

## **Appendix D**

### **Surface Water Laboratory Analytical Report**



## Antech Ltd.

One Triangle Lane  
Export, PA 15632  
Phone: (724)733-1161  
Fax: (724)327-7793

August 10, 2001

Mr. Robert D. Breakwell (Project Manager, P.G.)  
Earth Sciences Consultants, Inc.  
One Triangle Lane  
Export, PA 15632

Dear Mr. Breakwell:

Enclosed are analytical results for samples submitted to Antech Ltd. by Earth Sciences Consultants, Inc.. The samples were received on July 27, 2001. Please reference Antech project number 01-3344 when inquiring about this report.

Client Site: DEP Longwall Mining Stream Study  
Client Ref.: ESC #5904-04

Antech Sample Identification	Client Sample Identification
0107-1692	SW 1
0107-1693	SW 2
0107-1694	SW 2 DUP
0107-1695	SW 3
0107-1696	SW 4

**General Comments:** None

Please call me if you have any questions regarding the information contained within this report.

Sincerely,

Kathryn L. Stoudnour  
Project Coordinator

KLS: jld

Enclosures

Mr. Robert D. Breakwell (Project Manager, P.G.)  
 Earth Sciences Consultants, Inc.  
 One Triangle Lane  
 Export, PA 15632

Lab Project ID: 01-3344  
 Lab Sample ID: 0107-1692  
 Client Sample ID: SW 1  
 Sample Matrix: Aqueous

Client Site: DEP Longwall Mining Stream Study  
 Client Ref.: ESC #5904-04

Date Sampled: 07/27/2001  
 Date Received: 07/27/2001

### General Chemistry

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Acidity	305.1 <sup>(1)</sup>	<2.0	2.0	mg/l	CK0	08/06/2001	080609-09	4.7
Alkalinity (Total)	310.1 <sup>(1)</sup>	140	2.0	mg/l	CK0	08/06/2001	080609-09	<2.0
Coliform (Fecal)	IIC <sup>(2)</sup>	>6000	N/A	colonies/1	DAB	07/27/2001	073009-04	ND
Nitrate	10-107-04-1-A Aq <sup>(3)</sup>	0.11	0.10	mg/l	DAB	07/31/2001	073109-08	<0.10
Nitrite	354.1 <sup>(1)</sup>	<0.010	0.010	mg/l	EAC	07/30/2001	073009-10	<0.010
pH	150.1 <sup>(1)</sup>	8.06	1.00	pH	EAC	07/27/2001	073109-13	NAP
Phosphate (Total)	365.2 <sup>(1)</sup>	0.026	0.010	mg/l	CK0	08/06/2001	080709-01	<0.010
Sulfate	375.4 <sup>(1)</sup>	27	10	mg/l	EAC	07/31/2001	073109-19	<10
Total Dissolved Solids	160.1 <sup>(1)</sup>	210	10	mg/l	EAC	08/01/2001	080209-18	<10
Total Suspended Solids	160.2 <sup>(1)</sup>	5.0	4.0	mg/l	EAC	07/31/2001	073109-24	<4.0

### Metals

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Aluminum (Total)	6010B <sup>(4)</sup>	0.15	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Calcium (Total)	6010B <sup>(4)</sup>	53	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Calcium (Total)	314A <sup>(5)</sup>	53	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Hardness	314A <sup>(5)</sup>	160	2.0	mg/l	CS0	07/31/2001	073007-07	<2.0
Iron (Total)	6010B <sup>(4)</sup>	0.39	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Magnesium (Total)	6010B <sup>(4)</sup>	6.8	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Magnesium (Total)	314A <sup>(5)</sup>	6.8	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Manganese (Total)	6010B <sup>(4)</sup>	0.071	0.0050	mg/l	CS0	07/31/2001	073007-07	<0.0050

<sup>(1)</sup> U.S. Environmental Protection Agency, 1983, Methods for Chemical Analysis of Water and Wastes, EPA/600/4-79-020, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

<sup>(2)</sup> U.S. Environmental Protection Agency, Dec. 1978, Microbiological Methods for Monitoring the Environment, Water, and Wastes, EPA/600/8-78-017, Part III, Section C, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

<sup>(3)</sup> Lachat Instruments, Rev. Dec 1991, Nitrate/Nitrite,

<sup>(4)</sup> U.S. Environmental Protection Agency, 1996, Test Methods for Evaluating Solid Waste, SW846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.

<sup>(5)</sup> American Public Health Association, American Water Works Association, and Water Pollution Control Federation, 1980, Standard Methods for the Examination of Water and Wastewater, A.E.Greenberg, J.J. Connors, and D. Jenkins, eds., 15th ed., American Public Health Association, Washington, DC.

### Sample Comments:

Mr. Robert D. Breakwell (Project Manager, P.G.)  
 Earth Sciences Consultants, Inc.  
 One Triangle Lane  
 Export, PA 15632

Lab Project ID: 01-3344  
 Lab Sample ID: 0107-1693  
 Client Sample ID: SW2  
 Sample Matrix: Aqueous

Client Site: DEP Longwall Mining Stream Study  
 Client Ref.: ESC #5904-04

Date Sampled: 07/27/2001  
 Date Received: 07/27/2001

**General Chemistry**

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Acidity	305.1 <sup>(1)</sup>	<2.0	2.0	mg/l	CK0	08/06/2001	080609-09	4.7
Alkalinity (Total)	310.1 <sup>(1)</sup>	150	2.0	mg/l	CK0	08/06/2001	080609-09	<2.0
Coliform (Fecal)	IIIC <sup>(2)</sup>	>6000	N/A	colonies/1	DAB	07/27/2001	073009-04	ND
Nitrate	10-107-04-1-A Aq <sup>(3)</sup>	0.40	0.10	mg/l	DAB	07/31/2001	073109-08	<0.10
Nitrite	354.1 <sup>(1)</sup>	0.017	0.010	mg/l	EAC	07/30/2001	073009-10	<0.010
pH	150.1 <sup>(1)</sup>	8.18	1.00	pH	EAC	07/27/2001	073109-13	NAP
Phosphate (Total)	365.2 <sup>(1)</sup>	0.069	0.010	mg/l	CK0	08/06/2001	080709-01	<0.010
Sulfate	375.4 <sup>(1)</sup>	26	10	mg/l	EAC	07/31/2001	073109-19	<10
Total Dissolved Solids	160.1 <sup>(1)</sup>	220	10	mg/l	EAC	07/31/2001	080109-15	<10
Total Suspended Solids	160.2 <sup>(1)</sup>	7.0	4.0	mg/l	EAC	07/31/2001	073109-24	<4.0

**Metals**

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Aluminum (Total)	6010B <sup>(4)</sup>	0.17	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Calcium (Total)	6010B <sup>(4)</sup>	56	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Calcium (Total)	314A <sup>(5)</sup>	56	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Hardness	314A <sup>(5)</sup>	170	2.0	mg/l	CS0	07/31/2001	073007-07	<2.0
Iron (Total)	6010B <sup>(4)</sup>	0.24	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Magnesium (Total)	6010B <sup>(4)</sup>	7.2	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Magnesium (Total)	314A <sup>(5)</sup>	7.2	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Manganese (Total)	6010B <sup>(4)</sup>	0.055	0.0050	mg/l	CS0	07/31/2001	073007-07	<0.0050

<sup>(1)</sup> U.S. Environmental Protection Agency, 1983, Methods for Chemical Analysis of Water and Wastes, EPA/600/4-79-020, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

<sup>(2)</sup> U.S. Environmental Protection Agency, Dec. 1978, Microbiological Methods for Monitoring the Environment, Water, and Wastes, EPA/600/8-78-017, Part III, Section C, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

<sup>(3)</sup> Lachat Instruments, Rev. Dec 1991, Nitrate/Nitrite,

<sup>(4)</sup> U.S. Environmental Protection Agency, 1996, Test Methods for Evaluating Solid Waste, SW846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.

<sup>(5)</sup> American Public Health Association, American Water Works Association, and Water Pollution Control Federation, 1980, Standard Methods for the Examination of Water and Wastewater, A.E.Greenberg, J.J. Connors, and D. Jenkins, eds., 15th ed., American Public Health Association, Washington, DC.

Sample Comments: None

Mr. Robert D. Breakwell (Project Manager, P.G.)  
 Earth Sciences Consultants, Inc.  
 One Triangle Lane  
 Export, PA 15632

Lab Project ID: 01-3344  
 Lab Sample ID: 0107-1694  
 Client Sample ID: SW2 DUP  
 Sample Matrix: Aqueous

Client Site: DEP Longwall Mining Stream Study  
 Client Ref.: ESC #5904-04

Date Sampled: 07/27/2001  
 Date Received: 07/27/2001

### General Chemistry

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Acidity	305.1 <sup>(1)</sup>	<2.0	2.0	mg/l	CK0	08/06/2001	080609-09	4.7
Alkalinity (Total)	310.1 <sup>(1)</sup>	150	2.0	mg/l	CK0	08/06/2001	080609-09	<2.0
Coliform (Fecal)	IIC <sup>(2)</sup>	>6000	N/A	colonies/1	DAB	07/27/2001	073009-04	ND
Nitrate	10-107-04-1-A Aq <sup>(3)</sup>	0.39	0.10	mg/l	DAB	07/31/2001	073109-08	<0.10
Nitrite	354.1 <sup>(1)</sup>	0.017	0.010	mg/l	EAC	07/30/2001	073009-10	<0.010
pH	150.1 <sup>(1)</sup>	8.21	1.00	pH	EAC	07/27/2001	073109-13	NAP
Phosphate (Total)	365.2 <sup>(1)</sup>	0.069	0.010	mg/l	CK0	08/06/2001	080709-01	<0.010
Sulfate	375.4 <sup>(1)</sup>	26	10	mg/l	EAC	07/31/2001	073109-19	<10
Total Dissolved Solids	160.1 <sup>(1)</sup>	220	10	mg/l	EAC	07/31/2001	080109-15	<10
Total Suspended Solids	160.2 <sup>(1)</sup>	6.0	4.0	mg/l	EAC	07/31/2001	073109-24	<4.0

### Metals

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Aluminum (Total)	6010B <sup>(4)</sup>	0.16	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Calcium (Total)	6010B <sup>(4)</sup>	54	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Calcium (Total)	314A <sup>(5)</sup>	54	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Hardness	314A <sup>(5)</sup>	160	2.0	mg/l	CS0	07/31/2001	073007-07	<2.0
Iron (Total)	6010B <sup>(4)</sup>	0.27	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Magnesium (Total)	6010B <sup>(4)</sup>	6.8	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Magnesium (Total)	314A <sup>(5)</sup>	6.8	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Manganese (Total)	6010B <sup>(4)</sup>	0.049	0.0050	mg/l	CS0	07/31/2001	073007-07	<0.0050

<sup>(1)</sup> U.S. Environmental Protection Agency, 1983, Methods for Chemical Analysis of Water and Wastes, EPA/600/4-79-020, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

<sup>(2)</sup> U.S. Environmental Protection Agency, Dec. 1978, Microbiological Methods for Monitoring the Environment, Water, and Wastes, EPA/600/8-78-017, Part III, Section C, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

<sup>(3)</sup> Lachat Instruments, Rev. Dec 1991, Nitrate/Nitrite,

<sup>(4)</sup> U.S. Environmental Protection Agency, 1996, Test Methods for Evaluating Solid Waste, SW846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.

<sup>(5)</sup> American Public Health Association, American Water Works Association, and Water Pollution Control Federation, 1980, Standard Methods for the Examination of Water and Wastewater, A.E.Greenberg, J.J. Connors, and D. Jenkins, eds., 15th ed., American Public Health Association, Washington, DC.

Sample Comments: None

Mr. Robert D. Breakwell (Project Manager, P.G.)  
 Earth Sciences Consultants, Inc.  
 One Triangle Lane  
 Export, PA 15632

Lab Project ID: 01-3344  
 Lab Sample ID: 0107-1695  
 Client Sample ID: SW 3  
 Sample Matrix: Aqueous

Client Site: DEP Longwall Mining Stream Study  
 Client Ref.: ESC #5904-04

Date Sampled: 07/27/2001  
 Date Received: 07/27/2001

### General Chemistry

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Acidity	305.1 <sup>(1)</sup>	<2.0	2.0	mg/l	CK0	08/06/2001	080609-09	4.7
Alkalinity (Total)	310.1 <sup>(1)</sup>	170	2.0	mg/l	CK0	08/06/2001	080609-09	<2.0
Coliform (Fecal)	IIIC <sup>(2)</sup>	13	N/A	colonies/1	DAB	07/27/2001	073009-04	ND
Nitrate	10-107-04-1-A Aq <sup>(3)</sup>	<0.10	0.10	mg/l	DAB	07/31/2001	073109-08	<0.10
Nitrite	354.1 <sup>(1)</sup>	<0.010	0.010	mg/l	EAC	07/30/2001	073009-10	<0.010
pH	150.1 <sup>(1)</sup>	8.03	1.00	pH	EAC	07/27/2001	073109-13	NAP
Phosphate (Total)	365.2 <sup>(1)</sup>	0.033	0.010	mg/l	CK0	08/06/2001	080709-01	<0.010
Sulfate	375.4 <sup>(1)</sup>	30	10	mg/l	EAC	07/31/2001	073109-19	<10
Total Dissolved Solids	160.1 <sup>(1)</sup>	270	10	mg/l	EAC	07/31/2001	080109-15	<10
Total Suspended Solids	160.2 <sup>(1)</sup>	<4.0	4.0	mg/l	EAC	07/31/2001	073109-24	<4.0

### Metals

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Aluminum (Total)	6010B <sup>(4)</sup>	0.100	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Calcium (Total)	6010B <sup>(4)</sup>	46	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Calcium (Total)	314A <sup>(5)</sup>	46	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Hardness	314A <sup>(5)</sup>	140	2.0	mg/l	CS0	07/31/2001	073007-07	<2.0
Iron (Total)	6010B <sup>(4)</sup>	0.16	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Magnesium (Total)	6010B <sup>(4)</sup>	6.2	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Magnesium (Total)	314A <sup>(5)</sup>	6.2	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Manganese (Total)	6010B <sup>(4)</sup>	0.095	0.0050	mg/l	CS0	07/31/2001	073007-07	<0.0050

<sup>(1)</sup> U.S. Environmental Protection Agency, 1983, Methods for Chemical Analysis of Water and Wastes, EPA/600/4-79-020, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

<sup>(2)</sup> U.S. Environmental Protection Agency, Dec. 1978, Microbiological Methods for Monitoring the Environment, Water, and Wastes, EPA/600/8-78-017, Part III, Section C, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

<sup>(3)</sup> Lachat Instruments, Rev. Dec 1991, Nitrate/Nitrite,

<sup>(4)</sup> U.S. Environmental Protection Agency, 1996, Test Methods for Evaluating Solid Waste, SW846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.

<sup>(5)</sup> American Public Health Association, American Water Works Association, and Water Pollution Control Federation, 1980, Standard Methods for the Examination of Water and Wastewater, A.E.Greenberg, J.J. Connors, and D. Jenkins, eds., 15th ed., American Public Health Association, Washington, DC.

Sample Comments: None

Mr. Robert D. Breakwell (Project Manager, P.G.)  
 Earth Sciences Consultants, Inc.  
 One Triangle Lane  
 Export, PA 15632

Lab Project ID: 01-3344  
 Lab Sample ID: 0107-1696  
 Client Sample ID: SW 4  
 Sample Matrix: Aqueous

Client Site: DEP Longwall Mining Stream Study  
 Client Ref.: ESC #5904-04

Date Sampled: 07/27/2001  
 Date Received: 07/27/2001

### General Chemistry

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Acidity	305.1 <sup>(1)</sup>	<2.0	2.0	mg/l	CK0	08/06/2001	080609-09	4.7
Alkalinity (Total)	310.1 <sup>(1)</sup>	140	2.0	mg/l	CK0	08/06/2001	080609-09	<2.0
Coliform (Fecal)	IIIC <sup>(2)</sup>	12	N/A	colonies/1	DAB	07/27/2001	073009-04	ND
Nitrate	10-107-04-1-A Aq <sup>(3)</sup>	<0.10	0.10	mg/l	DAB	07/31/2001	073109-08	<0.10
Nitrite	354.1 <sup>(1)</sup>	<0.010	0.010	mg/l	EAC	07/30/2001	073009-10	<0.010
pH	150.1 <sup>(1)</sup>	8.28	1.00	pH	EAC	07/27/2001	073109-13	NAP
Phosphate (Total)	365.2 <sup>(1)</sup>	0.055	0.010	mg/l	CK0	08/06/2001	080709-01	<0.010
Sulfate	375.4 <sup>(1)</sup>	33	10	mg/l	EAC	07/31/2001	073109-19	<10
Total Dissolved Solids	160.1 <sup>(1)</sup>	230	10	mg/l	EAC	07/31/2001	080109-15	<10
Total Suspended Solids	160.2 <sup>(1)</sup>	18	4.0	mg/l	EAC	07/31/2001	073109-24	<4.0

### Metals

Test	Method	Result	Reporting Limit	Units	Analyst	Analysis Date	Method Blank ID	Blank Result
Aluminum (Total)	6010B <sup>(4)</sup>	0.086	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Calcium (Total)	6010B <sup>(4)</sup>	36	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Calcium (Total)	314A <sup>(5)</sup>	36	1.0	mg/l	CS0	07/31/2001	073007-07	<1.0
Hardness	314A <sup>(5)</sup>	120	2.0	mg/l	CS0	07/31/2001	073007-07	<2.0
Iron (Total)	6010B <sup>(4)</sup>	0.12	0.050	mg/l	CS0	07/31/2001	073007-07	<0.050
Magnesium (Total)	6010B <sup>(4)</sup>	6.1	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Magnesium (Total)	314A <sup>(5)</sup>	6.1	0.20	mg/l	CS0	07/31/2001	073007-07	<0.20
Manganese (Total)	6010B <sup>(4)</sup>	0.066	0.0050	mg/l	CS0	07/31/2001	073007-07	<0.0050

(1) U.S. Environmental Protection Agency, 1983, Methods for Chemical Analysis of Water and Wastes, EPA/600/4-79-020, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

(2) U.S. Environmental Protection Agency, Dec. 1978, Microbiological Methods for Monitoring the Environment, Water, and Wastes, EPA/600/8-78-017, Part III, Section C, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio.

(3) Lachat Instruments, Rev. Dec 1991, Nitrate/Nitrite,

(4) U.S. Environmental Protection Agency, 1996, Test Methods for Evaluating Solid Waste, SW846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.

(5) American Public Health Association, American Water Works Association, and Water Pollution Control Federation, 1980, Standard Methods for the Examination of Water and Wastewater, A.E.Greenberg, J.J. Connors, and D. Jenkins, eds., 15th ed., American Public Health Association, Washington, DC.

Sample Comments: None

