

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

Assessment of Water Quality in the Bear Creek Watershed, With Emphasis on Abandoned Mine Drainage, Dauphin County, Pennsylvania

The aquatic habitat of Bear Creek and its receiving waters are degraded by AMD originating from two discharges and multiple diffuse seeps draining the Lykens-Williamstown mine pool. Water chemistry data collected by USGS indicate that Bear Creek above abandoned mine inputs is relatively unpolluted by mine drainage. Below its confluence with Lykens Water Level Tunnel, Lykens Drift, and multiple seeps, Bear Creek becomes laden with orange iron precipitate that armors channel substrate, resulting in poor habitat and water quality. The affected reach of Bear Creek extends for 1.1 miles downstream of Lykens Water Level Tunnel, where it empties into Wiconisco Creek, degrading habitat and impairing fish and macroinvertebrate populations.

USGS has been collecting baseline chemical and hydrologic data at various sites in the Bear Creek watershed since October 1999. The following data were collected in water years 2002 and 2003, prior to any remediation. All previously collected data can be found in Annual Water Data Report (PA-00-2) and Annual Water Data Report (PA-01-2).

A total of seven sites were sampled in the period October 2001 to December 2003 (see map on page 337). Site WC1 is located on Wiconisco Creek below its confluence with Bear Creek. Site WC2 is located on Wiconisco Creek above its confluence with Bear Creek. These two sites determine the impact of Bear Creek on water quality in Wiconisco Creek. Site BC1 is at the mouth of Bear Creek and represents conditions prior to mixing with Wiconisco Creek. Site BC2 is a surface water site located immediately below all mining inputs. Sites BC3 and BC4 are underground mine discharges draining the Lykens-Williamstown mine pool complex. Even though they drain the same mine pool the chemical signatures of these sites are different, possibly due to stratification in the pool, or poorly connected flow paths which limit mixing. Site BC5 is a control site above all mining impacts.

For additional information, contact Jeff Chaplin at the U.S. Geological Survey, 215 Limekiln Road, New Cumberland, Pennsylvania 17070; phone - (717) 730-6957 (email - jchaplin@usgs.gov).

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

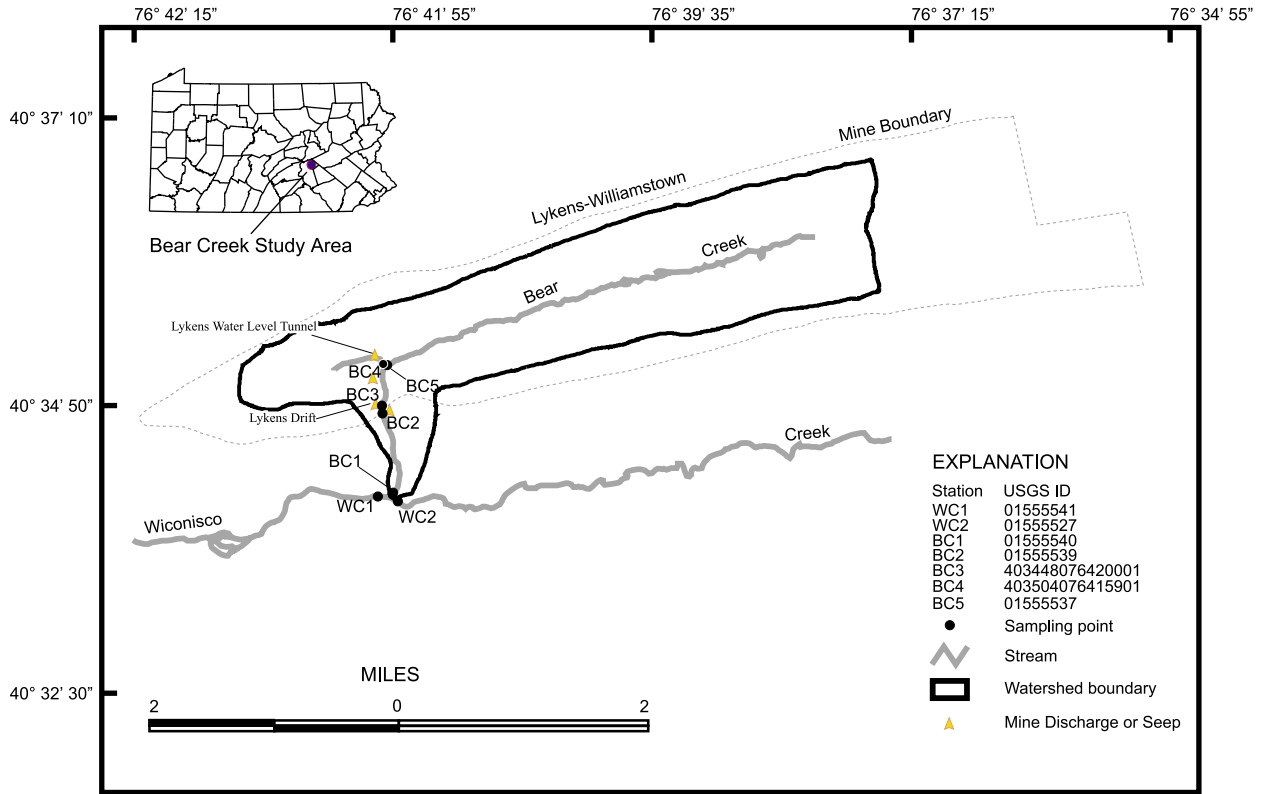


Figure 8.--Location of sites sampled for the Bear Creek Watershed project.

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

0155527 Wiconisco Creek (WC2) us Bear Creek at Lykens, PA

WATER-QUALITY DATA, OCTOBER 2001 TO SEPTEMBER 2002

| Date | Time | Hydro-logic event | AGENCY COL-LECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANA-LYZING SAMPLE (CODE NUMBER) (00028) | DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS-SOLVED (MG/L) (00300) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301) | PH WATER WHOLE FIELD (STAND-ARDS UNITS) (00400) | SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095) | TEMPER-ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB MG/L AS CAC03 (00417) |
|----------|------|-------------------|---|--|---|-----------------------------------|---|---|---|------------------------------------|---|--|---|
| OCT 2001 | | | | | | | | | | | | | |
| 23... | 1000 | 9 | 1028 | 9813 | 17 | 10.9 | 100 | 7.1 | 218 | 11.9 | 10.2 | 30 | 26 |
| NOV | | | | | | | | | | | | | |
| 30... | 1100 | 9 | 1028 | 9813 | E28 | 8.5 | 78 | 6.8 | 206 | 11.3 | 8.1 | 36 | 22 |
| DEC | | | | | | | | | | | | | |
| 18... | 0945 | 9 | 1028 | 9813 | E18 | 9.3 | 76 | 6.7 | 179 | 6.5 | 7.4 | 41 | 22 |
| JAN 2002 | | | | | | | | | | | | | |
| 24... | 1030 | 9 | 1028 | 9813 | 20 | 8.3 | 63 | 7.0 | 241 | 3.6 | 18.8 | 30 | 22 |
| 25... | 1415 | J | 1028 | 9813 | 42 | 8.8 | 68 | 7.1 | 214 | 4.2 | 10.8 | 33 | 17 |
| FEB | | | | | | | | | | | | | |
| 21... | 0900 | 9 | 1028 | 9813 | E20 | 10.1 | 80 | 6.2 | 156 | 6.1 | 6.7 | 32 | 15 |
| MAR | | | | | | | | | | | | | |
| 21... | 1000 | J | 1028 | 9813 | E56 | 8.8 | 69 | 6.5 | 111 | 5.2 | 7.9 | 52 | 13 |
| APR | | | | | | | | | | | | | |
| 29... | 1000 | 9 | 1028 | 9813 | E84 | 7.5 | 69 | 6.7 | 129 | 11.8 | 5.2 | .0 | 16 |
| MAY | | | | | | | | | | | | | |
| 02... | 1200 | J | 1028 | 9813 | 82 | 7.5 | 70 | 6.7 | 125 | 11.9 | 5.2 | 36 | 15 |
| 09... | 1345 | J | 1028 | 9813 | E70 | 7.4 | 71 | 7.0 | 131 | 13.3 | 4.6 | 28 | 19 |
| 30... | 1020 | 9 | 1028 | 9813 | 55 | 6.8 | 69 | 7.0 | 167 | 16.0 | 5.7 | .0 | 26 |
| JUN | | | | | | | | | | | | | |
| 19... | 0945 | 9 | 1028 | 9813 | E24 | 7.4 | 73 | 6.7 | 212 | 14.8 | 6.9 | 22 | 30 |
| JUL | | | | | | | | | | | | | |
| 18... | 0900 | 9 | 1028 | 9813 | 10 | 6.2 | 68 | 6.7 | 230 | 19.7 | 9.2 | .0 | 26 |
| 18... | 0901 | 9 | 1028 | 80020 | 10 | 6.2 | 68 | 6.7 | 230 | 19.7 | -- | -- | -- |
| AUG | | | | | | | | | | | | | |
| 21... | 0930 | 9 | 1028 | 9813 | E6.7 | 6.1 | 67 | 7.0 | 243 | 19.7 | 10.3 | .0 | 24 |
| SEP | | | | | | | | | | | | | |
| 16... | 0930 | 9 | 1028 | 9813 | 22 | 6.2 | 67 | 6.7 | 267 | 19.1 | 10.9 | .0 | 20 |
| 23... | 1300 | 9 | 1028 | 9813 | E25 | 6.4 | 69 | 6.8 | 181 | 19.0 | 7.0 | .0 | 22 |

| Date | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530) | ALUM-INUM, TOTAL RECOV-ERABLE (µG/L AS AL) (01105) | IRON, DIS-SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV-ERABLE (µG/L AS FE) (01045) | MANGA-NESE, DIS-SOLVED (µG/L AS MN) (01056) | MANGA-NESE, TOTAL RECOV-ERABLE (µG/L AS MN) (01055) |
|----------|--|--|--|---------------------------------------|---|---|---|---|
| OCT 2001 | | | | | | | | |
| 23... | 64.7 | 48 | <200 | 300 | <500 | 540 | 220 | 240 |
| NOV | | | | | | | | |
| 30... | 50.6 | <2 | <200 | 150 | <500 | 570 | 280 | 280 |
| DEC | | | | | | | | |
| 18... | 38.2 | 24 | 300 | 140 | <500 | 800 | 260 | 280 |
| JAN 2002 | | | | | | | | |
| 24... | 42.3 | 20 | 700 | 160 | <500 | 1000 | 370 | 390 |
| 25... | 42.0 | 10 | 400 | 90 | <500 | 770 | 400 | 440 |
| FEB | | | | | | | | |
| 21... | 39.6 | <2 | <200 | 130 | <500 | 350 | 340 | 360 |
| MAR | | | | | | | | |
| 21... | 21.9 | 92 | 1600 | 150 | <500 | 4370 | 380 | 520 |
| APR | | | | | | | | |
| 29... | 29.1 | 36 | 700 | 120 | <500 | 1500 | 210 | 280 |
| MAY | | | | | | | | |
| 02... | 34.6 | 40 | 600 | 90 | <500 | 1410 | 230 | 300 |
| 09... | 40.9 | 36 | 400 | 130 | <500 | 1190 | 280 | 310 |
| 30... | 46.6 | 14 | 400 | 150 | <500 | 1230 | 520 | 550 |
| JUN | | | | | | | | |
| 19... | 61.1 | 14 | <200 | 100 | <500 | 80 | 480 | 510 |
| JUL | | | | | | | | |
| 18... | 64.5 | 20 | <200 | 70 | 500 | 720 | 350 | 370 |
| 18... | 67.8 | -- | 120 | 77 | <500 | 650 | 325 | 338 |
| AUG | | | | | | | | |
| 21... | 67.2 | 2 | <200 | 90 | <500 | 620 | 250 | 270 |
| SEP | | | | | | | | |
| 16... | 57.6 | 32 | 1400 | 100 | <500 | 1620 | 180 | 240 |
| 23... | 48.3 | 42 | 700 | 100 | <500 | 1390 | 260 | 330 |

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

01555527 Wiconisco Creek (WC2) us Bear Creek at Lykens, PA--Continued

WATER-QUALITY DATA, OCTOBER 2002 TO DECEMBER 2002

| Date | Time | Hydro-logic event | AGENCY COL-LECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANA-LYZING SAMPLE (CODE NUMBER) (00028) | DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS-SOLVED (MG/L) (00300) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301) | PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400) | SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095) | TEMPER-ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417) |
|-----------|------|-------------------|---|--|---|-----------------------------------|---|--|---|------------------------------------|---|--|---|
| OCT 22... | 0930 | 9 | 1028 | 9813 | 19 | 8.9 | 75 | 6.9 | 207 | 8.0 | 8.5 | .0 | 20 |
| NOV 21... | 1000 | 9 | 1028 | 9813 | E65 | 9.8 | 80 | 6.4 | 131 | 6.4 | 5.6 | 40 | 13 |
| DEC 18... | 0930 | 9 | 1028 | 9813 | 104 | 11.6 | 83 | 6.2 | 118 | 1.6 | 4.9 | .0 | 12 |

| Date | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS-PENDE (MG/L) (00530) | ALUM-INUM, TOTAL RECOV-ERABLE (µG/L AS AL) (01105) | IRON, DIS-SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV-ERABLE (µG/L AS FE) (01045) | MANGA-NESE, DIS-SOLVED (µG/L AS MN) (01056) | MANGA-NESE, TOTAL RECOV-ERABLE (µG/L AS MN) (01055) |
|-----------|--|---|--|---------------------------------------|---|---|---|---|
| OCT 22... | 49.9 | <2 | <200 | 170 | <500 | 500 | 350 | 390 |
| NOV 21... | 31.0 | 6 | 200 | 90 | 500 | 490 | 180 | 210 |
| DEC 18... | 33.1 | 16 | 200 | 70 | <500 | 410 | 150 | 180 |

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

0155537 Bear Creek (BC5) at Wiconisco, PA

WATER-QUALITY DATA, OCTOBER 2001 TO SEPTEMBER 2002

| Date | Time | Hydro-logic event | AGENCY COL-LECTING SAMPLE NUMBER (CODE NUMBER) (00027) | AGENCY ANA-LYZING SAMPLE NUMBER (CODE NUMBER) (00028) | DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS-SOLVED (MG/L) (00300) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301) | PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400) | SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095) | TEMPER-ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB MG/L AS CAC03 (00417) |
|----------|------|-------------------|--|---|---|-----------------------------------|---|--|---|------------------------------------|---|--|---|
| OCT 2001 | | | | | | | | | | | | | |
| 23... | 1300 | 9 | 1028 | 9813 | .01 | 5.4 | 53 | 6.1 | 80 | 11.8 | .8 | 40 | 13 |
| NOV | | | | | | | | | | | | | |
| 30... | 1330 | 9 | 1028 | 9813 | .42 | 8.4 | 76 | 5.5 | 49 | 10.9 | .8 | 45 | 7 |
| DEC | | | | | | | | | | | | | |
| 18... | 1300 | 9 | 1028 | 9813 | E.01 | 10.4 | 87 | 4.7 | 49 | 7.2 | .8 | 43 | 8 |
| JAN 2002 | | | | | | | | | | | | | |
| 24... | 1415 | 9 | 1028 | 9813 | E.43 | 9.3 | 69 | 4.5 | 54 | 2.9 | .8 | 50 | 7 |
| 25... | 1145 | J | 1028 | 9813 | 4.1 | 10.5 | 75 | 4.5 | 53 | 1.8 | .9 | 54 | 6 |
| FEB | | | | | | | | | | | | | |
| 21... | 1230 | 9 | 1028 | 9813 | E.01 | 11.6 | 87 | 4.6 | 47 | 4.0 | 1.1 | 36 | 6 |
| MAR | | | | | | | | | | | | | |
| 21... | 1400 | J | 1028 | 9813 | 6.9 | 9.4 | 75 | 4.6 | 37 | 5.6 | .8 | 38 | 7 |
| APR | | | | | | | | | | | | | |
| 29... | 1330 | 9 | 1028 | 9813 | E4.9 | 8.6 | 78 | 4.6 | 37 | 10.9 | .7 | 52 | 8 |
| MAY | | | | | | | | | | | | | |
| 02... | 1240 | J | 1028 | 9813 | 8.1 | 8.4 | 77 | 4.5 | 37 | 11.3 | .7 | 46 | 7 |
| 09... | 1045 | J | 1028 | 9813 | E3.5 | 8.3 | 78 | 4.5 | 78 | 12.7 | .6 | 42 | 9 |
| 30... | 1400 | 9 | 1028 | 9813 | .48 | 7.5 | 74 | 5.1 | 30 | 14.6 | .7 | 49 | 6 |
| JUN | | | | | | | | | | | | | |
| 19... | 1400 | 9 | 1028 | 9813 | E.34 | 7.8 | 77 | 5.1 | 36 | 14.6 | .7 | 65 | 8 |
| JUL | | | | | | | | | | | | | |
| 18... | 1500 | 9 | 1028 | 9813 | E.01 | 2.3 | 22 | 5.8 | 87 | 12.6 | .8 | 47 | 24 |
| 18... | 1501 | 9 | 1028 | 80020 | E.01 | 2.3 | 22 | 5.8 | 87 | 12.6 | -- | -- | -- |
| AUG | | | | | | | | | | | | | |
| 21... | 1345 | 9 | 1028 | 9813 | E.01 | 2.5 | 24 | 5.8 | 78 | 13.8 | .6 | 44 | -- |
| SEP | | | | | | | | | | | | | |
| 16... | 1300 | 9 | 1028 | 9813 | E.01 | 2.5 | 24 | 5.8 | 56 | 14.7 | .6 | 48 | 14 |
| 23... | 0930 | 9 | 1028 | 9813 | E.01 | 4.8 | 47 | 5.7 | 54 | 15.1 | .6 | 46 | 10 |

| Date | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530) | ALUM-INUM, TOTAL RECOV-ERABLE (µG/L AS AL) (01105) | IRON, DIS-SOLVED (µG/L AS FE) (01046) | IRON FERROUS FLTRD (µG/L) (01047) | IRON, TOTAL RECOV-ERABLE (µG/L AS FE) (01045) | MANGA-NESE, DIS-SOLVED (µG/L AS MN) (01056) | MANGA-NESE, TOTAL RECOV-ERABLE (µG/L AS MN) (01055) |
|----------|--|--|--|---------------------------------------|-----------------------------------|---|---|---|
| OCT 2001 | | | | | | | | |
| 23... | 40.7 | 58 | <200 | 2350 | 2200 | 6630 | 770 | 910 |
| NOV | | | | | | | | |
| 30... | 21.8 | <2 | <200 | 270 | <500 | 280 | 620 | 650 |
| DEC | | | | | | | | |
| 18... | <20.0 | 6 | 300 | 140 | <500 | 510 | 540 | 550 |
| JAN 2002 | | | | | | | | |
| 24... | <20.0 | <2 | 300 | 470 | <500 | 460 | 500 | 490 |
| 25... | <20.0 | <2 | 300 | 400 | <500 | 600 | 430 | 450 |
| FEB | | | | | | | | |
| 21... | <20.0 | <2 | 200 | 220 | <500 | 200 | 340 | 320 |
| MAR | | | | | | | | |
| 21... | <20.0 | <2 | 300 | 180 | <500 | 250 | 280 | 270 |
| APR | | | | | | | | |
| 29... | <20.0 | <2 | 300 | 620 | <500 | 950 | 200 | 190 |
| MAY | | | | | | | | |
| 02... | <20.0 | 6 | 300 | 410 | <500 | 740 | 200 | 200 |
| 09... | <20.0 | <2 | 200 | 280 | <500 | 380 | 210 | 210 |
| 30... | <20.0 | <2 | 300 | 490 | <500 | 860 | 220 | 240 |
| JUN | | | | | | | | |
| 19... | <20.0 | 4 | 300 | 1260 | <500 | 1120 | 400 | 420 |
| JUL | | | | | | | | |
| 18... | 22.0 | <2 | <200 | 3160 | 1100 | 4180 | 500 | 560 |
| 18... | 18.2 | -- | 70 | 4660 | 1100 | 5390 | 548 | 585 |
| AUG | | | | | | | | |
| 21... | 20.9 | 4 | <200 | 4790 | 2900 | 7480 | 580 | 740 |
| SEP | | | | | | | | |
| 16... | 32.8 | 8 | <200 | 2080 | 2400 | 2770 | 500 | 530 |
| 23... | <20.0 | <2 | <200 | 1440 | 1400 | 1330 | 600 | 580 |

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

0155537 Bear Creek (BC5) at Wiconisco, PA--Continued

WATER-QUALITY DATA, OCTOBER 2002 TO DECEMBER 2002

| Date | Time | Hydro-logic event | AGENCY COL-LECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANA-LYZING SAMPLE (CODE NUMBER) (00028) | DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS-SOLVED (MG/L) (00300) | OXYGEN, (PER-CENT SATUR-ATION) (00301) | PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400) | SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095) | TEMPER-ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB MG/L AS CAC03 (00417) |
|-----------|------|-------------------|---|--|---|-----------------------------------|--|--|---|------------------------------------|---|--|---|
| OCT 22... | 1330 | 9 | 1028 | 9813 | .62 | 9.6 | 85 | 4.5 | 71 | 9.8 | .9 | 37 | 7 |
| NOV 21... | 1330 | 9 | 1028 | 9813 | E1.7 | 11.1 | 88 | 4.6 | 45 | 5.3 | .8 | 33 | 6 |
| DEC 18... | 1400 | 9 | 1028 | 9813 | 3.8 | 13.0 | 90 | 4.4 | 44 | .6 | .7 | 31 | 6 |

| Date | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530) | ALUM-INUM, TOTAL RECOV-ERABLE (µG/L AS AL) (01105) | IRON, DIS-SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV-ERABLE (µG/L AS FE) (01045) | MANGA-NESE, DIS-SOLVED (µG/L AS MN) (01056) | MANGA-NESE, TOTAL RECOV-ERABLE (µG/L AS MN) (01055) |
|-----------|--|--|--|---------------------------------------|---|---|---|---|
| OCT 22... | 24.4 | <2 | 300 | 160 | <500 | 180 | 530 | 540 |
| NOV 21... | <20.0 | <2 | 300 | 160 | <500 | 170 | 300 | 300 |
| DEC 18... | <20.0 | 4 | 300 | 140 | <500 | 150 | 240 | 240 |

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

0155540 Bear Creek (BC1) at Mouth at Lykens, PA

WATER-QUALITY DATA, OCTOBER 2001 TO SEPTEMBER 2002

| Date | Time | Hydro- logic event | AGENCY COL- LECTING SAMPLE NUMBER (CODE (00027) | AGENCY ANA- LYZING SAMPLE NUMBER (CODE (00028) | DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS- SOLVED (MG/L) (00300) | OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301) | PH WATER WHOLE FIELD (STAND- ARDS UNITS) (00400) | SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095) | TEMPER- ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER FET LAB MG/L AS CAC03 (00417) |
|----------|------|--------------------------|---|--|---|--|---|---|--|---|--|--|---|
| OCT 2001 | | | | | | | | | | | | | |
| 23... | 1045 | 9 | 1028 | 9813 | E3.6 | 10.1 | 97 | 7.6 | 298 | 13.5 | 6.4 | .0 | 86 |
| NOV | | | | | | | | | | | | | |
| 30... | 1115 | 9 | 1028 | 9813 | 4.1 | 9.7 | 93 | 7.5 | 274 | 13.7 | 5.3 | .0 | 80 |
| DEC | | | | | | | | | | | | | |
| 18... | 1015 | 9 | 1028 | 9813 | E4.5 | 9.2 | 83 | 7.4 | 222 | 10.4 | 7.2 | 30 | 32 |
| JAN 2002 | | | | | | | | | | | | | |
| 24... | 1115 | 9 | 1028 | 9813 | E4.7 | 7.6 | 68 | 7.6 | 262 | 10.2 | 6.0 | .0 | 72 |
| 25... | 1400 | J | 1028 | 9813 | E6.7 | 8.9 | 75 | 7.3 | 187 | 8.0 | 3.5 | .0 | 48 |
| FEB | | | | | | | | | | | | | |
| 21... | 1000 | 9 | 1028 | 9813 | 3.7 | 9.3 | 85 | 7.3 | 283 | 10.9 | 5.9 | .0 | 80 |
| MAR | | | | | | | | | | | | | |
| 21... | 1100 | J | 1028 | 9813 | E11 | 8.8 | 76 | 7.0 | 122 | 8.8 | 2.9 | .0 | 38 |
| APR | | | | | | | | | | | | | |
| 29... | 1030 | 9 | 1028 | 9813 | 14 | 8.6 | 78 | 7.2 | 171 | 11.3 | 3.2 | .0 | 46 |
| MAY | | | | | | | | | | | | | |
| 02... | 1130 | J | 1028 | 9813 | E20 | 8.2 | 76 | 7.3 | 163 | 12.0 | 3.1 | .0 | 46 |
| 09... | 1330 | J | 1028 | 9813 | 11 | 8.4 | 78 | 7.4 | 223 | 12.3 | 3.8 | .0 | 64 |
| 30... | 1045 | 9 | 1028 | 9813 | E11 | 7.9 | 78 | 7.1 | 233 | 14.7 | 4.3 | .0 | 68 |
| JUN | | | | | | | | | | | | | |
| 19... | 1045 | 9 | 1028 | 9813 | 8.3 | 8.7 | 86 | 7.3 | 262 | 14.8 | 4.8 | .0 | 80 |
| JUL | | | | | | | | | | | | | |
| 18... | 0930 | 9 | 1028 | 9813 | E5.2 | 9.4 | 93 | 7.4 | 234 | 14.7 | 5.5 | .0 | 88 |
| 18... | 0931 | 9 | 1028 | 80020 | E5.2 | 9.4 | 93 | 7.4 | 234 | 14.7 | -- | -- | -- |
| AUG | | | | | | | | | | | | | |
| 21... | 0945 | 9 | 1028 | 9813 | 5.3 | 9.4 | 91 | 7.6 | 291 | 13.9 | 5.5 | .0 | -- |
| SEP | | | | | | | | | | | | | |
| 16... | 0900 | 9 | 1028 | 9813 | E5.0 | 9.2 | 90 | 7.5 | 298 | 14.6 | 6.4 | .0 | 90 |
| 23... | 1315 | 9 | 1028 | 9813 | 4.7 | 8.7 | 88 | 7.8 | 299 | 15.8 | 6.5 | .0 | 90 |

| Date | SULFATE DIS- SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530) | ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105) | IRON, DIS- SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045) | MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056) | MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055) |
|----------|--|--|---|---|--|--|---|--|
| OCT 2001 | | | | | | | | |
| 23... | 81.5 | 70 | <200 | 3920 | <500 | 13400 | 2150 | 2220 |
| NOV | | | | | | | | |
| 30... | 68.3 | 46 | <200 | 70 | <500 | 22800 | 1560 | 1860 |
| DEC | | | | | | | | |
| 18... | 42.9 | 12 | <200 | 150 | 600 | 3090 | 450 | 520 |
| JAN 2002 | | | | | | | | |
| 24... | 59.7 | 30 | <200 | 700 | 600 | 15600 | 1460 | 1570 |
| 25... | 39.8 | 50 | 300 | 1360 | <500 | 35000 | 1100 | 1480 |
| FEB | | | | | | | | |
| 21... | 68.4 | 30 | <200 | 320 | <500 | 10300 | 1620 | 1740 |
| MAR | | | | | | | | |
| 21... | 29.6 | 6 | 200 | 1570 | <500 | 25200 | 890 | 1170 |
| APR | | | | | | | | |
| 29... | 38.1 | 28 | <200 | 880 | 500 | 10800 | 940 | 1060 |
| MAY | | | | | | | | |
| 02... | 29.7 | 46 | 200 | 960 | <500 | 11600 | 940 | 1010 |
| 09... | 52.7 | 20 | <200 | 1190 | 2500 | 9330 | 1190 | 1270 |
| 30... | 52.8 | 20 | <200 | 1270 | <500 | 9600 | 1380 | 1420 |
| JUN | | | | | | | | |
| 19... | 58.8 | 24 | <200 | 270 | <500 | 260 | 1500 | 1530 |
| JUL | | | | | | | | |
| 18... | 61.2 | 16 | <200 | 540 | <500 | 12500 | 1710 | 1850 |
| 18... | -- | -- | -- | -- | <500 | -- | -- | -- |
| AUG | | | | | | | | |
| 21... | 62.8 | 20 | <200 | 100 | <500 | 10900 | 1800 | 1840 |
| SEP | | | | | | | | |
| 16... | 70.6 | 34 | <200 | 120 | <500 | 13200 | 1750 | 1890 |
| 23... | 65.8 | 26 | <200 | 30 | <500 | 16600 | 1650 | 1870 |

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

01555540 Bear Creek (BC1) at Mouth at Lykens, PA--Continued

WATER-QUALITY DATA, OCTOBER 2002 TO DECEMBER 2002

| Date | Time | Hydro- logic event | AGENCY COL- LECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028) | DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS- SOLVED (MG/L) (00300) | OXYGEN, DIS- SOLVED SATUR- ATION (00301) | PH WATER WHOLE FIELD (STAND- ARDS UNITS) (00400) | SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095) | TEMPER- ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB MG/L AS CAC03 (00417) |
|--------------|------|--------------------------|--|---|---|--|---|---|--|---|--|--|--|
| OCT 22... | 0915 | 9 | 1028 | 9813 | E5.5 | 9.8 | 87 | 7.3 | 274 | 10.2 | 5.7 | .0 | 80 |
| NOV 21... | 1015 | 9 | 1028 | 9813 | 8.9 | 9.9 | 87 | 7.0 | 207 | 9.7 | 4.0 | .0 | 56 |
| DEC 18... | 1100 | 9 | 1028 | 9813 | E12 | 10.9 | 89 | 7.0 | 211 | 6.8 | 3.6 | .0 | 53 |

| Date | SULFATE DIS- SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530) | ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105) | IRON, DIS- SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045) | MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056) | MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055) |
|--------------|--|--|---|---|--|--|---|--|
| OCT 22... | 60.1 | 18 | <200 | 800 | 800 | 13500 | 1590 | 1720 |
| NOV 21... | 48.7 | <2 | <200 | 1940 | 1800 | 8520 | 1170 | 1250 |
| DEC 18... | 52.5 | 18 | <200 | 3820 | 3200 | 8520 | 1160 | 1190 |

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

0155541 Wiconisco Creek (WC1) ds Bear Creek at Lykens, PA

WATER-QUALITY DATA, OCTOBER 2001 TO SEPTEMBER 2002

| Date | Time | Hydro-logic event | AGENCY COL-LECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANA-LYZING SAMPLE (CODE NUMBER) (00028) | DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS-SOLVED (MG/L) (00300) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301) | PH WATER WHOLE FIELD (STAND-ARDS UNITS) (00400) | SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095) | TEMPER-ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB MG/L AS CAC03 (00417) |
|----------|------|-------------------|---|--|---|-----------------------------------|---|---|---|------------------------------------|---|--|---|
| OCT 2001 | | | | | | | | | | | | | |
| 23... | 0930 | 9 | 1028 | 9813 | E21 | 9.7 | 96 | 7.1 | 262 | 12.1 | 7.9 | .0 | 46 |
| NOV | | | | | | | | | | | | | |
| 30... | 1015 | 9 | 1028 | 9813 | 32 | 8.8 | 81 | 6.7 | 226 | 11.8 | 7.8 | .0 | 38 |
| DEC | | | | | | | | | | | | | |
| 18... | 0900 | 9 | 1028 | 9813 | E22 | 9.5 | 79 | 6.2 | 192 | 7.1 | 5.0 | .0 | 74 |
| JAN 2002 | | | | | | | | | | | | | |
| 24... | 0930 | 9 | 1028 | 9813 | E25 | 8.3 | 64 | 7.0 | 293 | 4.8 | .8 | .0 | 32 |
| 25... | 1530 | J | 1028 | 9813 | E49 | 9.4 | 72 | 7.0 | 203 | 4.4 | 9.2 | .0 | 22 |
| FEB | | | | | | | | | | | | | |
| 21... | 0830 | 9 | 1028 | 9813 | 24 | 9.7 | 80 | 6.1 | 182 | 6.8 | 6.2 | 27 | 26 |
| MAR | | | | | | | | | | | | | |
| 21... | 0915 | J | 1028 | 9813 | E67 | 8.9 | 70 | 6.4 | 113 | 5.4 | 7.5 | 49 | 16 |
| APR | | | | | | | | | | | | | |
| 29... | 0900 | 9 | 1028 | 9813 | 98 | 7.6 | 70 | 6.5 | 128 | 11.8 | 4.8 | .0 | 22 |
| MAY | | | | | | | | | | | | | |
| 02... | 1100 | J | 1028 | 9813 | E102 | 7.6 | 71 | 6.9 | 131 | 12.0 | 4.5 | 33 | 20 |
| 09... | 1415 | J | 1028 | 9813 | 81 | 7.6 | 72 | 7.0 | 144 | 13.1 | 4.7 | 22 | 28 |
| 30... | 0920 | 9 | 1028 | 9813 | E66 | 7.0 | 71 | 6.7 | 162 | 15.4 | 5.1 | .0 | 34 |
| JUN | | | | | | | | | | | | | |
| 19... | 0915 | 9 | 1028 | 9813 | 32 | 7.7 | 76 | 6.3 | 223 | 14.6 | 6.2 | .0 | 40 |
| JUL | | | | | | | | | | | | | |
| 18... | 0800 | 9 | 1028 | 9813 | E15 | 7.0 | 73 | 7.0 | 247 | 17.5 | 7.3 | .0 | 50 |
| 18... | 0801 | 9 | 1028 | 80020 | E15 | 7.0 | 73 | 7.0 | 247 | 17.5 | -- | -- | -- |
| AUG | | | | | | | | | | | | | |
| 21... | 0830 | 9 | 1028 | 9813 | 12 | 7.8 | 80 | 7.3 | 272 | 16.7 | 8.1 | .0 | -- |
| SEP | | | | | | | | | | | | | |
| 16... | 0830 | 9 | 1028 | 9813 | E27 | 7.0 | 74 | 6.8 | 273 | 18.2 | 10.1 | .0 | 34 |
| 23... | 1415 | 9 | 1028 | 9813 | 30 | 6.8 | 73 | 7.2 | 204 | 18.5 | 6.7 | .0 | 36 |

| Date | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530) | ALUM-INUM, TOTAL RECOV-ERABLE (µG/L AS AL) (01105) | IRON, DIS-SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV-ERABLE (µG/L AS FE) (01045) | MANGA-NESE, DIS-SOLVED (µG/L AS MN) (01056) | MANGA-NESE, TOTAL RECOV-ERABLE (µG/L AS MN) (01055) |
|----------|--|--|--|---------------------------------------|---|---|---|---|
| OCT 2001 | | | | | | | | |
| 23... | 81.5 | 64 | <200 | 240 | <500 | 3860 | 860 | 790 |
| NOV | | | | | | | | |
| 30... | 65.2 | <2 | <200 | 120 | <500 | 3110 | 630 | 660 |
| DEC | | | | | | | | |
| 18... | 60.8 | 36 | <200 | 460 | <500 | 19600 | 1470 | 1570 |
| JAN 2002 | | | | | | | | |
| 24... | 44.9 | 92 | 300 | 240 | <500 | 460 | 540 | 490 |
| 25... | 40.5 | 16 | 300 | 330 | <500 | 6900 | 550 | 640 |
| FEB | | | | | | | | |
| 21... | 45.0 | <2 | <200 | 320 | <500 | 1920 | 540 | 570 |
| MAR | | | | | | | | |
| 21... | 23.1 | 92 | 1600 | 340 | <500 | 7330 | 450 | 630 |
| APR | | | | | | | | |
| 29... | 28.8 | 4 | 1000 | 340 | <500 | 4000 | 360 | 390 |
| MAY | | | | | | | | |
| 02... | 56.8 | 54 | 700 | 320 | <500 | 3270 | 360 | 410 |
| 09... | 34.4 | 24 | 200 | 290 | <500 | 2280 | 440 | 490 |
| 30... | 51.7 | 20 | 300 | 360 | <500 | 2740 | 680 | 680 |
| JUN | | | | | | | | |
| 19... | 56.3 | 20 | <200 | 450 | <500 | 130 | 720 | 730 |
| JUL | | | | | | | | |
| 18... | 60.5 | 182 | <200 | 210 | <500 | 4950 | 860 | 920 |
| 18... | 65.3 | -- | 80 | 182 | <500 | 4690 | 819 | 862 |
| AUG | | | | | | | | |
| 21... | 64.6 | 20 | <200 | 80 | <500 | 5850 | 980 | 1050 |
| SEP | | | | | | | | |
| 16... | 64.6 | 32 | 1100 | 620 | <500 | 3450 | 490 | 560 |
| 23... | 51.2 | 16 | 600 | 80 | <500 | 3870 | 520 | 590 |

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

01555541 Wiconisco Creek (WC1) ds Bear Creek at Lykens, PA--Continued

WATER-QUALITY DATA, OCTOBER 2002 TO DECEMBER 2002

| Date | Time | Hydro-logic event | AGENCY COL-LECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANA-LYZING SAMPLE (CODE NUMBER) (00028) | DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS-SOLVED (MG/L) (00300) | OXYGEN, SATUR-ATION (00301) | PH WATER WHOLE FIELD (STAND-ARDS UNITS) (00400) | SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095) | TEMPER-ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417) |
|-----------|------|-------------------|---|--|---|-----------------------------------|-----------------------------|---|---|------------------------------------|---|--|---|
| OCT 22... | 0830 | 9 | 1028 | 9813 | E25 | 9.1 | 78 | 6.6 | 222 | 8.5 | 7.5 | .0 | 34 |
| NOV 21... | 0900 | 9 | 1028 | 9813 | 74 | 9.9 | 81 | 6.5 | 143 | 6.9 | 5.3 | .0 | 20 |
| DEC 18... | 0900 | 9 | 1028 | 9813 | E116 | 11.5 | 84 | 6.2 | 131 | 2.2 | 4.7 | .0 | 21 |

| Date | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS-PENDE (MG/L) (00530) | ALUM-INUM, TOTAL RECOV-ERABLE (µG/L AS AL) (01105) | IRON, DIS-SOLVED (µG/L AS FE) (01046) | IRON, FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV-ERABLE (µG/L AS FE) (01045) | MANGA-NESE, DIS-SOLVED (µG/L AS MN) (01056) | MANGA-NESE, TOTAL RECOV-ERABLE (µG/L AS MN) (01055) |
|-----------|--|---|--|---------------------------------------|--|---|---|---|
| OCT 22... | 61.8 | 4 | <200 | 330 | 500 | 2720 | 640 | 670 |
| NOV 21... | 35.0 | <2 | <200 | 400 | 600 | 1550 | 340 | 5430 |
| DEC 18... | 29.5 | 14 | 200 | 680 | 1000 | 1720 | 300 | 350 |

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

403448076420001 -- Lykens-Williamstown Seep (BC3)

WATER-QUALITY DATA, OCTOBER 2001 TO SEPTEMBER 2002

| Date | Time | Hydro- logic event | AGENCY COL- LECTING SAMPLE NUMBER (CODE (00027) | AGENCY ANA- LYZING SAMPLE NUMBER (CODE (00028) | DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS- SOLVED (MG/L) (00300) | OXYGEN, DIS- SOLVED SATUR- ATION (00301) | PH WATER WHOLE FIELD (STAND- ARDS UNITS) (00400) | SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095) | TEMPER- ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB MG/L AS CAC03 (00417) |
|----------|------|--------------------------|---|--|---|--|---|---|--|---|--|--|--|
| OCT 2001 | | | | | | | | | | | | | |
| 23... | 1200 | 9 | 1028 | 9813 | E1.4 | .4 | 4 | 6.8 | 361 | 13.4 | 6.4 | .0 | 130 |
| NOV | | | | | | | | | | | | | |
| 30... | 1300 | 9 | 1028 | 9813 | E2.4 | .4 | 4 | 6.6 | 363 | 13.3 | .8 | -- | -- |
| DEC | | | | | | | | | | | | | |
| 18... | 1130 | 9 | 1028 | 9813 | .55 | .2 | 2 | 6.6 | 345 | 13.3 | 5.9 | .0 | 132 |
| JAN 2002 | | | | | | | | | | | | | |
| 24... | 1345 | 9 | 1028 | 9813 | E1.4 | .3 | 3 | 6.6 | 362 | 13.3 | 5.8 | .0 | 126 |
| 25... | 1245 | J | 1028 | 9813 | E.46 | .4 | 4 | 6.5 | 369 | 13.3 | 6.1 | .0 | 124 |
| FEB | | | | | | | | | | | | | |
| 15... | 1135 | 9 | 1028 | 9813 | E1.0 | .9 | 7 | 6.5 | 364 | 11.3 | -- | -- | -- |
| 21... | 1045 | 9 | 1028 | 9813 | .40 | 5.7 | 54 | 6.5 | 368 | 13.3 | 6.4 | .0 | 132 |
| MAR | | | | | | | | | | | | | |
| 21... | 1300 | J | 1028 | 9813 | E2.9 | .4 | 4 | 6.6 | 303 | 13.3 | 6.1 | .0 | 132 |
| APR | | | | | | | | | | | | | |
| 29... | 1230 | 9 | 1028 | 9813 | 2.7 | 1.1 | 10 | 6.5 | 370 | 13.3 | 6.5 | .0 | 136 |
| MAY | | | | | | | | | | | | | |
| 02... | 1215 | J | 1028 | 9813 | E4.9 | .3 | 3 | 6.6 | 365 | 13.3 | 6.1 | .0 | 140 |
| 09... | 1200 | J | 1028 | 9813 | 3.0 | .4 | 4 | 6.5 | 366 | 13.3 | 6.4 | .0 | 140 |
| 30... | 1245 | 9 | 1028 | 9813 | E3.2 | .2 | 2 | 6.6 | 341 | 13.2 | 6.5 | .0 | 130 |
| JUN | | | | | | | | | | | | | |
| 19... | 1300 | 9 | 1028 | 9813 | 2.6 | .3 | 3 | 6.5 | 361 | 13.3 | 6.2 | .0 | 136 |
| JUL | | | | | | | | | | | | | |
| 18... | 1300 | 9 | 1028 | 9813 | E1.2 | .3 | 3 | 6.6 | 343 | 13.3 | 6.3 | .0 | 132 |
| 18... | 1301 | 9 | 1028 | 80020 | E1.2 | .3 | 3 | 6.6 | 343 | 13.3 | -- | -- | -- |
| AUG | | | | | | | | | | | | | |
| 21... | 1200 | 9 | 1028 | 9813 | 1.6 | .3 | 3 | 6.6 | 356 | 13.3 | 6.2 | .0 | 124 |
| SEP | | | | | | | | | | | | | |
| 16... | 1215 | 9 | 1028 | 9813 | E1.1 | .3 | 3 | 6.5 | 365 | 13.3 | 6.4 | .0 | 134 |
| 23... | 1100 | 9 | 1028 | 9813 | 1.3 | .4 | 3 | 6.5 | 364 | 13.3 | 6.4 | .0 | 128 |

| Date | SULFATE DIS- SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530) | ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105) | IRON, DIS- SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045) | MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056) | MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055) |
|----------|--|---|---|---|--|--|---|--|
| OCT 2001 | | | | | | | | |
| 23... | 78.9 | 68 | <200 | 21400 | 14400 | 20700 | 2720 | 2700 |
| NOV | | | | | | | | |
| 30... | 77.6 | <18 | <200 | 7150 | 5500 | 10500 | 1100 | 1080 |
| DEC | | | | | | | | |
| 18... | 65.7 | 20 | <200 | 18200 | 6400 | 19000 | 2080 | 2120 |
| JAN 2002 | | | | | | | | |
| 24... | 65.2 | 4 | <200 | 16700 | 8200 | 23000 | 2120 | 2230 |
| 25... | 59.6 | <2 | <200 | 18200 | 2000 | 18800 | 2060 | 2160 |
| FEB | | | | | | | | |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | 60.1 | 18 | <200 | 17300 | 4800 | 17500 | 2220 | 2230 |
| MAR | | | | | | | | |
| 21... | 55.8 | 14 | <200 | 19300 | 1500 | 20000 | 2080 | 2060 |
| APR | | | | | | | | |
| 29... | 58.9 | <2 | <200 | 18500 | 3500 | 18900 | 2160 | 2110 |
| MAY | | | | | | | | |
| 02... | 54.5 | 62 | <200 | 18400 | 900 | 18500 | 2180 | 2120 |
| 09... | 55.1 | 22 | <200 | 8300 | 1100 | 17100 | 1320 | 2170 |
| 30... | 54.6 | 12 | <200 | 18700 | 2000 | 18500 | 2090 | 2120 |
| JUN | | | | | | | | |
| 19... | 59.6 | 6 | <200 | 18900 | 2600 | 19800 | 2020 | 2110 |
| JUL | | | | | | | | |
| 18... | 61.3 | 14 | <200 | 18300 | 4000 | 18900 | 2120 | 2190 |
| 18... | -- | -- | -- | -- | 4000 | -- | -- | -- |
| AUG | | | | | | | | |
| 21... | 57.7 | 10 | <200 | 17500 | 4100 | 18300 | 2070 | 2070 |
| SEP | | | | | | | | |
| 16... | 88.8 | 14 | <200 | 17700 | 4300 | 18300 | 2150 | 2130 |
| 23... | 62.5 | 6 | <200 | 18100 | 4100 | 19200 | 2160 | 2200 |

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

403448076420001 -- Lykens-Williamstown Seep (BC3)--Continued

WATER-QUALITY DATA, OCTOBER 2002 TO DECEMBER 2002

| Date | Time | Hydro- logic event | AGENCY COL- LECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028) | DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS- SOLVED (MG/L) (00300) | OXYGEN, DIS- SOLVED SATUR- ATION (00301) | PH WATER WHOLE FIELD (STAND- ARDS UNITS) (00400) | SPE- CIFIC CON- DUCT- ANCE (µS/CM) (00095) | TEMPER- ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV- ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER FET LAB MG/L AS CAC03 (00417) |
|--------------|------|--------------------------|--|---|---|--|---|---|--|---|--|--|---|
| OCT 22... | 1230 | 9 | 1028 | 9813 | E1.6 | .3 | 3 | 6.5 | 367 | 13.3 | 6.0 | .0 | 130 |
| NOV 21... | 1300 | 9 | 1028 | 9813 | 1.5 | .4 | 4 | 6.6 | 361 | 13.3 | 6.3 | .0 | 132 |
| DEC 18... | 1300 | 9 | 1028 | 9813 | E3.4 | .4 | 4 | 6.5 | 364 | 13.3 | 6.4 | .0 | 125 |

| Date | SULFATE DIS- SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530) | ALUM- INUM, TOTAL RECOV- ERABLE (µG/L AS AL) (01105) | IRON, DIS- SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV- ERABLE (µG/L AS FE) (01045) | MANGA- NESE, DIS- SOLVED (µG/L AS MN) (01056) | MANGA- NESE, TOTAL RECOV- ERABLE (µG/L AS MN) (01055) |
|--------------|--|---|---|---|--|--|---|--|
| OCT 22... | 58.6 | 10 | <200 | 17100 | 3900 | 17500 | 2100 | 2090 |
| NOV 21... | 60.0 | 6 | <200 | 18000 | 4200 | 18100 | 2110 | 2110 |
| DEC 18... | 57.6 | 6 | <200 | 17800 | 3700 | 18200 | 2150 | 2160 |

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

403504076415901 -- Lykens-Williamstown Mine (BC4)

WATER-QUALITY DATA, OCTOBER 2001 TO SEPTEMBER 2002

| Date | Time | Hydro-logic event | AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028) | DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS-SOLVED (MG/L) (00300) | OXYGEN, DIS-SOLVED (PER-CENT SATURATION) (00301) | PH WATER WHOLE FIELD (STANDARD UNITS) (00400) | SPECIFIC CONDUCTANCE (µS/CM) (00095) | TEMPERATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOVERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417) |
|----------|------|-------------------|--|---|---|-----------------------------------|--|---|--------------------------------------|-----------------------------------|--|--|---|
| OCT 2001 | | | | | | | | | | | | | |
| 23... | 1230 | 9 | 1028 | 9813 | E1.4 | 8.9 | 80 | 5.8 | 219 | 10.8 | 1.0 | 67 | 12 |
| NOV | | | | | | | | | | | | | |
| 30... | 1315 | 9 | 1028 | 9813 | E.83 | 8.7 | 79 | 5.7 | 228 | 11.0 | .7 | 57 | 0 |
| DEC | | | | | | | | | | | | | |
| 18... | 1230 | 9 | 1028 | 9813 | .52 | 8.0 | 71 | 5.3 | 198 | 10.2 | .8 | 64 | 5 |
| JAN 2002 | | | | | | | | | | | | | |
| 24... | 1400 | 9 | 1028 | 9813 | E.97 | 6.5 | 58 | 5.1 | 220 | 10.2 | .7 | 55 | 1 |
| 25... | 1045 | J | 1028 | 9813 | .41 | 7.2 | 64 | 5.1 | 222 | 10.3 | .9 | 74 | 0 |
| FEB | | | | | | | | | | | | | |
| 15... | 1205 | 9 | 1028 | 9813 | E.73 | 8.2 | 73 | 5.9 | 164 | 10.2 | -- | -- | -- |
| 21... | 1130 | 9 | 1028 | 9813 | .72 | 10.5 | 95 | 5.8 | 202 | 10.3 | 1.2 | 60 | 9 |
| MAR | | | | | | | | | | | | | |
| 21... | 1330 | J | 1028 | 9813 | E1.9 | 7.0 | 63 | 6.0 | 182 | 10.7 | .9 | 49 | 26 |
| APR | | | | | | | | | | | | | |
| 29... | 1300 | 9 | 1028 | 9813 | 2.3 | 7.3 | 66 | 6.2 | 188 | 10.1 | .9 | 21 | 32 |
| MAY | | | | | | | | | | | | | |
| 02... | 1300 | J | 1028 | 9813 | E3.0 | 7.0 | 63 | 6.1 | 181 | 10.3 | .8 | 34 | 28 |
| 09... | 1100 | J | 1028 | 9813 | 2.8 | 7.2 | 64 | 6.0 | 187 | 10.1 | .7 | 23 | 28 |
| 30... | 1310 | 9 | 1028 | 9813 | E2.0 | 6.8 | 61 | 5.9 | 160 | 10.4 | .9 | 26 | 19 |
| JUN | | | | | | | | | | | | | |
| 19... | 1345 | 9 | 1028 | 9813 | 1.4 | 7.6 | 68 | 5.8 | 187 | 10.4 | .8 | 47 | 19 |
| JUL | | | | | | | | | | | | | |
| 18... | 1400 | 9 | 1028 | 9813 | E.85 | 8.4 | 75 | 5.8 | 185 | 10.6 | .8 | 50 | 16 |
| 18... | 1401 | 9 | 1028 | 80020 | E.85 | 8.4 | 75 | 5.8 | 185 | 10.6 | -- | -- | -- |
| AUG | | | | | | | | | | | | | |
| 21... | 1330 | 9 | 1028 | 9813 | .85 | 8.5 | 76 | 6.0 | 206 | 10.7 | .8 | 46 | 19 |
| SEP | | | | | | | | | | | | | |
| 16... | 1245 | 9 | 1028 | 9813 | E.81 | 8.8 | 79 | 5.9 | 211 | 10.7 | .8 | 53 | 19 |
| 23... | 1000 | 9 | 1028 | 9813 | .68 | 8.4 | 75 | 5.9 | 211 | 10.5 | .8 | 42 | 18 |

| Date | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530) | ALUMINUM, TOTAL RECOVERABLE (µG/L AS AL) (01105) | IRON, DIS-SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOVERABLE (µG/L AS FE) (01045) | MANGANESE, DIS-SOLVED (µG/L AS MN) (01056) | MANGANESE, TOTAL RECOVERABLE (µG/L AS MN) (01055) |
|----------|--|--|--|---------------------------------------|---|--|--|---|
| OCT 2001 | | | | | | | | |
| 23... | 85.3 | 58 | 300 | 10700 | 2000 | 14700 | 1330 | 1320 |
| NOV | | | | | | | | |
| 30... | 90.2 | 12 | <200 | 11000 | 3600 | 14700 | 1200 | 1240 |
| DEC | | | | | | | | |
| 18... | 77.6 | 6 | <200 | 7150 | 5400 | 10500 | 1100 | 1080 |
| JAN 2002 | | | | | | | | |
| 24... | 82.3 | 18 | <200 | 8860 | 5400 | 14300 | 1200 | 1200 |
| 25... | 73.1 | <2 | <200 | 7900 | 600 | 12200 | 1100 | 1110 |
| FEB | | | | | | | | |
| 15... | -- | -- | -- | -- | -- | -- | -- | -- |
| 21... | 75.3 | 22 | <200 | 7920 | 2400 | 13200 | 1130 | 1130 |
| MAR | | | | | | | | |
| 21... | 75.2 | 22 | <200 | 10100 | 1000 | 15500 | 1070 | 1050 |
| APR | | | | | | | | |
| 29... | 55.6 | 28 | 400 | 5170 | 1300 | 10600 | 830 | 820 |
| MAY | | | | | | | | |
| 02... | <20.0 | 8 | 400 | 4840 | 1200 | 9900 | 830 | 830 |
| 09... | 55.7 | 22 | 500 | 4540 | 1100 | 10000 | 800 | 810 |
| 30... | 54.6 | 12 | 500 | 2370 | <500 | 8960 | 790 | 800 |
| JUN | | | | | | | | |
| 19... | 64.8 | 18 | <200 | 5150 | 1600 | 5510 | 890 | 910 |
| JUL | | | | | | | | |
| 18... | 69.5 | 14 | 300 | 5960 | 3000 | 11500 | 990 | 1010 |
| 18... | -- | -- | -- | -- | 3000 | -- | -- | -- |
| AUG | | | | | | | | |
| 21... | 76.6 | 6 | 300 | 8950 | 5900 | 13500 | 1060 | 1070 |
| SEP | | | | | | | | |
| 16... | 70.9 | 6 | 200 | 9360 | 4200 | 13100 | 1080 | 1070 |
| 23... | 81.3 | <2 | <200 | 10100 | 4000 | 10100 | 1100 | 1140 |

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

403504076415901 -- Lykens-Williamstown Mine (BC4)--Continued

WATER-QUALITY DATA, OCTOBER 2002 TO DECEMBER 2002

| Date | Time | Hydro-logic event | AGENCY COL-LECTING SAMPLE (CODE NUMBER) (00027) | AGENCY ANA-LYZING SAMPLE (CODE NUMBER) (00028) | DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061) | OXYGEN, DIS-SOLVED (MG/L) (00300) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301) | PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400) | SPE-CIFIC CON-DUCT-ANCE (µS/CM) (00095) | TEMPER-ATURE WATER (DEG C) (00010) | SODIUM, TOTAL RECOV-ERABLE (MG/L AS NA) (00929) | ACIDITY TOTAL HEATED (MG/L AS CAC03) (70508) | ANC WATER UNFLTRD FET LAB (MG/L AS CAC03) (00417) |
|-----------|------|-------------------|---|--|---|-----------------------------------|---|--|---|------------------------------------|---|--|---|
| OCT 22... | 1300 | 9 | 1028 | 9813 | E.87 | 8.5 | 76 | 6.0 | 216 | 10.5 | .8 | 41 | 18 |
| NOV 21... | 1400 | 9 | 1028 | 9813 | 1.1 | 8.3 | 74 | 5.9 | 221 | 10.2 | .8 | 39 | 20 |
| DEC 18... | 1430 | 9 | 1028 | 9813 | E2.2 | 8.3 | 74 | 6.0 | 238 | 9.9 | .8 | 38 | 29 |

| Date | SULFATE DIS-SOLVED (MG/L AS SO4) (00945) | RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530) | ALUM-INUM, TOTAL RECOV-ERABLE (µG/L AS AL) (01105) | IRON, DIS-SOLVED (µG/L AS FE) (01046) | IRON FERROUS WATER FLTRD (µG/L) (01047) | IRON, TOTAL RECOV-ERABLE (µG/L AS FE) (01045) | MANGA-NESE, DIS-SOLVED (µG/L AS MN) (01056) | MANGA-NESE, TOTAL RECOV-ERABLE (µG/L AS MN) (01055) |
|-----------|--|--|--|---------------------------------------|---|---|---|---|
| OCT 22... | 77.5 | 4 | 200 | 9180 | 4800 | 12500 | 1080 | 1100 |
| NOV 21... | 80.8 | 6 | 500 | 10400 | 3700 | 15800 | 1070 | 1100 |
| DEC 18... | 80.6 | 12 | 600 | 11900 | 4800 | 15200 | 970 | 970 |