0	1.20	.7	.0
MAY 01...	9.7	8.80	8.8	8.40	9.0	1.00	1.0	1.30	.7	.0
JUN 03...	9.5	7.10	6.6	6.70	6.9	1.00	.7	1.50	.2	.0
JUL 23...	16.6	12.5	12.5	10.6	10.4	1.00	1.0	1.40	1.3	.0
AUG 19...	13.8	8.50	9.1	8.70	8.9	.90	1.0	1.10	1.1	.0
SEP 24...	12.9	4.90	4.9	4.80	4.4	.90	.9	1.00	1.0	.0

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 14...	8600	8900	1500	1530	2310	2500	255	258	715	663
DEC 19...	6100	6100	1550	1570	1590	1680	216	203	521	473
MAR 05...	3500	3500	770	710	890	930	104	113	279	239
APR 03...	6700	6200	1540	1640	1650	1590	231	228	548	533
MAY 01...	6700	6700	1710	1700	1620	1630	235	206	560	568
JUN 03...	4800	4400	1880	1260	1300	1180	184	159	432	419
JUL 23...	7700	7100	2900	1610	2140	2100	246	243	662	629
AUG 19...	5700	5600	1110	1240	1650	1780	205	205	572	552
SEP 24...	2700	2500	620	660	910	900	100	103	297	269

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**0157177790 -- Unnamed Trib to Lorberrry Cr nr Lorberrry Jct, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specif. conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	1015	1028	89203	.05	531	.0	10.9	4.8	4.9	42
DEC 19...	1100	1028	89203	3.4	530	.0	13.0	4.7	4.9	39
MAR 05...	1330	1028	89203	1.8	419	.0	14.0	5.0	5.0	38
APR 03...	1045	1028	89203	2.9	483	.0	12.0	4.7	4.8	45
MAY 01...	1145	1028	89203	3.2	560	.0	10.4	4.7	5.0	19
JUN 03...	1100	1028	89203	2.5	499	.0	10.3	4.8	4.8	20
JUL 23...	1315	1028	89203	1.2	495	.0	8.7	4.7	4.8	19
AUG 19...	1130	1028	89203	.37	487	13	8.9	4.5	4.4	19
SEP 24...	1145	1028	89203	10	557	.0	10.0	4.7	4.8	24

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, recoverable, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, recoverable, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, recoverable, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	7.9	2.10	1.9	.80	.8	.40	.4	1.20	.6	1
DEC 19...	2.6	1.20	1.2	.70	.7	.40	.4	.60	.6	.0
MAR 05...	1.2	1.00	1.1	.60	.6	.30	.4	.70	.6	3
APR 03...	6.5	1.00	1.0	.60	.6	.30	.4	.70	.3	1
MAY 01...	10.8	.90	.9	.50	.5	.30	.1	.80	<.1	2
JUN 03...	11.3	.90	.9	.50	.6	.10	.2	.80	.3	1
JUL 23...	17.3	.90	1.0	.50	.4	.50	.4	.70	.8	1
AUG 19...	17.0	.90	.9	.50	.4	.40	.4	.50	.8	.0
SEP 24...	14.4	.90	.9	.60	.5	.50	.5	.50	.7	2

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, fltrd, recoverable, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, fltrd, recoverable, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, fltrd, recoverable, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, fltrd, recoverable, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 14...	200	200	170	170	70.0	70.0	<5.00	<5.00	38.0	20.0
DEC 19...	200	100	100	110	50.0	50.0	<5.00	<5.00	24.0	15.0
MAR 05...	100	100	190	110	30.0	30.0	<5.00	10.0	14.0	15.0
APR 03...	200	100	230	80.0	50.0	40.0	<5.00	<5.00	18.0	13.0
MAY 01...	200	200	180	140	30.0	30.0	<5.00	10.0	20.0	17.0
JUN 03...	200	200	360	150	40.0	30.0	<5.00	6.00	17.0	11.0
JUL 23...	300	300	590	650	60.0	80.0	<5.00	<5.00	15.0	12.0
AUG 19...	300	300	470	650	50.0	60.0	10.0	6.00	15.0	13.0
SEP 24...	200	200	330	340	70.0	70.0	<5.00	8.00	19.0	15.0





**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571780 -- Lorberry Creek at Lorberry Junction, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Gallium water, fltrd, µg/L (01120)	Gallium water, unfltrd, µg/L (01122)	German- ium, water, fltrd, µg/L (01125)	German- ium, water, unfltrd, µg/L (01127)	Gold, water, fltrd, µg/L (82334)	Gold, water, unfltrd, µg/L (71910)	Holmium water, fltrd, µg/L (50577)	Holmium water, unfltrd, µg/L (01247)	Indium water, fltrd, µg/L (62843)	Indium, water, unfltrd, µg/L (01168)
OCT 01...	<.020	<.020	<.020	<.020	<.010	<.010	.150	.150	<.010	<.010
NOV 14...	--	--	--	--	--	--	--	--	--	--
DEC 19...	--	--	--	--	--	--	--	--	--	--
MAR 05...	--	--	--	--	--	--	--	--	--	--
APR 03...	--	--	--	--	--	--	--	--	--	--
MAY 01...	--	--	--	--	--	--	--	--	--	--
JUN 03...	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	--	--	--	--	--	--	--	--
AUG 19...	--	--	--	--	--	--	--	--	--	--
SEP 24...	--	--	--	--	--	--	--	--	--	--

Date	Iron, water, unfltrd recover- able, µg/L (01046)	Iron, water, unfltrd recover- able, µg/L (01045)	Lantha- num, water, fltrd, µg/L (01180)	Lantha- num, water, unfltrd µg/L (01182)	Lead, water, fltrd, µg/L (01049)	Lead, water, unfltrd recover- able, µg/L (01051)	Lithium water, fltrd, µg/L (01130)	Lithium water, unfltrd recover- able, µg/L (01132)	Mangan- ese, water, fltrd, µg/L (01056)	Mangan- ese, water, unfltrd recover- able, µg/L (01055)
OCT 01...	1300	1750	3.10	3.20	.300	.500	14.5	15.0	1040	1120
NOV 14...	3760	5320	--	--	--	--	--	--	1440	1580
DEC 19...	3020	4370	--	--	--	--	--	--	1120	1280
MAR 05...	2990	3430	--	--	--	--	--	--	1070	990
APR 03...	1310	2790	--	--	--	--	--	--	1050	1050
MAY 01...	1540	2760	--	--	--	--	--	--	950	940
JUN 03...	1700	2970	--	--	--	--	--	--	970	930
JUL 23...	1590	2930	--	--	--	--	--	--	1190	1210
AUG 19...	1910	3500	--	--	--	--	--	--	1250	1330
SEP 24...	1750	3330	--	--	--	--	--	--	860	930

Date	Molyb- denum, water, unfltrd recover- able, µg/L (01060)	Molyb- denum, water, unfltrd recover- able, µg/L (01062)	Neodym- ium, water, fltrd, µg/L (50579)	Neodym- ium, water, unfltrd µg/L (01237)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recover- able, µg/L (01067)	Praseo- dymium, water, fltrd, µg/L (50582)	Praseo- dymium, water, unfltrd µg/L (01238)	Rhenium water, fltrd, µg/L (50583)	Rhenium water, unfltrd µg/L (01242)
OCT 01...	.070	.080	3.10	3.20	59.0	61.5	.810	.850	<.020	<.020
NOV 14...	--	--	--	--	73.0	76.0	--	--	--	--
DEC 19...	--	--	--	--	43.0	56.0	--	--	--	--
MAR 05...	--	--	--	--	37.0	42.0	--	--	--	--
APR 03...	--	--	--	--	64.0	62.0	--	--	--	--
MAY 01...	--	--	--	--	44.0	40.0	--	--	--	--
JUN 03...	--	--	--	--	50.0	47.0	--	--	--	--
JUL 23...	--	--	--	--	55.0	56.0	--	--	--	--
AUG 19...	--	--	--	--	59.0	72.0	--	--	--	--
SEP 24...	--	--	--	--	40.0	40.0	--	--	--	--

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571780 -- Lorberry Creek at Lorberry Junction, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Rubidium, water, fltrd, µg/L (01135)	Rubidium, water, unfltrd, µg/L (01137)	Samarium, water, fltrd, µg/L (82323)	Samarium, water, unfltrd, µg/L (82322)	Selenium, water, fltrd, µg/L (01145)	Selenium, water, unfltrd, µg/L (01147)	Silver, water, fltrd, µg/L (01075)	Silver, water, unfltrd recover-able, µg/L (01077)	Strontium, water, fltrd, µg/L (01080)	Strontium, water, unfltrd recover-able, µg/L (01082)
OCT 01...	2.20	2.10	.570	.670	<.200	<.200	.010	<.010	72.0	71.5
NOV 14...	--	--	--	--	--	--	--	--	--	--
DEC 19...	--	--	--	--	--	--	--	--	--	--
MAR 05...	--	--	--	--	--	--	--	--	--	--
APR 03...	--	--	--	--	--	--	--	--	--	--
MAY 01...	--	--	--	--	--	--	--	--	--	--
JUN 03...	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	--	--	--	--	--	--	--	--
AUG 19...	--	--	--	--	--	--	--	--	--	--
SEP 24...	--	--	--	--	--	--	--	--	--	--

Date	Terbium, water, fltrd, µg/L (50586)	Terbium, water, unfltrd, µg/L (01218)	Thallium, water, fltrd, µg/L (01057)	Thallium, water, unfltrd, µg/L (01059)	Thorium, water, fltrd, µg/L (82365)	Thorium, water, unfltrd, µg/L (82364)	Thulium, water, fltrd, µg/L (50587)	Thulium, water, unfltrd, µg/L (01245)	Tungsten, water, fltrd, µg/L (01155)	Tungsten, water, unfltrd, µg/L (01154)
OCT 01...	.110	.120	<.050	<.050	<.040	<.040	.057	.059	.030	.030
NOV 14...	--	--	--	--	--	--	--	--	--	--
DEC 19...	--	--	--	--	--	--	--	--	--	--
MAR 05...	--	--	--	--	--	--	--	--	--	--
APR 03...	--	--	--	--	--	--	--	--	--	--
MAY 01...	--	--	--	--	--	--	--	--	--	--
JUN 03...	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	--	--	--	--	--	--	--	--
AUG 19...	--	--	--	--	--	--	--	--	--	--
SEP 24...	--	--	--	--	--	--	--	--	--	--

Date	Vanadium, water, fltrd, µg/L (01085)	Vanadium, water, unfltrd, µg/L (01087)	Ytterbium, water, fltrd, µg/L (01194)	Ytterbium, water, unfltrd, µg/L (01196)	Yttrium, water, fltrd, µg/L (01201)	Yttrium, water, unfltrd, µg/L (01203)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recover-able, µg/L (01092)	Uranium natural water, fltrd, µg/L (22703)	Uranium natural water, unfltrd, µg/L (28011)
OCT 01...	<.100	<.100	.330	.360	3.30	3.50	142	140	.130	.160
NOV 14...	--	--	--	--	--	--	173	166	--	--
DEC 19...	--	--	--	--	--	--	98.0	99.0	--	--
MAR 05...	--	--	--	--	--	--	82.0	70.0	--	--
APR 03...	--	--	--	--	--	--	152	154	--	--
MAY 01...	--	--	--	--	--	--	111	109	--	--
JUN 03...	--	--	--	--	--	--	109	106	--	--
JUL 23...	--	--	--	--	--	--	159	151	--	--
AUG 19...	--	--	--	--	--	--	158	150	--	--
SEP 24...	--	--	--	--	--	--	117	113	--	--



**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571758 -- Lower Rausch Creek near Lorberry Junction, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	0915	1028	89203	8.0	258	9.0	11.1	7.0	6.7	335
DEC 19...	1000	1028	89203	9.9	283	10	11.8	7.0	6.8	321
MAR 05...	1130	1028	89203	5.8	317	7.0	11.8	7.1	6.8	387
APR 03...	0945	1028	89203	9.1	370	13	11.2	6.8	6.6	342
MAY 01...	1045	1028	89203	7.3	264	13	10.7	6.8	6.9	361
JUN 03...	1000	1028	89203	13	232	8.0	10.8	7.0	6.9	322
JUL 23...	1215	1028	89203	3.5	281	26	10.2	6.9	6.9	432
AUG 19...	1030	1028	89203	7.7	240	28	10.1	6.7	6.8	381
SEP 24...	1015	1028	89203	18	250	15	10.5	7.1	6.8	223

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	8.4	25.3	30.5	15.6	17.5	1.90	1.9	14.8	15.7	14
DEC 19...	6.6	22.5	30.2	14.4	16.9	1.70	1.9	13.5	15.3	11
MAR 05...	6.9	26.8	29.0	15.8	16.9	2.30	2.2	21.5	20.7	17
APR 03...	9.9	23.4	27.4	15.0	17.2	1.80	1.9	16.3	12.6	8
MAY 01...	11.4	28.0	27.7	17.4	19.3	1.90	1.8	13.2	12.6	11
JUN 03...	11.4	23.2	21.6	13.0	13.2	1.80	1.8	18.6	16.9	14
JUL 23...	15.0	31.4	33.8	19.7	20.4	1.90	2.1	16.9	17.2	19
AUG 19...	13.9	29.4	30.7	17.8	19.3	2.00	2.3	15.6	17.9	13
SEP 24...	13.6	16.6	16.3	9.50	9.8	1.60	1.6	9.10	11.2	13

Date	Aluminum, water, fltrd, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, fltrd, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, fltrd, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, fltrd, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, fltrd, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 14...	<100	300	2500	3410	1180	1320	29.0	42.0	56.0	88.0
DEC 19...	<100	700	2780	4410	1180	1400	42.0	54.0	72.0	77.0
MAR 05...	<100	400	2020	2530	1190	1140	44.0	39.0	56.0	57.0
APR 03...	<100	900	1310	2560	1200	1290	58.0	57.0	104	113
MAY 01...	<100	900	1860	3400	1380	1430	55.0	50.0	92.0	110
JUN 03...	<100	600	1500	2380	980	1000	33.0	31.0	49.0	63.0
JUL 23...	<100	700	660	2520	1380	1470	52.0	50.0	50.0	77.0
AUG 19...	<100	800	1420	3250	1360	1480	47.0	52.0	73.0	89.0
SEP 24...	<100	400	850	1570	690	770	32.0	32.0	52.0	57.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571760 -- Lower Rausch Creek at Lorberry Junction, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd $\mu$ S/cm 25 degC (00095)
NOV 14...	0900	1028	89203	5.4	299	7.0	11.3	6.7	6.5	329
DEC 19...	0945	1028	89203	8.8	311	7.0	12.3	6.9	6.9	320
MAR 05...	1045	1028	89203	5.8	349	9.0	12.5	6.9	6.8	387
APR 03...	0930	1028	89203	9.9	391	11	11.4	6.6	6.6	339
MAY 01...	1030	1028	89203	6.1	276	9.0	10.7	6.8	6.8	358
JUN 03...	0945	1028	89203	8.5	244	8.0	11.0	6.8	6.8	319
JUL 23...	1200	1028	89203	4.2	382	14	9.8	6.7	6.8	425
AUG 19...	1015	1028	89203	5.4	275	24	10.1	6.5	6.8	377
SEP 24...	1000	1028	89203	17	291	24	10.6	7.0	5.3	218

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, recoverable, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, recoverable, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, recoverable, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	7.2	22.5	31.0	14.2	17.2	1.80	2.0	13.6	15.9	13
DEC 19...	5.4	24.7	27.2	15.4	16.8	1.80	1.9	13.2	13.3	12
MAR 05...	5.4	30.3	30.2	16.8	16.9	2.30	2.2	21.0	20.3	18
APR 03...	9.6	24.3	26.9	14.8	17.0	1.90	1.9	17.7	12.6	9
MAY 01...	11.6	27.6	28.0	17.6	18.8	1.80	1.8	14.7	13.4	11
JUN 03...	11.7	23.4	23.1	12.9	13.7	1.90	1.9	18.8	16.9	15
JUL 23...	17.1	33.1	34.0	19.9	20.0	2.30	2.3	18.6	18.6	2
AUG 19...	14.6	28.5	29.6	18.3	18.8	2.20	2.2	15.7	15.8	13
SEP 24...	13.5	15.6	16.9	9.30	9.6	1.60	1.8	8.90	11.2	7

Date	Aluminum, water, unfltrd, recoverable, $\mu$ g/L (01106)	Aluminum, water, unfltrd recoverable, $\mu$ g/L (01105)	Iron, water, unfltrd recoverable, $\mu$ g/L (01046)	Iron, water, unfltrd recoverable, $\mu$ g/L (01045)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01056)	Manganese, water, unfltrd recoverable, $\mu$ g/L (01055)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01065)	Nickel, water, unfltrd recoverable, $\mu$ g/L (01067)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01090)	Zinc, water, unfltrd recoverable, $\mu$ g/L (01092)
NOV 14...	<100	200	1430	2150	1110	1260	39.0	41.0	51.0	54.0
DEC 19...	<100	600	2580	3260	1200	1310	35.0	44.0	74.0	76.0
MAR 05...	<100	400	1850	2560	1190	1170	50.0	46.0	63.0	58.0
APR 03...	<100	800	1120	2360	1190	1280	67.0	59.0	102	112
MAY 01...	<100	700	1480	2310	1390	1340	60.0	51.0	92.0	102
JUN 03...	<100	400	1140	1870	950	920	35.0	48.0	48.0	56.0
JUL 23...	<100	300	360	1160	1330	1340	48.0	42.0	43.0	53.0
AUG 19...	<100	600	780	2240	1340	1410	47.0	46.0	71.0	77.0
SEP 24...	<100	500	600	1670	670	730	26.0	23.0	49.0	60.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**01571798 -- Swatara Creek at Lorberry Junction, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	Specific conductance, wat unfltrd, µS/cm 25 degC (00095)
NOV 14...	0815	1028	89203	41	339	4.0	11.3	6.6	6.4	176
DEC 19...	0900	1028	89203	50	385	6.0	12.9	6.4	6.5	167
MAR 05...	1000	1028	89203	53	370	4.0	13.4	6.8	6.3	204
APR 03...	0900	1028	89203	27	408	9.0	11.7	6.6	6.5	191
MAY 01...	1000	1028	89203	57	362	9.0	11.1	6.7	6.8	205
JUN 03...	0915	1028	89203	82	379	18	10.8	6.3	6.2	130
JUL 23...	1130	1028	89203	54	376	15	9.3	7.1	6.8	214
AUG 19...	0945	1028	89203	64	316	21	9.9	6.9	6.8	194
SEP 24...	0930	1028	89203	92	394	40	10.3	6.6	6.4	118

Date	Temperature, water, deg C (00010)	Calcium water, unfltrd, recoverable, mg/L (00915)	Calcium water, unfltrd recoverable, mg/L (00916)	Magnesium, water, fltrd, mg/L (00925)	Magnesium, water, unfltrd recoverable, mg/L (00927)	Potassium, water, fltrd, mg/L (00935)	Potassium, water, unfltrd recoverable, mg/L (00937)	Sodium, water, fltrd, mg/L (00930)	Sodium, water, unfltrd recoverable, mg/L (00929)	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)
NOV 14...	6.5	11.3	13.8	7.50	8.7	1.50	1.6	6.70	7.1	6
DEC 19...	3.2	10.2	11.9	7.70	8.5	1.20	1.2	6.10	5.7	5
MAR 05...	2.5	12.1	13.2	8.70	9.4	1.30	1.3	7.10	7.9	9
APR 03...	7.9	12.0	12.6	8.70	9.9	1.20	1.2	7.00	5.4	6
MAY 01...	11.9	14.2	13.8	10.6	11.1	1.20	1.1	7.10	6.4	7
JUN 03...	11.2	7.70	7.8	5.40	6.0	1.20	1.1	6.60	6.0	4
JUL 23...	18.3	14.9	16.9	10.3	11.3	1.30	1.5	5.70	6.0	8
AUG 19...	15.5	13.1	13.4	10.0	10.3	1.30	1.4	5.90	6.4	8
SEP 24...	13.6	7.90	8.5	5.00	5.4	1.40	1.6	4.20	5.4	7

Date	Aluminum, water, fltrd, µg/L (01106)	Aluminum, water, unfltrd recoverable, µg/L (01105)	Iron, water, fltrd, µg/L (01046)	Iron, water, unfltrd recoverable, µg/L (01045)	Manganese, water, fltrd, µg/L (01056)	Manganese, water, unfltrd recoverable, µg/L (01055)	Nickel, water, fltrd, µg/L (01065)	Nickel, water, unfltrd recoverable, µg/L (01067)	Zinc, water, fltrd, µg/L (01090)	Zinc, water, unfltrd recoverable, µg/L (01092)
NOV 14...	<100	300	290	580	580	670	21.0	30.0	55.0	54.0
DEC 19...	<100	600	610	1010	590	650	30.0	31.0	71.0	69.0
MAR 05...	<100	300	540	850	620	600	26.0	23.0	60.0	52.0
APR 03...	<100	500	610	950	530	560	33.0	30.0	70.0	63.0
MAY 01...	<100	300	180	800	560	540	21.0	34.0	56.0	62.0
JUN 03...	<100	500	200	1250	400	420	21.0	20.0	56.0	54.0
JUL 23...	<100	200	130	710	490	570	33.0	24.0	41.0	44.0
AUG 19...	<100	400	220	1010	650	690	33.0	27.0	63.0	60.0
SEP 24...	100	500	270	970	450	530	23.0	18.0	45.0	52.0

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403650076330701 -- Valley View Tunnel near Valley View, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	pH, water, unfltrd lab, std units (00403)	
JUN 04...	1015	1028	1028	2.5	280	17	10.0	90	6.0	6.5	
Date	Specif. conductance, uS/cm 25 degC (00095)	Temperature, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, recover, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, recover, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, recover, mg/L (00929)	
JUN 04...	250	11.2	15.1	--	13.8	--	1.10	--	.80	--	
Date	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)	Acidity water, unfltrd heated, mg/L as CaCO3 (70508)	Acidity water, unfltrd mg/L as CaCO3 (00435)	Chloride water, fltrd, mg/L (00940)	Fluoride water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	
JUN 04...	40.0	<10.3	50.0	1.0	.10	9.66	75.2	.10	<.020	<.001	
Date	Aluminum, water, fltrd, ug/L (01106)	Aluminum, water, unfltrd recover, ug/L (01105)	Antimony, water, fltrd, ug/L (01095)	Arsenic water, fltrd, ug/L (01000)	Barium, water, fltrd, ug/L (01005)	Beryllium, water, fltrd, ug/L (01010)	Bismuth water, fltrd, ug/L (01015)	Bromine water, unfltrd mg/L (71871)	Cadmium water, fltrd, ug/L (01025)	Cerium, water, fltrd, ug/L (01110)	Cesium, water, fltrd, ug/L (01115)
JUN 04...	105	--	.130	5.20	27.5	.240	.020	<.03	.079	.420	.110
Date	Chromium, water, fltrd, ug/L (01030)	Cobalt water, fltrd, ug/L (01035)	Copper, water, fltrd, ug/L (01040)	Dysprosium, water, fltrd, ug/L (82331)	Erbium, water, fltrd, ug/L (50573)	Europium, water, fltrd, ug/L (50574)	Gadolinium, water, fltrd, ug/L (50575)	Gallium water, fltrd, ug/L (01120)	Germanium, water, fltrd, ug/L (01125)	Gold, water, fltrd, ug/L (82334)	
JUN 04...	1.00	29.5	<.500	.086	.041	.007	.065	.034	.031	.060	

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403650076330701 -- Valley View Tunnel near Valley View, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Holmium water, fltrd, ug/L (50577)	Indium water, fltrd, ug/L (62843)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover- able, ug/L (01045)	Lantha- num, water, fltrd, ug/L (01180)	Lead, water, fltrd, ug/L (01049)	Lithium water, fltrd, ug/L (01130)	Mangan- ese, water, fltrd, ug/L (01056)	Mangan- ese, water, unfltrd recover- able, ug/L (01055)	Molyb- denum, water, fltrd, ug/L (01060)	
JUN 04...	.016	<.010	17400	--	.230	.069	20.0	1930	--	.110	
Date	Neodym- ium, water, fltrd, ug/L (50579)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recover- able, ug/L (01067)	Praseo- dymium, water, fltrd, ug/L (50582)	Rhenium water, fltrd, ug/L (50583)	Rubid- ium, water, fltrd, ug/L (01135)	Samar- ium, water, fltrd, ug/L (82323)	Selen- ium, water, fltrd, ug/L (01145)	Silver, water, fltrd, ug/L (01075)	Stront- ium, water, fltrd, ug/L (01080)	
JUN 04...	.180	31.5	--	.052	<.020	2.30	.040	<.200	.150	77.5	
Date	Terbium water, fltrd, ug/L (50586)	Thall- ium, water, fltrd, ug/L (01057)	Thorium water, fltrd, ug/L (82365)	Thulium water, fltrd, ug/L (50587)	Tung- sten, water, fltrd, ug/L (01155)	Vanad- ium, water, fltrd, ug/L (01085)	Ytterb- ium, water, fltrd, ug/L (01194)	Yttrium water, fltrd, ug/L (01201)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover- able, ug/L (01092)	Uranium natural water, fltrd, ug/L (22703)
JUN 04...	.012	<.050	<.010	.006	.092	<.100	.032	.500	35.0	--	.010

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403709076330201 -- Markson Columway near Valley View, PA**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Agency collecting sample, code (00027)	Agency analyzing sample, code (00028)	Instantaneous discharge, cfs (00061)	Oxidation-reduction potential, mV (00090)	Turbidity, water, unfltrd field, NTU (61028)	Dissolved oxygen, percent of saturation (00300)	pH, water, unfltrd field, std units (00301)	pH, water, unfltrd lab, std units (00400)		
JUN 04...	1030	1028	1028	4.5	680	10	3.0	27	3.4	3.3	
Date	Specif. conductance, wat unfltrd, 25 degC (00095)	Temperature, water, deg C (00010)	Calcium water, fltrd, mg/L (00915)	Calcium water unfltrd recover, mg/L (00916)	Magnesium water, fltrd, mg/L (00925)	Magnesium water, unfltrd recover, mg/L (00927)	Potassium water, fltrd, mg/L (00935)	Potassium water, unfltrd recover, mg/L (00937)	Sodium water, fltrd, mg/L (00930)	Sodium water, unfltrd recover, mg/L (00929)	
JUN 04...	730	10.8	38.1	--	36.4	--	1.50	--	2.15	--	
Date	ANC, wat unfltrd fixed end pt, lab, mg/L as CaCO3 (00417)	Acidity water, unfltrd heated, mg/L as CaCO3 (70508)	Acidity water, unfltrd, mg/L as CaCO3 (00435)	Chloride water, fltrd, mg/L (00940)	Fluoride water, fltrd, mg/L (00950)	Silica water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Nitrate water, fltrd, mg/L as N (00618)	Orthophosphate water, fltrd, mg/L as P (00671)	Phosphorus water, fltrd, mg/L (00666)	
JUN 04...	.000	55.0	90.0	4.6	.10	12.5	310	.04	<.080	<.001	
Date	Aluminum, water, fltrd, ug/L (01106)	Aluminum, water, unfltrd recover, ug/L (01105)	Antimony, water, fltrd, ug/L (01095)	Arsenic water, fltrd, ug/L (01000)	Barium, water, fltrd, ug/L (01005)	Beryllium, water, fltrd, ug/L (01010)	Bismuth water, fltrd, ug/L (01015)	Bromine water, unfltrd, ug/L (71871)	Cadmium water, fltrd, ug/L (01025)	Cerium, water, fltrd, ug/L (01110)	Cesium, water, fltrd, ug/L (01115)
JUN 04...	2150	--	<.020	<1.00	19.5	2.40	<.020	<.12	.430	11.0	.110
Date	Chromium, water, fltrd, ug/L (01030)	Cobalt water, fltrd, ug/L (01035)	Copper, water, fltrd, ug/L (01040)	Dysprosium, water, fltrd, ug/L (82331)	Erbium, water, fltrd, ug/L (50573)	Europium, water, fltrd, ug/L (50574)	Gadolinium, water, fltrd, ug/L (50575)	Gallium water, fltrd, ug/L (01120)	Germanium, water, fltrd, ug/L (01125)	Gold, water, fltrd, ug/L (82334)	
JUN 04...	<1.00	144	6.50	1.50	.860	.280	1.50	.072	.020	<.010	

**ANALYSIS OF SAMPLES COLLECTED AT SPECIAL-STUDY SITES  
SWATARA CREEK PROJECT--Continued**

**403709076330201 -- Markson Columway near Valley View, PA--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Holmium water, fltrd, ug/L (50577)	Indium water, fltrd, ug/L (62843)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover- able, ug/L (01045)	Lantha- num, water, fltrd, ug/L (01180)	Lead, water, fltrd, ug/L (01049)	Lithium water, fltrd, ug/L (01130)	Mangan- ese, water, fltrd, ug/L (01056)	Mangan- ese, water, unfltrd recover- able, ug/L (01055)	Molyb- denum, water, fltrd, ug/L (01060)	
JUN 04...	.310	<.010	6250	--	4.70	3.30	32.5	4430	--	.060	
Date	Neodym- ium, water, fltrd, ug/L (50579)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recover- able, ug/L (01067)	Praseo- dymium, water, fltrd, ug/L (50582)	Rhenium water, fltrd, ug/L (50583)	Rubid- ium, water, fltrd, ug/L (01135)	Samar- ium, water, fltrd, ug/L (82323)	Selen- ium, water, fltrd, ug/L (01145)	Silver, water, fltrd, ug/L (01075)	Stront- ium, water, fltrd, ug/L (01080)	
JUN 04...	5.40	199	--	1.30	<.020	3.90	1.30	<.200	<.010	120	
Date	Terbium water, fltrd, ug/L (50586)	Thall- ium, water, fltrd, ug/L (01057)	Thorium water, fltrd, ug/L (82365)	Thulium water, fltrd, ug/L (50587)	Tung- sten, water, fltrd, ug/L (01155)	Vanad- ium, water, fltrd, ug/L (01085)	Ytterb- ium, water, fltrd, ug/L (01194)	Yttrium water, fltrd, ug/L (01201)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover- able, ug/L (01092)	Uranium natural water, fltrd, ug/L (22703)
JUN 04...	.240	<.050	.030	.130	<.020	<.100	.730	7.40	398	--	.560