

**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 mi² 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 has 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 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 1995-98, data on discharge rate and water quality at 48 stations in the Swatara Creek basin and 5 stations in adjacent watersheds (table 1) 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 and on May 21, 1997, at station A1 to treat a larger discharge (50-200 gpm, anoxic inflow; 400 tons limestone) at 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.

For additional information, contact Charles Cravotta at the U.S. Geological Survey, 840 Market Street, Lemoyne, PA 17043; 717-730-6963 (email: cravotta@usgs.gov).

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

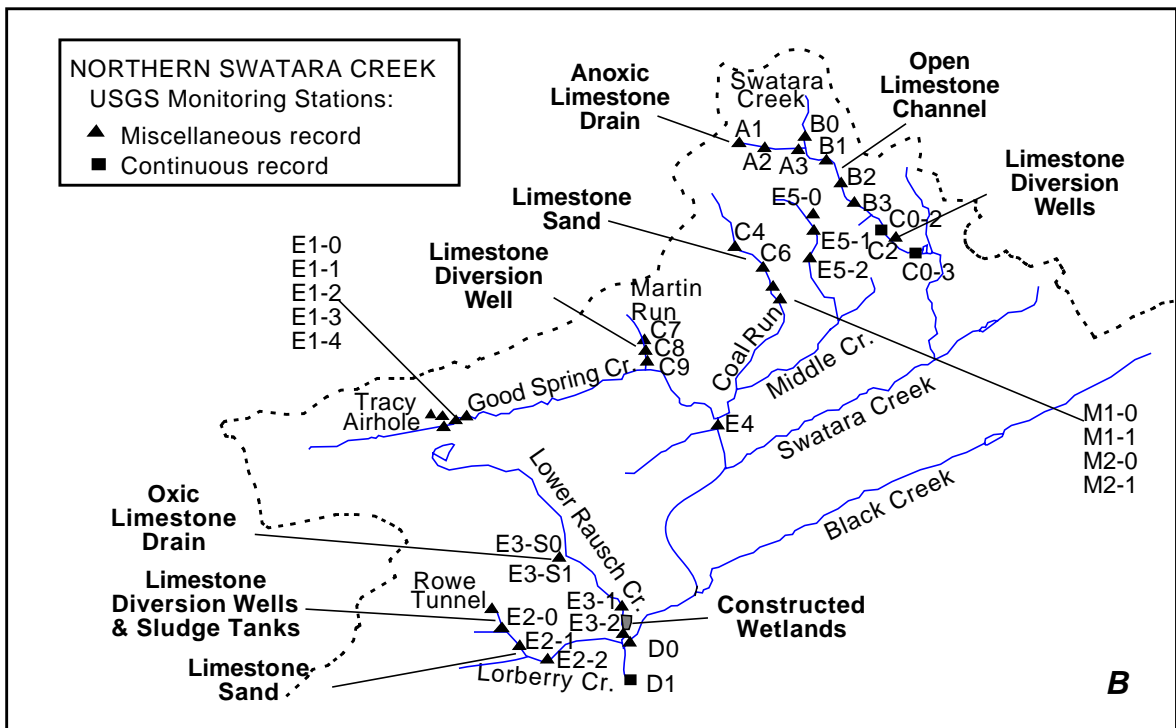
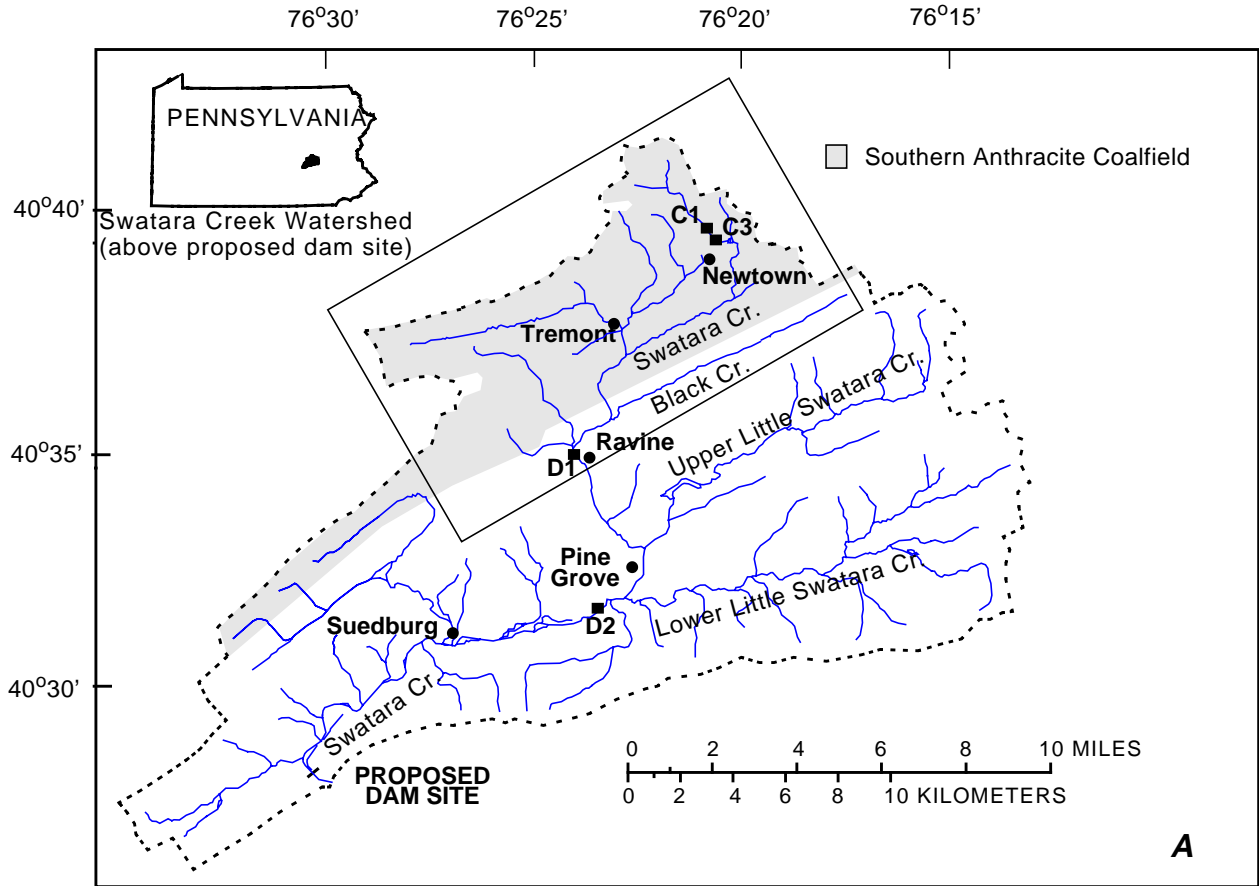


Figure 8.--Locations of selected water-quality and streamflow monitoring stations in the Swatara Creek Basin, Lebanon and Schuylkill Counties, Pennsylvania: A, continuous monitoring stations on Swatara Creek above the proposed dam for Swatara State Park Reservoir; B, monitoring stations within the Southern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

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

TABLE 1.--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; 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.
E2-0	01571774	LORBERRY CREEK, SITE E2-0, AT LORBERRY, PA	40°35'32"	76°26'22"	1.15
D1	01571820	SWATARA CREEK BL SR125 BRIDGE AT 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					
A2	0157154970	NORTHWEST TRIIBUTARY TO SWATARA CREEK, SITE A2, AT ALD OUTFLOW, NEAR NEWTOWN, PA	40°40'32"	76°22'25"	.25
A3	0157154972	NORTHWEST TRIIBUTARY 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 TRIIBUTARY, SITE B0, NEAR NEWTOWN, PA	40°40'34"	76°21'57"	1.14
B1	0157154980	SWATARA CREEK, BELOW NORTHWEST TRIIBUTARY, SITE B1, 50 FT ABOVE OLC, NEAR NEWTOWN, PA	40°40'22"	76°21'41"	1.75
B3	0157154984	SWATARA CREEK, BELOW NORTHWEST TRIIBUTARY, SITE B3, 400 FT BELOW OLC, NEAR NEWTOWN, PA	40°40'22"	76°21'36"	1.90
C0-2	403940076205901	HEGINS RED SEEP, SITE C0-2, AT NEWTOWN, PA	40°39'40"	76°21'01"	n.a.
C0-3	403939076205901	HEGINS WHITE SEEP, SITE C0-3, AT NEWTOWN, PA	40°39'39"	76°20'59"	n.a.
C2	0157155012	SWATARA CREEK, SITE C2, AT LDW OUTFLOW, AT NEWTOWN, PA	40°39'31"	76°20'47"	2.65
E5-0	403853076222301	MIDDLE CREEK MINE DISCHARGE, SITE E5-0, NEAR NEWTOWN, PA	40°38'52"	76°22'19"	n.a.
E5-1	0157157010	MIDDLE CREEK, SITE E5-1, 600 FT BELOW DISCHARGE, AT TR571, NEAR NEWTOWN, PA	40°38'48"	76°22'18"	1.63
C7-219	403825076242301	COLKET MINE TUNNEL, SITE C7-219, AT DONALDSON, PA	40°38'25"	76°24'23"	n.a.
C7	0157156010	MARTIN RUN, SITE C7, 100 FT ABOVE LDW, AT DONALDSON, PA	40°38'19"	76°24'19"	.48
C8	0157156012	MARTIN RUN, SITE C8, AT LDW OUTFLOW, AT DONALDSON, PA	40°38'17"	76°24'19"	.51
C9	0157156014	MARTIN RUN, SITE C9, 50 FT BELOW LDW, AT DONALDSON, PA	40°38'16"	76°24'19"	.53
E1-229	403745076271901	TRACY AIRHOLE, SITE E1-229, NEAR DONALDSON, PA	40°37'45"	76°27'19"	n.a.
E4	01571593	GOOD SPRING CREEK BL MIDDLE CREEK AT TREMONT, PA	40°37'35"	76°23'15"	14.0
E3-S0	403626076253001	ORCHARD MINE, SITE E3-S0, NEAR JOLIETT, PA	40°36'26"	76°25'30"	n.a.
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
E2-0a	01571772	LORBERRY CREEK BELOW ROWE DRAINAGE TUNNEL NEAR JOLIETT, PA	40°35'38"	76°26'23"	
E2-0b	01571773	LORBERRY CREEK, LDW OUTFLOW, AT NEWTOWN, PA	40°35'36"	76°26'25"	1.01
SR	01571776	STUMPS RUN AT LORBERRY, PA	40°35'30"	76°26'23"	.65
	403521076260601	SHADLE MINE SHAFT AT LORBERRY, PA	40°35'21"	76°26'06"	n.a.
E2-2a	0157177680	SHADLE MINE DRAINAGE, 250 FT BELOW 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 TRIIBUTARY TO LORBERRY CREEK NEAR LORBERRY JUNCTION, PA	40°35'07"	76°25'48"	1.14

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LOCAL ID	STATION NUMBER	STATION NAME	LATITUDE	LONGITUDE	DRAINAGE AREA
E2-1	01571778	LORBERRY CREEK ABOVE TR625 BRIDGE NEAR LORBERRY JUNCTION, PA	40°35'15"	76°25'35"	3.59
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
D2-0	01572010	SWATARA CREEK BELOW STATE ROUTE 645 HIGHWAY BRIDGE AT PINE GROVE, PA	40°32'12"	76°21'59"	110
MISCELLANEOUS-RECORD STATIONS IN NEARBY WATERSHEDS					
BMt-1	0155444050	BIG MOUNTAIN MINE NO. 1 SLOPE, 1,000 FT BELOW DISCHARGE, NEAR SHAMOKIN, PA	40°46'28"	76°32'21"	1.34
BMt-2	0155444052	BIG MOUNTAIN MINE NO. 1 SLOPE, 2,000 FT BELOW DISCHARGE, NEAR SHAMOKIN, PA	40°46'36"	76°32'23"	1.48
VV-258	403650076330701	VALLEY VIEW TUNNEL NEAR VALLEY VIEW, PA	40°36'56"	76°33'04"	n.a.
MC-259	403709076330201	MARKSON COLUMWAY NEAR VALLEY VIEW, PA	40°37'09"	76°33'02"	n.a.
PT-251	403619076310501	PORTER TUNNER NEAR TOWER CITY, PA	40°36'02"	76°30'21"	n.a.
SR-23	404619076321901	BIG MOUNTAIN MINE NO. 1 SLOPE, SR23, AT BIG MOUNTAIN, PA	40°46'19"	76°32'19"	n.a.

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	TIME	AGENCY COL- LECTING SAMPLE NUMBER) (00027)	AGENCY ANA- LYZING SAMPLE NUMBER) (00028)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (μ S/CM) (00095)	PH WATER WHOLE FIELD ARD UNITS) (00400)	PH WATER WHOLE LAB ARD UNITS) (00403)	OXID- ATION RED- DUCTION POTEN- TIAL (MV) (00090)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
0157154970		NW TRIB TO SWATARA CR, SITE A2, NEAR NEWTOWN, PA (LAT 40 40 32N LONG 076 22 27W)									
OCT 1998											
30...	1500	1028	9813	.01	436	7.0	6.8	246	11.0	7.1	65
NOV											
24...	1430	1028	9813	<.002	401	7.0	7.1	294	9.3	1.5	--
DEC											
31...	1210	1028	9813	.43	290	6.8	--	--	5.8	1.8	14
JAN 1999											
27...	1230	1028	9813	.43	271	6.1	--	300	9.6	.5	5
FEB											
26...	0945	1028	9813	.23	291	6.3	--	295	8.6	--	--
MAR											
18...	0850	1028	9813	.20	276	6.6	--	310	8.9	--	--
APR											
13...	0915	1028	9813	.23	278	6.9	--	289	9.0	--	--
MAY											
24...	1400	1028	9813	.16	351	6.8	--	244	9.9	.9	8
JUN											
22...	1400	1028	9813	<.01	394	6.8	--	155	10.0	.2	2
JUL											
13...	1315	1028	9813	<.01	417	6.9	--	125	16.0	6.2	--
AUG											
24...	1315	1028	9813	.13	373	6.8	--	278	11.0	.8	8
SEP											
15...	1430	1028	9813	.10	402	6.6	--	278	11.0	1.3	12
0157154972		NW TRIB TO SWATARA CR, SITE A3, NEAR NEWTOWN, PA (LAT 40 40 32N LONG 076 21 59W)									
OCT 1998											
30...	1420	1028	9813	.19	190	7.1	6.6	438	8.0	13.0	110
NOV											
24...	1400	1028	9813	.09	163	6.6	6.5	389	6.4	11.0	88
DEC											
31...	1040	1028	9813	.07	127	6.8	--	--	.1	13.0	91
JAN 1999											
27...	1300	1028	9813	3.0	196	7.2	--	469	6.8	11.0	90
FEB											
26...	1215	1028	9813	.54	227	6.7	--	391	4.2	--	--
MAR											
18...	0930	1028	9813	1.1	190	7.2	--	272	5.9	13.0	100
APR											
13...	0945	1028	9813	.68	215	7.0	--	297	5.8	--	--
MAY											
24...	1300	1028	9813	.91	200	6.9	--	413	12.0	11.0	100
JUN											
22...	1345	1028	9813	.22	210	6.8	--	302	13.5	9.8	94
JUL											
13...	1300	1028	9813	.03	201	6.1	--	291	14.5	10.0	--
AUG											
24...	1245	1028	9813	.09	187	6.6	--	480	15.0	9.4	93
SEP											
15...	1400	1028	9813	.24	244	7.0	--	506	14.0	8.3	85

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ACIDITY (MG/L AS CAC03) (00435)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	MAGNE- SIUM, TOTAL DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
0157154970 NW TRIB TO SWATARA CR, SITE A2, NEAR NEWTOWN, PA (LAT 40 40 32N LONG 076 22 27W)										
OCT 1998										
30...	--	.00	59	59	4.2	4.2	8.4	8.4	1.7	1.7
NOV										
24...	--	.00	74	73	4.4	4.2	7.2	7.2	1.7	1.6
DEC										
31...	--	7.6	19	17	4.5	4.5	8.5	8.5	--	--
JAN 1999										
27...	--	.00	22	--	5.4	--	11	--	--	--
FEB										
26...	--	--	--	--	--	--	--	--	--	--
MAR										
18...	--	.00	36	33	5.4	5.4	12	12	--	--
APR										
13...	--	.00	34	33	5.0	5.0	10	10	--	--
MAY										
24...	--	.00	39	39	5.7	5.7	13	13	--	--
JUN										
22...	--	.00	130	59	13	5.2	12	12	--	--
JUL										
13...	--	.00	11	3.9	1.3	1.3	2.9	2.9	--	--
AUG										
24...	.0	.00	81	78	5.1	4.9	12	12	2.0	2.0
SEP										
15...	--	.00	73	74	5.3	5.3	10	11	1.8	1.9
0157154972 NW TRIB TO SWATARA CR, SITE A3, NEAR NEWTOWN, PA (LAT 40 40 32N LONG 076 21 59W)										
OCT 1998										
30...	--	.00	23	22	3.7	3.7	8.1	8.1	1.3	1.3
NOV										
24...	--	.00	16	16	3.9	3.7	8.8	7.6	1.2	1.2
DEC										
31...	--	.00	15	15	3.6	3.6	8.3	8.3	--	--
JAN 1999										
27...	--	.00	13	13	4.0	4.0	9.9	9.9	--	--
FEB										
26...	--	.00	23	21	4.5	4.5	11	11	--	--
MAR										
18...	--	.00	15	15	3.7	3.6	12	12	--	--
APR										
13...	--	.00	18	17	4.2	3.8	12	10	--	--
MAY										
24...	--	.00	18	17	5.3	5.0	11	11	--	--
JUN										
22...	--	.00	20	20	4.8	4.8	11	11	--	--
JUL										
13...	--	.00	17	16	5.3	5.0	12	12	--	--
AUG										
24...	--	.00	25	24	5.4	5.3	11	11	1.4	1.4
SEP										
15...	.0	.00	29	28	5.1	5.1	10	10	1.5	1.2

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ANC WATER UNFLTRD FET LAB MG/L AS CACO3 (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L- SIO2) (00956)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	NITRO- GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
0157154970 NW TRIB TO SWATARA CR, SITE A2, NEAR NEWTOWN, PA (LAT 40 40 32N LONG 076 22 27W)										
OCT 1998										
30...	130	34	13	<.2	6.2	<2	<.040	.260	.39	<.020
NOV										
24...	170	33	12	<.2	5.6	56	.040	.130	.30	<.020
DEC										
31...	2	67	--	--	--	<2	--	--	--	--
JAN 1999										
27...	36	55	--	--	--	<2	--	--	--	--
FEB										
26...	--	--	--	--	--	--	--	--	--	--
MAR										
18...	68	51	--	--	--	32	--	--	--	--
APR										
13...	82	53	--	--	--	48	--	--	--	--
MAY										
24...	110	56	--	--	--	24	--	--	--	--
JUN										
22...	190	47	--	--	--	2200	--	--	--	--
JUL										
13...	160	37	--	--	--	16	--	--	--	--
AUG										
24...	180	37	16	--	--	22	--	--	--	--
SEP										
15...	160	44	13	--	--	22	--	--	--	--
0157154972 NW TRIB TO SWATARA CR, SITE A3, NEAR NEWTOWN, PA (LAT 40 40 32N LONG 076 21 59W)										
OCT 1998										
30...	30	44	12	<.2	4.4	<2	.110	.040	.27	<.020
NOV										
24...	14	43	12	<.2	4.5	<2	.100	.030	.30	.030
DEC										
31...	10	46	--	--	--	<2	--	--	--	--
JAN 1999										
27...	16	41	--	--	--	4	--	--	--	--
FEB										
26...	28	46	--	--	--	4	--	--	--	--
MAR										
18...	20	35	--	--	--	70	--	--	--	--
APR										
13...	26	40	--	--	--	30	--	--	--	--
MAY										
24...	17	44	--	--	--	16	--	--	--	--
JUN										
22...	19	53	--	--	--	10	--	--	--	--
JUL										
13...	11	56	--	--	--	<2	--	--	--	--
AUG										
24...	26	55	15	--	--	<2	--	--	--	--
SEP										
15...	36	53	15	--	--	4	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	COBALT, TOTAL RECOV- ERABLE (µG/L AS CO) (01037)	COBALT, DIS- SOLVED (µG/L AS CO) (01035)	COPPER, TOTAL RECOV- ERABLE (µG/L AS CU) (01042)	COPPER, DIS- SOLVED (µG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (µG/L AS PB) (01051)	LEAD, DIS- SOLVED (µG/L AS PB) (01049)	LITHIUM TOTAL RECOV- ERABLE (µG/L AS LI) (01132)	LITHIUM DIS- SOLVED (µG/L AS LI) (01130)
0157154970	NW TRIB TO SWATARA CR, SITE A2, NEAR NEWTOWN, PA (LAT 40 40 32N LONG 076 22 27W)									
OCT 1998										
30...	<50	<50	<10	<10	5000	4500	<10	<10	<30	<25
NOV										
24...	<50	<50	<10	<10	2000	1800	<1	<1.0	<30	<25
DEC										
31...	--	--	--	--	4800	4500	--	--	--	--
JAN 1999										
27...	--	--	--	--	6200	--	--	--	--	--
FEB										
26...	--	--	--	--	--	--	--	--	--	--
MAR										
18...	--	--	--	--	12000	10000	--	--	--	--
APR										
13...	--	--	--	--	8700	8400	--	--	--	--
MAY										
24...	--	--	--	--	25000	24000	--	--	--	--
JUN										
22...	--	--	--	--	140000	18000	--	--	--	--
JUL										
13...	--	--	--	--	1200	160	--	--	--	--
AUG										
24...	--	--	--	--	10000	8600	--	--	--	--
SEP										
15...	--	--	--	--	14000	12000	--	--	--	--
0157154972	NW TRIB TO SWATARA CR, SITE A3, NEAR NEWTOWN, PA (LAT 40 40 32N LONG 076 21 59W)									
OCT 1998										
30...	<50	<50	<10	<10	260	140	<10	<10	<30	<25
NOV										
24...	<50	<50	<10	<10	90	36	<1	<1.0	<30	<25
DEC										
31...	--	--	--	--	50	<20	--	--	--	--
JAN 1999										
27...	--	--	--	--	2100	100	--	--	--	--
FEB										
26...	--	--	--	--	3800	2200	--	--	--	--
MAR										
18...	--	--	--	--	3700	1600	--	--	--	--
APR										
13...	--	--	--	--	2700	1700	--	--	--	--
MAY										
24...	--	--	--	--	3000	420	--	--	--	--
JUN										
22...	--	--	--	--	1400	490	--	--	--	--
JUL										
13...	--	--	--	--	620	280	--	--	--	--
AUG										
24...	--	--	--	--	620	55	--	--	--	--
SEP										
15...	--	--	--	--	780	86	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	TIME	AGENCY COL- LECTING SAMPLE NUMBER) (00027)	AGENCY ANA- LYZING SAMPLE NUMBER) (00028)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (μ S/CM) (00095)	PH WATER WHOLE FIELD ARD UNITS) (00400)	PH WATER WHOLE LAB ARD UNITS) (00403)	OXID- ATION RED- DUCTION POTEN- TIAL (MV) (00090)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
0157154960		SWATARA CREEK, AB NW TRIB, SITE B0, NR NEWTOWN, PA (LAT 40 40 34N LONG 076 21 57W)									
OCT 1998											
30...	1410	1028	9813	.20	50	4.4	4.6	611	8.1	13.0	110
NOV											
24...	1345	1028	9813	.15	69	4.4	4.6	703	6.1	11.0	--
DEC											
31...	1030	1028	9813	.05	55	4.2	--	--	.3	14.0	94
JAN 1999											
27...	1315	1028	9813	8.4	88	4.3	--	469	3.7	12.0	88
FEB											
26...	1200	1028	9813	1.5	78	4.4	--	707	2.1	--	--
MAR											
18...	0945	1028	9813	3.4	88	6.3	--	--	4.6	14.0	100
APR											
13...	1000	1028	9813	1.8	84	4.4	--	515	5.9	--	--
MAY											
24...	1245	1028	9813	.76	80	4.4	--	511	13.0	10.0	97
JUN											
22...	1330	1028	9813	.18	73	4.4	--	461	14.5	9.1	89
JUL											
13...	1245	1028	9813	.24	74	4.9	--	436	15.5	9.8	--
AUG											
24...	1230	1028	9813	.06	66	4.1	--	629	16.0	9.1	92
SEP											
15...	1345	1028	9813	.03	84	4.3	--	560	16.0	6.7	68
0157154980		SWATARA CR, BL NW TRIB, SITE B1, NR NEWTOWN, PA (LAT 40 40 22N LONG 076 21 41W)									
OCT 1998											
30...	1345	1028	9813	.38	114	7.0	6.4	479	8.1	12.0	110
NOV											
24...	1315	1028	9813	.24	94	6.4	6.1	489	6.1	11.0	88
DEC											
31...	1120	1028	9813	.12	74	5.7	--	--	.1	13.0	90
JAN 1999											
27...	1400	1028	9813	11	93	5.8	--	504	4.5	11.0	87
FEB											
26...	1245	1028	9813	2.1	107	6.8	--	492	2.8	--	--
MAR											
18...	1010	1028	9813	4.5	95	4.5	--	299	5.2	14.0	110
APR											
13...	1030	1028	9813	2.5	90	6.4	--	377	5.9	--	--
MAY											
24...	1315	1028	9813	1.7	94	6.2	--	347	13.5	10.0	99
JUN											
22...	1315	1028	9813	.40	127	6.8	--	384	15.0	9.0	89
JUL											
13...	1230	1028	9813	.27	95	6.3	--	363	16.5	10.0	--
AUG											
24...	1215	1028	9813	.15	155	7.1	--	384	16.0	9.7	100
SEP											
15...	1330	1028	9813	.27	191	7.1	--	396	15.0	7.9	78

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ACIDITY (MG/L AS CACO3) (00435)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	MAGNE- SIUM, TOTAL DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	SODIUM, TOTAL DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)	POTAS- SIUM, TOTAL DIS- SOLVED (MG/L AS K) (00935)	ANC WATER UNFLTRD FET FIELD MG/L AS CACO3 (00410)
0157154960 SWATARA CREEK, AB NW TRIB, SITE B0, NR NEWTOWN, PA (LAT 40 40 34N LONG 076 21 57W)											
OCT 1998											
30...	--	7.0	1.3	1.3	1.3	1.3	4.9	4.9	<1.0	<1.0	--
NOV											
24...	--	7.6	1.2	1.2	1.6	1.5	3.7	3.7	<1.0	<1.0	--
DEC											
31...	--	8.8	1.7	1.7	1.7	1.7	4.5	4.4	--	--	--
JAN 1999											
27...	--	11	1.2	15	1.1	3.8	5.3	9.8	--	--	--
FEB											
26...	--	14	1.1	1.1	1.1	1.1	4.9	4.9	--	--	--
MAR											
18...	--	8.6	1.2	1.5	1.0	1.0	6.7	6.6	--	--	--
APR											
13...	--	8.8	1.2	1.5	.98	1.0	6.2	5.8	--	--	--
MAY											
24...	--	11	1.2	1.2	1.1	1.1	5.4	5.4	--	--	--
JUN											
22...	--	7.6	1.5	1.5	1.2	1.2	5.3	5.3	--	--	--
JUL											
13...	--	11	1.0	1.0	1.5	1.5	5.5	5.3	--	--	--
AUG											
24...	--	12	1.4	1.3	1.4	1.4	5.3	5.3	<1.0	<1.0	0
SEP											
15...	--	11	1.2	1.6	1.4	1.5	5.2	5.9	<1.0	<1.0	0
0157154980 SWATARA CR, BL NW TRIB, SITE B1, NR NEWTOWN, PA (LAT 40 40 22N LONG 076 21 41W)											
OCT 1998											
30...	--	.00	11	11	2.6	2.6	6.5	6.5	1.1	1.1	--
NOV											
24...	--	.20	7.1	7.1	2.4	2.4	6.0	5.5	<1.0	<1.0	--
DEC											
31...	--	3.6	6.0	6.0	2.2	2.2	5.9	5.9	--	--	--
JAN 1999											
27...	--	--	--	--	--	--	--	--	--	--	--
FEB											
26...	--	5.0	6.9	6.8	2.2	2.1	6.5	6.4	--	--	--
MAR											
18...	--	5.8	5.1	5.1	1.8	1.8	8.0	8.0	--	--	--
APR											
13...	--	5.2	4.9	4.9	1.7	1.7	6.8	6.8	--	--	--
MAY											
24...	--	5.6	5.2	5.2	1.9	1.9	6.5	6.5	--	--	--
JUN											
22...	--	.00	9.2	9.2	2.8	2.8	8.1	8.1	--	--	--
JUL											
13...	--	2.6	11	13	3.8	3.8	9.8	9.7	--	--	--
AUG											
24...	.0	.00	18	18	4.2	4.2	9.4	9.4	1.4	1.2	--
SEP											
15...	.0	.00	22	22	4.1	4.2	9.9	11	1.4	1.3	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ANC WATER UNFLTRD FET LAB MG/L AS CACO3 (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L- SIO2) (00956)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	NITRO- GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
0157154960 SWATARA CREEK, AB NW TRIB, SITE B0, NR NEWTOWN, PA (LAT 40 40 34N LONG 076 21 57W)										
OCT 1998										
30...	1	12	9.3	<.2	4.7	22	<.040	<.020	.14	<.020
NOV										
24...	1	14	7.2	<.2	5.9	10	<.040	<.020	.20	.020
DEC										
31...	0	12	--	--	--	<2	--	--	--	--
JAN 1999										
27...	0	15	--	--	--	<2	--	--	--	--
FEB										
26...	1	14	--	--	--	<2	--	--	--	--
MAR										
18...	0	23	--	--	--	10	--	--	--	--
APR										
13...	0	13	--	--	--	<2	--	--	--	--
MAY										
24...	0	16	--	--	--	<2	--	--	--	--
JUN										
22...	0	14	--	--	--	18	--	--	--	--
JUL										
13...	0	12	--	--	--	<2	--	--	--	--
AUG										
24...	0	12	10	--	--	<2	--	--	--	--
SEP										
15...	0	14	10	--	--	<2	--	--	--	--
0157154980 SWATARA CR, BL NW TRIB, SITE B1, NR NEWTOWN, PA (LAT 40 40 22N LONG 076 21 41W)										
OCT 1998										
30...	12	26	11	<.2	4.8	30	.060	<.020	.20	<.020
NOV										
24...	4	24	9.0	<.2	5.3	<2	.050	<.020	.20	.020
DEC										
31...	3	24	--	--	--	<2	--	--	--	--
JAN 1999										
27...	--	--	--	--	--	--	--	--	--	--
FEB										
26...	7	22	--	--	--	4	--	--	--	--
MAR										
18...	3	20	--	--	--	36	--	--	--	--
APR										
13...	5	19	--	--	--	14	--	--	--	--
MAY										
24...	3	20	--	--	--	<2	--	--	--	--
JUN										
22...	7	30	--	--	--	<2	--	--	--	--
JUL										
13...	4	36	--	--	--	<2	--	--	--	--
AUG										
24...	15	46	14	--	--	<2	--	--	--	--
SEP										
15...	22	42	14	--	--	8	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	COBALT, TOTAL RECOV- ERABLE (µG/L AS CO) (01037)	COBALT, DIS- SOLVED (µG/L AS CO) (01035)	COPPER, TOTAL RECOV- ERABLE (µG/L AS CU) (01042)	COPPER, DIS- SOLVED (µG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (µG/L AS PB) (01051)	LEAD, DIS- SOLVED (µG/L AS PB) (01049)	LITHIUM TOTAL RECOV- ERABLE (µG/L AS LI) (01132)	LITHIUM DIS- SOLVED (µG/L AS LI) (01130)
0157154960 SWATARA CREEK, AB NW TRIB, SITE B0, NR NEWTOWN, PA (LAT 40 40 34N LONG 076 21 57W)										
OCT 1998										
30...	<50	<50	<10	<10	120	110	<10	<10	<30	<25
NOV										
24...	<50	<50	11	<10	100	69	<1	<1.0	<30	<25
DEC										
31...	--	--	--	--	120	71	--	--	--	--
JAN 1999										
27...	--	--	--	--	170	210	--	--	--	--
FEB										
26...	--	--	--	--	210	210	--	--	--	--
MAR										
18...	--	--	--	--	180	180	--	--	--	--
APR										
13...	--	--	--	--	150	150	--	--	--	--
MAY										
24...	--	--	--	--	300	120	--	--	--	--
JUN										
22...	--	--	--	--	440	270	--	--	--	--
JUL										
13...	--	--	--	--	270	170	--	--	--	--
AUG										
24...	--	--	--	--	270	160	--	--	--	--
SEP										
15...	--	--	--	--	680	260	--	--	--	--
0157154980 SWATARA CR, BL NW TRIB, SITE B1, NR NEWTOWN, PA (LAT 40 40 22N LONG 076 21 41W)										
OCT 1998										
30...	<50	<50	<10	<10	180	33	<10	<10	<30	<25
NOV										
24...	<50	<50	20	<10	120	30	<1	<1.0	<30	<25
DEC										
31...	--	--	--	--	40	<20	--	--	--	--
JAN 1999										
27...	--	--	--	--	--	--	--	--	--	--
FEB										
26...	--	--	--	--	1400	590	--	--	--	--
MAR										
18...	--	--	--	--	880	470	--	--	--	--
APR										
13...	--	--	--	--	1100	410	--	--	--	--
MAY										
24...	--	--	--	--	1100	150	--	--	--	--
JUN										
22...	--	--	--	--	480	66	--	--	--	--
JUL										
13...	--	--	--	--	200	200	--	--	--	--
AUG										
24...	--	--	--	--	900	34	--	--	--	--
SEP										
15...	--	--	--	--	420	100	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (μ S/CM) (00095)	PH WATER WHOLE FIELD ARD (STAND- ARDS) UNITS) (00400)	PH WATER WHOLE LAB ARD (STAND- ARDS) UNITS) (00403)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	OXID- ATION RED- UCTION POTEN- TIAL (MV) (00090)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
0157154984		SWATARA CR, BL NW TRIB, SITE B3, NEAR NEWTOWN, PA (LAT 40 40 22N LONG 076 21 36W)									
OCT 1998											
30...	1325	1028	9813	.38	117	6.8	6.4	--	478	8.7	13.0
NOV											
24...	1300	1028	9813	.24	96	6.8	6.3	--	395	6.3	11.0
DEC											
31...	1110	1028	9813	.12	74	6.3	--	--	--	.1	13.0
JAN 1999											
27...	1345	1028	9813	11	98	5.9	--	--	501	4.5	11.0
FEB											
26...	1230	1028	9813	2.1	103	6.3	--	--	398	2.8	--
MAR											
18...	1020	1028	9813	4.6	98	6.0	--	--	272	5.3	15.0
APR											
13...	1045	1028	9813	2.5	100	6.4	--	--	380	6.6	--
MAY											
24...	1330	1028	9813	1.7	93	6.0	--	--	388	13.5	10.0
JUN											
22...	1300	1028	9813	.40	129	6.6	--	--	404	16.0	9.2
JUL											
13...	1215	1028	9813	.27	141	6.1	--	--	396	1200	9.7
AUG											
24...	1200	1028	9813	.15	154	7.0	--	--	379	17.5	9.4
SEP											
15...	1315	1028	9813	.27	191	6.7	--	--	396	15.5	8.7
403940076205901		HEGINS RED SEEP, SITE C0-2, AT NEWTOWN, PA (LAT 40 39 40N LONG 076 21 01W)									
MAY 1999											
27...	1500	1028	80020	--	287	7.3	6.4	<1	240	12.5	9.1
403939076205901		HEGINS WHITE SEEP, SITE C0-3, AT NEWTOWN, PA (LAT 40 39 39N LONG 076 21 01W)									
MAY 1999											
27...	1530	1028	80020	--	554	6.3	6.5	<1	236	16.0	8.5
0157155012		SWATARA CREEK, SITE C2, AT NEWTOWN, PA (LAT 40 39 31N LONG 076 20 47W)									
OCT 1998											
30...	1230	1028	9813	9.4	185	6.0	6.0	--	467	9.4	12.0
NOV											
24...	1215	1028	9813	.37	202	5.7	5.6	--	524	7.6	11.0
DEC											
31...	1250	1028	9813	.08	173	6.1	--	--	--	.7	12.0
JAN 1999											
27...	1530	1028	9813	--	133	5.8	--	--	356	5.3	10.0
FEB											
26...	1600	1028	9813	2.2	138	6.2	--	--	528	3.2	--
MAR											
18...	1100	1028	9813	4.7	124	6.3	--	--	426	6.9	13.0
APR											
13...	1210	1028	9813	--	129	7.2	--	--	471	8.4	--
MAY											
24...	1130	1028	9813	--	149	5.7	--	--	440	13.0	11.0
JUN											
22...	1215	1028	9813	--	196	5.2	--	--	433	15.5	8.9
JUL											
13...	1115	1028	9813	--	233	6.2	--	--	363	16.5	9.6
AUG											
24...	1130	1028	9813	.01	206	6.4	--	--	345	17.0	6.3
SEP											
15...	1215	1028	9813	.06	240	5.7	--	--	395	16.5	8.0

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	ACIDITY (MG/L AS CAC03) (00435)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	MAGNE- SIUM, TOTAL DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	SODIUM, TOTAL DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)	POTAS- SIUM, TOTAL DIS- SOLVED (MG/L AS K) (00935)
0157154984 SWATARA CR, BL NW TRIB, SITE B3, NEAR NEWTOWN, PA (LAT 40 40 22N LONG 076 21 36W)											
OCT 1998											
30...	110	--	.00	11	11	2.5	2.4	6.4	6.3	<1.0	1.1
NOV											
24...	91	--	.00	7.6	7.6	2.3	2.3	5.7	5.7	<1.0	<1.0
DEC											
31...	91	--	1.0	6.2	6.2	2.1	2.1	5.9	5.9	--	--
JAN 1999											
27...	87	--	8.6	4.6	4.6	1.9	1.9	6.7	6.7	--	--
FEB											
26...	--	--	5.0	6.7	6.7	2.1	2.1	6.5	6.5	--	--
MAR											
18...	110	--	5.0	5.3	5.3	1.8	1.8	8.3	8.3	--	--
APR											
13...	--	--	4.0	5.2	5.1	1.8	1.7	6.9	6.9	--	--
MAY											
24...	100	--	4.2	5.2	5.2	1.9	1.9	6.3	6.3	--	--
JUN											
22...	93	--	.00	9.4	9.4	2.8	2.8	8.1	8.1	--	--
JUL											
13...	--	--	2.8	11	11	3.8	3.8	9.9	9.9	--	--
AUG											
24...	98	.0	.00	19	18	4.4	4.4	9.8	9.8	1.3	1.2
SEP											
15...	87	.0	.00	22	22	4.0	4.2	9.8	9.8	1.4	1.3
403940076205901 HEGINS RED SEEP, SITE C0-2, AT NEWTOWN, PA (LAT 40 39 40N LONG 076 21 01W)											
MAY 1999											
27...	89	56	--	--	48	--	21	--	7.5	--	--
403939076205901 HEGINS WHITE SEEP, SITE C0-3, AT NEWTOWN, PA (LAT 40 39 39N LONG 076 21 01W)											
MAY 1999											
27...	86	25	--	--	52	--	29	--	9.0	--	--
0157155012 SWATARA CREEK, SITE C2, AT NEWTOWN, PA (LAT 40 39 31N LONG 076 20 47W)											
OCT 1998											
30...	110	--	1.8	15	15	9.1	9.1	5.7	5.7	1.2	1.2
NOV											
24...	91	--	2.8	14	14	9.9	9.9	5.0	5.0	1.3	1.3
DEC											
31...	86	--	.40	18	18	11	11	5.8	5.8	--	--
JAN 1999											
27...	81	--	.00	9.7	9.0	5.1	4.8	5.7	5.4	--	--
FEB											
26...	--	--	.00	11	7.9	5.3	5.1	5.5	5.5	--	--
MAR											
18...	110	--	.00	8.6	7.0	4.0	4.0	7.0	7.0	--	--
APR											
13...	--	--	.00	9.7	6.6	3.9	3.9	6.0	6.0	--	--
MAY											
24...	100	--	1.4	9.6	8.5	5.7	5.6	6.0	5.9	--	--
JUN											
22...	88	--	2.2	12	12	9.5	9.5	7.0	7.0	--	--
JUL											
13...	--	--	2.0	19	19	12	12	7.3	7.3	--	--
AUG											
24...	65	--	.00	21	21	11	11	7.0	7.0	1.4	1.4
SEP											
15...	88	--	2.4	20	21	15	16	7.4	8.0	1.5	1.6

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ANC WATER UNFLTRD FET FIELD MG/L AS CACO3 (00410)	ANC WATER UNFLTRD FET LAB MG/L AS CACO3 (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L- SIO2) (00956)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDEED (MG/L) (00530)	NITRO- GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
0157154984 SWATARA CR, BL NW TRIB, SITE B3, NEAR NEWTOWN, PA (LAT 40 40 22N LONG 076 21 36W)											
OCT 1998											
30...	--	12	26	10	<.2	4.9	24	.060	<.020	.18	<.020
NOV											
24...	--	5	24	9.0	<.2	5.1	<2	.050	<.020	.20	<.020
DEC											
31...	--	4	23	--	--	--	<2	--	--	--	--
JAN 1999											
27...	--	3	22	--	--	--	<2	--	--	--	--
FEB											
26...	--	7	22	--	--	--	6	--	--	--	--
MAR											
18...	--	3	19	--	--	--	30	--	--	--	--
APR											
13...	--	5	19	--	--	--	<2	--	--	--	--
MAY											
24...	--	3	20	--	--	--	12	--	--	--	--
JUN											
22...	--	7	30	--	--	--	8	--	--	--	--
JUL											
13...	--	4	36	--	--	--	<2	--	--	--	--
AUG											
24...	--	15	45	14	--	--	<2	--	--	--	--
SEP											
15...	--	22	46	14	--	--	8	--	--	--	--
403940076205901 HEGINS RED SEEP, SITE C0-2, AT NEWTOWN, PA (LAT 40 39 40N LONG 076 21 01W)											
MAY 1999											
27...	72	--	110	9.3	--	--	--	--	--	--	--
403939076205901 HEGINS WHITE SEEP, SITE C0-3, AT NEWTOWN, PA (LAT 40 39 39N LONG 076 21 01W)											
MAY 1999											
27...	44	--	210	11	--	--	--	--	--	--	--
0157155012 SWATARA CREEK, SITE C2, AT NEWTOWN, PA (LAT 40 39 31N LONG 076 20 47W)											
OCT 1998											
30...	--	5	67	8.6	<.2	7.0	24	.060	<.020	.16	<.020
NOV											
24...	--	3	77	8.0	<.2	7.3	6	.050	<.020	.30	<.020
DEC											
31...	--	4	87	--	--	--	<2	--	--	--	--
JAN 1999											
27...	--	11	40	--	--	--	<2	--	--	--	--
FEB											
26...	--	10	40	--	--	--	<2	--	--	--	--
MAR											
18...	--	8	31	--	--	--	34	--	--	--	--
APR											
13...	--	8	34	--	--	--	12	--	--	--	--
MAY											
24...	--	4	45	--	--	--	4	--	--	--	--
JUN											
22...	--	3	73	--	--	--	8	--	--	--	--
JUL											
13...	--	6	90	--	--	--	<2	--	--	--	--
AUG											
24...	--	9	90	9.5	--	--	<2	--	--	--	--
SEP											
15...	--	3	88	9.7	--	--	4	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	COBALT, TOTAL RECOV- ERABLE (µG/L AS CO) (01037)	COBALT, DIS- SOLVED (µG/L AS CO) (01035)	COPPER, TOTAL RECOV- ERABLE (µG/L AS CU) (01042)	COPPER, DIS- SOLVED (µG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (µG/L AS PB) (01051)	LEAD, DIS- SOLVED (µG/L AS PB) (01049)	LITHIUM TOTAL RECOV- ERABLE (µG/L AS LI) (01132)	LITHIUM DIS- SOLVED (µG/L AS LI) (01130)
0157154984 SWATARA CR, BL NW TRIB, SITE B3, NEAR NEWTOWN, PA (LAT 40 40 22N LONG 076 21 36W)										
OCT 1998										
30...	<50	<50	<10	<10	160	39	<10	<10	<30	<25
NOV										
24...	<50	<50	<10	<10	70	31	<1	<1.0	<30	<25
DEC										
31...	--	--	--	--	40	<20	--	--	--	--
JAN 1999										
27...	--	--	--	--	750	310	--	--	--	--
FEB										
26...	--	--	--	--	1900	640	--	--	--	--
MAR										
18...	--	--	--	--	1100	460	--	--	--	--
APR										
13...	--	--	--	--	1100	400	--	--	--	--
MAY										
24...	--	--	--	--	1400	150	--	--	--	--
JUN										
22...	--	--	--	--	880	28	--	--	--	--
JUL										
13...	--	--	--	--	170	51	--	--	--	--
AUG										
24...	--	--	--	--	260	41	--	--	--	--
SEP										
15...	--	--	--	--	540	110	--	--	--	--
403940076205901 HEGINS RED SEEP, SITE C0-2, AT NEWTOWN, PA (LAT 40 39 40N LONG 076 21 01W)										
MAY 1999										
27...	--	--	--	--	--	200	--	--	--	--
403939076205901 HEGINS WHITE SEEP, SITE C0-3, AT NEWTOWN, PA (LAT 40 39 39N LONG 076 21 01W)										
MAY 1999										
27...	--	--	--	--	--	61	--	--	--	--
0157155012 SWATARA CREEK, SITE C2, AT NEWTOWN, PA (LAT 40 39 31N LONG 076 20 47W)										
OCT 1998										
30...	<50	<50	<10	<10	140	140	<10	<10	<30	<25
NOV										
24...	<50	<50	<10	<10	200	190	<1	<1.0	<30	<25
DEC										
31...	--	--	--	--	180	120	--	--	--	--
JAN 1999										
27...	--	--	--	--	400	<20	--	--	--	--
FEB										
26...	--	--	--	--	510	240	--	--	--	--
MAR										
18...	--	--	--	--	600	260	--	--	--	--
APR										
13...	--	--	--	--	450	180	--	--	--	--
MAY										
24...	--	--	--	--	580	70	--	--	--	--
JUN										
22...	--	--	--	--	170	190	--	--	--	--
JUL										
13...	--	--	--	--	100	65	--	--	--	--
AUG										
24...	--	--	--	--	160	110	--	--	--	--
SEP										
15...	--	--	--	--	200	190	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	TIME	AGENCY COLLECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD) (UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD) (UNITS) (00403)	COLOR (PLAT-INUM-COBALT) (UNITS) (00080)	OXID-ATION RED-UCTION POTEN-TIAL (MV) (00090)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)
403853076222301 MIDDLE CR MINE DISCHARGE, SITE E5, NR NEWTOWN, PA (LAT 40 38 52N LONG 076 22 19W)											
MAY 1999											
27...	1645	1028	80020	2.0	272	5.4	4.9	<1	453	11.0	2.7
JUL 28...	1630	1028	80020	<.01	308	5.8	5.6	5	369	19.5	4.5
0157157010 MIDDLE CREEK, SITE E5-1, NEAR NEWTOWN, PA (LAT 40 38 48N LONG 076 22 18W)											
MAY 1999											
27...	1630	1028	80020	2.0	269	5.6	5.1	<1	382	11.0	2.7
403825076242301 COLKET MINE TUNNEL, SITE C7-219, AT DONALDSON, PA (LAT 40 38 25N LONG 076 24 23W)											
MAY 1999											
25...	1530	1028	9813	.31	407	5.9	--	--	266	11.5	5.0
26...	1230	1028	9813	--	421	6.1	--	--	294	11.5	4.8
JUL 28...	1545	1028	80020	.56	355	5.8	4.6	5	239	11.5	5.4
0157156010 MARTIN RUN, SITE C7, AT DONALDSON, PA (LAT 40 38 19N LONG 076 24 19W)											
APR 1999											
12...	0900	1028	9813	.50	198	5.2	--	--	370	8.2	12.0
MAY 25...	1445	1028	9813	.75	237	6.1	--	--	343	20.0	9.8
JUN 30...	1030	1028	9813	.51	270	6.2	--	--	326	14.5	10.0
JUL 14...	1415	1028	9813	.97	317	6.5	--	--	224	15.0	11.0
SEP 16...	1115	1028	9813	3.2	128	5.0	--	--	372	15.0	7.2
0157156012 MARTIN RUN, SITE C8, AT DONALDSON, PA (LAT 40 38 15N LONG 076 24 18W)											
APR 1999											
12...	0910	1028	9813	.50	197	6.4	--	--	311	8.2	11.0
MAY 25...	1500	1028	9813	--	238	6.4	--	--	341	13.0	10.0
JUN 30...	1015	1028	9813	.51	272	6.2	--	--	376	14.5	10.0
JUL 14...	1400	1028	9813	.84	325	7.0	--	--	185	15.0	8.8
SEP 16...	1100	1028	9813	--	136	5.7	--	--	347	14.5	7.2
0157156014 MARTIN RUN, SITE C9, AT DONALDSON, PA (LAT 40 38 12N LONG 076 24 18W)											
APR 1999											
12...	0930	1028	9813	.50	--	--	--	--	--	--	--
MAY 25...	1515	1028	9813	.75	238	6.6	--	--	363	13.0	10.0
JUN 30...	1000	1028	9813	.51	274	6.4	--	--	523	14.5	10.0
JUL 14...	1345	1028	9813	.99	331	7.5	--	--	178	15.5	10.0
AUG 13...	2130	1028	9813	3.2	318	6.9	--	--	--	20.0	--
SEP 16...	1045	1028	9813	3.2	137	5.8	--	--	318	15.0	7.3
30...	0730	1028	9813	--	--	--	--	--	--	--	--
403745076271901 TRACY AIRHOLE, SITE E1-229, NEAR DONALDSON, PA (LAT 40 37 44N LONG 076 27 19W)											
MAY 1999											
28...	1200	1028	80020	2.1	621	6.4	5.6	<1	266	11.0	1.1
JUL 28...	1515	1028	80020	1.3	665	5.8	5.6	5	248	11.0	.4

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	ACIDITY AS CAC03) (00435)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
403853076222301 MIDDLE CR MINE DISCHARGE, SITE E5, NR NEWTOWN, PA (LAT 40 38 52N LONG 076 22 19W)											
MAY 1999											
27...	24	38	--	--	12	--	14	--	8.9	--	--
JUL											
28...	51	19	--	--	17	--	18	--	8.1	--	--
0157157010 MIDDLE CREEK, SITE E5-1, NEAR NEWTOWN, PA (LAT 40 38 48N LONG 076 22 18W)											
MAY 1999											
27...	81	25	--	--	13	--	14	--	8.9	--	--
403825076242301 COLKET MINE TUNNEL, SITE C7-219, AT DONALDSON, PA (LAT 40 38 25N LONG 076 24 23W)											
MAY 1999											
25...	46	--	13	29	29	22	22	2.5	2.4	--	--
26...	44	--	--	--	--	--	--	--	--	--	--
JUL											
28...	50	57	--	--	30	--	22	--	2.4	--	--
0157156010 MARTIN RUN, SITE C7, AT DONALDSON, PA (LAT 40 38 19N LONG 076 24 19W)											
APR 1999											
12...	100	--	8.4	8.9	8.9	7.1	7.1	9.0	9.0	--	--
MAY											
25...	93	--	11	17	16	14	14	6.2	6.2	--	--
JUN											
30...	100	--	48	22	22	18	17	3.5	3.5	--	--
JUL											
14...	--	--	10	22	22	18	18	3.1	3.1	--	--
SEP											
16...	71	--	10	7.1	6.8	5.5	5.4	9.8	9.7	2.1	1.3
0157156012 MARTIN RUN, SITE C8, AT DONALDSON, PA (LAT 40 38 15N LONG 076 24 18W)											
APR 1999											
12...	94	--	.80	11	8.9	6.9	6.6	8.9	8.7	--	--
MAY											
25...	95	--	2.0	18	17	14	14	6.2	6.2	--	--
JUN											
30...	99	--	26	31	23	18	17	3.6	3.6	--	--
JUL											
14...	--	--	.00	27	22	18	17	3.0	2.8	--	--
SEP											
16...	71	--	8.8	8.0	7.7	6.3	5.9	10	10	1.8	1.3
0157156014 MARTIN RUN, SITE C9, AT DONALDSON, PA (LAT 40 38 12N LONG 076 24 18W)											
APR 1999											
12...	--	--	.00	14	10	7.2	7.2	9.2	9.2	--	--
MAY											
25...	96	--	2.0	20	17	14	13	6.4	6.2	--	--
JUN											
30...	99	--	.00	27	24	18	18	3.9	3.9	--	--
JUL											
14...	--	--	.00	27	24	18	17	2.9	2.9	--	--
AUG											
13...	--	--	.00	16	14	4.9	3.8	8.1	7.3	--	--
SEP											
16...	72	--	6.0	9.7	8.2	6.0	5.9	9.9	10	2.1	1.5
30...	--	--	10	7.1	6.5	2.5	2.0	4.8	4.5	--	--
403745076271901 TRACY AIRHOLE, SITE E1-229, NEAR DONALDSON, PA (LAT 40 37 44N LONG 076 27 19W)											
MAY 1999											
28...	10	100	--	--	41	--	42	--	6.5	--	--
JUL											
28...	4	40	--	--	44	--	44	--	6.4	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ANC WATER UNFLTRD FET FIELD CACO3 (00410)	ANC WATER UNFLTRD FET LAB MG/L AS CACO3 (00417)	SULFATE (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	ALUM- INUM, TOTAL, RECOV- ERABLE (µG/L AS AL) (01105)	ALUM- INUM, DIS- SOLVED (µG/L AS AL) (01106)	COBALT, TOTAL, RECOV- ERABLE (µG/L AS CO) (01037)	COBALT, DIS- SOLVED (µG/L AS CO) (01035)	COPPER, TOTAL, RECOV- ERABLE (µG/L AS CU) (01042)	COPPER, DIS- SOLVED (µG/L AS CU) (01040)
403853076222301 MIDDLE CR MINE DISCHARGE, SITE E5, NR NEWTOWN, PA (LAT 40 38 52N LONG 076 22 19W)											
MAY 1999											
27...	5	--	93	13	--	--	500	--	--	--	--
JUL 28...	7	--	110	12	--	--	53	--	--	--	--
0157157010 MIDDLE CREEK, SITE E5-1, NEAR NEWTOWN, PA (LAT 40 38 48N LONG 076 22 18W)											
MAY 1999											
27...	4	--	95	13	--	--	430	--	--	--	--
403825076242301 COLKET MINE TUNNEL, SITE C7-219, AT DONALDSON, PA (LAT 40 38 25N LONG 076 24 23W)											
MAY 1999											
25...	--	34	160	--	6	320	<200	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
JUL 28...	3	--	170	2.5	--	--	90	--	--	--	--
0157156010 MARTIN RUN, SITE C7, AT DONALDSON, PA (LAT 40 38 19N LONG 076 24 19W)											
APR 1999											
12...	--	2	69	--	<2	330	240	--	--	--	--
MAY 25...	--	3	93	--	4	330	<200	--	--	--	--
JUN 30...	--	5	130	--	8	340	<200	--	--	--	--
JUL 14...	--	4	140	--	20	460	<200	--	--	--	--
SEP 16...	--	3	34	17	120	3000	220	--	--	--	--
0157156012 MARTIN RUN, SITE C8, AT DONALDSON, PA (LAT 40 38 15N LONG 076 24 18W)											
APR 1999											
12...	--	5	58	--	<2	340	<200	--	--	--	--
MAY 25...	--	6	92	--	6	320	<200	--	--	--	--
JUN 30...	--	8	130	--	18	390	<200	--	--	--	--
JUL 14...	--	8	140	--	48	400	<200	--	--	--	--
SEP 16...	--	3	37	17	94	2600	270	--	--	--	--
0157156014 MARTIN RUN, SITE C9, AT DONALDSON, PA (LAT 40 38 12N LONG 076 24 18W)											
APR 1999											
12...	--	6	57	--	16	360	<200	--	--	--	--
MAY 25...	--	6	91	--	<2	320	<200	--	--	--	--
JUN 30...	--	10	130	--	32	590	<200	--	--	--	--
JUL 14...	--	9	140	--	36	380	<200	--	--	--	--
AUG 13...	--	15	36	--	280	6900	<200	<50	<50	34	<10
SEP 16...	--	4	37	17	160	2600	<200	--	--	--	--
30...	--	5	20	--	160	6000	<200	<50	<50	19	<10
403745076271901 TRACY AIRHOLE, SITE E1-229, NEAR DONALDSON, PA (LAT 40 37 44N LONG 076 27 19W)											
MAY 1999											
28...	30	--	240	11	--	--	<10	--	--	--	--
JUL 28...	26	--	270	12	--	--	16	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (µG/L AS PB) (01051)	LEAD, DIS- SOLVED (µG/L AS PB) (01049)	MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056)	NICKEL, TOTAL RECOV- ERABLE (µG/L AS NI) (01067)	NICKEL, DIS- SOLVED (µG/L AS NI) (01065)	ZINC, TOTAL RECOV- ERABLE (µG/L AS ZN) (01092)	ZINC, DIS- SOLVED (µG/L AS ZN) (01090)
403853076222301 MIDDLE CR MINE DISCHARGE, SITE E5, NR NEWTOWN, PA (LAT 40 38 52N LONG 076 22 19W)										
MAY 1999										
27...	--	1400	--	--	--	970	--	--	--	--
JUL 28...	3000	140	--	--	--	1300	--	--	--	--
0157157010 MIDDLE CREEK, SITE E5-1, NEAR NEWTOWN, PA (LAT 40 38 48N LONG 076 22 18W)										
MAY 1999										
27...	--	1300	--	--	--	980	--	--	--	--
403825076242301 COLKET MINE TUNNEL, SITE C7-219, AT DONALDSON, PA (LAT 40 38 25N LONG 076 24 23W)										
MAY 1999										
25...	28000	27000	--	--	1600	1600	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
JUL 28...	12000	25000	--	--	--	1500	--	--	--	--
0157156010 MARTIN RUN, SITE C7, AT DONALDSON, PA (LAT 40 38 19N LONG 076 24 19W)										
APR 1999										
12...	2200	1900	--	--	640	640	--	--	--	--
MAY 25...	3800	3300	--	--	1100	1000	--	--	--	--
JUN 30...	5700	5200	--	--	1200	1200	--	--	--	--
JUL 14...	6200	4800	--	--	1200	1200	--	--	--	--
SEP 16...	18000	1200	--	--	640	530	--	--	--	--
0157156012 MARTIN RUN, SITE C8, AT DONALDSON, PA (LAT 40 38 15N LONG 076 24 18W)										
APR 1999										
12...	2400	1700	--	--	600	590	--	--	--	--
MAY 25...	3600	3000	--	--	980	960	--	--	--	--
JUN 30...	6100	4600	--	--	1200	1200	--	--	--	--
JUL 14...	5400	4000	--	--	1200	1100	--	--	--	--
SEP 16...	17000	2100	--	--	630	580	--	--	--	--
0157156014 MARTIN RUN, SITE C9, AT DONALDSON, PA (LAT 40 38 12N LONG 076 24 18W)										
APR 1999										
12...	2200	1800	--	--	640	630	--	--	--	--
MAY 25...	3300	2700	--	--	950	940	--	--	--	--
JUN 30...	13000	3600	--	--	1200	1200	--	--	--	--
JUL 14...	5000	3500	--	--	1200	1100	--	--	--	--
AUG 13...	15000	120	23	<1.0	550	18	<50	<50	190	<10
SEP 16...	30000	1000	--	--	660	540	--	--	--	--
30...	12000	130	7	<1.0	470	170	<50	<50	80	<10
403745076271901 TRACY AIRHOLE, SITE E1-229, NEAR DONALDSON, PA (LAT 40 37 44N LONG 076 27 19W)										
MAY 1999										
28...	--	15000	--	--	--	2600	--	--	--	--
JUL 28...	15000	22000	--	--	--	3000	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	TIME	AGENCY COLLECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD) (UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD) (UNITS) (00403)	COLOR (PLAT-INUM-COBALT) (UNITS) (00080)	OXID-ATION RED-UCTION POTEN-TIAL (MV) (00090)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)
		0157156210 TRACY AIRHOLE, SITE E1-1, NEAR DONALDSON, PA (LAT 40 37 45N LONG 076 27 12W)									
MAY 1999											
28...	1145	1028	80020	2.1	615	6.4	6.0	<1	150	11.5	6.9
JUL 28...	1530	1028	9813	1.3	653	6.0	--	--	208	12.0	7.7
		01571593 GOOD SPRING CREEK BL MIDDLE CREEK AT TREMONT, PA (LAT 40 37 35N LONG 076 23 15W)									
SEP 1999											
27...	1045	1028	80020	13	317	6.8	6.4	--	377	13.5	9.3
		403626076253001 ORCHARD MINE, SITE E3-S0, NR JOLIETT, PA (LAT 40 36 26N LONG 076 25 30W)									
OCT 1998											
30...	1610	1028	9813	--	455	5.4	3.9	--	898	10.5	5.4
		01571758 LOWER RAUSCH CREEK NEAR LORBERRY JUNCTION, PA (LAT 40 35 34N LONG 076 24 40W)									
MAR 1999											
17...	1000	1028	9813	5.6	396	7.3	--	--	465	7.5	12.0
APR 12...	1100	1028	9813	7.6	337	6.7	--	--	277	8.5	15.0
MAY 25...	1015	1028	9813	3.3	375	7.0	--	--	239	11.5	11.0
JUN 30...	1215	1028	9813	2.7	397	7.2	--	--	192	16.0	10.0
JUL 14...	1145	1028	9813	2.6	454	6.7	--	--	225	15.5	10.0
AUG 13...	1310	1028	9813	2.0	228	6.9	--	--	247	17.0	8.8
SEP 07...	1615	1028	9813	--	368	7.4	--	--	--	17.1	5.5
16...	1245	1028	9813	32	317	9.0	--	--	292	16.0	7.1
		01571760 LOWER RAUSCH CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 22N LONG 076 24 42W)									
MAR 1999											
17...	0940	1028	9813	5.3	409	6.7	--	--	454	6.4	13.0
APR 12...	1045	1028	9813	7.4	316	6.6	--	--	276	8.0	15.0
MAY 25...	1000	1028	9813	3.8	380	6.9	--	--	287	13.0	11.0
JUN 30...	1145	1028	9813	1.3	413	7.2	--	--	304	22.0	8.7
JUL 14...	1200	1028	9813	1.5	473	7.0	--	--	225	22.0	9.1
AUG 13...	1215	1028	9813	.02	482	7.1	--	--	285	20.5	7.5
SEP 07...	1545	1028	9813	--	297	7.1	--	--	--	21.6	5.5
16...	1230	1028	9813	28	326	8.6	--	--	226	15.5	7.1
		01571772 LORBERRY CR BL ROWE DRAINAGE TUNNEL NR JOLIETT, PA (LAT 40 35 38N LONG 76 26 23W)									
MAY 1999											
28...	1030	1028	80020	--	250	6.6	6.2	5	.0	12.5	10.0
JUL 28...	1230	1028	80020	--	260	6.6	6.1	10	190	14.5	10.0
		01571773 LORBERRY CR DIV WELLS OUTFLOW NR LORBERRY, PA (LAT 40 35 35N LONG 76 26 24W)									
MAR 1999											
17...	1350	1028	9813	--	238	6.4	--	--	173	12.0	11.0
MAY 25...	1300	1028	9813	--	292	5.7	--	--	365	12.0	9.7
JUN 30...	1500	1028	9813	--	246	6.4	--	--	189	12.5	9.7
JUL 14...	0930	1028	9813	--	263	6.3	--	--	197	12.0	11.0
AUG 13...	1630	1028	9813	--	482	5.5	--	--	423	13.0	8.4
SEP 16...	1600	1028	9813	--	509	4.5	--	--	457	13.0	7.1

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	ACIDITY (MG/L AS CACO3) (00435)	ACIDITY TOTAL HEATED (MG/L AS CACO3) (70508)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
0157156210 TRACY AIRHOLE, SITE E1-1, NEAR DONALDSON, PA (LAT 40 37 45N LONG 076 27 12W)											
MAY 1999											
28...	63	56	--	--	40	--	41	--	6.4	--	--
JUL											
28...	72	--	--	--	--	--	--	--	--	--	--
01571593 GOOD SPRING CREEK BL MIDDLE CREEK AT TREMONT, PA (LAT 40 37 35N LONG 076 23 15W)											
SEP 1999											
27...	88	.0	--	--	22	--	16	--	9.6	--	--
403626076253001 ORCHARD MINE, SITE E3-S0, NR JOLIETT, PA (LAT 40 36 26N LONG 076 25 30W)											
OCT 1998											
30...	49	--	24	32	30	31	30	1.0	.89	<1.0	<1.0
01571758 LOWER RAUSCH CREEK NEAR LORBERRY JUNCTION, PA (LAT 40 35 34N LONG 076 24 40W)											
MAR 1999											
17...	100	--	.00	30	30	20	20	17	17	--	--
APR											
12...	130	--	.00	21	21	16	16	13	13	--	--
MAY											
25...	99	--	.00	30	29	21	21	14	13	--	--
JUN											
30...	100	--	.00	37	37	26	26	16	16	--	--
JUL											
14...	--	--	.00	33	32	23	22	16	15	--	--
AUG											
13...	93	.0	.00	36	31	24	21	16	15	--	--
SEP											
07...	60	--	.00	32	34	16	16	23	22	--	--
16...	72	.0	.00	120	54	11	3.8	19	16	23	3.5
01571760 LOWER RAUSCH CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 22N LONG 076 24 42W)											
MAR 1999											
17...	110	--	.00	29	29	20	20	20	20	--	--
APR											
12...	120	--	.00	22	21	16	16	14	14	--	--
MAY											
25...	110	--	.00	31	31	20	20	15	15	--	--
JUN											
30...	100	--	.00	38	37	26	26	14	14	--	--
JUL											
14...	--	--	.00	34	34	24	23	15	14	--	--
AUG											
13...	88	.0	.00	36	35	24	22	15	14	--	--
SEP											
07...	62	--	.00	28	27	7.9	7.8	20	19	--	--
16...	72	.0	.00	59	45	13	8.8	20	19	8.2	3.0
01571772 LORBERRY CR BL ROWE DRAINAGE TUNNEL NR JOLIETT, PA (LAT 40 35 38N LONG 76 26 23W)											
MAY 1999											
28...	94	21	--	--	10	--	15	--	3.2	--	--
JUL											
28...	99	14	--	--	15	--	16	--	3.6	--	--
01571773 LORBERRY CR DIV WELLS OUTFLOW NR LORBERRY, PA (LAT 40 35 35N LONG 76 26 24W)											
MAR 1999											
17...	99	--	.00	12	11	17	17	3.0	2.8	--	--
MAY											
25...	--	--	14	14	13	20	20	3.2	3.2	--	--
JUN											
30...	--	--	.00	27	17	22	22	3.0	3.6	--	--
JUL											
14...	--	--	.00	18	12	16	16	3.3	3.2	--	--
AUG											
13...	80	--	6.2	36	31	34	33	.6	.51	--	--
SEP											
16...	67	--	34	22	22	39	39	3.3	3.2	2.4	1.9

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ANC WATER UNFLTRD FET FIELD CACO3 (00410)	ANC WATER UNFLTRD FET LAB CACO3 (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L- SIO2) (00956)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDEED (MG/L) (00530)	NITRO- GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)
0157156210 TRACY AIRHOLE, SITE E1-1, NEAR DONALDSON, PA (LAT 40 37 45N LONG 076 27 12W)											
MAY 1999											
28...	30	--	240	11	--	--	--	--	--	--	--
JUL											
28...	--	--	--	--	--	--	--	--	--	--	--
01571593 GOOD SPRING CREEK BL MIDDLE CREEK AT TREMONT, PA (LAT 40 37 35N LONG 076 23 15W)											
SEP 1999											
27...	--	--	110	15	--	--	--	--	--	--	--
403626076253001 ORCHARD MINE, SITE E3-S0, NR JOLIETT, PA (LAT 40 36 26N LONG 076 25 30W)											
OCT 1998											
30...	--	0	210	.45	<.2	8.6	26	<.040	<.020	.11	<.020
01571758 LOWER RAUSCH CREEK NEAR LORBERRY JUNCTION, PA (LAT 40 35 34N LONG 076 24 40W)											
MAR 1999											
17...	--	11	120	--	--	--	20	--	--	--	--
APR											
12...	--	12	110	--	--	--	8	--	--	--	--
MAY											
25...	--	14	130	--	--	--	10	--	--	--	--
JUN											
30...	--	16	170	--	--	--	12	--	--	--	--
JUL											
14...	--	15	180	--	--	--	32	--	--	--	--
AUG											
13...	--	10	180	--	--	--	8	--	--	--	--
SEP											
07...	--	24	110	--	--	--	8	--	--	--	--
16...	--	62	110	15	--	--	1500	--	--	--	--
01571760 LOWER RAUSCH CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 22N LONG 076 24 42W)											
MAR 1999											
17...	--	10	120	--	--	--	14	--	--	--	--
APR											
12...	--	11	110	--	--	--	6	--	--	--	--
MAY											
25...	--	16	130	--	--	--	4	--	--	--	--
JUN											
30...	--	16	170	--	--	--	6	--	--	--	--
JUL											
14...	--	16	180	--	--	--	36	--	--	--	--
AUG											
13...	--	16	180	--	--	--	8	--	--	--	--
SEP											
07...	--	24	80	--	--	--	94	--	--	--	--
16...	--	46	110	18	--	--	430	--	--	--	--
01571772 LORBERRY CR BL ROWE DRAINAGE TUNNEL NR JOLIETT, PA (LAT 40 35 38N LONG 76 26 23W)											
MAY 1999											
28...	12	--	88	4.5	--	--	--	--	--	--	--
JUL											
28...	6	--	94	4.1	--	--	--	--	--	--	--
01571773 LORBERRY CR DIV WELLS OUTFLOW NR LORBERRY, PA (LAT 40 35 35N LONG 76 26 24W)											
MAR 1999											
17...	--	17	89	--	--	--	16	--	--	--	--
MAY											
25...	--	5	130	--	--	--	6	--	--	--	--
JUN											
30...	--	30	100	--	--	--	38	--	--	--	--
JUL											
14...	--	30	95	--	--	--	26	--	--	--	--
AUG											
13...	--	6	220	--	--	--	16	--	--	--	--
SEP											
16...	--	2	260	2.4	--	--	120	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	COBALT, TOTAL RECOV- ERABLE (µG/L AS CO) (01037)	COBALT, DIS- SOLVED (µG/L AS CO) (01035)	COPPER, TOTAL RECOV- ERABLE (µG/L AS CU) (01042)	COPPER, DIS- SOLVED (µG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (µG/L AS PB) (01051)	LEAD, DIS- SOLVED (µG/L AS PB) (01049)	LITHIUM TOTAL RECOV- ERABLE (µG/L AS LI) (01132)	LITHIUM DIS- SOLVED (µG/L AS LI) (01130)
0157156210	TRACY AIRHOLE, SITE E1-1, NEAR DONALDSON, PA (LAT 40 37 45N LONG 076 27 12W)									
MAY 1999										
28...	--	--	--	--	--	13000	--	--	--	--
JUL 28...	--	--	--	--	--	--	--	--	--	--
01571593	GOOD SPRING CREEK BL MIDDLE CREEK AT TREMONT, PA (LAT 40 37 35N LONG 076 23 15W)									
SEP 1999										
27...	--	--	--	--	--	360	--	--	--	--
403626076253001	ORCHARD MINE, SITE E3-S0, NR JOLIETT, PA (LAT 40 36 26N LONG 076 25 30W)									
OCT 1998										
30...	60	54	<10	<10	3300	510	<10	<10	<30	<25
01571758	LOWER RAUSCH CREEK NEAR LORBERRY JUNCTION, PA (LAT 40 35 34N LONG 076 24 40W)									
MAR 1999										
17...	--	--	--	--	3200	2800	--	--	--	--
APR 12...	--	--	--	--	2600	2100	--	--	--	--
MAY 25...	--	--	--	--	4100	1300	--	--	--	--
JUN 30...	--	--	--	--	3200	220	--	--	--	--
JUL 14...	--	--	--	--	3200	550	--	--	--	--
AUG 13...	--	--	--	--	3000	880	--	--	--	--
SEP 07...	<50	<50	<10	<10	1800	93	<1	<1.0	--	--
16...	--	--	--	--	45000	140	--	--	--	--
01571760	LOWER RAUSCH CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 22N LONG 076 24 42W)									
MAR 1999										
17...	--	--	--	--	3100	2200	--	--	--	--
APR 12...	--	--	--	--	2300	1700	--	--	--	--
MAY 25...	--	--	--	--	1000	120	--	--	--	--
JUN 30...	--	--	--	--	520	<20	--	--	--	--
JUL 14...	--	--	--	--	1300	38	--	--	--	--
AUG 13...	--	--	--	--	780	26	--	--	--	--
SEP 07...	<50	<50	13	11	5600	130	4	<1.0	--	--
16...	--	--	--	--	17000	150	--	--	--	--
01571772	LORBERRY CR BL ROWE DRAINAGE TUNNEL NR JOLIETT, PA (LAT 40 35 38N LONG 76 26 23W)									
MAY 1999										
28...	--	--	--	--	--	9400	--	--	--	--
JUL 28...	--	--	--	--	12000	7800	--	--	--	--
01571773	LORBERRY CR DIV WELLS OUTFLOW NR LORBERRY, PA (LAT 40 35 35N LONG 76 26 24W)									
MAR 1999										
17...	--	--	--	--	10000	8300	--	--	--	--
MAY 25...	--	--	--	--	8600	6700	--	--	--	--
JUN 30...	--	--	--	--	9800	9800	--	--	--	--
JUL 14...	--	--	--	--	10000	8800	--	--	--	--
AUG 13...	--	--	--	--	700	500	--	--	--	--
SEP 16...	--	--	--	--	10000	7800	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (μ S/CM) (00095)	PH WATER WHOLE FIELD ARD (STAND- ARDS) UNITS) (00400)	PH WATER WHOLE LAB ARD (STAND- ARDS) UNITS) (00403)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	OXID- ATION RED- UCTION POTEN- TIAL (MV) (00090)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	
		01571776 STUMPS RUN AT LORBERRY, PA (LAT 40 35 30N LONG 076 26 23W)										
MAR 1999												
17...	1320	1028	9813	2.0	64	6.3	--	--	526	7.2	13.0	
APR												
12...	1350	1028	9813	.90	51	5.1	--	--	315	10.0	13.0	
MAY												
25...	1300	1028	9813	--	50	6.2	--	--	351	11.5	9.8	
JUN												
30...	1415	1028	9813	.17	33	5.9	--	--	389	15.0	9.3	
JUL												
14...	1015	1028	9813	.05	21	6.6	--	--	321	12.5	9.8	
AUG												
13...	1615	1028	9813	.03	16	5.9	--	--	207	17.0	7.7	
SEP												
16...	1530	1028	9813	13	46	5.1	--	--	342	15.5	7.1	
		403521076260601 SHADLE MINE SHAFT AT LORBERRY, PA (LAT 40 35 21N LONG 076 26 06W)										
MAR 1999												
17...	1230	1028	9813	.02	2310	3.5	--	--	484	13.5	.9	
APR												
12...	1330	1028	9813	.05	2330	3.5	--	--	337	13.5	3.9	
MAY												
25...	1215	1028	9813	.02	2160	3.7	--	--	342	13.5	1.0	
28...	0915	1028	9813	--	2210	3.5	--	--	256	13.5	1.2	
JUN												
30...	1400	1028	9813	.03	1860	3.2	--	--	347	13.0	1.5	
JUL												
14...	1030	1028	9813	.02	2000	3.4	--	--	295	13.0	2.0	
28...	1000	1028	80020	.01	2050	3.5	3.3	15	326	16.5	1.3	
AUG												
13...	1530	1028	9813	.02	2000	3.6	--	--	321	15.5	2.6	
SEP												
16...	1515	1028	9813	.02	1730	3.3	--	--	332	13.5	2.6	
		0157177680 SHADLE MINE DRAINAGE, 250 FT BL SHAFT, NR LORBERRY, PA (LAT 40 35 15N LONG 76 25 59W)										
MAY 1999												
28...	0945	1028	80020	<.01	2340	2.8	2.7	150	736	15.0	.9	
JUL												
28...	1100	1028	80020	<.01	2450	2.6	2.6	50	656	24.5	1.2	
		01571777 LORBERRY CR AB PANTHER HEAD DISCH NR LORBERRY, PA (LAT 40 35 11N LONG 076 25 55W)										
MAR 1999												
17...	1145	1028	9813	5.9	217	6.6	--	--	483	10.5	12.0	
APR												
12...	1245	1028	9813	8.7	228	5.7	--	--	321	11.0	14.0	
MAY												
25...	1115	1028	9813	--	219	7.0	--	--	242	12.0	9.8	
JUN												
30...	1345	1028	9813	2.3	241	6.4	--	--	354	14.0	11.0	
JUL												
14...	1100	1028	9813	2.0	255	6.2	--	--	187	13.5	11.0	
AUG												
13...	1500	1028	9813	2.9	434	5.4	--	--	226	15.0	8.8	
SEP												
16...	1430	1028	9813	24	121	6.2	--	--	262	15.0	7.4	

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	ACIDITY AS CAC03) (00435)	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
01571776 STUMPS RUN AT LORBERRY, PA (LAT 40 35 30N LONG 076 26 23W)											
MAR 1999											
17...	100	--	.00	5.1	6.2	2.8	3.5	.7	.71	--	--
APR 12...	110	--	.00	3.5	6.0	2.1	3.6	.6	.79	--	--
MAY 25...	90	--	1.2	3.8	3.6	2.6	2.4	.8	.75	--	--
JUN 30...	93	--	1.8	2.2	2.5	1.4	1.6	.7	.51	--	--
JUL 14...	--	--	.00	1.4	2.0	.95	1.3	.6	.66	--	--
AUG 13...	80	--	.00	1.8	2.3	.78	.77	.7	.67	--	--
SEP 16...	71	--	11	4.3	6.4	2.6	2.6	.6	.57	1.7	1.0
403521076260601 SHADLE MINE SHAFT AT LORBERRY, PA (LAT 40 35 21N LONG 076 26 06W)											
MAR 1999											
17...	9	--	770	160	160	100	100	1.8	1.8	--	--
APR 12...	38	--	750	150	140	120	120	2.1	2.0	--	--
MAY 25...	10	--	720	150	140	110	110	2.3	2.3	--	--
JUN 28...	12	--	--	--	--	--	--	--	--	--	--
JUL 30...	14	--	690	160	160	87	87	1.6	1.4	--	--
AUG 14...	--	--	670	130	120	74	71	2.1	2.0	--	--
SEP 13...	26	--	580	140	140	87	87	2.2	1.8	--	--
SEP 16...	25	--	600	130	130	86	80	2.0	1.9	2.4	2.4
0157177680 SHADLE MINE DRAINAGE, 250 FT BL SHAFT, NR LORBERRY, PA (LAT 40 35 15N LONG 76 25 59W)											
MAY 1999											
28...	9	680	--	--	150	--	90	--	1.8	--	--
JUL 28...	14	650	--	--	140	--	85	--	1.8	--	--
01571777 LORBERRY CR AB PANTHER HEAD DISCH NR LORBERRY, PA (LAT 40 35 11N LONG 076 25 55W)											
MAR 1999											
17...	100	--	3.4	12	11	15	14	2.9	2.8	--	--
APR 12...	130	--	12	13	13	17	17	2.7	2.6	--	--
MAY 25...	91	--	2.8	12	12	15	15	3.0	3.0	--	--
JUN 30...	100	--	36	20	20	19	19	2.9	2.8	--	--
JUL 14...	--	--	.00	16	16	16	16	3.3	3.3	--	--
AUG 13...	87	--	16	29	27	29	27	4.5	4.2	--	--
SEP 16...	74	--	5.0	15	9.3	7.5	7.0	2.0	2.2	1.7	1.6

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ANC WATER UNFLTRD FET FIELD MG/L AS (00410)	ANC WATER UNFLTRD FET LAB MG/L AS (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105)	ALUM- INUM, DIS- SOLVED (µG/L AS AL) (01106)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056)
01571776 STUMPS RUN AT LORBERRY, PA (LAT 40 35 30N LONG 076 26 23W)											
MAR 1999											
17...	--	4	24	--	16	<200	<200	230	2600	79	210
APR 12...	--	4	19	--	<2	<200	270	90	5100	73	350
MAY 25...	--	5	22	--	<2	<200	<200	90	60	69	56
JUN 30...	--	6	29	--	6	<200	<200	120	73	17	<10
JUL 14...	--	7	3.5	--	76	390	<200	910	82	170	65
AUG 13...	--	7	1.0	--	4	<200	<200	130	42	14	14
SEP 16...	--	3	18	<.50	270	3700	290	7600	2400	760	340
403521076260601 SHADLE MINE SHAFT AT LORBERRY, PA (LAT 40 35 21N LONG 076 26 06W)											
MAR 1999											
17...	--	0	2000	--	8	17000	17000	370000	370000	20000	20000
APR 12...	--	0	1900	--	<2	15000	14000	340000	320000	20000	19000
MAY 25...	--	0	1600	--	<2	16000	15000	370000	370000	20000	19000
JUN 28...	--	--	--	--	--	--	--	--	--	--	--
JUN 30...	--	0	1800	--	6	16000	16000	330000	330000	22000	20000
JUL 14...	--	0	1600	--	6	15000	14000	280000	270000	18000	18000
JUL 28...	0	--	1400	1.4	--	--	15000	18000	280000	--	18000
AUG 13...	0	0	1400	--	16	16000	16000	300000	300000	20000	20000
SEP 16...	0	0	1400	<.50	68	16000	16000	330000	300000	20000	20000
0157177680 SHADLE MINE DRAINAGE, 250 FT BL SHAFT, NR LORBERRY, PA (LAT 40 35 15N LONG 76 25 59W)											
MAY 1999											
28...	0	--	1400	.69	--	--	16000	--	230000	--	18000
JUL 28...	0	--	1400	4.0	--	--	16000	22000	190000	--	19000
01571777 LORBERRY CR AB PANTHER HEAD DISCH NR LORBERRY, PA (LAT 40 35 11N LONG 076 25 55W)											
MAR 1999											
17...	--	7	96	--	14	1000	<200	7200	5200	1600	1600
APR 12...	--	3	99	--	4	1100	<200	6300	4100	1800	1600
MAY 25...	--	11	86	--	16	860	<200	7400	5400	1700	1700
JUN 30...	--	13	110	--	20	790	<200	6700	3000	1700	1700
JUL 14...	--	12	100	--	50	820	<200	7300	3900	1800	1800
AUG 13...	--	2	200	--	18	1300	440	7900	4700	3000	2800
SEP 16...	--	4	53	1.7	290	5600	300	36000	1500	1900	680

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (μ S/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	OXID- ATION RED- UCTION POTEN- TIAL (MV) (00090)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	ACIDITY (MG/L AS CACO3) (00435)
0157177780		PANTHER HEAD DISCH TO LORBERRY CR NR LORBERRY JCT, PA (LAT 40 35 10N LONG 076 25 56W)									
MAR 1999											
17...	1215	1028	9813	.07	442	3.4	766	5.9	12.0	99	--
APR											
12...	1300	1028	9813	<.13	8	3.2	655	7.9	12.0	110	--
MAY											
25...	1130	1028	9813	.03	478	3.2	491	10.5	7.6	68	--
AUG											
13...	1505	1028	9813	.00	--	--	--	--	--	--	--
SEP											
16...	1445	1028	9813	.10	265	3.4	633	15.0	6.7	67	--
0157177790		UNNAMED TRIB TO LORBERRY CR NR LORBERRY JCT, PA (LAT 40 35 07N LONG 076 25 48W)									
MAR 1999											
17...	1200	1028	9813	1.4	19	5.3	527	2.2	15.0	110	--
APR											
12...	1315	1028	9813	3.9	21	5.3	333	6.6	14.0	110	--
MAY											
25...	1145	1028	9813	--	16	5.1	533	12.5	9.2	86	--
JUN											
30...	1330	1028	9813	.53	12	6.3	577	15.0	9.2	93	--
JUL											
14...	1115	1028	9813	--	15	6.0	263	15.0	8.7	--	--
AUG											
13...	1515	1028	9813	.01	24	6.0	330	18.0	.5	6	--
SEP											
16...	1500	1028	9813	3.3	28	4.4	623	15.5	6.9	69	--
01571778		LORBERRY CREEK NEAR LORBERRY JUNCTION, PA (LAT 40 35 15N LONG 076 25 35W)									
MAR 1999											
17...	1100	1028	9813	7.4	181	6.6	511	8.7	13.0	110	--
APR											
12...	1210	1028	9813	13	171	6.0	313	9.6	15.0	130	--
MAY											
25...	1045	1028	9813	--	152	6.9	242	12.0	10.0	97	--
JUN											
30...	1245	1028	9813	2.8	225	6.5	598	14.5	10.0	100	--
JUL											
14...	1130	1028	9813	2.0	256	6.2	212	14.0	11.0	--	--
AUG											
13...	1430	1028	9813	3.0	424	5.4	383	16.0	9.5	95	--
SEP											
16...	1400	1028	9813	27	101	7.0	327	15.5	7.3	73	.0
01571780		LORBERRY CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 20N LONG 076 24 43W)									
MAR 1999											
17...	0900	1028	9813	7.5	183	6.5	512	7.0	13.0	110	--
APR											
12...	1015	1028	9813	14	273	6.3	306	8.1	14.0	120	--
MAY											
25...	0930	1028	9813	--	380	6.7	316	13.0	11.0	110	--
JUN											
30...	1130	1028	9813	2.7	247	6.9	329	15.0	9.8	97	--
JUL											
14...	1300	1028	9813	3.4	345	7.0	228	18.0	9.7	--	--
AUG											
13...	1200	1028	9813	3.8	404	6.4	333	17.0	8.7	91	--
SEP											
07...	1445	1028	9813	10.5	307	6.6	--	19.8	5.4	59	--
16...	1200	1028	9813	22	315	8.0	350	15.5	7.3	34	.0

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	MAGNE- SIUM, TOTAL DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	SODIUM, TOTAL DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)	POTAS- SIUM, TOTAL DIS- SOLVED (MG/L AS K) (00935)	ANC WATER UNFLTRD FET FIELD MG/L AS CAC03 (00410)
0157177780 PANTHER HEAD DISCH TO LORBERRY CR NR LORBERRY JCT, PA (LAT 40 35 10N LONG 076 25 56W)										
MAR 1999										
17...	86	10	10	9.2	9.2	1.0	.98	--	--	--
APR										
12...	100	12	12	12	12	1.1	1.1	--	--	--
MAY										
25...	92	11	11	9.4	9.1	1.2	1.2	--	--	--
AUG										
13...	--	--	--	--	--	--	--	--	--	--
SEP										
16...	44	16	16	6.6	6.9	.9	.90	1.4	1.6	0
0157177790 UNNAMED TRIB TO LORBERRY CR NR LORBERRY JCT, PA (LAT 40 35 07N LONG 076 25 48W)										
MAR 1999										
17...	4.8	1.2	1.2	.52	.62	.7	.72	--	--	--
APR										
12...	6.6	1.2	1.2	.61	.61	.6	.65	--	--	--
MAY										
25...	6.2	1.0	1.0	.44	.48	.6	.66	--	--	--
JUN										
30...	8.8	.74	.74	.34	.34	.8	.83	--	--	--
JUL										
14...	.00	.88	1.0	.40	.50	.9	.83	--	--	--
AUG										
13...	28	1.9	1.5	1.0	.74	1.2	1.1	--	--	--
SEP										
16...	11	1.6	2.0	.90	.94	.7	.76	1.1	<1.0	0
01571778 LORBERRY CREEK NEAR LORBERRY JUNCTION, PA (LAT 40 35 15N LONG 076 25 35W)										
MAR 1999										
17...	4.0	9.8	9.8	12	12	2.7	2.7	--	--	--
APR										
12...	8.0	8.7	8.2	10	9.7	2.2	2.1	--	--	--
MAY										
25...	2.8	10	10	11	11	2.8	2.8	--	--	--
JUN										
30...	42	19	18	18	17	2.6	2.6	--	--	--
JUL										
14...	.00	16	16	15	15	3.0	3.0	--	--	--
AUG										
13...	16	27	26	27	26	4.2	4.2	--	--	--
SEP										
16...	9.2	9.1	9.1	6.2	5.7	2.2	2.3	1.5	1.5	--
01571780 LORBERRY CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 20N LONG 076 24 43W)										
MAR 1999										
17...	2.6	10	10	12	11	5.5	4.2	--	--	--
APR										
12...	.00	20	19	15	14	14	12	--	--	--
MAY										
25...	.00	30	30	20	20	15	15	--	--	--
JUN										
30...	.00	20	20	16	16	6.2	6.0	--	--	--
JUL										
14...	.00	25	25	18	18	9.1	9.1	--	--	--
AUG										
13...	1.8	30	27	24	22	7.8	7.4	--	--	--
SEP										
07...	.00	26	25	14	14	17	18	--	--	--
16...	.00	45	36	14	11	19	18	6.7	2.8	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ANC WATER UNFLTRD FET LAB MG/L AS CACO3 (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105)	ALUM- INUM, DIS- SOLVED (µG/L AS AL) (01106)	COBALT, TOTAL RECOV- ERABLE (µG/L AS CO) (01037)	COBALT, DIS- SOLVED (µG/L AS CO) (01035)	COPPER, TOTAL RECOV- ERABLE (µG/L AS CU) (01042)	COPPER, DIS- SOLVED (µG/L AS CU) (01040)
0157177780	PANTHER HEAD DISCH TO LORBERRY CR NR LORBERRY JCT, PA (LAT 40 35 10N LONG 076 25 56W)									
MAR 1999										
17...	0	250	--	<2	8200	8200	--	--	--	--
APR 12...	0	190	--	<2	9100	8700	--	--	--	--
MAY 25...	0	190	--	<2	8400	8000	--	--	--	--
AUG 13...	--	--	--	--	--	--	--	--	--	--
SEP 16...	0	110	.63	62	5800	4200	--	--	--	--
0157177790	UNNAMED TRIB TO LORBERRY CR NR LORBERRY JCT, PA (LAT 40 35 07N LONG 076 25 48W)									
MAR 1999										
17...	0	23	--	<2	<200	<200	--	--	--	--
APR 12...	2	4.4	--	<2	<200	<200	--	--	--	--
MAY 25...	3	6.2	--	<2	<200	200	--	--	--	--
JUN 30...	3	1.8	--	14	<200	<200	--	--	--	--
JUL 14...	4	1.9	--	10	<200	<200	--	--	--	--
AUG 13...	4	1.8	--	270	7400	<200	--	--	--	--
SEP 16...	2	6.2	.91	120	760	430	--	--	--	--
01571778	LORBERRY CREEK NEAR LORBERRY JUNCTION, PA (LAT 40 35 15N LONG 076 25 35W)									
MAR 1999										
17...	5	76	--	8	890	<200	--	--	--	--
APR 12...	4	66	--	8	860	<200	--	--	--	--
MAY 25...	7	69	--	8	770	<200	--	--	--	--
JUN 30...	11	100	--	26	900	<200	--	--	--	--
JUL 14...	11	100	--	24	750	<200	--	--	--	--
AUG 13...	2	200	--	18	1100	220	--	--	--	--
SEP 16...	4	42	1.8	180	3500	490	--	--	--	--
01571780	LORBERRY CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 20N LONG 076 24 43W)									
MAR 1999										
17...	4	66	--	<2	790	<200	--	--	--	--
APR 12...	9	90	--	<2	420	<200	--	--	--	--
MAY 25...	16	130	--	<2	<200	<200	--	--	--	--
JUN 30...	11	100	--	18	560	<200	--	--	--	--
JUL 14...	13	130	--	34	370	<200	--	--	--	--
AUG 13...	7	170	--	18	560	<200	--	--	--	--
SEP 07...	16	96	--	57	3300	<200	<50	<50	11	<10
16...	30	110	19	380	22000	400	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (µG/L AS PB) (01051)	LEAD, DIS- SOLVED (µG/L AS PB) (01049)	MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056)	NICKEL, TOTAL RECOV- ERABLE (µG/L AS NI) (01067)	NICKEL, DIS- SOLVED (µG/L AS NI) (01065)	ZINC, TOTAL RECOV- ERABLE (µG/L AS ZN) (01092)	ZINC, DIS- SOLVED (µG/L AS ZN) (01090)
0157177780	PANTHER HEAD DISCH TO LORBERRY CR NR LORBERRY JCT, PA (LAT 40 35 10N LONG 076 25 56W)									
MAR 1999										
17...	2900	2800	--	--	2000	2000	--	--	--	--
APR 12...	4000	3800	--	--	2200	2100	--	--	--	--
MAY 25...	3000	2900	--	--	2100	2000	--	--	--	--
AUG 13...	--	--	--	--	--	--	--	--	--	--
SEP 16...	2300	1100	--	--	1800	1900	--	--	--	--
0157177790	UNNAMED TRIB TO LORBERRY CR NR LORBERRY JCT, PA (LAT 40 35 07N LONG 076 25 48W)									
MAR 1999										
17...	80	130	--	--	27	43	--	--	--	--
APR 12...	180	180	--	--	39	47	--	--	--	--
MAY 25...	280	260	--	--	29	38	--	--	--	--
JUN 30...	270	160	--	--	30	26	--	--	--	--
JUL 14...	220	170	--	--	41	51	--	--	--	--
AUG 13...	15000	300	--	--	870	100	--	--	--	--
SEP 16...	1100	560	--	--	180	170	--	--	--	--
01571778	LORBERRY CREEK NEAR LORBERRY JUNCTION, PA (LAT 40 35 15N LONG 076 25 35W)									
MAR 1999										
17...	5200	3900	--	--	1300	1300	--	--	--	--
APR 12...	4700	3100	--	--	1200	1100	--	--	--	--
MAY 25...	5500	3600	--	--	1300	1300	--	--	--	--
JUN 30...	6600	1600	--	--	1600	1500	--	--	--	--
JUL 14...	5900	2100	--	--	1700	1600	--	--	--	--
AUG 13...	6800	3900	--	--	2700	2700	--	--	--	--
SEP 16...	18000	1000	--	--	960	480	--	--	--	--
01571780	LORBERRY CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 20N LONG 076 24 43W)									
MAR 1999										
17...	4400	2800	--	--	1100	1100	--	--	--	--
APR 12...	2700	1800	--	--	1100	1100	--	--	--	--
MAY 25...	820	61	--	--	1300	1300	--	--	--	--
JUN 30...	3200	360	--	--	1200	1200	--	--	--	--
JUL 14...	2400	340	--	--	900	880	--	--	--	--
AUG 13...	4300	1500	--	--	1700	1600	--	--	--	--
SEP 07...	4700	510	3	<1.0	630	560	<50	<50	110	70
16...	18000	240	--	--	910	490	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	TIME	AGENCY COLLECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD) (00400)	PH WATER WHOLE LAB (STAND-ARD) (00403)	COLOR (PLAT-INUM-COBALT) (00080)	OXID-ATION RED-UCTION POTEN-TIAL (MV) (00090)	TEMPER-ATURE WATER (DEG C) (00010)	OXYGEN, DIS-SOLVED (MG/L) (00300)
		01571798 SWATARA CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 18N LONG 076 24 37W)									
MAR 1999											
17...	0930	1028	9813	63	179	6.4	--	--	582	3.5	15.0
APR 12...	1025	1028	9813	75	153	6.4	--	--	323	7.2	13.0
MAY 25...	0915	1028	9813	35	187	6.9	--	--	320	12.5	11.0
JUN 30...	1100	1028	9813	11	241	7.1	--	--	498	18.5	9.4
JUL 14...	1315	1028	9813	10	279	7.3	--	--	189	18.5	11.0
AUG 13...	1145	1028	9813	8.2	318	6.3	--	--	339	19.0	8.9
SEP 07...	1430	1028	9813	90	180	6.4	--	--	--	20.3	5.2
16...	1145	1028	9813	179	152	6.4	--	--	325	16.0	6.9
		01572010 SWATARA CR BL SR 645 HWY BRIDGE AT PINE GROVE, PA (LAT 40 32 12N LONG 076 21 59W)									
OCT 1998											
30...	0900	1028	9813	35	201	6.7	6.6	--	384	8.0	10.0
NOV 24...	0830	1028	9813	29	235	6.5	6.7	--	437	6.9	11.0
DEC 31...	0840	1028	9813	38	150	7.2	--	--	--	.0	13.0
JAN 1999											
27...	0945	1028	9813	520	141	6.7	--	--	328	3.4	12.0
FEB 26...	1800	1028	9813	130	181	6.9	--	--	365	5.4	--
MAR 18...	1310	1028	9813	260	148	6.9	--	--	379	8.4	13.0
APR 13...	1440	1028	9813	260	146	6.8	--	--	M512	12.0	--
MAY 24...	1030	1028	9813	83	162	7.0	--	--	454	16.0	9.2
JUN 22...	1015	1028	9813	43	216	7.2	--	--	487	18.0	8.8
JUL 13...	0945	1028	9813	28	251	7.0	--	--	315	18.0	9.6
AUG 24...	0900	1028	9813	21	231	7.1	--	--	528	18.5	8.1
SEP 15...	1000	1028	9813	26	266	7.1	--	--	398	19.0	9.6
		404619076321901 BIG MTN MINE NO 1 SLOPE, SR23, AT BIG MOUNTAIN, PA (LAT 40 46 16N LONG 76 32 15W)									
AUG 1999											
04...	1600	1028	80020	.51	914	3.5	3.2	--	552	11.5	1.8
06...	1415	1028	80020	--	913	3.7	3.2	--	572	11.0	4.0
		403650076330701 VALLEY VIEW TUNNEL NEAR VALLEY VIEW, PA (LAT 40 36 50N LONG 076 33 07W)									
MAY 1999											
26...	1415	1028	80020	3.31	237	6.3	5.8	<1	342	11.5	--
JUL 28...	1430	1028	80020	1.87	242	6.2	8.2	5	337	11.5	8.2
		403709076330201 MARKSON COLUMWAY NEAR VALLEY VIEW, PA (LAT 40 37 07N LONG 076 33 00W)									
MAY 1999											
26...	1500	1028	80020	4.0	702	3.5	3.2	<1	609	11.0	.5
JUL 28...	1400	1028	80020	2.7	802	3.4	3.3	5	630	11.0	.4
		403619076310501 PORTER TUNNEL NEAR TOWER CITY, PA (LAT 40 36 02N LONG 076 30 21W)									
MAY 1999											
26...	1600	1028	80020	1.6	948	3.3	3.0	5	982	11.5	9.9
JUL 28...	1300	1028	80020	.69	1040	3.1	5.6	10	694	11.5	10.0

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	ACIDITY (MG/L AS CACO3) (00435)	ACIDITY TOTAL HEATED (MG/L AS CACO3) (70508)	CALCIUM TOTAL RECOV- ERABLE (MG/L AS CA) (00916)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, TOTAL RECOV- ERABLE (MG/L AS MG) (00927)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, TOTAL RECOV- ERABLE (MG/L AS K) (00937)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
01571798 SWATARA CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 18N LONG 076 24 37W)											
MAR 1999											
17...	110	--	.00	12	12	8.3	8.3	7.3	7.3	--	--
APR											
12...	110	--	.00	11	11	7.1	6.8	5.6	5.4	--	--
MAY											
25...	110	--	.00	15	15	9.6	9.6	5.4	5.4	--	--
JUN											
30...	100	--	.00	21	20	14	14	6.9	6.6	--	--
JUL											
14...	--	--	.00	21	20	14	14	7.0	6.5	--	--
AUG											
13...	100	--	.00	26	22	16	14	9.0	8.6	--	--
SEP											
07...	58	--	8.8	17	17	7.9	7.7	4.5	4.3	--	--
16...	69	--	.00	17	16	8.0	7.3	6.1	6.2	2.7	1.6
01572010 SWATARA CR BL SR 645 HWY BRIDGE AT PINE GROVE, PA (LAT 40 32 12N LONG 076 21 59W)											
OCT 1998											
30...	85	--	.00	19	19	12	12	12	12	2.1	2.1
NOV											
24...	89	--	.00	17	16	9.0	11	10	10	1.8	1.7
DEC											
31...	88	--	.00	13	13	6.8	6.8	6.9	6.9	--	--
JAN 1999											
27...	90	--	.00	8.2	8.0	5.0	4.9	6.3	6.2	--	--
FEB											
26...	--	--	.00	13	12	7.5	7.0	6.3	5.8	--	--
MAR											
18...	110	--	.00	8.0	7.8	4.5	4.4	5.5	5.4	--	--
APR											
13...	--	--	.00	9.3	--	5.8	--	5.7	--	--	--
MAY											
24...	93	--	.00	12	12	6.6	7.0	6.0	5.9	--	--
JUN											
22...	92	--	.00	17	17	11	11	8.2	8.2	--	--
JUL											
13...	--	--	.00	21	20	12	12	12	11	--	--
AUG											
24...	87	.0	.00	21	21	13	13	14	13	2.2	2.2
SEP											
15...	100	.0	.00	25	25	16	16	11	12	2.0	2.0
404619076321901 BIG MTN MINE NO 1 SLOPE, SR23, AT BIG MOUNTAIN, PA (LAT 40 46 16N LONG 76 32 15W)											
AUG 1999											
04...	17	170	--	--	45	--	64	--	2.9	--	--
06...	42	95	--	--	44	--	62	--	2.7	--	--
403650076330701 VALLEY VIEW TUNNEL NEAR VALLEY VIEW, PA (LAT 40 36 50N LONG 076 33 07W)											
MAY 1999											
26...	58	53	--	--	12	--	13	--	.81	--	--
JUL											
28...	100	36	--	--	12	--	13	--	.87	--	--
403709076330201 MARKSON COLUMWAY NEAR VALLEY VIEW, PA (LAT 40 37 07N LONG 076 33 00W)											
MAY 1999											
26...	4	140	--	--	38	--	35	--	2.2	--	--
JUL											
28...	3	110	--	--	47	--	41	--	2.4	--	--
403619076310501 PORTER TUNNEL NEAR TOWER CITY, PA (LAT 40 36 02N LONG 076 30 21W)											
MAY 1999											
26...	91	120	--	--	39	--	47	--	5.1	--	--
JUL											
28...	98	95	--	--	47	--	55	--	6.0	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	ANC WATER UNFLTRD FET FIELD MG/L AS CACO3 (00410)	ANC WATER UNFLTRD FET LAB MG/L AS CACO3 (00417)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, TOTAL (MG/L AS F) (00951)	SILICA TOTAL (MG/L- SIO2) (00956)	RESIDUE TOTAL AT 105 DEG. C, RESIDUE SUS- PENDEDE (MG/L) (00530)	RESIDUE SETTLE- ABLE (MG/L) (00545)	NITRO- GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, TOTAL (MG/L AS N) (00600)
01571798 SWATARA CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 18N LONG 076 24 37W)											
MAR 1999											
17...	--	9	53	--	--	--	<2	--	--	--	--
APR 12...	--	7	44	--	--	--	4	--	--	--	--
MAY 25...	--	11	63	--	--	--	4	--	--	--	--
JUN 30...	--	16	92	--	--	--	12	--	--	--	--
JUL 14...	--	16	96	--	--	--	28	--	--	--	--
AUG 13...	--	20	100	--	--	--	38	--	--	--	--
SEP 07...	--	7	65	--	--	--	44	--	--	--	--
16...	--	17	48	6.8	--	--	260	--	--	--	--
01572010 SWATARA CR BL SR 645 HWY BRIDGE AT PINE GROVE, PA (LAT 40 32 12N LONG 076 21 59W)											
OCT 1998											
30...	--	28	69	9.8	<.2	8.0	16	--	.440	.780	1.8
NOV 24...	--	28	69	9.4	<.2	6.2	<2	<.00	.500	.630	1.8
DEC 31...	--	20	45	--	--	--	<2	--	--	--	--
JAN 1999											
27...	--	7	33	--	--	--	16	--	--	--	--
FEB 26...	--	14	52	--	--	--	<2	--	--	--	--
MAR 18...	--	11	24	--	--	--	12	--	--	--	--
APR 13...	--	11	36	--	--	--	10	--	--	--	--
MAY 24...	--	15	43	--	--	--	48	--	--	--	--
JUN 22...	--	20	66	--	--	--	<2	--	--	--	--
JUL 13...	--	18	80	--	--	--	<2	--	--	--	--
AUG 24...	--	28	83	11	--	--	<2	--	--	--	--
SEP 15...	--	22	80	11	--	--	<2	--	--	--	--
404619076321901 BIG MTN MINE NO 1 SLOPE, SR23, AT BIG MOUNTAIN, PA (LAT 40 46 16N LONG 76 32 15W)											
AUG 1999											
04...	0	--	520	3.1	--	--	--	--	--	--	--
06...	--	--	480	3.1	--	--	--	--	--	--	--
403650076330701 VALLEY VIEW TUNNEL NEAR VALLEY VIEW, PA (LAT 40 36 50N LONG 076 33 07W)											
MAY 1999											
26...	16	--	73	1.1	--	--	--	--	--	--	--
JUL 28...	14	--	74	.69	--	--	--	--	--	--	--
403709076330201 MARKSON COLUMWAY NEAR VALLEY VIEW, PA (LAT 40 37 07N LONG 076 33 00W)											
MAY 1999											
26...	0	--	310	2.0	--	--	--	--	--	--	--
JUL 28...	0	--	370	3.0	--	--	--	--	--	--	--
403619076310501 PORTER TUNNEL NEAR TOWER CITY, PA (LAT 40 36 02N LONG 076 30 21W)											
MAY 1999											
26...	0	--	430	14	--	--	--	--	--	--	--
JUL 28...	0	--	450	18	--	--	--	--	--	--	--

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

MISCELLANEOUS STATION ANALYSES

DATE	COBALT, TOTAL RECOV- ERABLE (µG/L AS CO) (01037)	COBALT, DIS- SOLVED (µG/L AS CO) (01035)	COPPER, TOTAL RECOV- ERABLE (µG/L AS CU) (01042)	COPPER, DIS- SOLVED (µG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045)	IRON, DIS- SOLVED (µG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (µG/L AS PB) (01051)	LEAD, DIS- SOLVED (µG/L AS PB) (01049)	LITHIUM TOTAL RECOV- ERABLE (µG/L AS LI) (01132)	LITHIUM DIS- SOLVED (µG/L AS LI) (01130)
01571798 SWATARA CREEK AT LORBERRY JUNCTION, PA (LAT 40 35 18N LONG 076 24 37W)										
MAR 1999										
17...	--	--	--	--	590	220	--	--	--	--
APR 12...	--	--	--	--	540	200	--	--	--	--
MAY 25...	--	--	--	--	380	62	--	--	--	--
JUN 30...	--	--	--	--	240	<20	--	--	--	--
JUL 14...	--	--	--	--	140	29	--	--	--	--
AUG 13...	--	--	--	--	90	<20	--	--	--	--
SEP 07...	<50	<50	14	<10	5100	85	5	<1.0	--	--
16...	--	--	--	--	17000	570	--	--	--	--
01572010 SWATARA CR BL SR 645 HWY BRIDGE AT PINE GROVE, PA (LAT 40 32 12N LONG 076 21 59W)										
OCT 1998										
30...	<50	<50	<10	<10	200	110	<10	<10	<30	<25
NOV 24...	<50	<50	<10	<10	170	89	<1	<1.0	<30	<25
DEC 31...	--	--	--	--	150	71	--	--	--	--
JAN 1999										
27...	--	--	--	--	470	170	--	--	--	--
FEB 26...	--	--	--	--	600	380	--	--	--	--
MAR 18...	--	--	--	--	530	97	--	--	--	--
APR 13...	--	--	--	--	520	--	--	--	--	--
MAY 24...	--	--	--	--	2300	110	--	--	--	--
JUN 22...	--	--	--	--	1200	71	--	--	--	--
JUL 13...	--	--	--	--	320	86	--	--	--	--
AUG 24...	--	--	--	--	240	86	--	--	--	--
SEP 15...	--	--	--	--	200	72	--	--	--	--
404619076321901 BIG MTN MINE NO 1 SLOPE, SR23, AT BIG MOUNTAIN, PA (LAT 40 46 16N LONG 76 32 15W)										
AUG 1999										
04...	--	--	--	--	--	29000	--	--	--	--
06...	--	--	--	--	--	26000	--	--	--	--
403650076330701 VALLEY VIEW TUNNEL NEAR VALLEY VIEW, PA (LAT 40 36 50N LONG 076 33 07W)										
MAY 1999										
26...	--	--	--	--	--	15000	--	--	--	--
JUL 28...	--	--	--	--	18000	14000	--	--	--	--
403709076330201 MARKSON COLUMWAY NEAR VALLEY VIEW, PA (LAT 40 37 07N LONG 076 33 00W)										
MAY 1999										
26...	--	--	--	--	--	11000	--	--	--	--
JUL 28...	--	--	--	--	22000	17000	--	--	--	--
403619076310501 PORTER TUNNEL NEAR TOWER CITY, PA (LAT 40 36 02N LONG 076 30 21W)										
MAY 1999										
26...	--	--	--	--	--	17000	--	--	--	--
JUL 28...	--	--	--	--	20000	18000	--	--	--	--

