

Table 27  
Stream Water Quality  
Lower Twolick Creek

Location ID	Name	Beginning Sample Date	Ending Sample Date	Flow	Average pH	Number of pH Samples	Number of Al Samples	Average Al	Number of Iron Samples	Average Iron	Number of Mn Samples	Average Mn	Number of Sulfate Samples	Average Sulfate	Number of Acidity Samples	Average Acidity	Total Average
LTLC-031	Allan Run	6/1/2002	6/1/2002	17.00	2.79	1	1	8.31	1	6.20	1	8.90	1	598.00	1	125.00	149.28
LTLC-027	Allan Run	6/1/2002	6/1/2002	4.00	3.85	1	1	6.61	1	0.88	1	7.10	1	565.00	1	49.20	125.76
LTLC-022	Cherry Run	6/1/2002	6/1/2002	500.00	6.98	1	1	0.36	1	2.53	1	0.39	1	522.00	1	1.00	105.26
LTLC-032	Allan Run	6/1/2002	6/1/2002	200.00	6.70	1	1	0.27	1	1.64	1	0.24	1	448.00	1	1.00	90.23
LTLC-029	Allan Run	6/1/2002	6/1/2002	5.00	3.73	1	1	1.64	1	0.40	1	9.40	1	360.00	1	24.80	79.25
LTLC-030	Allan Run	6/1/2002	6/1/2002	15.00	3.97	1	1	3.35	1	0.16	1	1.42	1	340.00	1	24.00	73.79
LTLC-028	Allan Run	6/1/2002	6/1/2002	12.00	4.23	1	1	1.68	1	0.05	1	1.35	1	300.00	1	13.60	63.34
LTLC-041	Coral Run	5/20/1999	5/20/1999		6.10	1	1	1.35	1	0.30	1	0.51	1	247.00			62.29
LTLC-034	Allan Run	6/1/2002	5/14/2004	2306.87	5.01	13	13	1.33	13	0.15	13	1.03	13	245.60	13	18.52	53.33
LTLC-024	Tearing Run	6/1/2002	6/1/2002	2246.00	4.46	1	1	4.22	1	6.60	1	1.37	1	219.00	1	23.20	50.88
LTLC-021	Un-named trib. To Twolick Creek	6/1/2002	6/1/2002	100.00	5.27	1	1	0.69	1	0.24	1	1.55	1	235.00	1	2.00	47.90
LTLC-058	Two Lick Graceton #1	2/20/1985	11/5/1987	92790.67	4.52	13	13	3.86	13	8.64	13	0.86	13	163.08			44.11
LTLC-063	Twolick Creek at mouth	6/1/2002	5/13/2004	9283.50	5.81	13	13	0.79	13	3.78	13	0.39	13	191.45	13	9.32	41.15
LTLC-062	Twolick Creek at Rt. old Rt. 56 bridge	6/1/2002	5/13/2004	130939.13	5.02	13	13	3.02	13	9.48	13	0.43	13	113.28	13	24.97	30.24
LTLC-059	Two Lick Graceton #2	11/3/1986	10/24/2003	44384.48	6.26	15	15	0.88	15	3.27	15	0.40	11	99.68	2	0.60	20.97
LTLC-056	Cherry Run	11/3/1986	8/17/1988	1135.56	6.65	6	6	0.51	6	24.31	6	0.77	1	68.00	2	0.25	18.77
LTLC-060	Twolick Creek above sewage treatment plant	6/26/2003	5/14/2004	69558.09	7.11	11	11	0.02	11	0.33	11	0.12	11	76.10	11	3.65	16.04
LTLC-026	Twolick Creek	6/1/2002	6/1/2002		6.80	1	1	0.01	1	0.11	1	0.32	1	77.00	1	1.00	15.69
LTLC-038	Two Lick Creek	6/1/2002	6/1/2002	200.00	7.24	1	1	0.10	1	0.03	1	0.02	1	54.50	1	1.00	11.13
LTLC-057	Ramsey Run	11/4/1986	8/17/1988	890.46	7.20	5	5	0.15	5	0.25	5	0.04	1	37.00	2	0.15	7.52
LTLC-025	Ramsey Run	6/1/2002	6/1/2002	4847.00	6.85	1	1	0.16	1	0.15	1	0.04	1	29.10	1	1.00	6.09
LTLC-039	Stoney Run	6/1/2002	6/1/2002		7.37	1	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	0.00

Table 28 - Discharge Water Quality Rankings  
Lower Twolick Creek

Location ID	Name	Beginning Sample Date	Ending Sample Date	Flow	Average pH	Number of pH Samples	pH Rank	Number of Al Samples	Average Al	Al Rank Factor	Al Rank	Number of Iron Samples	Average Iron	Iron Rank Factor	Iron Rank	Number of Mn Samples	Average Mn	Mn Rank Factor	Mn Rank	Number of Sulfate Samples	Average Sulfate	Sulfate Rank Factor	Sulfate Rank	Number of Acidity Samples	Average Acidity	Acidity Rank Factor	Acidity Rank	FINAL AVERAGE RANK
LTLC-061	Risinger Shaft Discharge - Homer City	6/27/2003	5/13/2004	2188.86	3.31	12	3	12	25.33	25.33	1	12	98.12	98.12	1	12	4.50	4.50	3	12	852.20	852.20	1	12	369.62	369.62	1	1.67
LTLC-014	Homer City Borehole Discharges	6/27/2003	5/13/2004	604.05	3.15	11	2	11	9.13	9.13	4	11	31.15	31.15	4	11	2.00	2.00	5	11	464.89	464.89	5	11	141.51	141.51	2	3.67
LTLC-064	Josephine Borehole AMD Discharge GW-9	5/31/1994	8/20/1996	40.75	4.18	24	6	24	8.90	8.90	5	24	20.62	20.62	5	24	8.37	8.37	1	24	813.17	813.17	2	24	116.83	116.83	5	4.00
LTLC-040	Discharge Sample	6/1/2002	6/1/2002	2000.00	4.19	1	7	1	21.90	10.95	3	1	113.80	56.90	2	1	4.78	2.39	4	1	748.00	374.00	6	1	283.00	141.50	3	4.17
LTLC-001	Potter Mine	6/26/2003	4/16/2004	330.30	3.66	9	5	9	6.90	6.90	6	9	12.75	12.75	7	9	4.97	4.97	2	9	587.62	587.62	3	9	99.06	99.06	6	4.83
LTLC-047	Campbell Mine	6/1/2002	6/1/2002	150.00	2.60	1	1	1	23.10	11.55	2	1	31.70	15.85	6	1	0.99	0.50	10	1	450.00	225.00	7	1	256.00	128.00	4	5.00
LTLC-012	Heavy borehole discharge - aluminum etc.	6/27/2003	5/13/2004	639.10	6.06	11	9	11	0.25	0.25	9	11	45.20	45.20	3	11	1.58	1.58	6	11	492.76	492.76	4	11	83.07	83.07	7	6.33
LTLC-051	Penn Hills No. 1 Mine	6/1/2002	5/14/2004	366.03	3.37	12	4	12	1.92	1.92	7	12	4.26	4.26	8	12	1.26	1.26	7	12	164.83	164.83	8	12	57.86	57.86	8	7.00
LTLC-037	Discharge Sample	6/1/2002	6/1/2002	40.00	5.94	1	8	1	0.10	0.05	10	1	7.30	3.65	9	1	2.47	1.24	8	1	300.00	150.00	9	1	1.00	0.50	9	8.83
LTLC-020	Discharge Sample	6/1/2002	6/1/2002		6.10	1	10	1	0.66	0.33	8	1	4.77	2.39	10	1	1.02	0.51	9	1	37.60	18.80	10	1	1.00	0.50	10	9.50

Table 29  
Discharge Loading Rankings  
Lower Twolick Creek

Location ID	Name	Beginning Sample Date	Ending Sample Date	Average Flow	Number of Al Loading Samples	Average Al Loading	AL Loading Rank Factor	AL Loading Rank	Number of Iron Loading Samples	Average Iron Loading	Iron Loading Rank Factor	Iron Loading Rank	Number of Mn Loading Samples	Average Mn Loading	Mn Loading Rank Factor	Mn Loading Rank	Number of Sulfate Loading Samples	Average Sulfate Loading	Sulfate Loading Rank Factor	Sulfate Loading Rank	Number of Acidity Loading Samples	Average Acidity Loading	Acidity Loading Rank Factor	Acidity Loading Rank	FINAL LOADING AVG RANK	FINAL WATER QUALITY AVG RANK	FINAL AVG RANK	FINAL RANK
LTL-061	Risinger Shaft Discharge - Homer City	6/27/2003	5/13/2004	2188.86	12	663.28	663.28	1	12	2600.33	2600.33	1	12	119.47	119.47	1	12	22294.60	22294.60	1	12	9638.06	9638.06	1	1.00	1.67	1.83	1
LTL-040	Discharge Sample	6/1/2002	6/1/2002	2000.00	1	525.60	262.8	2	1	2731.20	1365.60	2	1	114.72	57.36	2	1	17952.00	8976	2	1	6792.00	3396.00	2	2.00	4.17	4.08	2
LTL-014	Homer City Borehole Discharges	6/27/2003	5/13/2004	604.05	11	63.35	63.35	3	11	225.46	225.46	4	11	14.58	14.58	4	11	3300.86	3300.86	4	11	969.98	969.98	3	3.60	3.67	5.43	3
LTL-001	Potter Mine	6/26/2003	4/16/2004	330.30	9	31.52	31.52	4	9	58.30	58.30	5	9	22.38	22.38	3	9	2634.81	2634.81	5	9	446.31	446.31	5	4.40	4.83	6.82	4
LTL-012	Heavy borehole discharge - aluminum etc.	6/27/2003	5/13/2004	639.10	11	2.33	2.33	8	11	347.87	347.87	3	11	12.24	12.24	5	11	3756.98	3756.98	3	11	617.00	617.00	4	4.60	6.33	7.77	5
LTL-047	Campbell Mine	6/1/2002	6/1/2002	150.00	1	41.58	20.79	5	1	57.06	28.53	6	1	1.78	0.89	8	1	810.00	405	8	1	460.80	230.40	7	6.80	5.00	9.30	6
LTL-064	Josephine Borehole AMD Discharge GW-9	5/31/1994	8/20/1996	40.75	24	5.59	5.59	7	24	14.22	14.22	8	24	5.55	5.55	7	24	544.03	544.03	7	24	76.39	76.39	8	7.40	4.00	9.40	7
LTL-051	Penn Hills No. 1 Mine	6/1/2002	5/14/2004	366.03	12	8.87	8.87	6	12	18.73	18.73	7	12	5.67	5.67	6	12	723.33	723.33	6	12	274.30	274.30	6	6.20	7.00	9.70	8
LTL-020	Discharge Sample	6/1/2002	6/1/2002																						5.00	9.50	9.75	9
LTL-037	Discharge Sample	6/1/2002	6/1/2002	40.00	1	0.05	0.024	9	1	3.50	1.75	9	1	1.19	0.59	9	1	144.00	72	9	1	0.48	0.24	9	9.00	8.83	13.42	10

Table 30  
Lower Twolick Creek  
Prioritized Sites and General Recommendations

Assessed Rank	Loading Rank	Water Quality Rank	Site Designation/Name	Subwatershed	Principal Problem's	Range of Flows (gpm)	Source Reduction	Aerobic Wetlands	Anaerobic Wetlands	Oxic LS Channel	Anoxic LS Trench	Vertical Flow Reactor	Active Treatment	Comments
1	1	1	LTLC-061 Risinger Shaft Discharge Homer City BCWA Assessment IUP - LT4	Two Lick Creek	Very high flow; High AL (25 mg/l), FE (98 mg/l), MN, SO4; Moderate Acidity; Moderate pH <3.50.	1115-3376						X	X	Extremely high flows may make passive treatment problematic; if possible, Al and pH values preclude use of wetlands or oxic/anoxic LS systems; insufficient information to evaluate source reduction
3	3	2	LTLC-014 Homer City Borehole Discharges BCWA Assessment IUP - LT8	Two Lick Creek	High flow; Moderate AL (9 mg/l), FE (31 mg/l), MN, SO4; Relatively low Acidity; Low pH < 3.20.	156-1482						X	X	Moderately high Al concentration precludes use of wetlands or oxic/anoxic LS systems; insufficient information to evaluate source reduction; high flows may require use of multiple cells or possible occasional bypass
4	4	5	LTLC-001 Potter Mine BCWA Assessment IUP - LT6	Two Lick Creek	High flow; Moderate Al (7 mg/l), FE (13 mg/l), SO4, MN Low Acidity; Moderate pH < 3.70.	53-602						X	X	Moderately high Al concentration precludes use of wetlands or oxic/anoxic LS systems; insufficient information to evaluate source reduction; high flows may require use of multiple cells or possible occasional bypass
5	5	7	LTLC-012 Heavy borehole discharge BCWA Assessment IUP - LT7	Cherry Run	High flow; High FE (45 mg/l); Very low Al (< 1 mg/l); Low MN Acidity; Moderate SO4; High pH > 6.0	303-915		X	X	X	X			Relatively low Al and high pH make this a candidate for wetland or oxic/anoxic limestone treatment; insufficient information to evaluate source reduction; high flows may require a fairly large wetland or possibly multiple limestone treatment cells
7	9	3	LTLC-064 Josephine Borehole AMD Discharge GW-9 Senate Coal SC-1	Two Lick Creek	Low flow; Moderate AL (9 mg/l), FE (21 mg/l), Acidity; High MN, SO4; Moderate pH <4.20.	0-146						X	X	Moderately high Al concentration precludes use of wetlands or oxic/anoxic LS systems; insufficient information to evaluate source reduction
8	7	8	LTLC-051 Penn Hills No. 1 Mine BCWA Assessment IUP - LT1	Two Lick Creek	High flow; Very low AL (2.0 mg/l), FE (4.3 mg/l), SO4, Acidity; Moderate MN, Low pH < 3.40.	100-1055		X	X	X	X			Relatively low Al but low pH make this a candidate for oxic/anoxic limestone treatment followed by a wetland polishing area; insufficient information to evaluate source reduction; high flows may require a fairly large wetland or possibly multiple limestone treatment cells