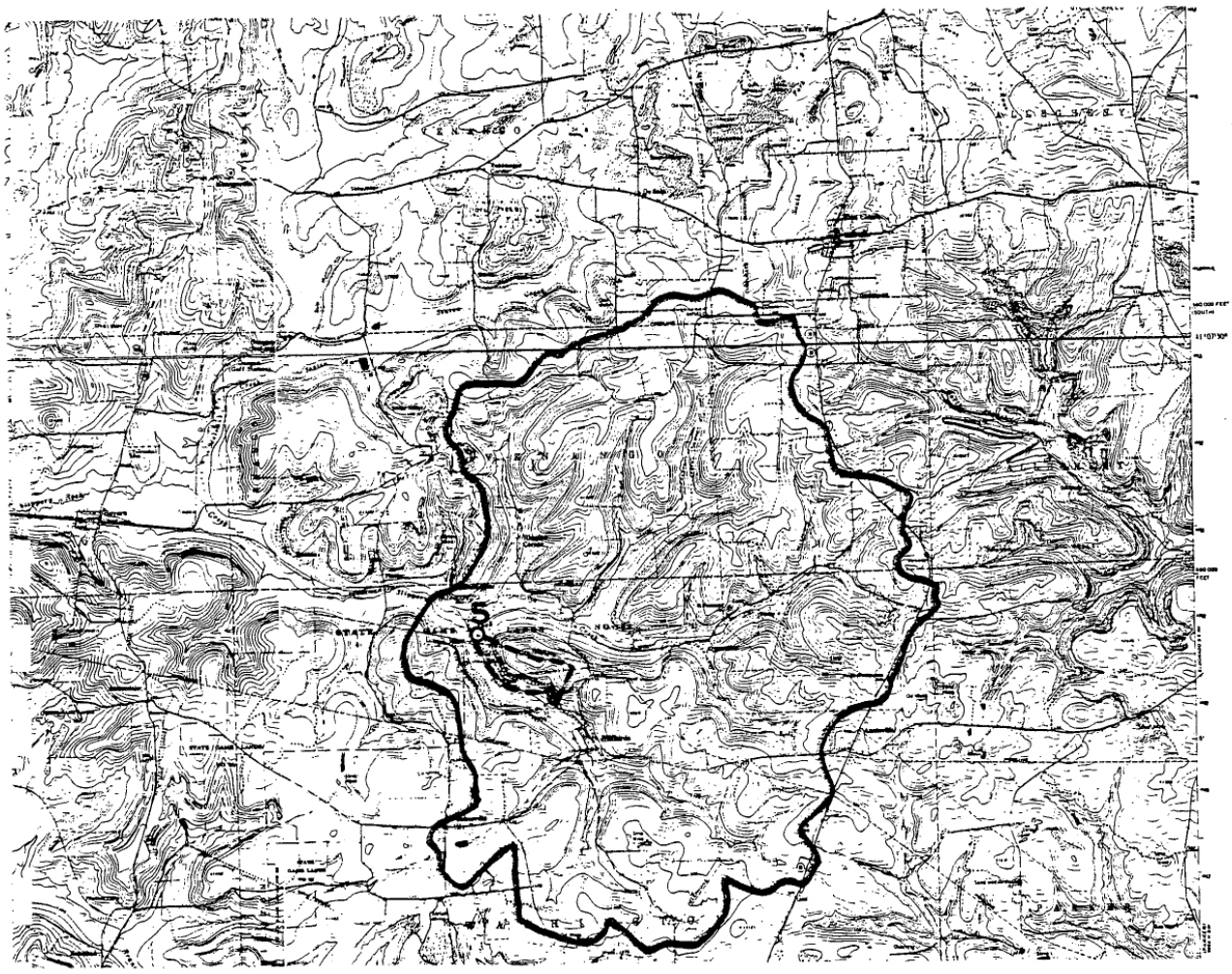
APPENDIX 5

SAMPLE STATION 5

DISCHARGE FROM SURFACE MINE PIT AND OPERATION

PA STATE GAME LANDS #95

PROJECT SL-110-7-101.5



SAMPLE STATION 5 (--)

SAMPLE LOCATION IN RELATION
TO
TOTAL SITE

SAMPLE STATION 5

SAMPLE 5 PROJECT SL110-7-101.5:BIG BERTHA

DATE	SPEC COND UMHOS/CM	DISCHARGE C.F.S.	PH SU	ALKALINITY MG/L	ACIDITY MG/L	SULPHATES MG/L	TOTAL IRON MG/L	FERROUS IRON MG/L	FERRIC IRON MG/L	REC #
021783	1500	.21	2.91	00	422	694	94.0	6.0	88.0	1
022883	1160	.18	2.75	00	486	1041	94.0	4.5	89.5	2
030783	1700	.16	2.68	00	501	1079	67.0	2.5	64.5	3
031483	1550	.18	2.65	00	482	982	85.5	2.8	82.7	4
032583	1140	.27	2.85	00	474	1178	101.0	7.3	93.7	5
033183	1140	.27	2.85	00	414	969	81.0	4.6	76.4	6
040783	1400	.27	2.72	00	391	718	52.0	4.3	47.7	7
041383	1200	.35	2.84	00	428	649	75.0	4.8	70.2	8
042083	1200	.27	2.88	00	391	587	68.0	9.9	58.1	9
042683	1300	.21	2.85	00	397	788	74.5	14.7	59.8	10
050483	1250	.53	2.63	00	336	1110	48.0	13.0	35.0	11
051183	1300	.27	2.69	00	431	444	74.5	4.7	69.8	12
051983	1650	.27	2.66	00	401	771	60.0	2.5	57.5	13
052583	1600	.31	2.74	00	404	680	63.8	4.1	59.7	14
060183	1700	.21	2.59	00	418	861	72.8	3.1	69.7	15
060783	1600	.24	2.68	00	440	894	50.0	3.5	46.5	16
061283	2000	.18	2.53	00	468	1058	39.6	1.5	38.1	17
061683	2000	.16	2.41	00	493	928	50.0	2.4	47.6	18
062183	1900	.16	2.40	00	505	999	47.5	3.1	44.4	19
062983	1500	.43	2.54	00	388	745	44.2	3.9	40.3	20
071083	2200	.16	2.60	00	550	1102	73.2	4.8	68.4	21
071983	2500	.16	2.54	00	567	992	56.1	3.8	52.3	22
072683	2500	.16	2.47	00	586	1043	67.3	3.8	63.5	23
080283	2500	.16	2.47	00	573	1092	57.9	3.8	54.1	24
080183	2200	.16	2.41	00	668	1223	82.0	4.3	77.7	25

Discharge Relationships

I. Drainage Area

The surface acreage contributing runoff to the monitoring location is estimated to be 110 acres.

2. Measurement of Discharge

The discharge at this monitoring point was observed using a 90 degree V-notch weir capable of measuring a discharge range up to 2.4c.f.s.

3. Observed Discharge

The observed range of discharge measured at this monitoring point varied from 0.16 c. f. s. - 0.53 c.f.s. during the sampling.

4. Specific Yield

The specific yield of this monitoring point showed the following range:

1.5 c.f.s./1000 acres Minimum yield
4.8 c.f.s./1000 acres Maximum yield

The reviewer is directed to refer to the following materials during the discussion of the sample analyses and trends at this monitoring points

a. Sheet 16 - which shows the data plotted and shows the regression line and field of variance.

b. Appendix 5 - which contains the sample data and regression runs.

5. pH relationship

The pH during the sampling period varied from 2.40 - 2.91. Regression analysis of the pH values indicates: A weak relationship exists where pH values increases as discharge increases.

6. Specific conductance relationship

The conductance during the sampling period varied from 1140 - 2500 Regression analysis of the conductance indicates: An extremely strong relationship exists where conductance decreases as discharge increases.

Chemical Relationships

1. pH relationship

The pH during the sampling period varied from 2.40 - 2.91. Regression analysis of the pH values showed that: A strong relationship exists where pH values decrease as conductance increases.

2. Acidity/Alkalinity balance (mg/l)

The acidity during the sampling period varied from 336 - 668 Regression analysis of the acidity values indicates: A strong relationship exists where acidity concentration increase as conductance increases. The alkalinity during the sample period was 0-0. No regression analysis was attempted as no alkalinity was measured.

3. Sulphate relationship (mg/l)

The sulphates during the sampling period varied from 649 - 1223. Regression analysis of the sulphate values indicates: A moderate relationship exists where sulphate concentrations increase as conductance increases.

4. Total iron relationship (mg/l)
The total iron during the sampling period varied from 39.6 - 101.0. Regression analysis of the total iron values indicates: A weakrelationship exists where total iron concentrations decrease as conductance increases.

5. Ferrous iron relationship (mg/l)

The ferrous iron during the sampling period varied from 1.5 - 14.7 Regression analysis of the ferrous iron values indicates: A moderate relationship exists where ferrous iron concentrations decrease as conductance increases.

6. Ferric iron relationship (mg/l)
The ferric iron during the sampling period varied from 35.0 - 93.7. Regression analysis of the ferric iron values indicates: A weak relationship exists where ferric iron concentrations decrease as conductance increases.

SAMPLE.FIVE DISCHARGE VS. SPECIFIC CONDUCTANCE

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2 41690.0000
9314.3867
2391.2529

REGRESSION COEFFICIENTS OF NORMAL EQUATION

3773.845947265625
- 13666.242187500000
17589.648437500000

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
0.2100	1500.0000	1679.6387	179.6387
0.1800	1160.0000	1883.8269	723.8269
0.1600	1700.0000	2037.5420	337.5420
0.1800	1550.0000	1883.8269	333.8269
0.2700	1140.0000	1366.2451	226.2451
0.2700	1140.0000	1366.2451	226.2451
0.2700	1400.0000	1366.2451	33.7549
0.3500	1200.0000	1145.3943	54.6057
0.2700	1200.0000	1366.2451	166.2451
0.2100	1300.0000	1679.6387	379.6387
0.5300	1250.0000	1471.6702	221.6702
0.2700	1300.0000	1366.2451	66.2451
0.2700	1650.0000	1366.2451	283.7549
0.3100	1600.0000	1227.6792	372.3208
0.2100	1700.0000	1679.6387	20.3613
0.2400	1600.0000	1507.1113	92.8887
0.1800	2000.0000	1883.8269	116.1731
0.1600	2000.0000	2037.5420	37.5420
0.1600	1900.0000	2037.5420	137.5420
0.4300	1500.0000	1149.6912	350.3088
0.1600	2200.0000	2037.5420	162.4580
0.1600	2500.0000	2037.5420	462.4580
0.1600	2500.0000	2037.5420	462.4580
0.1600	2500.0000	2037.5420	462.4580
0.1600	2200.0000	2037.5420	162.4580

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 2
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 4770111
SUMS OF SQUARES DUE TO REGRESSION= 2579168
SUMS OF SQUARES DUE TO DEVIATION= 2190944
GOODNESS OF FIT= .540693
MULTIPLE CORRELATION COEFFICIENT 0.73532
STANDARD DEVIATION 302.1406

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LAST REGRESSION	1593552.00	1	1593552.00
CUR. REGRESSION	2579168.00	2	1289584.00
CUR. ADDITION	985616.00	1	985616.00
CUR. DEVIATION	2190944.00	22	99588.00
TOTAL VARIATION	4770112.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 12.95
LEVEL .05% - CRITICAL VALUE = 3.44

F TEST - IMPROVEMENT OF ADDED TERM = 9.90
LEVEL .05% - CRITICAL VALUE = 4.30

SAMPLE.FIVE SPECIFIC CONDUCTANCE VS. PH

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	4169	66.3398
4169	7429228	109313.6250

REGRESSION COEFFICIENTS OF NORMAL EQUATION

3.112958908081

-0.000275474042

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
1500.0000	2.9100	2.6997	0.2103
1160.0000	2.7500	2.7934	0.0434
1700.0000	2.6800	2.6447	0.0353
1550.0000	2.6500	2.6860	0.0360
1140.0000	2.8500	2.7989	0.0511
1140.0000	2.8500	2.7989	0.0511
1400.0000	2.7200	2.7273	0.0073
1200.0000	2.8400	2.7824	0.0576
1200.0000	2.8800	2.7824	0.0976
1300.0000	2.8500	2.7548	0.0952
1250.0000	2.6300	2.7686	0.1386
1300.0000	2.6900	2.7548	0.0648
1650.0000	2.6600	2.6584	0.0016
1600.0000	2.7400	2.6722	0.0678
1700.0000	2.5900	2.6447	0.0547
1600.0000	2.6800	2.6722	0.0078
2000.0000	2.5300	2.5620	0.0320
2000.0000	2.4100	2.5620	0.1520
1900.0000	2.4000	2.5896	0.1896
1500.0000	2.5400	2.6997	0.1597
2200.0000	2.6000	2.5069	0.0931
2500.0000	2.5400	2.4243	0.1157
2500.0000	2.4700	2.4243	0.0457
2500.0000	2.4700	2.4243	0.0457
2200.0000	2.4100	2.5069	0.0969

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1

NUMBER OF X - Y PAIRS= 25

TOTAL SUMS OF SQUARE= .591278

SUMS OF SQUARES DUE TO REGRESSION= .362564

SUMS OF SQUARES DUE TO DEVIATION= .228714

GOODNESS OF FIT= .613187

MULTIPLE CORRELATION COEFFICIENT 0.78306

STANDARD DEVIATION .09762

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	.36	1	.36
DEVIATION	.23	23	.01
TOTAL VARIATION	.59	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE

F TEST - SIGNIFICANCE OF REGRESSION = 36.46

LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.FIVE DISCHARGE VS. PH

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2 66.3398
15.8459

REGRESSION COEFFICIENTS OF NORMAL EQUATION

2.527385711670
0.532016932964

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
0.2100	2.9100	2.6391	0.2709
0.1800	2.7500	2.6231	0.1269
0.1600	2.6800	2.6125	0.0675
0.1800	2.6500	2.6231	0.0269
0.2700	2.8500	2.6710	0.1790
0.2700	2.8500	2.6710	0.1790
0.2700	2.7200	2.6710	0.0490
0.3500	2.8400	2.7136	0.1264
0.2700	2.8800	2.6710	0.2090
0.2100	2.8500	2.6391	0.2109
0.5300	2.6300	2.8094	0.1794
0.2700	2.6900	2.6710	0.0190
0.2700	2.6600	2.6710	0.0110
0.3100	2.7400	2.6923	0.0477
0.2100	2.5900	2.6391	0.0491
0.2400	2.6800	2.6551	0.0249
0.1800	2.5300	2.6231	0.0931
0.1600	2.4100	2.6125	0.2025
0.1600	2.4000	2.6125	0.2125
0.4300	2.5400	2.7562	0.2162
0.1600	2.6000	2.6125	0.0125
0.1600	2.5400	2.6125	0.0725
0.1600	2.4700	2.6125	0.1425
0.1600	2.4700	2.6125	0.1425
0.1600	2.4100	2.6125	0.2025

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= .591278
SUMS OF SQUARES DUE TO REGRESSION= .059418
SUMS OF SQUARES DUE TO DEVIATION= .53186
GOODNESS OF FIT= .10049
MULTIPLE CORRELATION COEFFICIENT 0.31700
STANDARD DEVIATION .148865

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	.06	1	.06
DEVIATION	.53	23	.02
TOTAL VARIATION	.59	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 2.57
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.FIVE SPECIFIC CONDUCTANCE VS. ALKALINITY

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	4169	0.0000
4169	7429228	0.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

0.000000000000
0.000000000000

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
1500.0000	0.0000	0.0000	0.0000
1160.0000	0.0000	0.0000	0.0000
1700.0000	0.0000	0.0000	0.0000
1550.0000	0.0000	0.0000	0.0000
1140.0000	0.0000	0.0000	0.0000
1140.0000	0.0000	0.0000	0.0000
1400.0000	0.0000	0.0000	0.0000
1200.0000	0.0000	0.0000	0.0000
1200.0000	0.0000	0.0000	0.0000
1300.0000	0.0000	0.0000	0.0000
1250.0000	0.0000	0.0000	0.0000
1300.0000	0.0000	0.0000	0.0000
1650.0000	0.0000	0.0000	0.0000
1600.0000	0.0000	0.0000	0.0000
1700.0000	0.0000	0.0000	0.0000
1600.0000	0.0000	0.0000	0.0000
2000.0000	0.0000	0.0000	0.0000
2000.0000	0.0000	0.0000	0.0000
1900.0000	0.0000	0.0000	0.0000
1500.0000	0.0000	0.0000	0.0000
2200.0000	0.0000	0.0000	0.0000
2500.0000	0.0000	0.0000	0.0000
2500.0000	0.0000	0.0000	0.0000
2500.0000	0.0000	0.0000	0.0000
2200.0000	0.0000	0.0000	0.0000

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 0
SUMS OF SQUARES DUE TO REGRESSION= 0
SUMS OF SQUARES DUE TO DEVIATION= 0
GOODNESS OF FIT= 0
MULTIPLE CORRELATION COEFFICIENT 0.00000
STANDARD DEVIATION 0

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	.00	1	.00
DEVIATION	.00	23	.00
TOTAL VARIATION	.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 0.00
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.FIVE SPECIFIC CONDUCTANCE VS. ACIDITY

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	4169	11614.0000
4169	7429228	20015216.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

238.103012084961
0.135797500610

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
1500.0000	422.0000	441.7991	19.7991
1160.0000	486.0000	395.6279	90.3721
1700.0000	501.0000	468.9587	32.0413
1550.0000	482.0000	448.5891	33.4109
1140.0000	474.0000	392.9121	81.0879
1140.0000	414.0000	392.9121	21.0879
1400.0000	391.0000	428.2195	37.2195
1200.0000	428.0000	401.0598	26.9402
1200.0000	391.0000	401.0598	10.0598
1300.0000	397.0000	414.6396	17.6396
1250.0000	336.0000	407.8499	71.8499
1300.0000	431.0000	414.6396	16.3604
1650.0000	401.0000	462.1687	61.1687
1600.0000	404.0000	455.3789	51.3789
1700.0000	418.0000	468.9587	50.9587
1600.0000	440.0000	455.3789	15.3789
2000.0000	468.0000	509.6978	41.6978
2000.0000	493.0000	509.6978	16.6978
1900.0000	505.0000	496.1179	8.8821
1500.0000	388.0000	441.7991	53.7991
2200.0000	550.0000	536.8572	13.1428
2500.0000	567.0000	577.5964	10.5964
2500.0000	586.0000	577.5964	8.4036
2500.0000	573.0000	577.5964	4.5964
2200.0000	668.0000	536.8572	131.1428

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 145418
SUMS OF SQUARES DUE TO REGRESSION= 87978
SUMS OF SQUARES DUE TO DEVIATION= 57440
GOODNESS OF FIT= .605001
MULTIPLE CORRELATION COEFFICIENT 0.77782
STANDARD DEVIATION 48.92169

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	87978.00	1	87978.00
DEVIATION	57440.00	23	2497.39
TOTAL VARIATION	145418.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 35.23
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.FIVE SPECIFIC CONDUCTANCE VS. SULPHATES

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	4169	22527.0000
4169	7429228	38454352.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

590.496582031250
0.186244964600

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
1500.0000	694.0000	869.8640	175.8640
1160.0000	1041.0000	806.5405	234.4595
1700.0000	1079.0000	907.1128	171.8872
1550.0000	982.0000	879.1763	102.8237
1140.0000	1178.0000	802.8157	375.1843
1140.0000	969.0000	802.8157	166.1843
1400.0000	718.0000	851.2395	133.2395
1200.0000	649.0000	813.9905	164.9905
1200.0000	587.0000	813.9905	226.9905
1300.0000	788.0000	832.6150	44.6150
1250.0000	1110.0000	823.3027	286.6973
1300.0000	444.0000	832.6150	388.6150
1650.0000	771.0000	897.8005	126.8005
1600.0000	680.0000	888.4885	208.4885
1700.0000	861.0000	907.1128	46.1128
1600.0000	894.0000	888.4885	5.5115
2000.0000	1058.0000	962.9863	95.0137
2000.0000	928.0000	962.9863	34.9863
1900.0000	999.0000	944.3618	54.6382
1500.0000	745.0000	869.8640	124.8640
2200.0000	1102.0000	1000.2354	101.7646
2500.0000	892.0000	1056.1089	164.1089
2500.0000	1043.0000	1056.1089	13.1089
2500.0000	1092.0000	1056.1089	35.8911
2200.0000	1223.0000	1000.2354	222.7646

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 970576
SUMS OF SQUARES DUE TO REGRESSION= 165744
SUMS OF SQUARES DUE TO DEVIATION= 804832
GOODNESS OF FIT= .170769
MULTIPLE CORRELATION COEFFICIENT 0.41324
STANDARD DEVIATION 183.1246

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	165744.00	1	165744.00
DEVIATION	804832.00	23	34992.69
TOTAL VARIATION	970576.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 4.74
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.FIVE SPECIFIC CONDUCTANCE VS. TOTAL IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	4169	1678.8989
4169	7429228	2737322.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

88.970520019531

- 0.013081550598

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
1500.0000	94.0000	69.3482	24.6518
1160.0000	94.0000	73.7959	20.2041
1700.0000	67.0000	66.7319	0.2681
1550.0000	85.5000	68.6941	16.8059
1140.0000	101.0000	74.0575	26.9425
1140.0000	81.0000	74.0575	6.9425
1400.0000	52.0000	70.6564	18.6564
1200.0000	75.0000	73.2727	1.7273
1200.0000	68.0000	73.2727	5.2727
1300.0000	74.5000	71.9645	2.5355
1250.0000	48.0000	72.6186	24.6186
1300.0000	74.5000	71.9645	2.5355
1650.0000	60.0000	67.3860	7.3860
1600.0000	63.8000	68.0400	4.2400
1700.0000	72.8000	66.7319	6.0681
1600.0000	50.0000	68.0400	18.0400
2000.0000	39.6000	62.8074	23.2074
2000.0000	50.0000	62.8074	12.8074
1900.0000	47.5000	64.1156	16.6156
1500.0000	44.2000	69.3482	25.1482
2200.0000	73.2000	60.1911	13.0089
2500.0000	56.1000	56.2666	0.1666
2500.0000	67.3000	56.2666	-11.0334
2500.0000	57.9000	56.2666	1.6333
2200.0000	82.0000	60.1911	21.8089

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 6702
SUMS OF SQUARES DUE TO REGRESSION= 817.0625
SUMS OF SQUARES DUE TO DEVIATION= 5884.937
GOODNESS OF FIT= .121913
MULTIPLE CORRELATION COEFFICIENT 0.34916
STANDARD DEVIATION 15.65904

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	817.06	1	817.06
DEVIATION	5884.94	23	255.87
TOTAL VARIATION	6702.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 3.19
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.FIVE SPECIFIC CONDUCTANCE VS. FERRIC IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	4169	1555.1980
4169	7429228	2546198.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

78.723388671875

- 0.009903848171

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
1500.0000	88.0000	63.8676	24.1324
1160.0000	89.5000	67.2349	22.2651
1700.0000	64.5000	61.8869	2.6131
1550.0000	82.7000	63.3724	19.3276
1140.0000	93.7000	67.4330	26.2670
1140.0000	76.4000	67.4330	8.9670
1400.0000	47.7000	64.8580	17.1580
1200.0000	70.2000	66.8388	3.3612
1200.0000	58.1000	66.8388	8.7388
1300.0000	59.8000	65.8484	6.0484
1250.0000	35.0000	66.3436	31.3436
1300.0000	69.8000	65.8484	3.9516
1650.0000	57.5000	62.3820	4.8820
1600.0000	59.7000	62.8772	3.1772
1700.0000	69.7000	61.8869	7.8131
1600.0000	46.5000	62.8772	16.3772
2000.0000	38.1000	58.9157	20.8157
2000.0000	47.6000	58.9157	11.3157
1900.0000	44.4000	59.9061	15.5061
1500.0000	40.3000	63.8676	23.5676
2200.0000	68.4000	56.9349	11.4651
2500.0000	52.3000	53.9638	1.6638
2500.0000	63.5000	53.9638	9.5362
2500.0000	54.1000	53.9638	0.1362
2200.0000	77.7000	56.9349	20.7651

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 6490.75
SUMS OF SQUARES DUE TO REGRESSION= 468.5625
SUMS OF SQUARES DUE TO DEVIATION= 6022.187
GOODNESS OF FIT= .072188
MULTIPLE CORRELATION COEFFICIENT 0.26868
STANDARD DEVIATION 15.84059

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	468.56	1	468.56
DEVIATION	6022.19	23	261.83
TOTAL VARIATION	6490.75	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 1.79
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.FIVE SPECIFIC CONDUCTANCE VS. FERROUS IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	4169	123.6998
4169	7429228	191120.7500

REGRESSION COEFFICIENTS OF NORMAL EQUATION

10.247994422913

- 0.003178232117

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
1500.0000	6.0000	5.4806	0.5194
1160.0000	4.5000	6.5612	2.0612
1700.0000	2.5000	4.8450	2.3450
1550.0000	2.8000	5.3217	2.5217
1140.0000	7.3000	6.6248	0.6752
1140.0000	4.6000	6.6248	2.0248
1400.0000	4.3000	5.7985	1.4985
1200.0000	4.8000	6.4341	1.6341
1200.0000	9.9000	6.4341	3.4659
1300.0000	14.7000	6.1163	8.5837
1250.0000	13.0000	6.2752	6.7248
1300.0000	4.7000	6.1163	1.4163
1650.0000	2.5000	5.0039	2.5039
1600.0000	4.1000	5.1628	1.0628
1700.0000	3.1000	4.8450	1.7450
1600.0000	3.5000	5.1628	1.6628
2000.0000	1.5000	3.8915	2.3915
2000.0000	2.4000	3.8915	1.4915
1900.0000	3.1000	4.2094	1.1094
1500.0000	3.9000	5.4806	1.5806
2200.0000	4.8000	3.2559	1.5441
2500.0000	3.8000	2.3024	1.4976
2500.0000	3.8000	2.3024	1.4976
2500.0000	3.8000	2.3024	1.4976
2200.0000	4.3000	3.2559	1.0441

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1

NUMBER OF X - Y PAIRS= 25

TOTAL SUMS OF SQUARE= 242.0458

SUMS OF SQUARES DUE TO REGRESSION= 48.18335

SUMS OF SQUARES DUE TO DEVIATION= 193.8625

GOODNESS OF FIT= .199067

MULTIPLE CORRELATION COEFFICIENT 0.44617

STANDARD DEVIATION 2.842113

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	48.18	1	48.18
DEVIATION	193.86	23	8.43
TOTAL VARIATION	242.05	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE

F TEST - SIGNIFICANCE OF REGRESSION = 5.72

LEVEL .05% - CRITICAL VALUE = 4.28

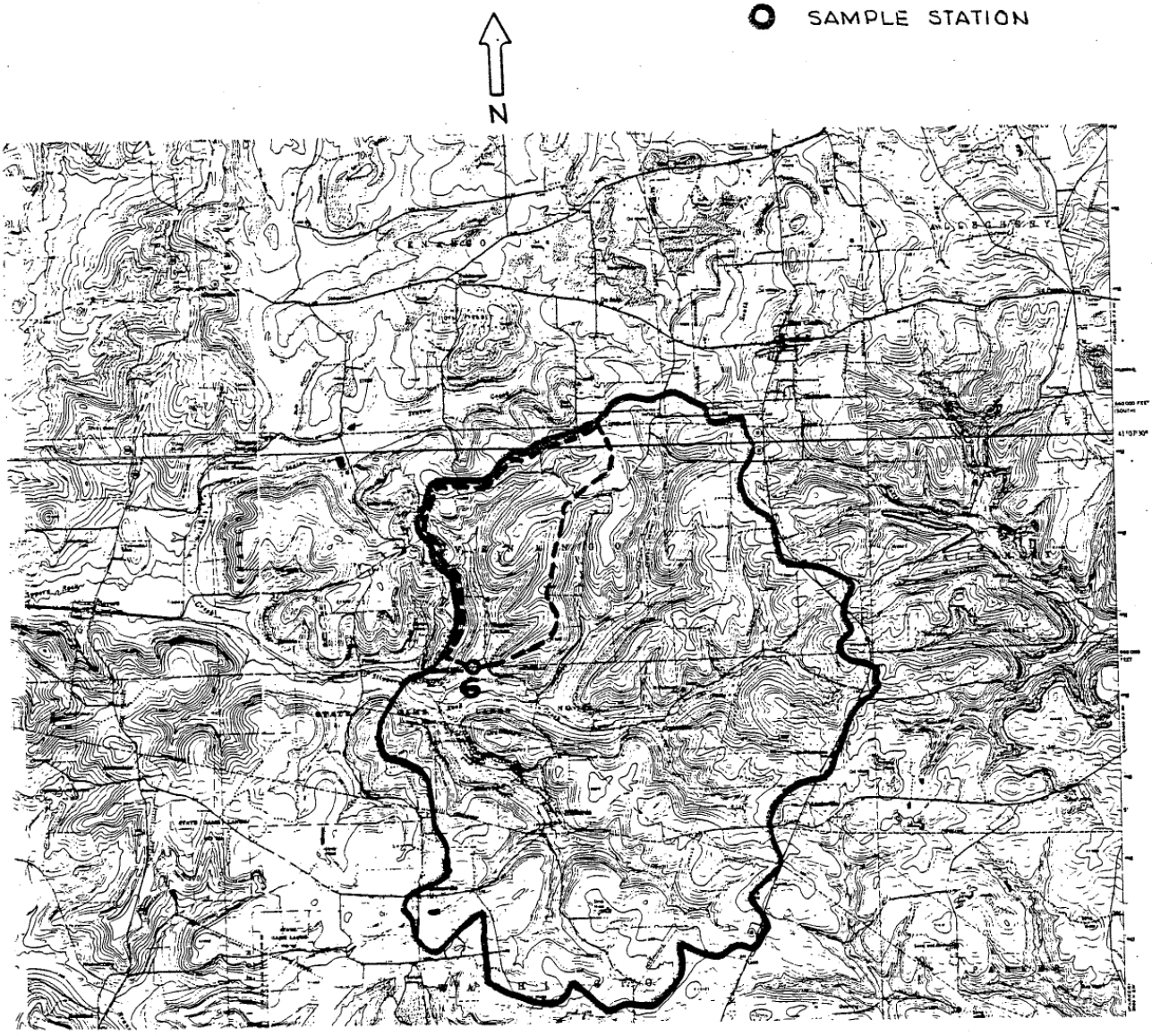
APPENDIX 6

SAMPLE STATION 6

TRIBUTARY TO SLIPPERY ROCK CREEK

PA STATE GAME LANDS #95

PROJECT SL-110-7-101.5



SAMPLE STATION 6 (--)

SAMPLE LOCATION IN RELATION
TO
TOTAL SITE

SAMPLE 6 PROJECT SL110-7-101.5:BIG BERTHA

DATE	SPEC COND UMHOS/CM	DISCHARGE C.F.S.	PH SU	ALKALINITY MG/L	ACIDITY MG/L	SULPHATES MG/L	TOTAL IRON MG/L	FERROUS IRON MG/L	FERRIC IRON MG/L	REC #
021783	110	1.62	5.53	03	03	75	1.2	.9	.3	1
022883	150	1.36	5.35	02	04	74	.9	.8	.1	2
030783	150	1.11	5.32	02	07	88	.6	.2	.4	3
031483	120	1.62	5.49	03	05	62	.8	.4	.4	4
032583	90	3.13	5.57	03	06	57	.7	.3	.4	5
033183	90	3.13	5.40	02	03	68	.6	.2	.4	6
040783	100	3.74	5.59	05	02	48	.8	.5	.3	7
041383	80	4.93	5.79	03	09	44	.8	.4	.4	8
042083	75	3.74	5.46	02	03	43	.7	.5	.2	9
042683	100	1.90	5.58	02	03	55	.7	.3	.4	10
050483	70	6.98	5.55	02	03	32	.5	.1	.4	11
051183	90	2.48	5.75	04	04	42	.6	.2	.4	12
051983	110	2.48	5.95	09	04	55	1.5	.7	.8	13
052583	90	5.72	5.57	04	03	41	.6	.3	.3	14
060183	115	2.19	5.45	03	04	60	1.3	.5	.8	15
060783	100	2.73	5.76	04	03	33	.5	.2	.3	16
061283	140	.48	5.44	02	03	59	.4	.1	.3	17
061683	150	.48	4.58	01	09	66	.9	.4	.5	18
062183	160	.30	5.24	02	18	92	1.9	.6	1.3	19
062983	100	6.13	5.86	05	04	58	1.2	.4	.8	20
071083	210	.18	4.58	01	12	99	1.7	.8	.9	21
071983	280	.18	4.29	00	38	85	.6	.4	.2	22
072683	350	.08	3.82	00	22	87	1.1	.4	.7	23
080683	380	.08	3.87	00	23	140	1.1	.4	.7	24
082183	420	.02	3.35	00	48	356	3.9	1.7	2.2	25

SAMPLE STATION 6

Discharge Relationships

1. Drainage Area

The surface acreage contributing runoff to the monitoring location is estimated to be 1020 acres.

2. Measurement of Discharge

The discharge at this monitoring point was observed using a rectangular weir capable of measuring a discharge range up to 35 c.f.s. The weir size was 6' opening, 18 inches high.

3. Observed Discharge

The observed range of discharge measured at this monitoring point varied from 0.02 c. f.s. 6.98 c.f.s. during the sampling.

4. Specific Yield

The specific yield of this monitoring point showed the following range:

.02 c.f.s./1000 acres Minimum yield
6.8 c.f.s./1000 acres Maximum yield

The reviewer is directed to refer to the following materials during
the discussion of the sample analyses and trends at this monitoring points:

a. Sheet 13 - which shows the data plotted and shows the regression line and field of variance.

b. Appendix 6 - which contains the sample data and regression runs

5. pH relationship

The pH during the sampling period varied from 3.35-5.95. Regression analysis of the pH values indicates: An extremely strong relationship exists where pH values increases as discharge increases.

6. Specific conductance relationship

The conductance during the sampling period varied from 70 - 420. Regression analysis of the conductance indicates: An extremely strong relationship exists where conductance decreases as discharge increases.

CHEMICAL RELATIONSHIPS

1. pH relationship

The pH during the sampling period varied from 3.35 - 5.95. Regression analysis of the pH values showed that: An extremely strong relationship exists where pH values decreases as conductance increases.

2. Acidity/Alkalinity balance (mg/l)

The acidity during the sampling period varied from 2 - 48. Regression analysis of the acidity values indicates: An extremely strongrelationship exists where acidity concentration increases as conductance increases.
The alkalinity during the sampling period varied from 0-9. Regression analysis of the acidity values indicates: A strong relationship exists where alkalinity concentration decreases as conductance increases.

3. Sulphate relationship (mg/l)

The sulphates during the sampling period varied from 32 - 356. Regression analysis of the sulphate values indicates: An extremely strong relationship exists where sulphate concentrations increases as conductance increases.

4. Total iron relationship (mg/l)

The total iron during the sampling period varied from 0.4 - 3.9. Regression analysis of the total iron values indicates: A strong relationship exists where total iron concentrations increases as conductance increases.

5. Ferrous iron relationship (mg/l)

The ferrous iron during the sampling period varied from 0.1 - 1.7. Regression analysis of the ferrous iron values indicates A moderate relationship exists where ferrous iron concentrations increases as conductance increases.

6. Ferric iron relationship (mg/l)

The ferric iron during the sampling period varied from 0.1 - 2.2 Regression analysis of the ferric iron values indicates: A moderate relationship exists where ferric iron concen--trations increases as conductance increases.

SAMPLE.SIX DISCHARGE VS. SPECIFIC CONDUCTANCE

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	5	22	3830.0000
5	22	112	5524.8281
22	112	621	20324.1211

REGRESSION COEFFICIENTS OF NORMAL EQUATION

280.671142578125
-101.895523071289
11.402395248413

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
1.6200	110.0000	145.5248	35.5248
1.3600	150.0000	163.1831	13.1831
1.1100	150.0000	181.6160	31.6160
1.6200	120.0000	145.5248	25.5248
3.1300	90.0000	73.4464	16.5536
3.1300	90.0000	73.4464	16.5536
3.7400	100.0000	59.0741	40.9259
4.9300	80.0000	55.4604	24.5396
3.7400	75.0000	59.0741	15.9259
1.9000	100.0000	128.2323	28.2323
6.9800	70.0000	124.9697	54.9697
2.4800	90.0000	98.0996	8.0996
2.4800	110.0000	98.0996	11.9004
5.7200	90.0000	70.8970	19.1030
2.1900	115.0000	112.2070	2.7930
3.7300	100.0000	87.4774	12.5226
0.4800	140.0000	234.3884	94.3884
0.4800	150.0000	234.3884	84.3884
0.3000	160.0000	251.1287	91.1287
6.1300	100.0000	84.5181	15.4819
0.1800	210.0000	262.6992	52.6992
0.1800	280.0000	262.6992	17.3008
0.0800	350.0000	272.5920	77.4080
0.0800	380.0000	272.5920	107.4080
0.0200	420.0000	278.6375	141.3625

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 2
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 232894
SUMS OF SQUARES DUE TO REGRESSION= 156998.7
SUMS OF SQUARES DUE TO DEVIATION= 75895.25
GOODNESS OF FIT= .674121
MULTIPLE CORRELATION COEFFICIENT 0.82105
STANDARD DEVIATION 56.23434

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LAST REGRESSION	101842.81	1	101842.81
CUR. REGRESSION	156998.75	2	78499.00
CUR. ADDITION	55155.94	1	55155.94
CUR. DEVIATION	75895.25	22	3449.78
TOTAL VARIATION	232894.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST = SIGNIFICANCE OF REGRESSION = 22.75
LEVEL .05% - CRITICAL VALUE = 3.44

F TEST = IMPROVEMENT OF ADDED TERM = 15.99
LEVEL .05% - CRITICAL VALUE = 4.30

SAMPLE.SIX DISCHARGE VS. PH

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	5	130.1398
5	22	317.6995

REGRESSION COEFFICIENTS OF NORMAL EQUATION

4.699079513550
0.222972393036

ORIGINAL X	Y PAIRS	PREDICTED VALUES	DEVIATION
1.6200	5.5300	5.0603	0.4697
1.3600	5.3500	5.0023	0.3477
1.1100	5.3200	4.9466	0.3734
1.6200	5.4900	5.0603	0.4297
3.1300	5.5700	5.3970	0.1730
3.1300	5.4000	5.3970	0.0030
3.7400	5.5900	5.5330	0.0570
4.9300	5.7900	5.7983	0.0083
3.7400	5.4600	5.5330	0.0730
1.9000	5.5800	5.1227	0.4573
6.9800	5.5500	6.2554	0.7054
2.4800	5.7500	5.2521	0.4979
2.4800	5.9500	5.2521	0.6979
5.7200	5.5700	5.9745	0.4045
2.1900	5.4500	5.1874	0.2626
2.7300	5.7600	5.3078	0.4522
0.4800	5.4400	4.8061	0.6339
0.4800	4.5800	4.8061	0.2261
0.3000	5.2400	4.7660	0.4740
6.1300	5.8600	6.0659	0.2059
0.1800	4.5800	4.7392	0.1592
0.1800	4.2900	4.7392	0.4492
0.0800	3.8200	4.7169	0.8969
0.0800	3.8700	4.7169	0.8469
0.0200	3.3500	4.7035	1.3535

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 11.80786
SUMS OF SQUARES DUE TO REGRESSION= 4.923584
SUMS OF SQUARES DUE TO DEVIATION= 6.884277
GOODNESS OF FIT= .416975
MULTIPLE CORRELATION COEFFICIENT 0.64574
STANDARD DEVIATION .535578

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	4.92	1	4.92
DEVIATION	6.88	23	.30
TOTAL VARIATION	11.81	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 16.45
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SIX SPECIFIC CONDUCTANCE VS. PH

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	383	130.1398
383	81965	18359.7109

REGRESSION COEFFICIENTS OF NORMAL EQUATION

6.243376731873

\- 0.006774127483

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
110.0000	5.5300	5.4982	0.0318
150.0000	5.3500	5.2273	0.1227
150.0000	5.3200	5.2273	0.0927
120.0000	5.4900	5.4305	0.0595
90.0000	5.5700	5.6337	0.0637
90.0000	5.4000	5.6337	0.2337
100.0000	5.5900	5.5660	0.0240
80.0000	5.7900	5.7014	0.0886
75.0000	5.4600	5.7353	0.2753
100.0000	5.5800	5.5660	0.0140
70.0000	5.5500	5.7692	0.2192
90.0000	5.7500	5.6337	0.1163
110.0000	5.9500	5.4982	0.4518
90.0000	5.5700	5.6337	0.0637
115.0000	5.4500	5.4644	0.0144
100.0000	5.7600	5.5660	0.1940
140.0000	5.4400	5.2950	0.1450
150.0000	4.5800	5.2273	0.6473
160.0000	5.2400	5.1595	0.0805
100.0000	5.8600	5.5660	0.2940
210.0000	4.5800	4.8208	0.2408
280.0000	4.2900	4.3466	0.0566
350.0000	3.8200	3.8724	0.0524
380.0000	3.8700	3.6692	0.2008
420.0000	3.3500	3.3982	0.0482

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 11.80786
SUMS OF SQUARES DUE TO REGRESSION= 10.68725
SUMS OF SQUARES DUE TO DEVIATION= 1.120605
GOODNESS OF FIT= .905097
MULTIPLE CORRELATION COEFFICIENT 0.95137
STANDARD DEVIATION .216083

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	10.69	1	10.69
DEVIATION	1.12	23	.05
TOTAL VARIATION	11.81	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 219.35
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SIX SPECIFIC CONDUCTANCE VS. ALKALINITY

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	383	64.0000
383	81965	6885.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

4.480655670166
0.012536942959

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
110.0000	3.0000	3.1016	0.1016
150.0000	2.0000	2.6001	0.6001
150.0000	2.0000	2.6001	0.6001
120.0000	3.0000	2.9762	0.0238
90.0000	3.0000	3.3523	0.3523
90.0000	2.0000	3.3523	1.3523
100.0000	5.0000	3.2270	1.7730
80.0000	3.0000	3.4777	0.4777
75.0000	2.0000	3.5404	1.5404
100.0000	2.0000	3.2270	1.2270
70.0000	2.0000	3.6031	1.6031
90.0000	4.0000	3.3523	0.6477
110.0000	9.0000	3.1016	5.8984
90.0000	4.0000	3.3523	0.6477
115.0000	3.0000	3.0389	0.0389
100.0000	4.0000	3.2270	0.7730
140.0000	2.0000	2.7255	0.7255
150.0000	1.0000	2.6001	1.6001
160.0000	2.0000	2.4747	0.4747
100.0000	5.0000	3.2270	1.7730
210.0000	1.0000	1.8479	0.8479
280.0000	0.0000	0.9703	0.9703
350.0000	0.0000	0.0927	0.0927
380.0000	0.0000	0.2834	0.2834
420.0000	0.0000	0.7849	0.7849

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 94.16
SUMS OF SQUARES DUE TO REGRESSION= 36.60585
SUMS OF SQUARES DUE TO DEVIATION= 57.55415
GOODNESS OF FIT= .388762
MULTIPLE CORRELATION COEFFICIENT 0.62351
STANDARD DEVIATION 1.548575

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	36.61	1	36.61
DEVIATION	57.55	23	2.50
TOTAL VARIATION	94.16	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 14.63
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SIX SPECIFIC CONDUCTANCE VS. ACIDITY

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	383	243.0000
383	81965	61685.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

- 6.368270874023
0.105014801025

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
110.0000	3.0000	5.1834	2.1834
150.0000	4.0000	9.3839	5.3839
150.0000	7.0000	9.3839	2.3839
120.0000	5.0000	6.2335	1.2335
90.0000	6.0000	3.0831	2.9169
90.0000	3.0000	3.0831	0.0831
100.0000	2.0000	4.1332	2.1332
80.0000	9.0000	2.0329	6.9671
75.0000	3.0000	1.5078	1.4922
100.0000	3.0000	4.1332	1.1332
70.0000	3.0000	0.9828	2.0172
90.0000	4.0000	3.0831	0.9169
110.0000	4.0000	5.1834	1.1834
90.0000	3.0000	3.0831	0.0831
115.0000	4.0000	5.7084	1.7084
100.0000	3.0000	4.1332	1.1332
140.0000	3.0000	8.3338	5.3338
150.0000	9.0000	9.3839	0.3839
160.0000	18.0000	10.4341	7.5659
100.0000	4.0000	4.1332	0.1332
210.0000	12.0000	15.6848	3.6848
280.0000	38.0000	23.0359	14.9641
350.0000	22.0000	30.3869	8.3869
380.0000	23.0000	33.5374	10.5374
420.0000	48.0000	37.7379	10.2621

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 3295.042
SUMS OF SQUARES DUE TO REGRESSION= 2568.378
SUMS OF SQUARES DUE TO DEVIATION= 726.664
GOODNESS OF FIT= .779467
MULTIPLE CORRELATION COEFFICIENT 0.88287
STANDARD DEVIATION 5.502507

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	2568.38	1	2568.38
DEVIATION	726.66	23	31.59
TOTAL VARIATION	3295.04	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 81.29
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SIX SPECIFIC CONDUCTANCE VS. SULPHATES

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	383	1919.0000
383	81965	410685.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

- 0.003356933594
0.501064956188

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
110.0000	75.0000	55.1138	19.8862
150.0000	74.0000	75.1564	1.1564
150.0000	88.0000	75.1564	12.8436
120.0000	62.0000	60.1244	1.8756
90.0000	57.0000	45.0925	11.9075
90.0000	68.0000	45.0925	22.9075
100.0000	48.0000	50.1031	2.1031
80.0000	44.0000	40.0818	3.9182
75.0000	43.0000	37.5765	5.4235
100.0000	55.0000	50.1031	4.8969
70.0000	32.0000	35.0712	3.0712
90.0000	42.0000	45.0925	3.0925
110.0000	55.0000	55.1138	0.1138
90.0000	41.0000	45.0925	4.0925
115.0000	60.0000	57.6191	2.3809
100.0000	33.0000	50.1031	17.1031
140.0000	59.0000	70.1457	11.1457
150.0000	66.0000	75.1564	9.1564
160.0000	92.0000	80.1670	11.8330
100.0000	58.0000	50.1031	7.8969
210.0000	99.0000	105.2203	6.2203
280.0000	85.0000	140.2948	55.2948
350.0000	87.0000	175.3694	88.3694
380.0000	140.0000	190.4013	50.4013
420.0000	356.0000	210.4439	145.5561

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 95153
SUMS OF SQUARES DUE TO REGRESSION= 58472.25
SUMS OF SQUARES DUE TO DEVIATION= 36680.75
GOODNESS OF FIT= .614508
MULTIPLE CORRELATION COEFFICIENT 0.78391
STANDARD DEVIATION 39.09428

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	58472.25	1	58472.25
DEVIATION	36680.75	23	1594.81
TOTAL VARIATION	95153.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 36.66
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SIX SPECIFIC CONDUCTANCE VS. TOTAL IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	383	25.5999
383	81965	4924.9961

REGRESSION COEFFICIENTS OF NORMAL EQUATION

0.364122390747
0.004307210445

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
110.0000	1.2000	0.8379	0.3621
150.0000	0.9000	1.0102	0.1102
150.0000	0.6000	1.0102	0.4102
120.0000	0.8000	0.8810	0.0810
90.0000	0.7000	0.7518	0.0518
90.0000	0.6000	0.7518	0.1518
100.0000	0.8000	0.7948	0.0052
80.0000	0.8000	0.7087	0.0913
75.0000	0.7000	0.6872	0.0128
100.0000	0.7000	0.7948	0.0948
70.0000	0.5000	0.6656	0.1656
90.0000	0.6000	0.7518	0.1518
110.0000	1.5000	0.8379	0.6621
90.0000	0.6000	0.7518	0.1518
115.0000	1.3000	0.8595	0.4405
100.0000	0.5000	0.7948	0.2948
140.0000	0.4000	0.9671	0.5671
150.0000	0.9000	1.0102	0.1102
160.0000	1.9000	1.0533	0.8467
100.0000	1.2000	0.7948	0.4052
210.0000	1.7000	1.2686	0.4314
280.0000	0.6000	1.5701	0.9701
350.0000	1.1000	1.8716	0.7716
380.0000	1.1000	2.0009	0.9009
420.0000	3.9000	2.1732	1.7268

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 12.20581
SUMS OF SQUARES DUE TO REGRESSION= 4.32074
SUMS OF SQUARES DUE TO DEVIATION= 7.88507
GOODNESS OF FIT= .35399
MULTIPLE CORRELATION COEFFICIENT 0.59497
STANDARD DEVIATION .573188

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	4.32	1	4.32
DEVIATION	7.89	23	.34
TOTAL VARIATION	12.21	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 12.60
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SIX SPECIFIC CONDUCTANCE VS. FERROUS IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	383	11.7000
383	81965	2193.9971

REGRESSION COEFFICIENTS OF NORMAL EQUATION

0.203850030899
0.001724213595

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
110.0000	0.9000	0.3935	0.5065
150.0000	0.8000	0.4625	0.3375
150.0000	0.2000	0.4625	0.2625
120.0000	0.4000	0.4108	0.0108
90.0000	0.3000	0.3590	0.0590
90.0000	0.2000	0.3590	0.1590
100.0000	0.5000	0.3763	0.1237
80.0000	0.4000	0.3418	0.0582
75.0000	0.5000	0.3332	0.1668
100.0000	0.3000	0.3763	0.0763
70.0000	0.1000	0.3245	0.2245
90.0000	0.2000	0.3590	0.1590
110.0000	0.7000	0.3935	0.3065
90.0000	0.3000	0.3590	0.0590
115.0000	0.5000	0.4021	0.0979
100.0000	0.2000	0.3763	0.1763
140.0000	0.1000	0.4452	0.3452
150.0000	0.4000	0.4625	0.0625
160.0000	0.6000	0.4797	0.1203
100.0000	0.4000	0.3763	0.0237
210.0000	0.8000	0.5659	0.2341
280.0000	0.4000	0.6866	0.2866
350.0000	0.4000	0.8073	0.4073
380.0000	0.4000	0.8591	0.4591
420.0000	1.7000	0.9280	0.7720

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 2.674406
SUMS OF SQUARES DUE TO REGRESSION= .692382
SUMS OF SQUARES DUE TO DEVIATION= 1.982024
GOODNESS OF FIT= .258891
MULTIPLE CORRELATION COEFFICIENT 0.50881
STANDARD DEVIATION .287373

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	.69	1	.69
DEVIATION	1.98	23	.09
TOTAL VARIATION	2.67	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 8.03
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SIX SPECIFIC CONDUCTANCE VS. FERRIC IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	383	13.9000
383	81965	2730.9973

REGRESSION COEFFICIENTS OF NORMAL EQUATION

0.160312116146
0.002582812216

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
110.0000	0.3000	0.4444	0.1444
150.0000	0.1000	0.5477	0.4477
150.0000	0.4000	0.5477	0.1477
120.0000	0.4000	0.4702	0.0702
90.0000	0.4000	0.3928	0.0072
90.0000	0.4000	0.3928	0.0072
100.0000	0.3000	0.4186	0.1186
80.0000	0.4000	0.3669	0.0331
75.0000	0.2000	0.3540	0.1540
100.0000	0.4000	0.4186	0.0186
70.0000	0.4000	0.3411	0.0589
90.0000	0.4000	0.3928	0.0072
110.0000	0.8000	0.4444	0.3556
90.0000	0.3000	0.3928	0.0928
115.0000	0.8000	0.4573	0.3427
100.0000	0.3000	0.4186	0.1186
140.0000	0.3000	0.5219	0.2219
150.0000	0.5000	0.5477	0.0477
160.0000	1.3000	0.5736	0.7264
100.0000	0.8000	0.4186	0.3814
210.0000	0.9000	0.7027	0.1973
280.0000	0.2000	0.8835	0.6835
350.0000	0.7000	1.0643	0.3643
380.0000	0.7000	1.1418	0.4418
420.0000	2.2000	1.2451	0.9549

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 4.581614
SUMS OF SQUARES DUE TO REGRESSION= 1.553623
SUMS OF SQUARES DUE TO DEVIATION= 3.02799
GOODNESS OF FIT= .3391
MULTIPLE CORRELATION COEFFICIENT 0.58232
STANDARD DEVIATION .355198

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	1.55	1	1.55
DEVIATION	3.03	23	.13
TOTAL VARIATION	4.58	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 11.80
LEVEL .05% - CRITICAL VALUE = 4.28

APPENDIX 7

SAMPLE STATION 7

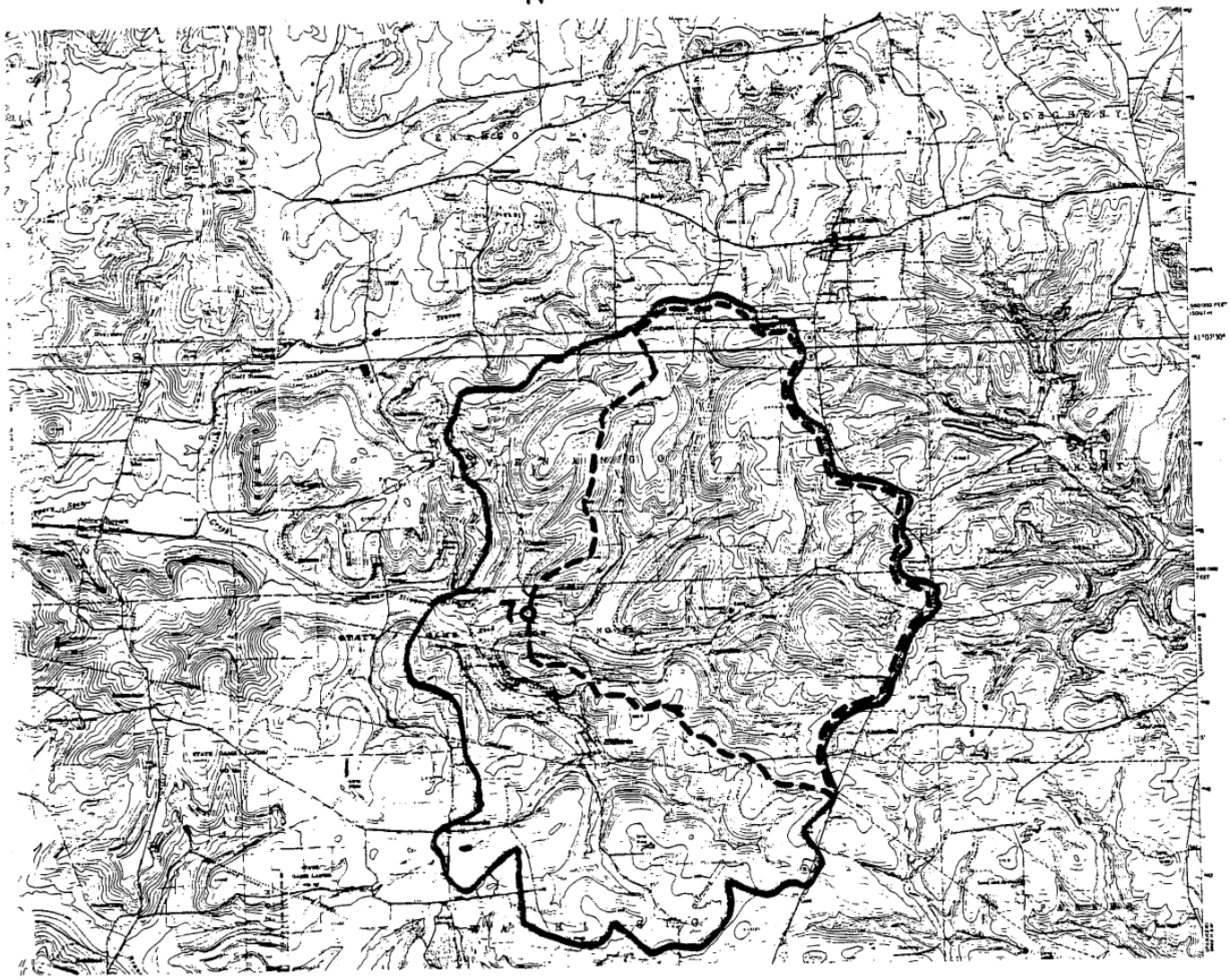
SLIPPERY ROCK CREEK

PA STATE GAME LANDS #95

PROJECT SL-110-7-101.5

LEGEND:
- DRAINAGE AREA
- PROJECT AREA
- SAMPLE STATION

N



SAMPLE STATION 7 (-·-)

SAMPLE LOCATION IN RELATION
TO
TOTAL SITE

SAMPLE 7 PROJECT SL110-7-101.5:BIG BERTHA

DATE	SPEC COND UMHOS/CM	DISCHARGE C.F.S.	PH SU	ALKALINITY MG/L	ACIDITY MG/L	SULPHATES MG/L	TOTAL IRON MG/L	FERROUS IRON MG/L	FERRIC IRON MG/L	REC #
021783	260	7.41	4.21	00	20	92	2.2	1.7	.5	1
022883	350	5.33	4.18	00	21	131	2.2	2.1	.1	2
030783	390	4.56	3.93	00	35	157	2.4	1.6	.8	3
031483	300	6.55	4.18	00	27	132	2.1	1.6	.5	4
032583	200	12.65	4.75	01	11	117	1.4	.6	.8	5
033183	210	12.65	4.41	00	16	119	1.0	.4	.6	6
040783	220	13.73	4.14	00	18	108	1.2	.6	.6	7
041383	165	18.28	4.74	01	24	87	.6	.5	.1	8
042083	180	13.73	4.48	00	19	119	1.1	.8	.3	9
042683	270	7.85	4.20	00	18	128	1.2	.6	.6	10
050483	150	26.34	4.93	01	09	56	.3	.1	.2	11
051183	250	9.70	4.51	00	16	91	1.5	.4	1.1	12
051983	280	9.24	4.14	00	20	127	1.6	1.3	.3	13
052583	175	20.47	4.81	01	13	54	.5	.3	.2	14
060183	270	9.70	4.43	00	34	139	2.2	1.1	1.1	15
060783	240	10.18	4.42	00	16	95	1.0	.5	.5	16
061283	360	6.13	4.06	00	14	152	.4	.4	.0	17
061683	390	4.93	3.86	00	34	152	1.7	1.2	.5	18
062183	370	4.93	4.05	00	20	169	1.5	.9	.6	19
062983	190	21.03	4.30	00	18	87	1.1	.3	.8	20
071083	480	3.47	3.98	00	21	185	1.5	1.1	.4	21
071983	510	3.13	3.82	00	30	156	.7	.3	.4	22
072683	580	1.90	3.64	00	32	128	.4	.2	.2	23
080683	650	1.62	3.81	00	18	195	.4	.1	.3	24
082183	680	1.36	3.51	00	35	290	.9	.1	.8	25

SAMPLE STATION 8

Discharge Relationships

1. Drainage Area

The surface acreage contributing runoff to the monitoring location is estimated to be less than one acre. The principle origin of this discharge is seepage from a deep mine.

2. Measurement of Discharge

The discharge at this monitoring point was observed using a rectangular weir capable of measuring a discharge range up to 35 c.f.s. The weir size was 6' opening, 18 inches high.

3. Observed Discharge

The observed. range of discharge measured at this monitoring point varied from 1.36 c.f.s. to 26.34 c.f.s. during the sampling.

4. Specific Yield

The specific yield of this monitoring point showed the, following range:

0.3 c.f.s./1000 acres Minimum yield
6.3 c.f.s./1000 acres Maximum yield

The reviewer is directed to refer to the following materials during
the discussion of the sample analyses and trends at this monitoring points:

a. Sheet 11 - which shows the data plotted and shows the regression line and field of variance.

b. Appendix 7 - which contains the sample data and regression runs.

5. pH relationship

The pH during the sampling period varied from 3.51-4.93 . Regression analysis of the pH values indicates: An extremely strong relationship exists where pH values increases as discharge increases.

6. Specific conductance relationship

The conductance during the sampling period varied from 1.50 - 680 Regression analysis of the conductance indicates: An extremely strong relationship exists where conductance decreases as discharge increases.

Chemical Relationships

1. pH relationship

The pH during the sampling period varied from 3.51- 4.93. Regression analysis of the pH values showed that: An extremely strong relationship exists where pH values decreases as conductance increases.

2. Acidity/Alkalinity balance (mg/l)

The acidity during the sampling period varied from 9-35. Regression analysis of the acidity values indicates: A moderate relationship exists where acidity concentration increases as conductance increases. The alkalinity during the sample period varied from 0-l. No regression analysis was attempted as the alkalinity was generally absent.

3. Sulphate relationship (mg/l)

The sulphates during the sampling period varied from 56-290. Regression analysis of the sulphate values indicates: An extremely strong relationship exists where sulphate concentrations increases as conductance increases.

4. Total iron relationship (mg/l)

The total iron during the sampling period varied from 0.3 - 2.4. Regression analysis of the total iron values indicates: An extremely weak relationship exists where total iron concentrations decreases as conductance increases.

5. Ferrous iron relationship (mg/l)

The ferrous iron during the sampling period varied from 0.l - 2.1. Regression analysis of the ferrous iron values indicates: An extremely weak relationship exists where ferrous iron concentrations decreases as conductance increases.

6. Ferric iron relationship (mg/l)

The ferric iron during the sampling period varied from 0.1 - 1.1. Regression analysis of the ferric iron values indicates: An extremely weak relationship exists where ferric iron concentrations decreases as conductance increases.

SAMPLE.SEVEN DISCHARGE VS. SPECIFIC CONDUCTANCE

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	23	328	8120.0000
23	328	5712	57248.2969
328	5712	113495	664951.9375

REGRESSION COEFFICIENTS OF NORMAL EQUATION

664.265380859375
- 57.249542236328
1.543068885803

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
7.4100	260.0000	324.7732	64.7732
5.3300	350.0000	402.9622	52.9622
4.5600	390.0000	435.2935	45.2935
6.5500	300.0000	355.4824	55.4824
12.6500	200.0000	186.9845	13.0155
12.6500	210.0000	186.9845	23.0155
13.7300	220.0000	169.1174	50.8826
18.2800	165.0000	133.3728	31.6272
13.7300	180.0000	169.1174	10.8826
7.8500	270.0000	309.9443	39.9443
26.3400	150.0000	226.8865	76.8865
9.7000	250.0000	254.1324	4.1324
9.2400	280.0000	267.0232	12.9768
20.4700	175.0000	138.9451	36.0549
9.7000	270.0000	254.1324	15.8676
10.1800	240.0000	241.3770	1.3770
6.1300	360.0000	371.3093	11.3093
4.9300	390.0000	419.5291	29.5291
4.9300	370.0000	419.5291	49.5291
21.0300	190.0000	142.7463	47.2537
3.4700	480.0000	484.1892	4.1892
3.1300	510.0000	500.1914	9.8086
1.9000	580.0000	561.0615	18.9385
1.6200	650.0000	575.5706	74.4294
1.3600	680.0000	589.2600	90.7400

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 2
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 550874
SUMS OF SQUARES DUE TO REGRESSION= 505068
SUMS OF SQUARES DUE TO DEVIATION= 45806
GOODNESS OF FIT= .916848
MULTIPLE CORRELATION COEFFICIENT 0.95752
STANDARD DEVIATION 43.68731

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LAST REGRESSION	371244.00	1	371244.00
CUR. REGRESSION	505068.00	2	252534.00
CUR. ADDITION	133824.00	1	133824.00
CUR. DEVIATION	45806.00	22	2082.09
TOTAL VARIATION	550874.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 121.29
LEVEL .05% - CRITICAL VALUE = 3.44

F TEST - IMPROVEMENT OF ADDED TERM = 64.27
LEVEL .05% - CRITICAL VALUE = 4.30

SAMPLE.SEVEN DISCHARGE VS. PH

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	23	105.4899
23	328	1048.8428

REGRESSION COEFFICIENTS OF NORMAL EQUATION

3.771696090698
0.047272015363

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
7.4100	4.2100	4.1220	0.0880
5.3300	4.1800	4.0237	0.1563
4.5600	3.9300	3.9873	0.0573
6.5500	4.1800	4.0813	0.0987
12.6500	4.7500	4.3697	0.3803
12.6500	4.4100	4.3697	0.0403
13.7300	4.1400	4.4207	0.2807
18.2800	4.7400	4.6358	0.1042
13.7300	4.4800	4.4207	0.0593
7.8500	4.2000	4.1428	0.0572
26.3400	4.9300	5.0168	0.0868
9.7000	4.5100	4.2302	0.2798
9.2400	4.1400	4.2085	0.0685
20.4700	4.8100	4.7394	0.0706
9.7000	4.4300	4.2302	0.1998
10.1800	4.4200	4.2529	0.1671
6.1300	4.0600	4.0615	0.0015
4.9300	3.8600	4.0047	0.1447
4.9300	4.0500	4.0047	0.0453
21.0300	4.3000	4.7658	0.4658
3.4700	3.9800	3.9357	0.0443
3.1300	3.8200	3.9197	0.0997
1.9000	3.6400	3.8615	0.2215
1.6200	3.8100	3.8483	0.0383
1.3600	3.5100	3.8360	0.3260

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 3.1958
SUMS OF SQUARES DUE TO REGRESSION= 2.332764
SUMS OF SQUARES DUE TO DEVIATION= .863037
GOODNESS OF FIT= .729946
MULTIPLE CORRELATION COEFFICIENT 0.85437
STANDARD DEVIATION .189631

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	2.33	1	2.33
DEVIATION	.86	23	.04
TOTAL VARIATION	3.20	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 62.17
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SEVEN SPECIFIC CONDUCTANCE VS. PH

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	812	105.4899
812	318825	33094.1172

REGRESSION COEFFICIENTS OF NORMAL EQUATION

4.908769607544

\- 0.002121882746

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
260.0000	4.2100	4.3571	0.1471
350.0000	4.1800	4.1661	0.0139
390.0000	3.9300	4.0812	0.1512
300.0000	4.1800	4.2722	0.0922
200.0000	4.7500	4.4844	0.2656
210.0000	4.4100	4.4632	0.0532
220.0000	4.1400	4.4420	0.3020
165.0000	4.7400	4.5587	0.1813
180.0000	4.4800	4.5268	0.0468
270.0000	4.2000	4.3359	0.1359
150.0000	4.9300	4.5905	0.3395
250.0000	4.5100	4.3783	0.1317
280.0000	4.1400	4.3146	0.1746
175.0000	4.8100	4.5374	0.2726
270.0000	4.4300	4.3359	0.0941
240.0000	4.4200	4.3995	0.0205
360.0000	4.0600	4.1449	0.0849
390.0000	3.8600	4.0812	0.2212
370.0000	4.0500	4.1237	0.0737
190.0000	4.3000	4.5056	0.2056
480.0000	3.9800	3.8903	0.0897
510.0000	3.8200	3.8266	0.0066
580.0000	3.6400	3.6781	0.0381
650.0000	3.8100	3.5295	0.2805
680.0000	3.5100	3.4659	0.0441

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1

NUMBER OF X - Y PAIRS= 25

TOTAL SUMS OF SQUARE= 3.1958

SUMS OF SQUARES DUE TO REGRESSION= 2.48291

SUMS OF SQUARES DUE TO DEVIATION= .712891

GOODNESS OF FIT= .776929

MULTIPLE CORRELATION COEFFICIENT 0.88144

STANDARD DEVIATION .172348

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	2.48	1	2.48
DEVIATION	.71	23	.03
TOTAL VARIATION	3.20	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE

F TEST - SIGNIFICANCE OF REGRESSION = 80.11

LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SEVEN SPECIFIC CONDUCTANCE VS. ALKALINITY

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	812	4.0000
812	318825	690.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

0.519168138504
- 0.001105824485

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
260.0000	0.0000	0.2317	0.2317
350.0000	0.0000	0.1321	0.1321
390.0000	0.0000	0.0879	0.0879
300.0000	0.0000	0.1874	0.1874
200.0000	1.0000	0.2980	0.7020
210.0000	0.0000	0.2869	0.2869
220.0000	0.0000	0.2759	0.2759
165.0000	1.0000	0.3367	0.6633
180.0000	0.0000	0.3201	0.3201
270.0000	0.0000	0.2206	0.2206
150.0000	1.0000	0.3533	0.6467
250.0000	0.0000	0.2427	0.2427
280.0000	0.0000	0.2095	0.2095
175.0000	1.0000	0.3256	0.6744
270.0000	0.0000	0.2206	0.2206
240.0000	0.0000	0.2538	0.2538
360.0000	0.0000	0.1211	0.1211
390.0000	0.0000	0.0879	0.0879
370.0000	0.0000	0.1100	0.1100
190.0000	0.0000	0.3091	0.3091
480.0000	0.0000	0.0116	0.0116
510.0000	0.0000	0.0448	0.0448
580.0000	0.0000	0.1222	0.1222
650.0000	0.0000	0.1996	0.1996
680.0000	0.0000	0.2328	0.2328

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 3.36
SUMS OF SQUARES DUE TO REGRESSION= .673631
SUMS OF SQUARES DUE TO DEVIATION= 2.686369
GOODNESS OF FIT= .200485
MULTIPLE CORRELATION COEFFICIENT 0.44776
STANDARD DEVIATION .334562

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	.67	1	.67
DEVIATION	2.69	23	.12
TOTAL VARIATION	3.36	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 5.77
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SEVEN SPECIFIC CONDUCTANCE VS. ACIDITY

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	812	539.0000
812	318825	190865.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

12.244935989380
0.028679091483

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
260.0000	20.0000	19.7015	0.2985
350.0000	21.0000	22.2826	1.2826
390.0000	35.0000	23.4298	11.5702
300.0000	27.0000	20.8487	6.1513
200.0000	11.0000	17.9807	6.9807
210.0000	16.0000	18.2675	2.2675
220.0000	18.0000	18.5543	0.5543
165.0000	24.0000	16.9770	7.0230
180.0000	19.0000	17.4072	1.5928
270.0000	18.0000	19.9883	1.9883
150.0000	9.0000	16.5468	7.5468
250.0000	16.0000	19.4147	3.4147
280.0000	20.0000	20.2751	0.2751
175.0000	13.0000	17.2638	4.2638
270.0000	34.0000	19.9883	14.0117
240.0000	16.0000	19.1279	3.1279
360.0000	14.0000	22.5694	8.5694
390.0000	34.0000	23.4298	10.5702
370.0000	20.0000	22.8562	2.8562
190.0000	18.0000	17.6940	0.3060
480.0000	21.0000	26.0109	5.0109
510.0000	30.0000	26.8713	3.1287
580.0000	32.0000	28.8788	3.1212
650.0000	18.0000	30.8863	12.8863
680.0000	35.0000	31.7467	3.2533

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 1444.187
SUMS OF SQUARES DUE TO REGRESSION= 453.1679
SUMS OF SQUARES DUE TO DEVIATION= 991.0195
GOODNESS OF FIT= .313787
MULTIPLE CORRELATION COEFFICIENT 0.56017
STANDARD DEVIATION 6.425922

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	453.17	1	453.17
DEVIATION	991.02	23	43.09
TOTAL VARIATION	1444.19	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 10.52
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SEVEN SPECIFIC CONDUCTANCE VS. SULPHATES

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	812	3266.0000
812	318825	1209185.0000

REGRESSION COEFFICIENTS OF NORMAL EQUATION

43.152877807617

0.269359171391

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
260.0000	92.0000	113.1862	21.1862
350.0000	131.0000	137.4286	6.4286
390.0000	157.0000	148.2029	8.7971
300.0000	132.0000	123.9606	8.0394
200.0000	117.0000	97.0247	19.9753
210.0000	119.0000	99.7183	19.2817
220.0000	108.0000	102.4119	5.5881
165.0000	87.0000	87.5971	0.5971
180.0000	119.0000	91.6375	27.3625
270.0000	128.0000	115.8799	12.1201
150.0000	56.0000	83.5567	27.5567
250.0000	91.0000	110.4927	19.4927
280.0000	127.0000	118.5734	8.4266
175.0000	54.0000	90.2907	36.2907
270.0000	139.0000	115.8799	23.1201
240.0000	95.0000	107.7991	12.7991
360.0000	152.0000	140.1222	11.8778
390.0000	152.0000	148.2029	3.7971
370.0000	169.0000	142.8158	26.1842
190.0000	87.0000	94.3311	7.3311
480.0000	185.0000	172.4453	12.5547
510.0000	156.0000	180.5260	24.5260
580.0000	128.0000	199.3812	71.3812
650.0000	195.0000	218.2363	23.2363
680.0000	290.0000	226.3171	63.6829

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1

NUMBER OF X - Y PAIRS= 25

TOTAL SUMS OF SQUARE= 56872

SUMS OF SQUARES DUE TO REGRESSION= 39968.56

SUMS OF SQUARES DUE TO DEVIATION= 16903.43

GOODNESS OF FIT= .702781

MULTIPLE CORRELATION COEFFICIENT 0.83832

STANDARD DEVIATION 26.5388

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	39968.56	1	39968.56
DEVIATION	16903.44	23	734.93
TOTAL VARIATION	56872.00	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE

F TEST - SIGNIFICANCE OF REGRESSION = 54.38

LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SEVEN SPECIFIC CONDUCTANCE VS. TOTAL IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	812	31.0999
812	318825	9824.4687

REGRESSION COEFFICIENTS OF NORMAL EQUATION

1.407129287720

- 0.000502288807

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
260.0000	2.2000	1.2765	0.9235
350.0000	2.2000	1.2313	0.9687
390.0000	2.4000	1.2112	1.1888
300.0000	2.1000	1.2564	0.8436
200.0000	1.4000	1.3067	0.0933
210.0000	1.0000	1.3016	0.3016
220.0000	1.2000	1.2966	0.0966
165.0000	0.6000	1.3243	0.7243
180.0000	1.1000	1.3167	0.2167
270.0000	1.2000	1.2715	0.0715
150.0000	0.3000	1.3318	1.0318
250.0000	1.5000	1.2816	0.2184
280.0000	1.6000	1.2665	0.3335
175.0000	0.5000	1.3192	0.8192
270.0000	2.2000	1.2715	0.9285
240.0000	1.0000	1.2866	0.2866
360.0000	0.4000	1.2263	0.8263
390.0000	1.7000	1.2112	0.4888
370.0000	1.5000	1.2213	0.2787
190.0000	1.1000	1.3117	0.2117
480.0000	1.5000	1.1660	0.3340
510.0000	0.7000	1.1510	0.4510
580.0000	0.4000	1.1158	0.7158
650.0000	0.4000	1.0806	0.6806
680.0000	0.9000	1.0656	0.1656

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 9.94162
SUMS OF SQUARES DUE TO REGRESSION= .139343
SUMS OF SQUARES DUE TO DEVIATION= 9.802277
GOODNESS OF FIT= .014016
MULTIPLE CORRELATION COEFFICIENT 0.11839
STANDARD DEVIATION .639084

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	.14	1	.14
DEVIATION	9.80	23	.43
TOTAL VARIATION	9.94	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 0.33
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SEVEN SPECIFIC CONDUCTANCE VS. FERROUS IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	812	18.7999
812	318825	5885.9844

REGRESSION COEFFICIENTS OF NORMAL EQUATION

0.881839334965
- 0.000399764627

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
260.0000	1.7000	0.7779	0.9221
350.0000	2.1000	0.7419	1.3581
390.0000	1.6000	0.7259	0.8741
300.0000	1.6000	0.7619	0.8381
200.0000	0.6000	0.8019	0.2019
210.0000	0.4000	0.7979	0.3979
220.0000	0.6000	0.7939	0.1939
165.0000	0.5000	0.8159	0.3159
180.0000	0.8000	0.8099	0.0099
270.0000	0.6000	0.7739	0.1739
150.0000	0.1000	0.8219	0.7219
250.0000	0.4000	0.7819	0.3819
280.0000	1.3000	0.7699	0.5301
175.0000	0.3000	0.8119	0.5119
270.0000	1.1000	0.7739	0.3261
240.0000	0.5000	0.7859	0.2859
360.0000	0.4000	0.7379	0.3379
390.0000	1.2000	0.7259	0.4741
370.0000	0.9000	0.7339	0.1661
190.0000	0.3000	0.8059	0.5059
480.0000	1.1000	0.6900	0.4100
510.0000	0.3000	0.6780	0.3780
580.0000	0.2000	0.6500	0.4500
650.0000	0.1000	0.6220	0.5220
680.0000	0.1000	0.6100	0.5100

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 7.682436
SUMS OF SQUARES DUE TO REGRESSION= .088124
SUMS OF SQUARES DUE TO DEVIATION= 7.594312
GOODNESS OF FIT= .011471
MULTIPLE CORRELATION COEFFICIENT 0.10710
STANDARD DEVIATION .56252

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	.09	1	.09
DEVIATION	7.59	23	.33
TOTAL VARIATION	7.68	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 0.27
LEVEL .05% - CRITICAL VALUE = 4.28

SAMPLE.SEVEN SPECIFIC CONDUCTANCE VS. FERRIC IRON

COEFFICIENT MATRIX AND AUGMENTED MATRIX

2	812	12.3000
812	318825	3938.4988

REGRESSION COEFFICIENTS OF NORMAL EQUATION

0.525333046913

- 0.000102628575

ORIGINAL X - Y PAIRS		PREDICTED VALUES	DEVIATION
260.0000	0.5000	0.4986	0.0014
350.0000	0.1000	0.4894	0.3894
390.0000	0.8000	0.4853	0.3147
300.0000	0.5000	0.4945	0.0055
200.0000	0.8000	0.5048	0.2952
210.0000	0.6000	0.5038	0.0962
220.0000	0.6000	0.5028	0.0972
165.0000	0.1000	0.5084	0.4084
180.0000	0.3000	0.5069	0.2069
270.0000	0.6000	0.4976	0.1024
150.0000	0.2000	0.5099	0.3099
250.0000	1.1000	0.4997	0.6003
280.0000	0.3000	0.4966	0.1966
175.0000	0.2000	0.5074	0.3074
270.0000	1.1000	0.4976	0.6024
240.0000	0.5000	0.5007	0.0007
360.0000	0.0000	0.4884	0.4884
390.0000	0.5000	0.4853	0.0147
370.0000	0.6000	0.4874	0.1126
190.0000	0.8000	0.5058	0.2942
480.0000	0.4000	0.4761	0.0761
510.0000	0.4000	0.4730	0.0730
580.0000	0.2000	0.4658	0.2658
650.0000	0.3000	0.4586	0.1586
680.0000	0.8000	0.4555	0.3445

STATISTICAL ANALYSIS WITH ORDER OF EQUATION= 1
NUMBER OF X - Y PAIRS= 25
TOTAL SUMS OF SQUARE= 2.098403
SUMS OF SQUARES DUE TO REGRESSION= 5.815506E-3
SUMS OF SQUARES DUE TO DEVIATION= 2.092587
GOODNESS OF FIT= 2.771396E-3
MULTIPLE CORRELATION COEFFICIENT 0.05264
STANDARD DEVIATION .295281

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARE
LIN. REGRESSION	.01	1	.01
DEVIATION	2.09	23	.09
TOTAL VARIATION	2.10	24	

F-TEST FOR EQUALITY OF SAMPLE/REGRESSION VARIANCE
F TEST - SIGNIFICANCE OF REGRESSION = 0.06
LEVEL .05% - CRITICAL VALUE = 4.28