

## SAMPLING AND MEASURING RESULTS

The study of the watershed revealed fifty eight (58) significant sources of mine drainage pollution from both deep and surface mined areas. These are described in detail under "Abatement Plan". In addition, the pollution load data indicates that the streams are, to some extent, being adversely affected by ground water pollution which could not be visually detected.

The pollution sources and the areas disturbed by surface mining are distributed as follows:

Sub-Basin	No. of Sources	Acid Load Pounds Per Day	Total Disturbed Acres
Flat Run	3	478	221
Mons Run	10	3,135	141
Browns Run	26	9,185	457
Alder Run	19	16,470	1,245
Total	58		2,064

All of the pollution loads which emanated from specific sources were not continually monitored, but were sampled and measured sufficiently to give an order of magnitude to each source, which was useful in the analyses of priorities of abatement measures.

**SAMPLING STATION NO. 1**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.15		3.2	480.	388	7	5.7	950.
Sept 8, 1969	Rain	0.10		3.0	500.	270	3.5	1.9	1050.
Sept 22, 1969	Fair	0.00		3.3	3.C.	0	2.05	0	566
Oct 6, 1969	Fair	0.00		3.0	350.	0	2.8	0	1050.
Oct 20, 1969	Fair	0.03		2.2	400.	65	7	1.1	700.
Nov 3, 1969	Rain	0.11		2.8	400.	237	4.3	2.5	1050.
Nov 17, 1969	Fair	0.15		3.1	700.	566	3	2.4	1000.
Dec 1, 1969	Fair	0.05		3.2	180.	51	6.75	1.9	1400.
Dec 23, 1969	Fair	0.16		3.0	100.	86	2.9	2.5	1050.
Jan 12, 1970	Fair	0.10		3.5	180.	97	2.9	1.6	900.
Mar 16, 1970	Fair	0.23		3.3	240.	938	6.75	26.4	750.
Apr 7, 1970	Fair	2.00		3.0	250.	2372	6.25	67.	725.
May 29, 1970	Fair	1.07		3.3	280.	1499	4.5	26.	1075.
Average				3.1	333.	505	4.6	10.7	1008.

**SAMPLING STATION NO. 2**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.02		3.5	180.	19	4.5	0.5	700.
Sept 8, 1969	Rain	0.00		3.3	110.	0	18.	0.	900.
Sept 22, 1969	Fair	0.00		3.4	120.	0	9.	0.	580.
Oct 6, 1969	Fair	0.00		3.2	160.	0	8.5	0.	850.
Oct 20, 1969	Fair	0.00		3.2	160.	0	6.	0.	650.
Nov 3, 1969	Rain	0.08		3.0	180.	58	6.	1.9	850.
Nov 17, 1969	Fair	0.06		3.5	100.	32	5.5	1	650.
Dec 1, 1969	Fair	0.06		3.7	64.	21	3	1.8	300.
Dec 23, 1969	Fair	0.00		3.8	180.	0	660.	0	283
Jan 12, 1970	Fair	0.20		3.9	72.	78	2.0	2.2	250.
Mar 16, 1970	Fair	0.20		3.7	40.	151	3.4	12.8	220.
Apr 7, 1970	Fair	0.25		3.4	128.	172	5.8	7.8	750.
May 29, 1970	Fair	0.25		3.5	125.	44	6.5	2.5	613.
Average				3.5	125.	44	6.5	2.5	613.

**SAMPLING STATION NO. 2X**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.08		3.0	650.	—	155.	—	1200.
Sept 8, 1969	Rain	0.08		2.9	850.	367	2.8	1.2	1800.
Sept 22, 1969	Fair	0.07		2.9	1250.	472	77.5	29.2	2100.
Oct 6, 1969	Fair	0.07		2.8	700.	264	150.	56.6	2300.
Oct 20, 1969	Fair	0.06		2.5	550.	178	13.	4.2	2200.
Nov 3, 1969	Rain	0.07		2.3	750.	283	9.5	3.6	2400.
Nov 17, 1969	Fair	0.06		2.7	600.	194	75	24.3	2700.
Dec 1, 1969	Fair	0.07		3.0	750.	287	35	12.5	2800.
Dec 23, 1969	Fair	0.07		3.2	700.	264	140.	52.8	3800.
Jan 12, 1970	Fair	0.08		3.1	600.	286	97.5	43.	2450.
Mar 16, 1970	Fair	0.19		3.0	500.	523	38.5	40.3	600.
Apr 7, 1970	Fair	0.23		3.3	150.	580	2.4	9.4	750.
May 29, 1970	Fair	0.22		3.1	200.	237	10.6	12.6	1025.
Average				2.9	635.	325	62.1	24.1	2010.

**SAMPLING STATION NO. 3**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.47		3.0	450.	1140	4.25	10.9	1050.
Sept 8, 1969	Rain	0.41		2.9	700.	1547	100.	221.	1900.
Sept 22, 1969	Fair	0.09		2.9	1000.	—	2.15	—	2700.
Oct 6, 1969	Fair	0.09		2.8	550.	267	1.6	0.8	2500.
Oct 20, 1969	Fair	0.18		2.4	450.	437	4.4	4.3	2300.
Nov 3, 1969	Rain	0.41		2.4	550.	1215	20.5	45.3	1750.
Nov 17, 1969	Fair	0.14		2.8	650.	490	21.5	16.2	2700.
Dec 1, 1969	Fair	0.18		3.0	1000.	965	42.5	41.	2700.
Dec 23, 1969	Fair	0.43		3.3	524.	1223	2.3	5.4	1850.
Jan 12, 1970	Fair	0.13		3.2	540.	379	25.	18.	1975.
Mar 16, 1970	Fair	1.33		3.3	280.	2001	5.75	145.	750.
Apr 7, 1970	Fair	4.68		3.1	220.	5045	12.5	115.2	1385.
May 29, 1970	Fair	1.71		3.1	220.	2029	12.5	115.2	1385.
Average				3.0	547.	1395	19.6	59.1	1877.

**SAMPLING STATION NO. 4**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.72		3.0	550.	5	4.5	—	800.
Sept 8, 1969	Rain	0.05		—	—	—	—	—	7
Sept 22, 1969	Fair	0.05		—	—	—	—	—	—
Oct 6, 1969	Fair	0.05		—	—	—	—	—	—
Oct 20, 1969	Fair	0.05		—	—	—	—	—	—
Nov 3, 1969	Rain	0.05		—	—	—	—	—	—
Nov 17, 1969	Fair	0.01		3.1	900.	61	6.25	0.4	2200.
Dec 1, 1969	Fair	0.01		2.9	1500.	437	2.3	0.7	3200.
Dec 23, 1969	Fair	0.05		3.0	600.	162	25.	6.7	1100.
Jan 12, 1970	Fair	0.05		3.0	600.	162	4.15	6.7	450.
Mar 16, 1970	Fair	0.30		3.9	112.	181	6.5	1.1	900.
Apr 7, 1970	Fair	0.23		3.0	300.	49	6.5	1.1	900.
May 29, 1970	Fair	0.09		3.2	660.	149	8.1	3.1	1450.
Average				3.2	660.	149	8.1	3.1	1450.

**SAMPLING STATION NO. 5**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.50		3.0	500.	1348	6.75	18.2	1250.
Sept 8, 1969	Rain	0.33		2.9	500.	889	2.3	4.1	2000.
Sept 22, 1969	Fair	0.00		2.17	0	0	2.17	0	2100.
Oct 6, 1969	Fair	0.02		2.8	450.	49	2.5	0.3	1850.
Oct 20, 1969	Fair	0.22		2.4	500.	533	6.	7.1	2100.
Nov 3, 1969	Rain	0.50		2.7	650.	1732	18.	48.5	2200.
Nov 17, 1969	Fair	0.09		2.8	500.	243	4.5	2.2	2100.
Dec 1, 1969	Fair	0.46		3.0	750.	364	6.	2.9	2300.
Dec 23, 1969	Fair	0.44		3.2	440.	1034	2.7	6.6	1850.
Jan 12, 1970	Fair	0.44		3.2	240.	1780	9.	66.7	290.
Mar 16, 1970	Fair	1.38		3.3	200.	3234	5.15	83.	900.
Apr 7, 1970	Fair	3.00		3.1	200.	1800	7.	63.	1100.
May 29, 1970	Fair	1.67		3.0	458.	106	5.8	23.8	1657.
Average				3.0	458.	106	5.8	23.8	1657.

**SAMPLING STATION NO. 6**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.11		3.9	28	17	1.52	0.9	140.
Sept 8, 1969	Rain	0.05		4.0	20.	5	6.7	0.2	280.
Sept 22, 1969	Fair	0.00		3.9	38.	0	147	0.	340.
Oct 6, 1969	Fair	0.03		3.9	20.	3	5	0.1	320.
Oct 20, 1969	Fair	0.03		4.3	42.	7	6	0.1	360.
Nov 3, 1969	Rain	0.09		4.3	24.	12	1.9	0.9	320.
Nov 17, 1969	Fair	0.20		4.6	40.	43	0.8	0.9	290.
Dec 1, 1969	Snow	0.12		4.7	30.	19	0.8	260.	168
Dec 23, 1969	Fair	0.48		4.7	34.	88	10.25	28.5	245.
Jan 12, 1970	Fair	0.15		4.6	34.	28	1.75	1.4	220.
Mar 16, 1970	Fair	0.25		4.6	16.	22	1	1	108.
Apr 7, 1970	Fair	0.39		4.1	36.	76	3	0.6	230.
May 29, 1970	Fair	0.16		4.3	30.	27	1.8	2.7	259.
Average				4.3	30.	27	1.8	2.7	259.

**SAMPLING STATION NO. 10**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.00		3.5	180	0	14	0.	340
Sept 8, 1969	Rain	0.00		3.5	170	0	3.2	0.	480
Sept 22, 1969	Fair	0.00		3.7	172	0	85	0.	480
Oct 6, 1969	Fair	0.00		3.5	200.	0	2.15	0.	480
Oct 20, 1969	Fair	0.00		—	—	—	—	—	—
Nov 3, 1969	Rain	0.02		—	—	—	—	—	—
Nov 17, 1969	Fair	0.02		3.7	206.	22	2.	0.2	750.
Dec 1, 1969	Snow	0.02		3.7	212.	23	65	0.1	700.
Dec 23, 1969	Fair	0.22		4.0	100.	119	55	0.7	320.
Jan 12, 1970	Fair	0.09		3.9	124.	61	55	0.3	410.
Mar 16, 1970	Fair	0.77		3.8	100.	415	3	1.2	290.
Apr 7, 1970	Fair	2.00		3.6	70.	755	56	7.1	240.
May 29, 1970	Fair	0.76		3.6	92.	376	22	9.0	160.
Average				3.7	148.	161	2.5	1.7	417.

**SAMPLING STATION NO. 11**

DATE	WEATHER	FLOW CFS	FLOW GPM	pH	ACIDITY CONC.	ALKALINITY CONC.	TOTAL IRON CONC.	SULFATES CONC.	ALUMINIUM CONC.
July 21, 1969	Rain	0.00		3.5	180	0	14	0.	340
Sept 8, 1969	Rain	0.00		3.5	170	0	3.2	0.	480
Sept 22, 1969	Fair	0.00		3.7	172	0	85	0.	480
Oct 6, 1969	Fair	0.00		3.5	200.	0	2.15	0.	480
Oct 20, 1969	Fair	0.00		—	—	—	—	—	—
Nov 3, 1969	Rain	0.02		—	—	—	—	—	—
Nov 17, 1969	Fair	0.02		3.7	206.	22	2.	0.2	750.
Dec 1, 1969	Snow	0.02		3.7	212.	23	65	0.1	700.
Dec 23, 1969	Fair	0.22		4.0	100.	119	55	0.7	320.
Jan 12, 1970	Fair	0.09		3.9	124.	61	55	0.3	410.
Mar 16, 1970	Fair	0.77		3.8	100.	415	3	1.2	290.
Apr 7, 1970	Fair	2.00		3.6	70.	755	56	7.1	240.
May 29, 1970	Fair	0.76		3.6	92.	376	22	9.0	160.
Average				3.7	148.	161	2.5	1.7	417.

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF MINES AND MINERAL INDUSTRIES

Steddy and Day  
ENGINEERS CONSULTANTS  
THIRTY THIRTIETH NORTH SECOND STREET  
HARRISBURG, PENNSYLVANIA

ALDER RUN WATERSHED  
PROJECT NO. SL-143

**SAMPLING STATION NO. 12**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY
July 21, 1969	Rain	0.05	3.8	3.8	50	4.5	—	—	4.5	—	350	—	—	
Sept 8, 1969	Rain	0.02	3.2	3.2	90	33.5	—	—	33.5	—	290	—	—	
Sept 22, 1969	Fair	0.00	3.3	3.3	76	5.75	0	0	5.75	0	200	0	0	
Oct 6, 1969	Fair	0.00	3.2	3.2	90	13.5	0	0	13.5	0	130	0	0	
Oct 20, 1969	Fair	0.00	2.8	2.8	220	12.5	0	0	12.5	0	320	0	0	
Nov 3, 1969	Fair	0.03	2.7	2.7	280	11.5	1.9	150.2	2.43	1.9	110	1.8	—	
Dec 1, 1969	Fair	0.02	4.2	4.2	32	2.7	0.3	120	2.7	0.3	120	15	—	
Dec 23, 1969	Fair	0.08	4.1	4.1	34	3.1	1.4	140	3.1	1.4	140	62	—	
Jan 12, 1970	Fair	0.08	—	—	—	—	—	—	—	—	—	—	—	
Mar 16, 1970	Fair	0.40	2.9	2.9	450	32.5	70	550	1186	70	550	1186	—	
Apr 7, 1970	Fair	0.12	4.0	4.0	12	1.06	0.7	86	1.06	0.7	86	56	1.2	
May 29, 1970	Fair	0.08	—	—	—	—	—	—	—	—	—	—	—	
Average			0.08	3.5	118	115	—	—	11.0	8.3	346	176	12	

**SAMPLING STATION NO. 13**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY
July 21, 1969	Rain	0.06	3.4	3.4	120	3.9	—	—	3.7	1.2	650	210	—	
Sept 8, 1969	Rain	0.02	3.4	3.4	90	10	—	—	3	0.3	190	20	—	
Sept 22, 1969	Fair	0.00	3.6	3.6	110	0	—	—	2.13	0	300	0	—	
Oct 6, 1969	Fair	0.00	3.6	3.6	44	0	—	—	8	0	180	0	—	
Oct 20, 1969	Fair	0.08	3.3	3.3	36	16	—	—	2.6	1.1	420	181	—	
Nov 4, 1969	Fair	0.02	3.2	3.2	110	12	—	—	2.4	0.3	650	70.2	—	
Nov 17, 1969	Fair	0.02	3.5	3.5	80	9	—	—	1.6	0.1	260	28	—	
Dec 1, 1969	Fair	0.03	3.7	3.7	120	17	—	—	3.1	0.4	450	64	—	
Dec 23, 1969	Fair	0.19	4.0	4.0	92	96	—	—	9	0.9	270	282	—	
Jan 12, 1970	Fair	0.12	3.9	3.9	100	65	—	—	9	0.6	320	208	—	
Mar 16, 1970	Fair	0.12	—	—	—	—	—	—	—	—	—	—	—	
Apr 7, 1970	Fair	0.88	3.6	3.6	64	304	—	—	2.3	10.9	280	1388	9.5	
May 29, 1970	Fair	0.13	—	—	—	—	—	—	—	—	—	—	—	
Average			0.13	3.6	89	52	—	—	2.7	1.4	361	217	9.5	

**SAMPLING STATION NO. 14**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY
July 21, 1969	Rain	0.36	3.3	3.3	220	427	—	—	4	7.8	700	1358	—	
Sept 8, 1969	Rain	0.12	3.3	3.3	180	103	—	—	2.5	1.6	360	233	—	
Sept 22, 1969	Fair	0.01	3.4	3.4	110	6	—	—	2.17	0.1	280	15	—	
Oct 6, 1969	Fair	0.06	3.2	3.2	180	58	—	—	3.04	1	250	81	—	
Oct 20, 1969	Fair	0.43	2.9	2.9	500	1159	—	—	7.25	16.8	1450	3361	—	
Nov 4, 1969	Fair	0.65	2.8	2.8	400	1401	—	—	2.1	7.4	1700	5956	—	
Nov 17, 1969	Fair	0.19	3.1	3.1	200	205	—	—	4	4.1	550	563	—	
Dec 1, 1969	Fair	0.19	3.5	3.5	240	242	—	—	5	5	340	343	—	
Dec 23, 1969	Fair	0.37	3.6	3.6	120	237	—	—	2.5	4.9	340	671	—	
Jan 12, 1970	Fair	0.22	3.6	3.6	112	135	—	—	4.3	5	240	290	—	
Mar 16, 1970	Fair	0.86	3.6	3.6	276	1275	—	—	3	13.9	600	2772	—	
Apr 7, 1970	Fair	1.75	3.7	3.7	36	340	—	—	1	9.4	210	1981	—	
May 29, 1970	Fair	0.98	3.4	3.4	120	634	—	—	3.95	20.9	180	951	17.2	
Average			0.48	3.3	206	478	—	—	3.5	7.5	554	1429	17.2	

**SAMPLING STATION NO. 15**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY
July 21, 1969	Rain	0.05	4.6	4.6	14	4	—	—	0.23	0.1	160	43	—	
Sept 8, 1969	Rain	0.02	5.1	5.1	12	1	—	—	1	0	59	6	—	
Sept 22, 1969	Fair	0.01	5.1	5.1	4	0	—	—	2.17	0.1	12	1	—	
Oct 6, 1969	Fair	0.01	5.1	5.1	4	0	—	—	1	0	44	2	—	
Oct 20, 1969	Fair	0.05	4.4	4.4	4	1	—	—	4	0.1	42	11	—	
Nov 3, 1969	Fair	0.07	4.7	4.7	—	—	6	2	1.1	0.4	110	42	—	
Nov 17, 1969	Fair	0.04	4.8	4.8	4	1	—	—	1	0	56	12	—	
Dec 1, 1969	Fair	0.07	5.3	5.3	4	2	—	—	3.5	0.1	52	21	—	
Dec 23, 1969	Fair	0.18	5.0	5.0	0	0	—	—	1.9	1.8	60	58	—	
Jan 12, 1970	Fair	0.14	5.2	5.2	0	0	—	—	1	0.1	48	37	—	
Mar 17, 1970	Fair	0.29	—	—	—	—	—	—	—	—	—	—	—	
Apr 7, 1970	Fair	0.29	5.1	5.1	6	9	—	—	1.7	2.7	36	56	3.3	
May 29, 1970	Fair	0.08	—	—	—	—	—	—	—	—	—	—	—	
Average			0.08	4.9	5	2	—	—	0.8	0.5	62	26	3.3	

**SAMPLING STATION NO. 16**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY
July 21, 1969	Rain	0.42	3.4	3.4	140	317	—	—	4.5	10.2	210	475	—	
Sept 8, 1969	Rain	0.26	3.3	3.3	180	136	—	—	3.1	2.3	220	166	—	
Sept 22, 1969	Fair	0.01	5.4	5.4	6	0	—	—	6.8	0	72	4	—	
Oct 6, 1969	Fair	0.06	3.3	3.3	160	52	—	—	2.2	0.7	240	78	—	
Oct 20, 1969	Fair	0.51	2.8	2.8	260	715	—	—	7	19.2	370	1017	—	
Nov 3, 1969	Fair	0.67	3.0	3.0	180	650	—	—	1.9	6.9	1600	5778	—	
Nov 17, 1969	Fair	0.21	3.3	3.3	110	125	—	—	2.15	2.4	320	362	—	
Dec 1, 1969	Fair	0.22	3.7	3.7	40	47	—	—	4	4.7	220	261	—	
Dec 23, 1969	Fair	0.94	3.8	3.8	96	486	—	—	1.45	7.3	245	1241	—	
Jan 12, 1970	Fair	0.56	3.8	3.8	96	290	—	—	1.9	4.4	280	739	—	
Mar 17, 1970	Fair	0.20	—	—	—	—	—	—	—	—	—	—	—	
Apr 7, 1970	Fair	2.00	3.6	3.6	79	892	—	—	1.3	14	280	3018	11.2	
May 29, 1970	Fair	0.52	—	—	—	—	—	—	—	—	—	—	—	
Average			0.52	3.6	122	334	—	—	2.7	6.6	369	1194	11.2	

**SAMPLING STATION NO. 18**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY
July 21, 1969	Rain	1.00	3.5	3.5	100	539	—	—	3	16.2	150	809	—	
Sept 8, 1969	Fair	0.32	4.3	4.3	60	104	—	—	1.35	2.3	230	397	—	
Sept 22, 1969	Fair	0.04	4.0	4.0	22	5	—	—	5	1.1	165	36	—	
Oct 6, 1969	Fair	0.14	3.1	3.1	90	68	—	—	1.25	0.9	320	242	—	
Oct 20, 1969	Fair	1.12	3.1	3.1	220	1328	—	—	4	24	340	2053	—	
Nov 3, 1969	Fair	1.48	3.3	3.3	100	798	—	—	8.0	63.8	290	2313	—	
Nov 17, 1969	Fair	0.50	3.6	3.6	48	129	—	—	13.8	37.2	240	647	—	
Dec 1, 1969	Fair	0.58	4.0	4.0	100	313	—	—	3.1	9.7	180	563	—	
Dec 23, 1969	Fair	1.48	4.0	4.0	32	255	—	—	9.5	7.6	200	1595	—	
Jan 12, 1970	Fair	0.30	—	—	—	—	—	—	—	—	—	—	—	
Mar 17, 1970	Fair	4.00	4.2	4.2	10	216	—	—	3.5	541.7	260	4204	—	
Apr 7, 1970	Fair	2.40	3.7	3.7	56	724	—	—	3	6.5	90	1940	—	
May 29, 1970	Fair	1.34	—	—	—	—	—	—	1.86	17.9	185	2393	6.9	
Average			1.34	3.7	78	508	—	—	6.3	60.7	221	1433	6.9	

**SAMPLING STATION NO. 19**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY	CONC.	LBS/DAY
July 21, 1969	Rain	0.17	2.9	2.9	1000	96	—	—	4.5	41.2	1400	1283	—	
Sept 8, 1969	Rain	0.11	2.8	2.8	1650	978	—	—	160	94.9	2900	1719	—	
Sept 22, 1969	Fair	0.03	2.9	2.9	2100	340	—	—	4.50	72.8	3400	550	—	
Oct 6, 1969	Fair	0.05	2.7	2.7	1800	485	—	—	2.5	6.7	2700	728	—	
Oct 20, 1969	Fair	0.13	2.4	2.4	900	631	—	—	14.5	10.2	2800	1962	—	
Nov 3, 1969	Fair	0.22	2.5	2.5	750	889	—	—	4	4.7	1700	2016	—	
Nov 17, 1969	Fair	0.15	2.6	2.6	800	647	—	—	148	119.7	2300	1860	—	
Dec 1, 1969	Fair	0.26	3.0	3.0	1582	200	—	—	200	275	2500	3440	—	
Dec 23, 1969	Fair	0.1												



**SAMPLING STATION NO. 23**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM.	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	1.80		3.7	50	485			1.25	12.1	90	873		
Sept 8, 1969	Rain	0.37		3.6	52	104			.7	1.4	290	578		
Sept 22, 1969	Fair	0.04		5.7	4	1			.15	0	20	2		
Oct 6, 1969	Fair	0.22		3.7	44	52			1.9	2.3	170	202		
Oct 20, 1969	Fair	0.76		3.6	48	197			3.4	13.9	210	860		
Nov 3, 1969	Fair	1.92		3.4	54	455			6.	62.1	425	4398		
Nov 17, 1969	Fair	1.04		3.6	52	291			4.4	24.7	180	1009		
Dec 1, 1969	Fair	1.15		4.0	20	124			.55	3.4	120	746		
Dec 23, 1969	Fair	1.70		4.1	24	293			4	8.5	110	1008		
Jan 12, 1970	Fair	0.95		4.2	24	123			4	20.5	170	3482		
Mar 12, 1970	Fair	3.80		4.0	66	1352			1.	20.5	170	3482		
Apr 7, 1970	Fair	4.50		3.7	58	1407			1.06	26.	110	2668		
May 29, 1970	Fair	3.00		3.8	30.	485			4	64.7	120	1940		
Average				3.9	40.	413			1.9	18.5	163	1410		4.5

**SAMPLING STATION NO. 24**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM.	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	0.62		5.3	0	0			2.	6.7	26	87		
Sept 8, 1969	Rain	0.40		5.7					.8	1.7	.85	1.8	36	78
Sept 22, 1969	Fair	0.06		3.9	24	8			.47	0.1	90	29		
Oct 6, 1969	Fair	0.08		5.3					4.	2	45	0.2	42	18
Oct 20, 1969	Fair	0.24		4.8					4.	5	9	1.2	34	44
Nov 3, 1969	Fair	0.67		5.3					10.	36	1	0.4	36	130
Nov 17, 1969	Fair	0.46		5.5	0.	0			2.2	5.5	28	69		
Dec 1, 1969	Fair	0.46		5.5	0.	0			0.	0	0	0.3	16	39
Dec 23, 1969	Fair	0.67		5.1	6.	22			1.	0.4	36	129		
Jan 12, 1970	Fair	0.46		5.2	0.	0			4.	1	2.2	5	44	108
Mar 12, 1970	Fair	0.46		5.2	10.	22			4	0.9	52	115		
Apr 7, 1970	Fair	2.00		4.6	20.	216			1.1	1.1	64	690		
May 29, 1970	Fair	0.30		5.7	0.	0			0	0	0	0.2	74	120
Average				5.1	7.5	34			3.	7	0.8	1.8	44	127

**SAMPLING STATION NO. 25**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM.	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	3.66		3.3	160	3156			80.	1578	250	4932		
Sept 8, 1969	Rain	1.10		3.0	500	2965			2.05	12.2	1100	6522		
Sept 22, 1969	Fair	0.21		3.1	500	566			3.7	6.2	1400	1569		
Oct 6, 1969	Fair	0.48		3.1	400	1035			2.4	4.2	850	2199		
Oct 20, 1969	Fair	1.53		2.7	500	4123			7.25	59.8	850	7010		
Nov 3, 1969	Fair	3.74		3.1	200	484			2.9	58.5	1700	34269		
Nov 17, 1969	Fair	2.00		2.7	24	484			10.1	109.	550	5929		
Dec 1, 1969	Fair	2.28		3.3	160	1966			9	111.	525	6452		
Dec 23, 1969	Fair	3.52		3.5	82	1556			3.2	60.7	280	5312		
Jan 12, 1970	Fair	1.92		3.4	130	1343			10.	103	500	5166		
Mar 12, 1970	Fair	6.00		3.5	124	4010			4.	129.4	450	14553		
Apr 7, 1970	Fair	10.00		3.6	80.	4312			76	41.	180	9702		
May 29, 1970	Fair	5.33		3.6	40.	1149			3.25	93.4	220	6320		
Average				3.2	223.	2217			10.7	182.0	681	8458		4

**SAMPLING STATION NO. 28**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM.	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	0.90		—	—	—			—	—	—	—		
Sept 8, 1969	Fair	0.09		3.4	90.	44			2.6	1.3	390	189		
Sept 22, 1969	Fair	0.04		3.5	80.	27			.3	0.1	300	65		
Oct 6, 1969	Rain	0.06		3.3	80.	26			2.15	0.7	370	120		
Oct 20, 1969	Fair	0.17		3.4	72.	66			3.4	3.1	380	348		
Nov 3, 1969	Fair	0.33		2.9	90.	160			4.25	7.6	1900	3380		
Nov 17, 1969	Fair	0.27		3.3	80.	116			1.8	2.6	120	175		
Dec 1, 1969	Fair	0.27		3.6	72.	106			3.	4.4	1100	1613		
Dec 23, 1969	Fair	0.46		3.7	44.	108			5.5	13.5	280	687		
Jan 12, 1970	Fair	0.39		3.7	48.	75			3.8	8.	280	408		
Mar 12, 1970	Fair	1.35		2.8	80.	582			6.7	48.8	340	2474		
Apr 7, 1970	Fair	1.75		3.7	500.	4716			82.5	778.	1300	12,262		
May 29, 1970	Fair	0.84		3.3	120.	608			2	10.1	700	3547		10.
Average				3.4	113.	552			9.8	73.0	620	2106		10.

**SAMPLING STATION NO. 30**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM.	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	0.23		3.0	850	1094			11.5	142.6	1250	1550		
Sept 8, 1969	Rain	0.19		2.7	1400	1434			3.1	3.2	2150	2202		
Sept 22, 1969	Fair	0.16		2.8	1500	1294			82.5	194	2200	1897		
Oct 6, 1969	Fair	0.18		2.6	1500	1455			125.	121.3	2100	2037		
Oct 20, 1969	Fair	0.21		2.3	1100	1245			15.5	17.5	2300	2603		
Nov 3, 1969	Fair	0.26		2.3	1250	1752			30.	42.	2000	2803		
Nov 17, 1969	Fair	0.29		2.5	1250	1954			170.	265.7	2200	3439		
Dec 1, 1969	Fair	0.21		2.8	1250	1408			220	246.	1400	1577		
Dec 23, 1969	Fair	0.29		2.7	1050	1647			160.	251.	2300	3608		
Jan 12, 1970	Fair	0.22		2.9	1450	1751			170.	205	2300	2777		
Mar 12, 1970	Fair	0.29		2.7	1000	1568			150.	233.3	2000	3137		
Apr 7, 1970	Fair	2.00		2.7	750.	8085			116.	125.0	2100	12,638		
May 29, 1970	Fair	1.20		2.8	850.	5498			133.	860.2	1900	12,289		37
Average				2.7	1169.	2318			110.0	281.6	2015	4812		37.

**SAMPLING STATION NO. 31X**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM.	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	0.18		2.9	1250	1213			155.	180.	1550	1504		
Sept 8, 1969	Rain	0.16		2.8	1650	1423			110.	94.9	2150	1854		
Sept 22, 1969	Fair	0.14		2.8	1750	1391			500.	377.3	2500	1887		
Oct 6, 1969	Fair	0.12		2.6	1700	1100			150.	97.	2100	1388		
Oct 20, 1969	Fair	0.12		2.4	1550	1003			14.	9.1	2700	1746		
Nov 3, 1969	Rain	0.12		2.3	1750	1132			300.	194.	2400	1552		
Nov 17, 1969	Fair	0.14		2.5	1500	1132			225.	169.8	2500	1887		
Dec 1, 1969	Fair	0.13		2.8	1600	1130			275.	194	2150	1518		
Dec 23, 1969	Fair	0.18		2.8	1250	1219			175.	170.7	1800	1756		
Jan 12, 1970	Fair	0.18		2.8	1450	1415			155.	151.	2400	2342		
Mar 12, 1970	Fair	1.05		2.7	950	537			150.	84.8	1600	9055		
Apr 7, 1970	Fair	1.50		2.7	800	6468			136.	1100	2100	16,979		
May 29, 1970	Fair	0.61		2.8	850.	2795			125.	411.	1850	6033		64
Average				2.7	1388.	2056			190.	305.2	2138	3809		64.

**SAMPLING STATION NO. 32**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM.	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	0.88		2.9	1000	4743			225.	1067.2	1250	5929		
Sept 8, 1969	Rain	0.20		2.7	1900	2048			1.7	1.8	2300	2479		
Sept 22, 1969	Fair	0.21		2.8	2000	2264			310.	350.9	2800	3169		
Oct 6, 1969	Fair	0.10		2.5	2000	1078			175.	94.3	2800	1401		
Oct 20, 1969	Fair	0.09		2.2	1150	538			15.	7.3	3100	1504		
Nov 3, 1969	Fair	0.28		2.3	1250	1482			145.	171.9	1850	2194		
Nov 17, 1969	Fair	0.38		2.5	100	205			175.	358.4	2100	4301		
Dec 1, 1969	Fair	0.22		2.8	1250	1477			160.	189.	2200	2363		
Dec 23, 1969	Fair	0.53		2.8	1350	6003								

**SAMPLING STATION NO. 36**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	2.90		3.0	550.	8597			67.5	1055.	900.	14,088		
Sept 8, 1969	Fair	0.95		2.7	1050.	5377			2.2	11.3	2700.	13,825		
Sept 22, 1969	Fair	1.10		2.8	1300.	7700			1.65	9.8	2500.	14,823		
Oct 6, 1969	Rain	0.98		2.6	1250.	6603			125.	660.	1900.	10,036		
Oct 20, 1969	Fair	0.61		2.2	800.	2630			15.5	51.	1800.	5,918		
Nov 3, 1969	Fair	1.49		2.3	500.	4417			6.	48.	2000.	16,062		
Nov 17, 1969	Fair	0.97		2.6	650.	3398			95.	497.	2300.	11,502		
Dec 1, 1969	Fair	0.70		2.9	750.	2830			108.	407.	1900.	7,169		
Dec 23, 1969	Fair	2.85		2.9	850.	13057			275.	422.	2100.	32,259		
Jan 12, 1970	Fair	*												
Mar 17, 1970	Fair	4.00		2.7	1000.	21,560			190.	4096.4	2400.	51,744		
Apr 7, 1970	Fair	6.00		2.7	900.	29,106			200.	6466.	2100.	67,914		
May 29, 1970	Fair	3.13		2.8	750.	12,653			110.	1855.8	2150.	36,272		33
Average		2.14		2.7	867.	9828			79.0	1296.5	2054.	23,466		33

**SAMPLING STATION NO. 37**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	0.67		3.1	400.	1445			40.	144.	625.	2527		
Sept 8, 1969	Fair	0.16		2.7	1500.	1294			2.6	2.2	2360.	2035		
Sept 22, 1969	Fair	0.10		2.8	1700.	916			170.	91.6	2800.	1401		
Oct 6, 1969	Rain	0.17		2.6	1550.	1420			170.	155.8	2850.	2611		
Oct 20, 1969	Fair	0.41		2.3	800.	1768			13.	287.	2100.	4841		
Nov 3, 1969	Fair	0.46		2.5	750.	1860			27.5	68.2	1700.	4215		
Nov 17, 1969	Fair	0.29		2.3	1000.	1663			102.5	160.2	1900.	2970		
Dec 1, 1969	Fair	0.29		2.8	800.	1255			110.	173.	1700.	2666		
Dec 23, 1969	Fair	0.67		2.9	950.	3047			80.	286.7	2100.	7527		
Jan 12, 1970	Fair	0.41		2.9	950.	2095			125.	276.	1850.	4079		
Mar 17, 1970	Fair	2.72		2.8	1000.	14650			135.	1977.8	2150.	31,998		
Apr 7, 1970	Fair	2.00		2.7	600.	6488			90.	970.	1800.	19,404		
May 29, 1970	Fair	0.57		2.8	650.	1997			90.	276.5	2150.	6605		40
Average		0.69		2.7	965.	3060.			88.9	354.7	1991.	7070		40

**SAMPLING STATION NO. 39**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	0.17		3.3	350.	293			20.	18.	650.	596		
Sept 8, 1969	Fair	0.09		3.0	850.	412			152.	73.7	2800.	1388		
Sept 22, 1969	Fair	0.04		3.0	1000.	216			.7	0.2	1950.	420		
Oct 6, 1969	Rain	0.04		3.0	650.	140			1.6	0.3	1900.	410		
Oct 20, 1969	Fair	0.08		2.7	500.	216			14.5	6.3	1800.	776		
Nov 3, 1969	Fair	0.10		2.7	500.	323			5.75	3.7	1400.	906		
Nov 17, 1969	Fair	0.10		3.1	300.	162			15.	8.1	1100.	593		
Dec 1, 1969	Fair	0.08		3.5	240.	106			1.25	0.6	900.	398		
Dec 23, 1969	Fair	0.17		3.4	272.	245			8.5	7.7	1025.	923		
Jan 12, 1970	Fair	0.13		3.3	500.	353			17.5	57.1	1600.	1130		
Mar 17, 1970	Fair	0.61		3.0	500.	1630			13.	14.1	2600.	8478		
Apr 7, 1970	Fair	1.24		2.8	600.	4010			54.	361.	2200.	14,704		
May 29, 1970	Fair	0.37		3.0	560.	1117			76.	151.6	1800.	3530		32
Average		0.25		3.1	522.	709			29.2	54.0	1594.	2637		32

**SAMPLING STATION NO. 43**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	0.60		2.9	64.	207			2.	6.	225.	5437		
Sept 8, 1969	Fair	0.19		3.4	100.	102			2.1	2.	490.	634		
Sept 22, 1969	Fair	0.16		3.1	680.	513			1.1	0.8	1500.	5660		
Oct 6, 1969	Rain	0.16		3.3	160.	138			1.6	1.	900.	2814		
Oct 20, 1969	Fair	0.27		2.9	110.	160			3.	4.	350.	11,332		
Nov 3, 1969	Fair	0.43		3.0	80.	185			2.4	6.	525.	3877		
Nov 17, 1969	Fair	0.37		3.3	110.	219			1.25	2.	290.	981		
Dec 1, 1969	Fair	0.37		3.6	82.	164			1.35	3.	290.	3598		
Dec 23, 1969	Fair	0.56		3.8	60.	181			.7	2.	360.	2814		
Jan 12, 1970	Fair	*												
Mar 17, 1970	Fair	1.75		3.0	500.	4716.			55.	519.	1700.	16,035		
Apr 7, 1970	Fair	0.83		3.3	110.	492.			2.5	11.2	725.	3,343		48
May 29, 1970	Fair	0.52		3.2	187.	643.			6.6	50.6	665.	5111		10.7
Average														48

**SAMPLING STATION NO. 44**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	4.16		2.6	250.	5606			44.	99.	700.	15,696		
Sept 8, 1969	Fair	1.60		3.0	500.	4312			1.9	16	430.	3,708		
Sept 22, 1969	Fair	0.71		3.2	500.	995			1.48	6	1200.	4,592		
Oct 6, 1969	Rain	0.98		2.9	560.	2905			2.7	14	1300.	6,867		
Oct 20, 1969	Fair	2.03		2.6	500.	5471			7.5	82	1200.	13,130		
Nov 3, 1969	Fair	4.24		2.7	400.	9141			5.5	126	2200.	60,278		
Nov 17, 1969	Fair	2.50		3.0	220.	2965			4.	54	300.	4,043		
Dec 1, 1969	Fair	2.78		3.3	160.	2397			10.5	157	550.	8,241		
Dec 23, 1969	Fair	4.00		3.5	124.	2673			4.1	88	500.	10,780		
Jan 12, 1970	Fair	*												
Mar 17, 1970	Fair	10.00		3.6	114.	6145			1.75	94.3	290.	15,631		
Apr 7, 1970	Fair	9.00		3.4	100.	4851			3.25	157.7	370.	17,949		11.2
May 29, 1970	Fair	3.82		3.1	289.	4315			4.3	81.3	822.	13,719		54.3
Average														54.3

**SAMPLING STATION NO. 45**

DATE	WEATHER	FLOW CFS	FLOW GPM	PH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY	CONC.	LBSDAY
July 21, 1969	Rain	4.76		2.6	260.	6414			4.0	103	350.	8,980		
Sept 8, 1969	Fair	1.88		3.0	500.	5067			2.7	87	1050.	10,640		
Sept 22, 1969	Fair	0.85		3.5	150.	687			.1	0.6	640.	2,332		
Oct 6, 1969	Rain	1.14		3.0	450.	2765			2.	12	900.	5,530		
Oct 20, 1969	Fair	2.30		2.6	400.	4859			6.	74.	1100.	13,637		
Nov 3, 1969	Fair	4.67		2.7	450.	11,327			1.95	49	700.	17,620		
Nov 17, 1969	Fair	2.87		2.9	220.	3,403			6.25	97.	280.	4,331		
Dec 1, 1969	Fair	3.15		3.3	170.	2886			20.	340.	525.	8,914		
Dec 23, 1969	Fair	4.56		3.4	120.	2949			6.	147.	550.	13,518		
Jan 12, 1970	Fair	*												
Mar 17, 1970	Fair	11.00		3.3	160.	9486			3.8	225.	240.	14,230		
Apr 7, 1970	Fair	9.00		3.4	100.	4851								

**SAMPLING STATION NO. 50**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY		
July 21, 1969	Rain	3.84		2.4	400	8279		35	724	425	8796			
Sept 8, 1969	Fair	1.30		2.7	1000	7007		2.3	16	1600	1211			
Sept 22, 1969	Fair	1.34		2.8	1250	9028		2	14	2000	14445			
Oct 6, 1969	Rain	1.29		2.6	1000	6953		2.1	15	1500	14602			
Oct 20, 1969	Fair	1.20		2.4	450	2911		7	45	1500	9702			
Nov 3, 1969	Fair	2.17		2.4	550	6433		5.25	61	850	3942			
Nov 17, 1969	Fair	1.46		2.6	500	3935		62.5	492	1200	9443			
Dec 1, 1969	Fair	1.17		2.9	500	3193		50	315	1400	8829			
Dec 23, 1969	Fair	3.79		3.0	500	10214		40	817	1100	22471			
Jan 12, 1970	Fair	*		—	—	—		—	—	—	—			
Mar 17, 1970	Fair	*		—	—	—		—	—	—	—			
Apr 7, 1970	Fair	8.00		2.8	750	32340		93	4010	2300	99176			
May 29, 1970	Fair	4.00		2.9	500	10780		57.5	1240	1500	32340			
Average		2.69		2.7	673	9185		32.4	704	1452	20396			

**SAMPLING STATION NO. 51**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY		
July 21, 1969	Rain	9.63		2.4	400	20782		27.5	1427	525	27250			
Sept 8, 1969	Fair	3.50		2.6	730	33771		2.4	45	1600	30184			
Sept 22, 1969	Fair	2.37		2.9	1000	12774		2.4	31	3400	43432			
Oct 6, 1969	Rain	3.09		2.7	900	14990		2.4	40	2100	34376			
Oct 20, 1969	Fair	4.10		2.4	450	5945		7	155	1300	28129			
Nov 3, 1969	Fair	7.55		2.4	550	22382		8.5	346	1200	48533			
Nov 17, 1969	Fair	5.15		2.7	450	12491		62.5	1735	900	24983			
Dec 1, 1969	Fair	5.28		3.0	500	14230		32.5	925	900	25613			
Dec 23, 1969	Fair	9.38		3.0	220	1123		27.5	1390	750	37319			
Jan 12, 1970	Fair	*		—	—	—		—	—	—	—			
Mar 17, 1970	Fair	*		—	—	—		—	—	—	—			
Apr 7, 1970	Fair	20.00		2.8	700	75460		95	10241	1800	194040			
May 29, 1970	Fair	10.00		2.9	500	26950		42.5	2291	1400	75460			
Average		7.27		2.7	582	20443		28.2	1693	1443	51947			

**SAMPLING STATION NO. 53**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY		
July 21, 1969	Rain	0.70		3.3	740	2792		1.55	6	170	641			
Sept 8, 1969	Rain	0.08		3.8	110	47		1.35	0.6	320	138			
Sept 22, 1969	Fair	0.03		4.0	100	16		.1	0	320	52			
Oct 6, 1969	Fair	0.08		3.9	70	30		.35	0.2	240	103			
Oct 20, 1969	Fair	0.19		3.5	92	94		2.3	2.4	240	246			
Nov 3, 1969	Fair	0.50		3.5	176	474		.1	0.3	290	782			
Nov 17, 1969	Fair	0.43		4.0	86	199		.7	1.7	220	540			
Dec 1, 1969	Fair	0.46		4.1	80	196		1.6	6	145	544			
Dec 23, 1969	Fair	0.70		4.3	54	203		—	—	—	—			
Jan 12, 1970	Fair	*		—	—	—		—	—	—	—			
Mar 17, 1970	Fair	*		—	—	—		—	—	—	—			
Apr 7, 1970	Fair	3.58		4.3	28	540		26	5	76	1467			
May 29, 1970	Fair	1.07		4.2	46	265		96	5.5	170	980			
Average		0.71		3.9	144	441		0.87	2.5	223	554			

**SAMPLING STATION NO. 54**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY		
July 21, 1969	Rain	0.14		2.6	550	415		4	3	620	466			
Sept 8, 1969	Fair	*		3.2	640	—		2.6	—	2000	—			
Sept 22, 1969	Fair	0.01		3.1	850	46		.8	0	1430	78			
Oct 6, 1969	Rain	0.04		2.9	650	140		2.1	0.5	1100	237			
Oct 20, 1969	Fair	0.09		2.7	500	243		6.75	3.3	1200	582			
Nov 3, 1969	Fair	0.10		2.7	500	270		6	3.2	1100	593			
Nov 17, 1969	Fair	0.09		2.9	550	267		4.36	2.1	900	437			
Dec 1, 1969	Fair	0.06		3.3	360	109		3.2	1	1080	317			
Dec 23, 1969	Fair	0.14		3.2	460	355		7.55	5.8	1100	848			
Jan 12, 1970	Fair	*		—	—	—		—	—	—	—			
Mar 17, 1970	Fair	*		—	—	—		—	—	—	—			
Apr 7, 1970	Fair	0.93		2.9	320	1604		24	1203	700	3509			
May 29, 1970	Fair	0.14		3.1	380	287		16.3	12.3	700	528			
Average		0.17		3.0	524	374		7.07	15.2	1084	760			

**SAMPLING STATION NO. 54X**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY		
July 21, 1969	Rain	*		—	—	—		—	—	—	—			
Sept 8, 1969	Fair	*		—	—	—		—	—	—	—			
Sept 22, 1969	Fair	0.04		3.1	400	86		50	16.2	800	280			
Oct 6, 1969	Rain	0.04		2.9	400	1590		75	25.4	1300	4134			
Oct 20, 1969	Fair	0.09		2.7	500	2717		6.25	28.3	1300	5886			
Nov 3, 1969	Fair	0.84		2.7	600	2117		7.5	23.9	700	2226			
Nov 17, 1969	Fair	0.59		2.9	500	1590		22.5	32	1050	1490			
Dec 1, 1969	Fair	0.26		3.3	370	525		6.5	44.1	1700	11545			
Dec 23, 1969	Fair	1.26		3.3	500	3396		—	—	—	—			
Jan 12, 1970	Fair	*		—	—	—		—	—	—	—			
Mar 17, 1970	Fair	*		—	—	—		—	—	—	—			
Apr 7, 1970	Fair	*		—	—	—		—	—	—	—			
May 29, 1970	Fair	*		—	—	—		—	—	—	—			
Average		0.51		3.0	467	1651		25.1	283	1164	4260			

**SAMPLING STATION NO. 55**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY		
July 21, 1969	Rain	*		—	—	—		—	—	—	—			
Sept 8, 1969	Fair	*		—	—	—		—	—	—	—			
Sept 22, 1969	Fair	*		—	—	—		—	—	—	—			
Oct 6, 1969	Rain	*		—	—	—		—	—	—	—			
Oct 20, 1969	Fair	*		—	—	—		—	—	—	—			
Nov 3, 1969	Fair	8.15		2.5	500	21964		7.5	329	700	30730			
Nov 17, 1969	Fair	5.67		2.7	240	7335		17.5	53.5	1000	30561			
Dec 1, 1969	Fair	5.80		3.1	240	7503		25	78.2	840	26573			
Dec 23, 1969	Fair	10.22		3.2	220	12119		13	71.6	890	46823			
Jan 12, 1970	Fair	*		—	—	—		—	—	—	—			
Mar 17, 1970	Fair	*		—	—	—		—	—	—	—			
Apr 7, 1970	Fair	*		—	—	—		—	—	—	—			
May 29, 1970	Fair	1320		3.1	200	14230		9.5	676	700	49804			
Average		8.61		2.9	280	12630		14.5	608	818	36902			

**SAMPLING STATION NO. 56**

DATE	WEATHER	FLOW C.F.S.	FLOW GPM	pH	ACIDITY		ALKALINITY		TOTAL IRON		SULFATES		ALUMINIUM	
					CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY	CONC. LBS/DAY		
July 21, 1969	Rain	10.57		2.5	300	17092		3.5	199	425	24213			
Sept 8, 1969	Fair	3.68		3.0	550	10909		3	60	1200	23802			
Sept 22, 1969	Fair	2.51		3.0	750	10147		1.8	24	1400	18940			
Oct 6, 1969	Rain	3.31		3.0	400	7136		3.0	54	900	16057			
Oct 20, 1969	Fair	4.48		2.5	140	3381		6.25	151	1050	25355			
Nov 3, 1969	Fair	8.25		2.5	450	20010		6.25	278	1100	48914			
Nov 17, 1969	Fair	5.77		2.6	260	8086		21.5	669	900	27990			
Dec 1, 1969	Fair	5.90		3.1	220	6996		22.5	716	1050	33391			
Dec 23, 1969	Fair	10.32		3.2	200	11125		10.5	584	500	27812			
Jan 12, 1970	Fair	*		3.1	400	—		17.5	—	720	—			
Mar 17, 1970	Fair	15.00		3.1	220	17787		12.5	1010	700	96595			
Apr 7, 1970	Fair	22.00		2.9	550	65219		39	4624	650	77077			
May 29, 1970	Fair	16.66		3.1	220	19755		12.5	1122.5	725	65103			
Average		9.03		2.9	358	16470		12.3	791	871	37104			

**SAMPLING STATION**





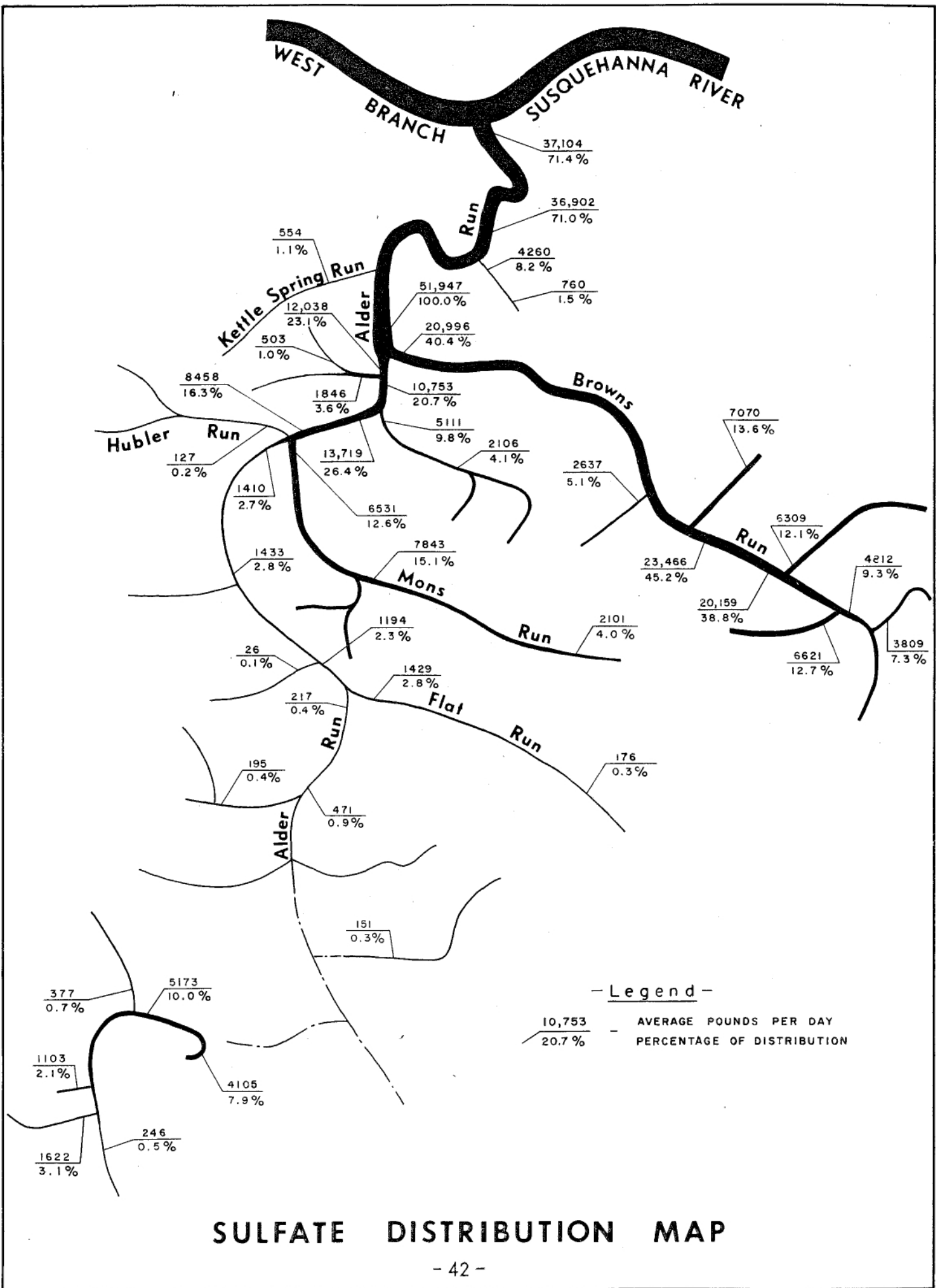
As a result of the regular sampling and flow measurement at forty-three (43) points on the watershed, the data on the tabulation pages was compiled.

#### Sulfate Materials Balance

The data was studied to determine if a reasonable materials balance could be achieved by utilization of the sulfate ion as an indicator. Sulfate was chosen because it is prevalent in mine drainage and it does not significantly degrade or precipitate from solution at the relatively constant pH's exhibited by the watershed's streams.

The materials balance assists in defining portions of streams where undetected pollution, such as polluted ground water, is entering the surface stream system. It also helps to compare pollution loads among numerous tributaries since the sulfate ion concentration is essentially affected only by dilution. This is unlike acid and iron which are more chemically reactive and therefore changing in concentration for reasons other than dilution.

A review of the materials balance data (see the exhibit next page) indicates mixed results which are generally difficult to correlate. The sulfate load at the mouth of Alder Run corresponds very well with a sampling station about one mile upstream and with the sum of the loads in Alder Run and Browns Run above the confluence of these two streams. The sampling station below this confluence, however, indicated a sulfate load 53% higher than expected. There was also a discrepancy between the analyses at Browns Run's mouth and stations upstream on Browns Run. An assessment of the flows and analyses at some of these points leads us to believe the principal error is in the



**SULFATE DISTRIBUTION MAP**

sulfate analysis. For example, the average flow at Station 51 was 7.27 cfs and increased to 9.03 cfs (24%) at Alder Run's mouth (Station 56) as would be expected when comparing the areas tributary to these stations. A comparison of sulfates indicates a decrease in concentration of 552 mg/L or 38%. Such a large decrease in sulfate concentration is inexplicable. The sulfate analyses at the other stations where discrepancies exist also appear erroneous. Overall, these discrepancies have decreased the potential benefits of the sulfate materials balance on this watershed.