R-0360-52

R-0360-55

Century Refin
AKP

COAL MINING AND RECLAMATION PERMIT APPLICATION TO REVISE A PERMIT (ARP)

Issued To: OHIO VALLEY COAL CO
56854 PLEASANT RIDGE ROAD
ALLEDONIA, OH 43902

Telephone: (740) 926-1351

Permit Number: D-360
Application Number R-360-52

Effective: 12/30/2002
Expires: 06/19/2004

ARP Type:
Revise Refuse Disposal Plan

The issuance of this ARP means only that the application to conduct a coal mining operation meets the requirements of Chapter 1513 of the Revised Code, and as such DOES NOT RELIEVE the operator of any obligation to meet other federal, state or local requirements.

This ARP is issued in accordance with and subject to the provisions, conditions, and limitations of Chapter 1513 of the Revised Code and Chapters 1501:13-1, 1501:13-3 through 1501:13-14 of the Administrative Code.

The approved water monitoring plan for this ARP is:

Quality: N/A
Quantity: N/A

Note: Any previous condition(s) imposed on this permit, or subsequent adjacent areas, also apply to this ARP unless noted otherwise.

Signature: Michael G Donsa by [illegible] **Date:** 12/30/2002
Chief, Mineral Resources Management

OPERATOR

F100 Rev: 07/01/2001

TOVCC 19727

2/96

_____ New Submittal
__x__ Revised Submittal

R- 360-152

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RES... EMENT

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

APPLICATION TO REVISE A COAL MINING PERMIT

Note: Refer to the Division's "General Guideline for Processing ARPs" and "Requirements for Specific Types of Common ARPs" for guidance on submitting and processing ARPs.

1. Applicant's Name THE OHIO VALLEY COAL COMPANY .
   Address 56854 PLEASANT RIDGE ROAD
   City ALLEDONIA State Ohio Zip 43902
   Telephone Number 740 - 926 - 1351
2. Permit Number D-0360

3. Section of mining and reclamation plan to be revised:

   PART 3, PAGE 23, ITEM A(14)(a)

4. Describe in detail the proposed revision and submit any necessary drawings, plans, maps, etc.:

   THIS REVISION INCLUDES CHANGES TO THE REFUSE DISPOSAL PLAN

5. Describe in detail the reason for requesting the revision:

   THIS REVISION SHOWS THAT REFUSE FROM THE NEARBY CENTURY MINE WILL BE DISPOSED OF AT THE NO. 6 MINE (D-0360 PERMIT AREA).

6. Will this revision constitute a significant alternation from the mining and reclamation operation contemplated in the original permit? _____ Yes, __X__ No.
   (**Note:** refer to paragraph (E) (2) of 1501:13-04-06 of the Ohio Administrative Code to determine if a revision is deemed significant.)

   If "yes," complete the following items 7 through 9.

OPERATOR

TOVCC 19728

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7. In the space below give the name and address of the newspaper in which the public notice is to be published.

N/A

8. In the space below give the text of the public notice that is to be published. (Include the information required by paragraph (A)(1) of 1501:13-05-01 of the Ohio Administrative Code.)

N/A

9. In the space below give the name and address of the public office where this application is to be filed for public viewing.

N/A

I, the undersigned, a responsible official of the applicant, do hereby verify the information contained in this revision request is true and correct to the best of my information and belief.

JOHN R. FORRELLI
Print Name

11/4/02
Date

Signature

President and General Manager
Title

Sworn before me and subscribed in my presence this 4th day of November, 20 02

Denise R. Jackson
Notary Public

DENISE R. JACKSON
Notary Public, State of Ohio
My Commission Expires 9-27-2005

FOR DIVISION USE ONLY

APPROVED

This request is hereby _____.

Michael L. Sponsler
Chief, Division of Mines and Reclamation

12-30-02
Date

ADDENDUM TO ARP ITEM 4
THE OHIO VALLEY COAL COMPANY
PERMIT D-0360

Coal mine waste will be transported to the Ohio Valley Coal Company for disposal at its facilities. The disposal facilities have a current capacity of over 19 million tons of refuse (8 years at 5 million clean tons of coal per year). Future facilities are planned to continue this operation once the current facilities are completed. Attachment 13's from the Century Mine show the nature of the roof, floor, and coal at the Century Mine. Refuse from the Century Mine is expected to be comprised of these materials or parts of these materials.

All refuse will be disposed at the Powhatan No. 6 facilities in accordance with approved plans and specifications. Reclamation of these facilities is discussed in the original permit application and in application D-0360-8.

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-01

Field Engineer: Kim Cecil
Surface Elevation: 1,023.19
Drill Hole Coordinates (State Plane 1927 NA Datum)
Northing: 678,882
Easting: 2,420,954
Drilling Company: LJ Hughes and Sons, Inc.

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
23.00	0.00	23.00	Casing				0.00
16.40	23.00	39.40	Shale, blk	YES	cm, em		0.00
1.30	39.40	40.70	Claystone, dk gy	YES	cv, ev		0.00
0.70	40.70	41.40	Claystone, gy	YES	cv, ev		0.00
3.10	41.40	44.50	Claystone, dk gy		cv, ev		0.00
11.90	44.50	56.40	Sandstone, gy w/ sh stks		cs, es	y	11.90
0.60	56.40	57.00	Claystone, grn		cv, ev		0.00
12.00	57.00	69.00	Claystone, gy		cv, ev		0.00
0.80	69.00	69.80	Shale, dk gy, layered		cm, em		0.00
2.60	69.80	72.40	Claystone, gy		cv, ev		0.00
0.30	72.40	72.70	Shale, dk gy		cm, em		0.00
0.50	72.70	73.20	Claystone, dk gy		cv, ev		0.00
3.70	73.20	76.90	Shale, dk gy		cm, em		0.00
21.80	76.90	98.70	Claystone, dk gy		cv, ev		0.00
0.20	98.70	98.90	**Bone w/ coal, WAYNESBURG No. 11**		ac, cv, ev		0.00
1.30	98.90	100.20	Claystone, gy		cv, ev		0.00
0.60	100.20	100.80	Shale, blk		ac, cm, em		0.00
26.80	100.80	127.60	Claystone, dk gy w/ ss stks		ak, cv, ev		0.00
2.90	127.60	130.50	Shale, gy		cm, em		0.00
7.40	130.50	137.90	Claystone, red/ grn		cv, ev		0.00
7.50	137.90	145.40	Limestone		ak, cs, es	y	7.50
8.10	145.40	153.50	Claystone, grn		cv, ev		0.00
12.70	153.50	166.20	Claystone, gy w/ ls nods		ak, cv, ev		0.00
1.20	166.20	167.40	Claystone, grn		cv, ev		0.00
21.50	167.40	188.90	Claystone, gy w/ ls nods		ak, cv, ev		0.00
3.90	188.90	192.80	Shale, grn		cm, em		0.00
3.60	192.80	196.40	Claystone, gy w/ ls nods		ak, cv, ev		0.00
0.35	196.40	196.75	Claystone, grn		cv, ev		0.00
0.55	196.75	197.30	Shale, blk		ac, cm, em		0.00
19.00	197.30	216.30	Limestone, shaley, layered		ak, cs, es	y	19.00
1.80	216.30	218.10	Claystone, grn		cv, ev		0.00
5.70	218.10	223.80	Limestone		ak, cs, es	y	5.70
0.90	223.80	224.70	Flintclay, layered		ak, cs, es		0.00
2.30	224.70	227.00	Claystone, gy		cv, ev		0.00
5.50	227.00	232.50	Claystone, grn		cv, ev		0.00
0.90	232.50	233.40	Claystone, gy		cv, ev		0.00
8.90	233.40	242.30	Limestone		ak, cs, es	y	8.90
1.40	242.30	243.70	Claystone, dk gy		cv, ev		0.00
1.50	243.70	245.20	Shale, blk		ac, cm, em		0.00
4.10	245.20	249.30	**Coal, SEWICKLEY No. 9**		ac, cv, ev		0.00
6.00	249.30	255.30	Shale, gy/ grn		cm, em		0.00
9.80	255.30	265.10	Claystone, gy/ grn		cv, ev		0.00
2.10	265.10	267.20	Shale, dk gy		cm, em		0.00
4.50	267.20	271.70	**Coal**		ac, cv, ev		0.00
1.00	271.70	272.70	Shale, gy/ grn		cm, em		0.00
17.00	272.70	289.70	Limestone		ak, cs, es	y	17.00
0.30	289.70	290.00	Claystone, grn		cv, ev		0.00
21.80	290.00	311.80	Claystone, gy		cv, ev		0.00
4.10	311.80	315.90	Shale, blk		ac, cm, em		0.00
10.90	315.90	326.80	Claystone, gy/ grn		cv, ev		0.00
1.90	326.80	328.70	Limestone, massive		ak, cs, es	y	1.90
2.10	328.70	330.80	Shale, dk gy w/ ls nods		ak, cm, em		0.00

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-01

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
1.80	330.80	332.60	Limestone, shaley, nodular		ak, cs, es	y	1.80
1.60	332.60	334.20	Claystone, gy w/ ls nods		ak, cv, ev		0.00
1.80	334.20	336.00	Claystone, dk gy w/ ss stks		cm, em		0.00
0.30	336.00	336.30	**Coal w/ bone stks**		ac, cv, ev		0.00
0.10	336.30	336.40	Shale, blk		ac, cm, em		0.00
0.10	336.40	336.50	**Coal w/ bone stks, ROOF COAL**		ac, cv, ev		0.00
0.50	336.50	337.00	Shale, gy, soft		cm, em		0.00
0.35	337.00	337.35	Shale w/bone		cm, em		0.00
3.61	337.35	340.96	**Coal w/ bone stks, PITTSBURGH No.8**		ac, cv, ev		0.00
1.49	340.96	342.45	**Coal w/ bone, pyritic**		ac, cv, ev		0.00
1.00	342.45	343.45	Shale, dk		cm, em		0.00
3.40	343.45	346.85	Shale; gy w/ ls nods		ak, cm, em		0.00
3.50	346.85	350.35	Claystone, gy w/ ls nods		ak, cv, ev		0.00
3.00	350.35	353.35	Shale, gy, sandy		cs, es		0.00
2.20	353.35	355.55	Shale, gy		cm, em		0.00
2.70	355.55	358.25	Sandstone w/sh stks		cs, es	y	2.70
6.40	358.25	364.65	Shale, gy		cm, em		0.00
	Total Depth	364.65					76.40

Acid Producing: ac
Alkaline Producing: ak
Compactible: c (v-very, m-moderate, s-slight)
Erodible: e (v-very, m-moderate, s-slight)

Total Thickness of Hard Rock Overlying Mining Unit 76.40

Thickness and Percentage of Hard and Soft Rock Overlying Mining Unit 21%

	Thickness (Ft.)	Percent (%)
Hard Rock:	76.40	21%
Soft Rock:	288.25	79%
	364.65	

ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 Coalbed

Stratum	Neutralization Potential, tons/1000 tons as CaCO3	Total Sulphur %	Pyritic Sulphur %	Potential Acidity, tons /1000 tons as $CaCO_3$ (Total Sul.)	CaCO3 Deficiency, tons/1000 tons as $CaCO_3$ (Total Sul.)
Roof, 10 ft.	203.49	1.91	1.65	59.7	-143.8
Coal	2.96	4.71	1.68	147.00	144.0
Bottom, 10 ft.	320.60	3.64	3.62	113.55	-207.1

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ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-02

Field Engineer: Kim Cecil
Surface Elevation: 1,264.00
Drill Hole Coordinates (State Plane 1927 NA Datum)
Northing: 678,055
Easting: 2,426,386
Drilling Company: LJ Huges and Sons, Inc.

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
21.00	0.00	21.00	Casing				0.00
5.00	21.00	26.00	Shale, grn	YES	cm, em		0.00
7.00	26.00	33.00	Sandstone, gy	YES	cs, es	y	7.00
4.70	33.00	37.70	Shale, grn		cm, em		0.00
4.20	37.70	41.90	Shale, red/grn	YES	cm, em		0.00
5.00	41.90	46.90	Claystone, gy		cv, ev		0.00
1.10	46.90	48.00	Shale, gy	YES	cm, em		0.00
7.00	48.00	55.00	Shale, grn, limey		ak, cm, em		0.00
11.00	55.00	66.00	Shale, red/grn		cm, em		0.00
7.00	66.00	73.00	Shale, gy w/ ls nods		ak, cm, em		0.00
2.90	73.00	75.90	Sandstone, gy		cs, es	y	2.90
2.10	75.90	78.00	Shale, grn		cm, em		0.00
5.00	78.00	83.00	Claystone, red		cv, ev		0.00
14.00	83.00	97.00	Shale, grn		cm, em		0.00
21.00	97.00	118.00	Shale, red		cm, em		0.00
11.90	118.00	129.90	Shale, grn w/ ls nods		ak, cm, em		0.00
16.10	129.90	146.00	Claystone, red/grn		cv, ev		0.00
7.00	146.00	153.00	Shale, grn w/ ls nods		ak, cm, em		0.00
15.00	153.00	168.00	Shale, grn		cm, em		0.00
5.80	168.00	173.80	Claystone, red/grn		cv, ev		0.00
2.50	173.80	176.30	Limestone, nodular		ak, cs, es	y	2.50
1.30	176.30	177.60	Claystone, red/grn		cv, ev		0.00
5.40	177.60	183.00	Shale, grn, limey		ak, cm, em		0.00
2.00	183.00	185.00	Shale, grn		cm, em		0.00
3.90	185.00	188.90	Sandstone, gy		cs, es	y	3.90
6.50	188.90	195.40	Shale, grn		cm, em		0.00
2.60	195.40	198.00	Shale, red		cm, em		0.00
25.00	198.00	223.00	Shale, grn		cm, em		0.00
10.00	223.00	233.00	Claystone, gy		cv, ev		0.00
2.10	233.00	235.10	Coal w/ sh layers, WASHINGTON No. 12		ac, cv, ev		0.00
0.50	235.10	235.60	Shale, gy		cm, em		0.00
1.00	235.60	236.60	Coal		ac, cv, ev		0.00
2.90	236.60	239.50	Claystone, gy		cv, ev		0.00
10.30	239.50	249.80	Claystone, grn		cv, ev		0.00
6.60	249.80	256.40	Claystone, red		cv, ev		0.00
5.60	256.40	262.00	Shale, gy, sandy		cs, es		0.00
16.60	262.00	278.60	Shale, gy, sandy		cs, es		0.00
8.60	278.60	287.20	Shale, grn		cm, em		0.00
0.55	287.20	287.75	Coal, WAYNESBURG "A"		ac, cv, ev		0.00
0.45	287.75	288.20	Shale, gy, pyrite		ac, cm, em		0.00
0.20	288.20	288.40	Coal w/ bone		ac, cv, ev		0.00
0.30	288.40	288.70	Coal w/ sh stks		ac, cv, ev		0.00
0.80	288.70	289.50	Shale, gy		cm, em		0.00
3.00	289.50	292.50	Limestone, nodular		ak, cs, es	y	3.00
8.50	292.50	301.00	Limestone, shaley		ak, cs, es	y	8.50
6.50	301.00	307.50	Sandstone, gy		cs, es	y	6.50
3.80	307.50	311.30	Shale, grn		cm, em		0.00
1.30	311.30	312.60	Limestone, nodular		ak, cs, es	y	1.30
1.50	312.60	314.10	Shale, grn w/ ls nods		ak, cm, em		0.00
5.60	314.10	319.70	Sandstone, gy		cs, es	y	5.60
4.90	319.70	324.60	Shale, grn		cm, em		0.00
4.50	324.60	329.10	Limestone		ak, cs, es	y	4.50
3.10	329.10	332.20	Claystone, gy		cv, ev		0.00
0.50	332.20	332.70	Shale, blk		ac, cm, em		0.00
0.95	332.70	333.65	Shale, dk gy		cm, em		0.00
4.20	333.65	337.85	Shale, gy		cm, em		0.00

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ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-02

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
13.20	337.85	351.05	Sandstone, gy w/sh stks		cs, es	y	13.20
0.50	351.05	351.55	Shale, blk		ac, cm, em		0.00
0.30	351.55	351.85	**Coal, WAYNESBURG No. 11**		ac, cv, ev		0.00
0.50	351.85	352.35	Shale, gy		cm, em		0.00
3.50	352.35	355.85	Claystone, gy		cv, ev		0.00
20.30	355.85	376.15	Limestone, shaley		ak, cs, es	y	20.30
7.50	376.15	383.65	Claystone, grn		cv, ev		0.00
2.20	383.65	385.85	Claystone, gy		cv, ev		0.00
1.60	385.85	387.45	Claystone, grn		cv, ev		0.00
3.40	387.45	390.85	Shale, red/grn		cm, em		0.00
24.20	390.85	415.05	Limestone w/ sh layers		ak, cs, es	y	24.20
2.00	415.05	417.05	Claystone, gy		cv, ev		0.00
5.20	417.05	422.25	Limestone w/ sh layers		ak, cs, es	y	5.20
4.10	422.25	426.35	Claystone, grn		cv, ev		0.00
10.30	426.35	436.65	Limestone		ak, cs, es	y	10.30
3.60	436.65	440.25	Shale, grn		cm, em		0.00
43.60	440.25	483.85	Limestone w/ sh layers		ak, cs, es	y	43.60
2.40	483.85	486.25	Claystone, gy		cv, ev		0.00
0.30	486.25	486.55	Shale, gy		cm, em		0.00
1.85	486.55	488.40	**Coal, SEWICKLEY No. 9**		ac, cv, ev		0.00
3.00	488.40	491.40	Shale, gy		cm, em		0.00
10.10	491.40	501.50	Shale, grn, sandy		cs, es		0.00
17.00	501.50	518.50	Sandstone, gy		cs, es	y	17.00
3.00	518.50	521.50	Shale, gy, sandy		cs, es		0.00
6.45	521.50	527.95	Shale, gy		cm, em		0.00
1.30	527.95	529.25	Sandstone, gy w/ coal stks		cs, es		0.00
0.40	529.25	529.65	Claystone, gy		cv, ev		0.00
1.25	529.65	530.90	**Coal**		ac, cv, ev		0.00
0.25	530.90	531.15	Shale, gy		cm, em		0.00
1.30	531.15	532.45	**Coal**		ac, cv, ev		0.00
19.85	532.45	552.30	Limestone w/ sh layers		ak, cs, es	y	19.85
2.40	552.30	554.70	Shale, grn		cm, em		0.00
3.20	554.70	557.90	Shale, gy		cm, em		0.00
9.70	557.90	567.60	Limestone, nodular		ak, cs, es	y	9.70
1.10	567.60	568.70	**Coal, bony**		ac, cv, ev		0.00
2.50	568.70	571.20	Shale, gy w/ ls nods		ak, cm, em		0.00
2.65	571.20	573.85	Limestone		ak, cs, es	y	2.65
14.00	573.85	587.85	Limestone w/ claystone stks		ak, cs, es	y	14.00
3.90	587.85	591.75	Claystone, grn		cv, ev		0.00
0.50	591.75	592.25	Shale, gy		cm, em		0.00
1.43	592.25	593.68	**Coal w/ bone, pyritic, ROOF COAL**		ac, cv, ev		0.00
0.82	593.68	594.50	Shale, gy		cm, em		0.00
5.15	594.50	599.65	**Coal, PITTSBURGH NO. 8**		ac, cv, ev		0.00
0.17	599.65	599.82	**Bone w/ coal stks**		ac, cv, ev		0.00
1.35	599.82	601.17	Shale, gy		cm, em		0.00
10.10	601.17	611.27	Shale, gy w/ ls nods		ak, cm, em		0.00
	Total Depth	611.27					225.70

Acid Producing: ac
Alkaline Producing: ak
Compactible: c (v-very, m-moderate, s-slight)
Erodible: e (v-very, m-moderate, s-slight)

Total Thickness of Hard Rock Overlying Mining Unit 225.70

Thickness and Percentage of Hard and Soft Rock Overlying Mining Unit 37%

Thickness (Ft.)	Percent (%)

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-02

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
Hard Rock:	225.70	37%					
Soft Rock:	385.57	63%					
	611.27						

ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 Coalbed

Stratum	Neutralization Potential, tons/1000 tons as CaCO3	Total Sulphur %	Pyritic Sulphur %	Potential Acidity, tons /1000 tons as $CaCO_3$ (Total Sul.)	CaCO3 Deficiency, tons/1000 tons as $CaCO_3$ (Total Sul.)
Roof, 10 ft.	187.17	2.24	1.31	70.1	-117.2
Coal	3.88	5.91	3.04	185.00	181.0
Bottom, 10 ft.	28.40	5.08	4.21	159.00	130.0

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-03

Field Engineer: Kim Cecil
Surface Elevation: 976.43
Drill Hole Coordinates (State Plane 1927 NA Datum)
Northing: 682,637
Easting: 2,421,552
Drilling Company: LJ Hughes & Sons, Inc.

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
23.00	0.00	23.00	Casing				0.00
2.00	23.00	25.00	Shale, gy	YES	cm, em		0.00
3.30	25.00	28.30	Claystone, gy w/ ls nods	YES	ak, cv, ev		0.00
0.60	28.30	28.90	Limestone		ak, cs, es	y	0.60
0.30	28.90	29.20	Claystone, gy, soft	YES	cv, ev		0.00
0.50	29.20	29.70	Shale, dk gy, limey		ak, cm, em		0.00
0.80	29.70	30.50	Limestone		ak, cs, es	y	0.80
0.30	30.50	30.80	Claystone, gy, soft		cv, ev		0.00
3.20	30.80	34.00	Core loss				0.00
0.50	34.00	34.50	Claystone, dk gy		cv, ev		0.00
1.50	34.50	36.00	Shale, gy, sandy	YES	cs, es		0.00
2.00	36.00	38.00	Shale, gy		cm, em		0.00
0.50	38.00	38.50	Shale, gy, sandy		cs, es		0.00
0.60	38.50	39.10	Clay, soft		cv, ev		0.00
1.60	39.10	40.70	Shale, gy, sandy		cs, es		0.00
1.20	40.70	41.90	Shale, gy		cm, em		0.00
15.10	41.90	57.00	Sandstone, gy w/sh stks		cs, es	y	15.10
0.40	57.00	57.40	Claystone, gy		cv, ev		0.00
0.30	57.40	57.70	**Bone w/ coal stks, WAYNESBURG No. 11**		ac, cv, ev		0.00
2.10	57.70	59.80	Claystone, gy w/ ls nods		ak, cv, ev		0.00
3.00	59.80	62.80	Limestone, shaley, nodular		ak, cs, es	y	3.00
3.50	62.80	66.30	Shale, gy w/ ls nods		ak, cm, em		0.00
0.80	66.30	67.10	Limestone		ak, cs, es	y	0.80
1.60	67.10	68.70	Shale, gy w/ ls nods		ak, cm, em		0.00
4.00	68.70	72.70	Limestone, massive		ak, cs, es	y	4.00
2.80	72.70	75.50	Shale, gy, limey		ak, cm, em		0.00
8.50	75.50	84.00	Claystone, gy		cv, ev		0.00
2.00	84.00	86.00	Limestone, nodular		ak, cs, es	y	2.00
9.00	86.00	95.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
0.40	95.00	95.40	Claystone, red		cv, ev		0.00
2.60	95.40	98.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
0.70	98.00	98.70	Limestone		ak, cs, es	y	0.70
11.50	98.70	110.20	Shale, gy w/ ls nods		ak, cm, em		0.00
12.80	110.20	123.00	Limestone w/ sh layers		ak, cs, es	y	12.80
0.60	123.00	123.60	Limestone, shaley, nodular		ak, cs, es	y	0.60
14.90	123.60	138.50	Shale, gy, limey		ak, cm, em		0.00
4.00	138.50	142.50	Limestone, nodular		ak, cs, es	y	4.00
0.50	142.50	143.00	Shale, gy w/ ls nods		ak, cm, em		0.00
4.90	143.00	147.90	Claystone, gy w/ ls nods		ak, cv, ev		0.00
2.30	147.90	150.20	Limestone, shaley		ak, cs, es	y	2.30
2.30	150.20	152.50	Shale, gy w/ ls nods		ak, cm, em		0.00
16.00	152.50	168.50	Limestone, layered		ak, cs, es	y	16.00
2.40	168.50	170.90	Claystone, gy w/ ls nods		ak, cv, ev		0.00
5.00	170.90	175.90	Limestone		ak, cs, es	y	5.00
7.10	175.90	183.00	Shale, gy w/ ls nods		ak, cm, em		0.00
11.60	183.00	194.60	Limestone, nodular		ak, cs, es	y	11.60
4.40	194.60	199.00	Shale, dk gy, limey		ak, cm, em		0.00
1.40	199.00	200.40	Shale, dk gy, broken		cv, ev		0.00
0.20	200.40	200.60	Shale, blk		ac, cm, em		0.00
1.30	200.60	201.90	**Coal w/ sh stks, SEWICKLEY No. 9**		ac, cv, ev		0.00
1.20	201.90	203.10	Shale, dk gy		cm, em		0.00
4.30	203.10	207.40	Shale, gy, sandy		cs, es		0.00
6.40	207.40	213.80	Sandstone w/ sh stks		cs, es	y	6.40
12.40	213.80	226.20	Shale, gy		cm, em		0.00

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-03

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
0.15	226.20	226.35	Shale, blk		ac, cm, em		0.00
1.75	226.35	228.10	**Coal w/ sh stks, FISHPOT**		ac, cv, ev		0.00
0.25	228.10	228.35	**Shale w/ coal, carbonated**		ac, cv, ev		0.00
0.70	228.35	229.05	**Coal, pyritic**		ac, cv, ev		0.00
0.50	229.05	229.55	**Coal, bony**		ac, cv, ev		0.00
0.85	229.55	230.40	Shale, dk gy		cm, em		0.00
17.10	230.40	247.50	Limestone, nodular		ak, cs, es	y	17.10
0.40	247.50	247.90	Claystone, grn		cv, ev		0.00
1.90	247.90	249.80	Limestone, shaley		ak, cs, es	y	1.90
0.60	249.80	250.40	Claystone, grn		cv, ev		0.00
1.30	250.40	251.70	Shale, gy		cm, em		0.00
3.70	251.70	255.40	Sandstone w/sh stks		cs, es	y	3.70
1.10	255.40	256.50	Shale, gy, sandy		cs, es		0.00
3.60	256.50	260.10	Shale, gy		cm, em		0.00
1.40	260.10	261.50	Shale, gy w/ ls nods		ak, cm, em		0.00
1.50	261.50	263.00	Limestone, nodular		ak, cs, es	y	1.50
4.10	263.00	267.10	Claystone, gy w/ ls nods		ak, cv, ev		0.00
1.20	267.10	268.30	Limestone, shaley		ak, cs, es	y	1.20
1.50	268.30	269.80	Claystone, gy w/ ls nods		ak, cv, ev		0.00
1.70	269.80	271.50	Limestone, shaley, nodular		ak, cs, es	y	1.70
1.40	271.50	272.90	Shale, gy w/ ls nods		ak, cm, em		0.00
13.40	272.90	286.30	Limestone, nodular		ak, cs, es	y	13.40
4.50	286.30	290.80	Shale, gy w/ ls nods		ak, cm, em		0.00
2.50	290.80	293.30	Claystone, gy		cv, ev		0.00
0.40	293.30	293.70	Shale, dk gy		cm, em		0.00
0.66	293.70	294.36	**Coal, pyrite, ROOF COAL**		ac, cv, ev		0.00
0.25	294.36	294.61	**Coal, bony w/ sh**		ac, cv, ev		0.00
0.97	294.61	295.58	Shale, dk gy		cm, em		0.00
3.84	295.58	299.42	**Coal, bony w/ sh stks PITTSBURGH NO.8**		ac, cv, ev		0.00
0.95	299.42	300.37	**Coal**		ac, cv, ev		0.00
0.21	300.37	300.58	**Coal w/ sh stks**		ac, cv, ev		0.00
0.50	300.58	301.08	Shale, dk gy		cm, em		0.00
1.95	301.08	303.03	Limestone, shaley, nodular		ak, cs, es	y	1.95
5.20	303.03	308.23	Claystone, gy w/ ls nods		ak, cv, ev		0.00
5.50	308.23	313.73	Shale, gy		cm, em		0.00
8.00	313.73	321.73	Sandstone w/ sh stks		cs, es	y	8.00
1.30	321.73	323.03	Limestone, nodular		ak, cs, es	y	1.30
	Total Depth	323.03					137.45

Acid Producing: ac
Alkaline Producing: ak
Compactible: c (v-very, m-moderate, s-slight)
Erodible: e (v-very, m-moderate, s-slight)

Total Thickness of Hard Rock Overlying Mining Unit 137.45

Thickness and Percentage of Hard and Soft Rock Overlying Mining Unit 43%

	Thickness (Ft.)	Percent (%)
Hard Rock:	137.45	43%
Soft Rock:	185.58	57%
	323.03	

ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 Coalbed

	Potential Acidity, tons	CaCO3 Deficiency,

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-03

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)

Stratum	Neutralization Potential, tons/100 tons as CaCO3	Total Sulphur %	Pyritic Sulphur %	/1000 tons as $CaCO_3$ (Total Sul.)	tons/1000 tons as $CaC0_3$ (Total Sul.)
Roof, 10 ft.	164.06	2.90	2.14	90.7	-73.4
Coal	7.63	5.62	3.02	176.0	168.0
Bottom, 10 ft.	308.00	3.00	2.58	93.6	-214.0

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-04

Field Engineer: Kim Cecil
Surface Elevation: 1,267.00
Drill Hole Coordinates (State Plane 1927 NA Datum)
Northing: 682,440
Easting: 2,430,373
Drilling Company: LJ Hughes and Sons, Inc.

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
23.00	0.00	23.00	Casing				0.00
14.00	23.00	37.00	Claystone, red/gy	YES	cv, ev		0.00
1.00	37.00	38.00	Core loss				0.00
2.30	38.00	40.30	Claystone, gy	YES	cv, ev		0.00
3.30	40.30	43.60	Shale, gy w/ ls nods		ak, cm, em		0.00
1.80	43.60	45.40	Shale, gy, broken		cv, ev		0.00
5.20	45.40	50.60	Shale, gy w/ ls nods		ak, cm, em		0.00
2.40	50.60	53.00	Claystone, red	YES	cv, ev		0.00
6.60	53.00	59.60	Claystone, red/gy	YES	cv, ev		0.00
5.40	59.60	65.00	Sandstone, gy w/ sh stks		cs, es	y	5.40
14.60	65.00	79.60	Shale, gy w/ ls nods		ak, cm, em		0.00
11.00	79.60	90.60	Claystone, red	YES	cv, ev		0.00
0.40	90.60	91.00	Core loss				0.00
11.50	91.00	102.50	Shale, red/gy		cm, em		0.00
0.50	102.50	103.00	Core loss				0.00
16.00	103.00	119.00	Shale, gy		cv, ev		0.00
0.20	119.00	119.20	**Bone, WASHINGTON No. 12**		ac, cv, ev		0.00
3.80	119.20	123.00	Shale, gy, limey		ak, cm, em		0.00
54.00	123.00	177.00	Shale, red/ gy w/ ls nods		ak, cm, em		0.00
2.60	177.00	179.60	Limestone, nodular		ak, cs, es	y	2.60
7.40	179.60	187.00	Shale, gy w/ ls nods		ak, cm, em		0.00
3.30	187.00	190.30	Shale, red		cm, em		0.00
18.30	190.30	208.60	Shale, gy w/ ls nods		ak, cm, em		0.00
0.20	208.60	208.80	Shale, blk		ac, cm, em		0.00
5.60	208.80	214.40	Shale, gy, sandy w/ ls nods		ak, cs, es		0.00
25.55	214.40	239.95	Sandstone, gy w/ ss stks		cs, es	y	25.55
0.10	239.95	240.05	Shale, blk		ac, cm, em		0.00
3.10	240.05	243.15	**Coal w/ shale stks, LITTLE WASHINGTON**		ac, cv, ev		0.00
2.70	243.15	245.85	Claystone, gy		cv, ev		0.00
0.25	245.85	246.10	Core loss				0.00
16.30	246.10	262.40	Claystone, gy w/ ls nods		ak, cv, ev		0.00
0.60	262.40	263.00	Core loss				0.00
10.90	263.00	273.90	Shale, gy		cm, em		0.00
9.10	273.90	283.00	Shale, gy, sandy		cs, es		0.00
2.35	283.00	285.35	Shale, gy		cm, em		0.00
5.75	285.35	291.10	**Coal, bony w/ sh stks WAYNESBURGH "A"**		ac, cv, ev		0.00
0.65	291.10	291.75	Shale, gy w/ ls nods		ak, cm, em		0.00
1.00	291.75	292.75	Shale, blk, carb.		ac, cm, em		0.00
10.25	292.75	303.00	Shale, gy w/ ls nods		ak, cm, em		0.00
1.00	303.00	304.00	Shale, gy, sandy		cs, es		0.00
10.90	304.00	314.90	Shale, gy		cm, em		0.00
5.50	314.90	320.40	Sandstone, gy		cs, es	y	5.50
2.90	320.40	323.30	Shale, gy, sandy		cm, em		0.00
3.50	323.30	326.80	Sandstone w/ sh stks		cs, es	y	3.50
0.80	326.80	327.60	Claystone, gy		cv, ev		0.00
3.70	327.60	331.30	Limestone, nodular		ak, cs, es	y	3.70
1.40	331.30	332.70	Claystone, gy, soft		cv, ev		0.00
0.50	332.70	333.20	Shale, dk gy, soft		cm, em		0.00
2.30	333.20	335.50	Shale, gy, sandy		cm, em		0.00
5.60	335.50	341.10	Sandstone, gy		cs, es	y	5.60
4.90	341.10	346.00	Shale, gy, sandy		cm, em		0.00
5.30	346.00	351.30	Sandstone w/ sh stks		cs, es	y	5.30

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-04

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
1.30	351.30	352.60	Shale, gy w/ ss stks		cs, es		0.00
4.60	352.60	357.20	Shale, gy		cm, em		0.00
0.30	357.20	357.50	Shale, blk		ac, cm, em		0.00
1.00	357.50	358.50	Claystone, gy		cv, ev		0.00
4.50	358.50	363.00	Limestone, massive		ak, cs, es	y	4.50
3.80	363.00	366.80	Shale, gy w/ ls nods		ak, cm, em		0.00
10.60	366.80	377.40	Limestone		ak, cs, es	y	10.60
12.30	377.40	389.70	Shale, gy w/ ls nods		ak, cm, em		0.00
5.20	389.70	394.90	Shale, gy, sandy		cs, es		0.00
5.60	394.90	400.50	Shale, red/gy		cm, em		0.00
2.50	400.50	403.00	Limestone, nodular		ak, cs, es	y	2.50
20.00	403.00	423.00	Limestone w/ claystone parting		ak, cs, es	y	20.00
2.30	423.00	425.30	Limestone		ak, cs, es	y	2.30
11.80	425.30	437.10	Claystone, gy w/ ls nods		ak, cv, ev		0.00
5.90	437.10	443.00	Limestone, shaley		ak, cs, es	y	5.90
35.00	443.00	478.00	Limestone w/ sh layers		ak, cs, es	y	35.00
10.50	478.00	488.50	Shale, gy w/ ls nods		ak, cm, em		0.00
8.90	488.50	497.40	Limestone, shaley		ak, cs, es	y	8.90
3.00	497.40	500.40	Shale, gy w/ ls nods		ak, cm, em		0.00
2.05	500.40	502.45	**Coal, bone, pyrite, SEWICKLEY No. 9**		ac, cv, ev		0.00
22.35	502.45	524.80	Shale, gy		cm, em		0.00
1.60	524.80	526.40	Shale, dk gy, soft		cm, em		0.00
0.80	526.40	527.20	Claystone, gy		cv, ev		0.00
1.10	527.20	528.30	**Coal w/ sh stks**		ac, cv, ev		0.00
0.90	528.30	529.20	**Coal w/ pyrite**		ac, cv, ev		0.00
19.90	529.20	549.10	Limestone, nodular		ak, cs, es	y	19.90
8.60	549.10	557.70	Shale, gy w/ ls nods		ak, cm, em		0.00
3.90	557.70	561.60	Limestone, shaley		ak, cs, es	y	3.90
2.20	561.60	563.80	Claystone, gy		cv, ev		0.00
0.60	563.80	564.40	Shale, blk w/ coal		ac, cm, em		0.00
0.80	564.40	565.20	**Coal, bone**		ac, cv, ev		0.00
2.50	565.20	567.70	Shale, gy, limey		ak, cm, em		0.00
13.20	567.70	580.90	Limestone, nodular		ak, cs, es	y	13.20
6.20	580.90	587.10	Claystone, gy		cv, ev		0.00
1.60	587.10	588.70	Claystone, dk gy		cv, ev		0.00
0.60	588.70	589.30	Shale, blk, carb.		ac, cm, em		0.00
0.97	589.30	590.27	**Coal w/ bone, ROOF COAL**		ac, cv, ev		0.00
0.92	590.27	591.19	Shale, dk gy, soft		cm, em		0.00
3.97	591.19	595.16	**Coal w/ sh stks, pyrite, PITTSBURGH No.8**		ac, cv, ev		0.00
0.90	595.16	596.06	**Bone w/ coal layers**		ac, cv, ev		0.00
0.33	596.06	596.39	**Coal w/ pyrite**		ac, cv, ev		
4.20	596.39	600.59	Claystone, gy w/ ls nods		ak, cv, ev		0.00
5.40	600.59	605.99	Shale, gy, sandy		cs, es		0.00
2.60	605.99	608.59	Claystone, gy		cv, ev		0.00
2.00	608.59	610.59	Shale, gy		cm, em		0.00
	Total Depth	610.59					183.85

Acid Producing: ac
Alkaline Producing: ak
Compactible: c (v-very, m-moderate, s-slight)
Erodible: e (v-very, m-moderate, s-slight)

Total Thickness of Hard Rock Overlying Mining Unit 183.85

Thickness and Percentage of Hard and Soft Rock Overlying Mining Unit 30%

	Thickness (Ft.)	Percent (%)
Hard Rock:	183.85	30%
Soft Rock:	426.74	70%
	610.59	

TOVCC 19740

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2000-04

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)

ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 Coalbed

Stratum	Neutralization Potential, tons/1000 tons as CaCO3	Total Sulphur %	Pyritic Sulphur %	Potential Acidity, tons /1000 tons as $CaCO_3$ (Total Sul.)	CaCO3 Deficiency, tons/1000 tons as $CaCO_3$ (Total Sul.)
Roof, 10 ft.	278.84	2.94	2.64	91.92	-186.80
Coal	5.01	5.95	2.85	186.0	181.0
Bottom, 10 ft.	164.00	3.32	3.17	103.85	-60.1

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2001-02

Field Engineer: Kim Cecil
Surface Elevation: 1,238.55
Drill Hole Coordinates (State Plane 1927 NA Datum)
Northing: 684,949
Easting: 2,425,410
Drilling Company: LJ Hughes and Sons, Inc.

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
22.00	0.00	22.00	Casing				0.00
1.30	22.00	23.30	Shale, gy	YES	cm, em		0.00
1.30	23.30	24.60	Claystone, gy, soft	YES	cv, ev		0.00
0.60	24.60	25.20	Shale, gy		cm, em		0.00
3.20	25.20	28.40	Limestone, massive	YES	ak, cs, es	y	3.20
16.10	28.40	44.50	Shale, red/gy w/ ls nods		ak, cm, em		0.00
2.40	44.50	46.90	Shale, gy, sandy w/ ls nods		ak, cs, es		0.00
4.60	46.90	51.50	Sandstone, gy	YES	cs, es	y	4.60
3.80	51.50	55.30	Shale, gy w/ ls nods		ak, cm, em		0.00
7.70	55.30	63.00	Claystone, red		cv, ev		0.00
33.50	63.00	96.50	Shale, red/gy	YES	cm, em		0.00
6.50	96.50	103.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
20.00	103.00	123.00	Claystone, red/gy w/ ls nods		ak, cv, ev		0.00
20.00	123.00	143.00	Shale, gy w/ ls nods		ak, cm, em		0.00
4.10	143.00	147.10	Claystone, red/gy		cv, ev		0.00
3.30	147.10	150.40	Limestone, nodular		ak, cs, es	y	3.30
1.00	150.40	151.40	Claystone, gy		cv, ev		0.00
0.40	151.40	151.80	Limestone		ak, cs, es	y	0.40
5.80	151.80	157.60	Claystone, gy		cv, ev		0.00
3.90	157.60	161.50	Shale, red/gy		cm, em		0.00
1.50	161.50	163.00	Shale, gy, sandy		cs, es		0.00
15.50	163.00	178.50	Shale, gy		cm, em		0.00
4.50	178.50	183.00	Claystone, gy		cv, ev		0.00
20.00	183.00	203.00	Shale, gy		cm, em		0.00
4.90	203.00	207.90	Claystone, gy		cv, ev		0.00
1.00	207.90	208.90	Shale, dk gy		cm, em		0.00
0.90	208.90	209.80	Shale, blk		ac, cm, em		0.00
2.65	209.80	212.45	**Coal w/ pyrite, WASHINGTON No. 12**		ac, cv, ev		0.00
0.55	212.45	213.00	**Shale, gy w/ coal stks**		ac, cv, ev		0.00
0.20	213.00	213.20	**Coal w/ bone stks**		ac, cv, ev		0.00
0.30	213.20	213.50	**Shale, dk gy w/ coal stks**		ac, cv, ev		0.00
0.95	213.50	214.45	**Coal**		ac, cv, ev		0.00
0.30	214.45	214.75	Shale, blk		ac, cm, em		0.00
14.00	214.75	228.75	Claystone, gy		cv, ev		0.00
12.00	228.75	240.75	Shale, gy		cm, em		0.00
4.50	240.75	245.25	Shale, gy, sandy		cs, es		0.00
1.20	245.25	246.45	Shale, gy		cm, em		0.00
6.10	246.45	252.55	Shale, dk gy		cm, em		0.00
7.00	252.55	259.55	**Coal w/ pyrite and sh stks, LITTLE WASHINGTON**		ac, cv, ev		0.00
0.40	259.55	259.95	Limestone, nodular		ak, cs, es	y	0.40
0.35	259.95	260.30	Shale, gy w/ ls nods		ak, cm, em		0.00
0.75	260.30	261.05	Shale, blk		ac, cm, em		0.00
0.80	261.05	261.85	Limestone		ak, cs, es	y	0.80
0.70	261.85	262.55	Claystone, gy		cv, ev		0.00
0.70	262.55	263.25	Limestone, nodular		ak, cs, es	y	0.70
6.30	263.25	269.55	Claystone, gy w/ ls nods		ak, cv, ev		0.00
5.20	269.55	274.75	Sandstone, gy, massive		cs, es	y	5.20
5.50	274.75	280.25	Shale, gy, sandy		cs, es		0.00
3.20	280.25	283.45	Shale, gy		cm, em		0.00
1.70	283.45	285.15	Shale, gy, sandy w/ ls nods		ak, cs, es		0.00
4.10	285.15	289.25	Sandstone, gy		cs, es	y	4.10
4.00	289.25	293.25	Shale, gy, sandy		cs, es		0.00
1.30	293.25	294.55	Shale, gy		cm, em		0.00
1.50	294.55	296.05	Shale, dk gy		cm, em		0.00
0.90	296.05	296.95	Shale, gy w/ ls nods		ak, cm, em		0.00
4.70	296.95	301.65	Claystone, dk gy		cv, ev		0.00

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2001-02

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
0.70	301.65	302.35	Shale, blk		ac, cm, em		0.00
0.20	302.35	302.55	Shale, dk gy		ac, cm, em		0.00
7.80	302.55	310.35	Shale, gy		cm, em		0.00
6.10	310.35	316.45	Shale, gy, sandy		cs, es		0.00
5.10	316.45	321.55	Shale, gy		cm, em		0.00
0.20	321.55	321.75	**Coal w/ pyrite, WAYNESBURGH No. 11**		ac, cv, ev		0.00
0.60	321.75	322.35	Shale, gy		cm, em		0.00
1.80	322.35	324.15	Shale, gy w/ ls nods		ak, cm, em		0.00
2.30	324.15	326.45	Limestone, nodular		ak, cs, es	y	2.30
3.80	326.45	330.25	Claystone, gy, w/ ls nods		ak, cv, ev		0.00
12.10	330.25	342.35	Limestone w/ sh layers		ak, cs, es	y	12.10
16.00	342.35	358.35	Claystone, gy w/ ls nods		ak, cv, ev		0.00
3.20	358.35	361.55	Shale, red/gy w/ ls nods		ak, cm, em		0.00
1.20	361.55	362.75	Limestone		ak, cs, es	y	1.20
3.60	362.75	366.35	Claystone, gy		cv, ev		0.00
1.20	366.35	367.55	Limestone, shaley		ak, cs, es	y	1.20
2.00	367.55	369.55	Claystone, gy w/ ls nods		ak, cv, ev		0.00
0.50	369.55	370.05	Limestone, nodular		ak, cs, es	y	0.50
2.00	370.05	372.05	Shale, gy		cm, em		0.00
1.20	372.05	373.25	Core loss				0.00
41.10	373.25	414.35	Limestone w/ sh layers		ak, cs, es	y	41.10
21.10	414.35	435.45	Limestone, shale, nodular		ak, cs, es	y	21.10
19.00	435.45	454.45	Limestone w/ sh layers		ak, cs, es	y	19.00
2.70	454.45	457.15	Shale, gy, limey		ak, cm, em		0.00
0.60	457.15	457.75	Shale, dk gy		cm, em		0.00
0.20	457.75	457.95	Shale, blk		ac, cm, em		0.00
0.90	457.95	458.85	**Coal, SEWICKELY No. 9**		ac, cv, ev		0.00
0.70	458.85	459.55	Shale, dk gy w/ coal		ac, cm, em		0.00
8.50	459.55	468.05	Shale, gy		cm, em		0.00
5.40	468.05	473.45	Shale, gy, sandy		cs, es		0.00
5.70	473.45	479.15	Shale, gy		cm, em		0.00
10.40	479.15	489.55	Sandstone w/ sh stks		cs, es	y	10.40
1.40	489.55	490.95	Shale, gy		cm, em		0.00
1.00	490.95	491.95	**Coal w/ bone layers, FISHPOT**		ac, cv, ev		0.00
0.35	491.95	492.30	**Coal / shale layers**		ac, cv, ev		0.00
0.90	492.30	493.20	**Coal w/ pyrite**		ac, cv, ev		0.00
19.65	493.20	512.85	Limestone, nodular		ak, cs, es	y	19.65
6.50	512.85	519.35	Shale, gy, sandy		cs, es		0.00
4.90	519.35	524.25	Shale, gy		cm, em		0.00
3.20	524.25	527.45	Limestone, massive		ak, cs, es	y	3.20
1.50	527.45	528.95	Claystone, gy		cv, ev		0.00
1.50	528.95	530.45	Claystone, dk gy		cv, ev		0.00
3.40	530.45	533.85	Shale, gy w/ ls nods		ak, cm, em		0.00
13.70	533.85	547.55	Limestone, nodular		ak, cs, es	y	13.70
5.40	547.55	552.95	Claystone, gy		cv, ev		0.00
0.25	552.95	553.20	Shale, dk gy		cm, em		0.00
0.50	553.20	553.70	Claystone, gy, soft		cv, ev		0.00
0.95	553.70	554.65	Claystone, gy		cv, ev		0.00
0.64	554.65	555.29	**Coal w/ bone and sh stks, ROOF COAL**		ac, cv, ev		0.00
0.70	555.29	555.99	Claystone, gy		cv, ev		0.00
2.06	555.99	558.05	**Coal w/ pyrite, PITTSBURGH No.8**		ac, cv, ev		0.00
1.21	558.05	559.26	**Coal w/ bone**		ac, cv, ev		0.00
2.08	559.26	561.34	**Coal w/ sh layers**		ac, cv, ev		0.00
1.87	561.34	563.21	Claystone, dk gy		cv, ev		0.00
2.60	563.21	565.81	Claystone, gy		cv, ev		0.00
5.50	565.81	571.31	Shale, gy, sandy		cs, es		0.00
9.80	571.31	581.11	Sandstone w/ sh stks		cs, es	y	9.80
	Total Depth	581.11					177.95

Acid Producing: ac
Alkaline Producing: ak
Compactible: c (v-very, m-moderate, s-slight)
Erodible: e (v-very, m-moderate, s-slight)

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2001-02

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
Total Thickness of Hard Rock Overlying Mining Unit							177.95
Thickness and Percentage of Hard and Soft Rock Overlying Mining Unit							31%

	Thickness (Ft.)	Percent (%)
Hard Rock:	177.95	31%
Soft Rock:	403.16	69%
	581.11	

ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 Coalbed

Stratum	Neutralization Potential, tons/1000 tons as CaCO3	Total Sulphur %	Pyritic Sulphur %	Potential Acidity, tons /1000 tons as $CaCO_3$ (Total Sul.)	CaCO3 Deficiency, tons/1000 tons as $CaC0_3$ (Total Sul.)
Roof, 10 ft.	148.21	2.44	2.22	76.26	-71.95
Coal	4.74	5.44	2.92	170.0	165.3
Bottom, 10 ft.	156.50	3.64	3.40	113.55	-43.0

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2001-04

Field Engineer: Kim Cecil
Surface Elevation: 1,003.59
Drill Hole Coordinates (State Plane 1927 NA Datum)
Northing: 684,675
Easting: 2,418,410
Drilling Company: Jay Little Drilling Company

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
18.00	0.00	18.00	Casing				0.00
1.42	18.00	19.42	Sandstone, gy	YES	cs, es	y	1.42
1.75	19.42	21.17	Shale, dk gy w/ coal	YES	cv, ev		0.00
1.00	21.17	22.17	Limestone	YES	ak, cs, es	y	1.00
0.58	22.17	22.75	Claystone, gy		cv, ev		0.00
1.45	22.75	24.20	**Coal w/ sh stks, WAYNESBURGH "A"**	YES	ac, cv, ev		0.00
1.08	24.20	25.28	Limestone		ak, cs, es	y	1.08
0.50	25.28	25.78	Claystone, gy	YES	cv, ev		0.00
9.67	25.78	35.45	Claystone, gy w/ ls nods		ak, cv, ev		0.00
4.34	35.45	39.79	Shale, gy, sandy w/ ls nods		ak, cs, es		0.00
9.25	39.79	49.04	Claystone, red/gy, sandy w/ ls nods		ak, cm, em		0.00
2.50	49.04	51.54	Limestone, shaley		ak, cs, es	y	2.50
2.16	51.54	53.70	Sandstone, gy		cs, es	y	2.16
4.25	53.70	57.95	Shale, gy, sandy		cs, es		0.00
1.58	57.95	59.53	Claystone, gy		cv, ev		0.00
3.75	59.53	63.28	Limestone w/ clay stks		ak, cs, es	y	3.75
3.92	63.28	67.20	Claystone, dk gy/ gy w/ ls nods		ak, cv, ev		0.00
18.16	67.20	85.36	Shale, gy, sandy		cs, es		0.00
30.00	85.36	115.36	Limestone w/ claystone		ak, cs, es	y	30.00
4.42	115.36	119.78	Shale, gy, sandy		cs, es		0.00
11.42	119.78	131.20	Limestone w/ sh layers		ak, cs, es	y	11.42
5.92	131.20	137.12	Shale, gy, sandy w/ ls nods		ak, cs, es		0.00
0.50	137.12	137.62	Sandstone, gy		cs, es	y	0.50
0.83	137.62	138.45	Shale, grn, sandy		cs, es		0.00
12.50	138.45	150.95	Limestone, w/ claystone		ak, cs, es	y	12.50
16.92	150.95	167.87	Shale, gy/grn, sandy, limey		ak, cs, es		0.00
9.16	167.87	177.03	Claystone, gy/grn w/ ls nods		ak, cv, ev		0.00
20.34	177.03	197.37	Limestone, shaley		ak, cs, es	y	20.34
3.50	197.37	200.87	Shale, grn, sandy, limey		ak, cs, es		0.00
14.00	200.87	214.87	Claystone, grn w/ ls nods		ak, cv, ev		0.00
3.25	214.87	218.12	Shale, grn w/ ls nods		ak, cm, em		0.00
9.58	218.12	227.70	Limestone, shaley, nodular		ak, cs, es	y	9.58
3.58	227.70	231.28	Claystone, gy		cv, ev		0.00
2.00	231.28	233.28	**Coal, bony w/ sh. Layers, SEWICKLEY No. 9**		ac, cv, ev		0.00
1.50	233.28	234.78	Shale, dk gy		cm, em		0.00
7.75	234.78	242.53	Sandstone, gy		cs, es	y	7.75
6.00	242.53	248.53	Shale, gy		cm, em		0.00
5.00	248.53	253.53	Claystone, gy		cv, ev		0.00
2.55	253.53	256.08	**Coal w/ sh layers**		ac, cv, ev		0.00
0.71	256.08	256.79	Shale, dk gy, sandy		cs, es		0.00
16.16	256.79	272.95	Limestone, shaley		ak, cs, es	y	16.16
5.58	272.95	278.53	Claystone, gy/ grn w/ ls nods		ak, cv, ev		0.00
4.58	278.53	283.11	Sandstone, gy		cs, es	y	4.58
4.42	283.11	287.53	Shale, gy		cm, em		0.00
2.16	287.53	289.69	Limestone, nodular		ak, cs, es	y	2.16
3.16	289.69	292.85	Claystone, gy/ grn w/ ls nods		ak, cv, ev		0.00
0.50	292.85	293.35	Shale, dk gy		cm, em		0.00
1.25	293.35	294.60	**Coal w/ pyrite**		ac, cv, ev		0.00
12.25	294.60	306.85	Limestone, shaley, nodular		ak, cs, es	y	12.25
3.25	306.85	310.10	Claystone, gy w/ ls nods		ak, cv, ev		0.00
3.00	310.10	313.10	Claystone, gy/grn w/ ls nods		ak, cv, ev		0.00
0.42	313.10	313.52	Limestone		ak, cs, es	y	0.42

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC 2001-04

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
2.92	313.52	316.44	Claystone, gy/grn w/ ls nods		ak, cv, ev		0.00
3.16	316.44	319.60	Claystone, gy		cv, ev		0.00
0.95	319.60	320.55	**Coal w/ sh layers, ROOF COAL**		ac, cv, ev		0.00
1.02	320.55	321.57	Shale, dk gy		cm, em		0.00
4.03	321.57	325.60	**Coal, bony, PITTSBURGH No.8**		ac, cv, ev		0.00
1.27	325.60	326.87	**Coal w/ pyrite**		ac, cv, ev		0.00
3.81	326.87	330.68	Limestone, shaley		ak, cs, es	y	3.81
4.00	330.68	334.68	Claystone, gy w/ ls nods		ak, cv, ev		0.00
7.83	334.68	342.51	Sandstone, gy		cs, es	y	7.83
0.84	342.51	343.35	Shale, gy, sandy		cs, es		0.00
	Total Depth	343.35					151.21

Acid Producing: ac
Alkaline Producing: ak
Compactible: c (v-very, m-moderate, s-slight)
Erodible: e (v-very, m-moderate, s-slight)

Total Thickness of Hard Rock Overlying Mining Unit 151.21

Thickness and Percentage of Hard and Soft Rock Overlying Mining Unit 44%

	Thickness (Ft.)	Percent (%)
Hard Rock:	151.21	44%
Soft Rock:	192.14	56%
	343.35	

ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 Coalbed

Stratum	Neutralization Potential, tons/1000 tons as CaCO3	Total Sulphur %	Pyritic Sulphur %	Potential Acidity, tons /1000 tons as $CaCO_3$ (Total Sul.)	CaCO3 Deficiency, tons/1000 tons as $CaC0_3$ (Total Sul.)
Roof, 10 ft.	175.05	2.07	1.25	64.7	-110.4
Coal	4.61	5.05	2.79	158.00	153.4
Bottom, 10 ft.	401.00	2.01	1.51	62.81	-338.19

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC-2001-10

Field Engineer: Kim Cecil
Surface Elevation: 1,266.50
Drill Hole Coordinates (State Plane 1927 NA Datum)
Northing: 678,002
Easting: 2,417,321
Drilling Company: Kerogen Resources

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
67.00	0.00	67.00	Casing				0.00
3.00	67.00	70.00	Claystone, gy	YES	cv, ev		0.00
10.00	70.00	80.00	Claystone, red/ grn	YES	cv, ev		0.00
9.00	80.00	89.00	Shale, gy, sandy	YES	cm, em		0.00
3.80	89.00	92.80	Shale, red		cm, em		0.00
12.10	92.80	104.90	Claystone, red/ grn w/ ls nods		ak, cv, ev		0.00
3.70	104.90	108.60	Claystone, gy, sandy		cm, em		0.00
2.10	108.60	110.70	Claystone, red/ grn w/ ls nods		ak, cv, ev		0.00
2.20	110.70	112.90	Shale, grn, sandy w/ ls nods		ak, cs, es		0.00
5.80	112.90	118.70	Shale, red/ grn, sandy		cs, es		0.00
0.90	118.70	119.60	Claystone, red/ grn		cv, ev		0.00
16.80	119.60	136.40	Claystone, red/ grn w/ ls nods		ak, cv, ev		0.00
2.30	136.40	138.70	Shale, gy, sandy		cs, es		0.00
0.80	138.70	139.50	Claystone, red/ grn		cv, ev		0.00
10.50	139.50	150.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
3.60	150.00	153.60	Claystone, red/ grn, limey		ak, cv, ev		0.00
3.70	153.60	157.30	Shale, gy w/ ss stks		cs, es		0.00
6.40	157.30	163.70	Shale, red/ grn		cm, em		0.00
38.00	163.70	201.70	Sandstone, gy w/ sh stks		cs, es	y	38.00
0.60	201.70	202.30	Shale, blk w/ coal stks		ac, cv, ev		0.00
12.70	202.30	215.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
63.00	215.00	278.00	Sandstone, gy w/ sh stks		cs, es	y	63.00
1.80	278.00	279.80	Sandstone, gy w/ coal stks		cs, es	y	1.80
8.20	279.80	288.00	Sandstone, gy, massive		cs, es	y	8.20
0.40	288.00	288.40	Sandstone, gy w/ coal stks		cs, es	y	0.40
15.50	288.40	303.90	Sandstone, gy, massive		cs, es	y	15.50
1.60	303.90	305.50	Claystone, gy		cv, ev		0.00
2.10	305.50	307.60	Limestone, shaley		ak, cs, es	y	2.10
2.40	307.60	310.00	Shale, gy w/ interbedded ss		cs, es		0.00
4.60	310.00	314.60	Sandstone, gy w/ sh stks		cs, es	y	4.60
2.10	314.60	316.70	Shale, gy w/ ls nods		ak, cm, em		0.00
2.10	316.70	318.80	Shale, dk gy		cm, em		0.00
5.50	318.80	324.30	Limestone, shaley, layered		ak, cs, es	y	5.50
2.60	324.30	326.90	Shale, dk gy		cm, em		0.00
0.35	326.90	327.25	Shale, blk		ac, cm, em		0.00
0.65	327.25	327.90	**Coal w/ bone stks, WAYNESBURGH No. 11**		ac, cv, ev		0.00
5.10	327.90	333.00	Shale, gy		cm, em		0.00
2.20	333.00	335.20	Shale, gy w/ ss stks		cs, es		0.00
5.80	335.20	341.00	Sandstone, gy w/ sh stks		cs, es	y	5.80
0.90	341.00	341.90	Shale, gy		cm, em		0.00
0.30	341.90	342.20	**Bone w/ coal, LITTLE WAYNESBURGH**		ac, cv, ev		0.00
0.80	342.20	343.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
27.00	343.00	370.00	Limestone, shaley, layered		ak, cs, es	y	27.00
2.80	370.00	372.80	Claystone, gy		cv, ev		0.00
4.50	372.80	377.30	Sandstone, gy, churned		cs, es	y	4.50
4.60	377.30	381.90	Shale, red/ grn		cm, em		0.00
1.00	381.90	382.90	Limestone, shaley, massive		ak, cs, es	y	1.00
5.20	382.90	388.10	Claystone, gy w/ ls nods		ak, cv, ev		0.00
1.00	388.10	389.10	Shale, gy, sandy		cs, es		0.00
7.90	389.10	397.00	Sandstone, gy w/ sh stks		cs, es	y	7.90
10.80	397.00	407.80	Claystone, gy, sandy		cm, em		0.00
2.20	407.80	410.00	Limestone, massive		ak, cs, es	y	2.20

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC-2001-10

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
1.00	410.00	411.00	Claystone, gy		cv, ev		0.00
5.20	411.00	416.20	Limestone, massive		ak, cs, es	y	5.20
2.00	416.20	418.20	Shale, gy, sandy		cs, es		0.00
3.00	418.20	421.20	Sandstone, gy w/ sh stks		cs, es	y	3.00
0.80	421.20	422.00	Claystone, gy		cv, ev		0.00
33.60	422.00	455.60	Limestone, shaley, layered		ak, cs, es	y	33.60
3.30	455.60	458.90	Shale, grn		cm, em		0.00
5.40	458.90	464.30	Limestone, massive		ak, cs, es	y	5.40
17.40	464.30	481.70	Limestone, shaley, layered		ak, cs, es	y	17.40
2.30	481.70	484.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
2.00	484.00	486.00	Shale, dk gy		cm, em		0.00
3.15	486.00	489.15	**Coal w/ bone stks, SEWICKLEY No. 9**		ac, cv, ev		0.00
0.10	489.15	489.25	Pyrite		ac, cs, es	y	0.10
1.35	489.25	490.60	Claystone, gy w/ ls nods		ak cv, ev		0.00
2.50	490.60	493.10	Shale, gy, sandy		cs, es		0.00
1.90	493.10	495.00	Claystone, gy, sandy w/ ls nods		ak, cm, em		0.00
8.70	495.00	503.70	Shale, gy		cm, em		0.00
3.50	503.70	507.20	Shale, dk gy		cm, em		0.00
0.85	507.20	508.05	**Coal w/ bone stks**		ac, cv, ev		0.00
0.40	508.05	508.45	Claystone, dk gy		cv, ev		0.00
1.00	508.45	509.45	**Coal**		ac, cv, ev		0.00
0.30	509.45	509.75	Claystone, dk gy		cv, ev		0.00
0.55	509.75	510.30	**Coal w/ sh stks**		ac, cv, ev		0.00
1.50	510.30	511.80	Claystone, dk gy		cv, ev		0.00
14.30	511.80	526.10	Limestone, shaley, layered		ak, cs, es	y	14.30
3.40	526.10	529.50	Claystone, gy w/ ls nods		ak, cv, ev		0.00
4.50	529.50	534.00	Sandstone, gy		cs, es	y	4.50
7.00	534.00	541.00	Shale, gy, sandy w/ ls nods		ak, cs, es		0.00
2.80	541.00	543.80	Limestone, shaley, layered		ak, cs, es	y	2.80
3.75	543.80	547.55	Claystone, gy		cv, ev		0.00
0.65	547.55	548.20	**Coal, shaley, bony, pyritic**		ac, cv, ev		0.00
16.30	548.20	564.50	Limestone, shaley, layered		ak, cs, es	y	16.30
3.20	564.50	567.70	Claystone, gy w/ ls nods		ak, cv, ev		0.00
0.70	567.70	568.40	Limestone, shaley, layered		ak, cs, es	y	0.70
1.60	568.40	570.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
1.80	570.00	571.80	Claystone, dk gy		cv, ev		0.00
2.32	571.80	574.12	Shale, dk gy		cm, em		0.00
0.28	574.12	574.40	**Coal w/ pyrite, ROOF COAL**		ac, cv, ev		0.00
0.90	574.40	575.30	Shale, dk gy/ gy		cm, em		0.00
5.05	575.30	580.35	**Coal, PITTSBURGH No. 8**		ac, cv, ev		0.00
0.15	580.35	580.50	**Coal w/ bone stks**		ac, cv, ev		0.00
1.85	580.50	582.35	Shale, gy		cm, em		0.00
1.35	582.35	583.70	Limestone, shaley		ak, cs, es	y	1.35
2.70	583.70	586.40	Claystone, gy w/ ls nods		ak, cv, ev		0.00
2.10	586.40	588.50	Claystone, gy		cv, ev		0.00
1.10	588.50	589.60	Claystone, gy w/ ls nods		ak, cv, ev		0.00
0.50	589.60	590.10	Shale, gy, sandy		cs, es		0.00
3.40	590.10	593.50	Sandstone, gy w/ sh stks		cs, es	y	3.40
0.80	593.50	594.30	Shale, gy w/ ss stks		cs, es		0.00
1.90	594.30	596.20	Sandstone, gy w/ sh stks		cs, es	y	1.90
1.70	596.20	597.90	Shale, gy w/ ss stks		cs, es		0.00
2.10	597.90	600.00	Sandstone, gy, churned		cs, es	y	2.10
	Total Depth	600.00					299.55

Acid Producing: ac
Alkaline Producing: ak
Compactible: c (v-very, m-moderate, s-slight)
Erodible: e (v-very, m-moderate, s-slight)

TOVCC 19748

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC-2001-10

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
Total Thickness of Hard Rock Overlying Mining Unit							299.55
Thickness and Percentage of Hard and Soft Rock Overlying Mining Unit							50%

	Thickness (Ft.)	Percent (%)
Hard Rock:	299.55	50%
Soft Rock:	300.45	50%
	600.00	

ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 Coalbed

Stratum	Neutralization Potential, tons/1000 tons as CaCO3	Total Sulphur %	Pyritic Sulphur %	Potential Acidity, tons /1000 tons as $CaCO_3$ (Total Sul.)	CaCO3 Deficiency, tons/1000 tons as $CaC0_3$ (Total Sul.)
Roof, 10 ft.	158.20	1.60	1.51	50.1	-108.1
Coal	4.35	5.24	2.61	165.00	160.7
Bottom, 10 ft.	188.60	2.28	2.01	71.10	-117.5

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC-2001-14

Field Engineer: Kim Cecil
Surface Elevation: 1,314.97
Drill Hole Coordinates (State Plane 1927 NA Datum)
Northing: 674,806
Easting: 2,425,948
Drilling Company: Kerogen Resources

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
15.00	0.00	15.00	Casing				0.00
4.90	15.00	19.90	Sandstone, gy / sh stks	Yes	cs, es	y	4.90
5.10	19.90	25.00	Shale, gy	Yes	cm, em		0.00
8.70	25.00	33.70	Shale,dk gy	Yes	cm, em		0.00
1.40	33.70	35.10	Limestone		ak, cs, es	y	1.40
2.55	35.10	37.65	Shale,dk gy		cm, em		0.00
0.25	37.65	37.90	Coal		ac, cv, ev		0.00
0.20	37.90	38.10	Shale, blk		ac, cv, ev		0.00
7.50	38.10	45.60	Claystone, gy w/ ls nods		ak, cv, ev		0.00
11.40	45.60	57.00	Claystone, red w/ ls nods	Yes	ak, cv, ev		0.00
3.70	57.00	60.70	Claystone, gy, sandy, limey		ak, cm, em		0.00
4.80	60.70	65.50	Sandstone, gy / sh stks	Yes	cs, es	y	4.80
33.50	65.50	99.00	Claystone, red w/ ls nods		ak, cv, ev		0.00
2.60	99.00	101.60	Claystone, gy, sandy w/ ls nods		ak, cm, em		0.00
6.80	101.60	108.40	Sandstone, gy / sh stks		cs, es	y	6.80
3.20	108.40	111.60	Shale, gy w/ ss stks		cs, es		0.00
6.40	111.60	118.00	Shale, red/ grn w/ ls nods	Yes	ak, cm, em		0.00
1.00	118.00	119.00	Claystone, gy		cv, ev		0.00
4.30	119.00	123.30	Shale, gy, sandy		cs, es		0.00
5.20	123.30	128.50	Claystone, gy w/ ls nods		ak, cv, ev		0.00
7.50	128.50	136.00	Claystone, red		cv, ev		0.00
4.00	136.00	140.00	Claystone, red/ grn, sandy w/ ls nods		ak, cm, em		0.00
1.90	140.00	141.90	Sandstone, gy / sh stks		cs, es	y	1.90
6.10	141.90	148.00	Shale, red/ grn		cm, em		0.00
1.10	148.00	149.10	Sandstone, gy, churned		cs, es	y	1.10
4.90	149.10	154.00	Sandstone, gy / sh stks		cs, es	y	4.90
7.60	154.00	161.60	Claystone, red/ grn w/ ls nods		ak, cv, ev		0.00
5.40	161.60	167.00	Claystone, gy, sandy w/ ls nods		ak, cm, em		0.00
2.10	167.00	169.10	Claystone, red/ grn w/ ls nods		ak, cv, ev		0.00
2.00	169.10	171.10	Claystone, dk gy		cv, ev		0.00
1.90	171.10	173.00	Shale, gy, sandy w/ ls nods		ak, cm, em		0.00
12.40	173.00	185.40	Claystone, red/ grn		cv, ev		0.00
8.80	185.40	194.20	Claystone, red/ grn w/ ls nods		ak, cv, ev		0.00
0.30	194.20	194.50	Claystone, blk		ac, cv, ev		0.00
8.00	194.50	202.50	Claystone, gy w/ ls nods		ak, cv, ev		0.00
27.20	202.50	229.70	Claystone, red/ grn w/ ls nods		ak, cv, ev		0.00
12.70	229.70	242.40	Shale, gy w/ ls nods		ak, cm, em		0.00
0.45	242.40	242.85	Shale, dk gy, layered		cm, em		0.00
5.15	242.85	248.00	Claystone, red/ grn		cv, ev		0.00
4.00	248.00	252.00	Limestone, shaley, layered		ak, cs, es	y	4.00
8.30	252.00	260.30	Shale, gy, sandy w/ ls nods		ak, cs, es		0.00
2.30	260.30	262.60	Claystone, gy		cv, ev		0.00
1.40	262.60	264.00	Shale, gy w/ ss stks		cs, es		0.00
5.60	264.00	269.60	Sandstone, gy / sh stks		cs, es	y	5.60
0.40	269.60	270.00	Shale, gy w/ ss stks		cs, es		0.00
7.00	270.00	277.00	Claystone, red/ grn		cv, ev		0.00
2.60	277.00	279.60	Claystone, gy, sandy		cm, em		0.00
4.20	279.60	283.80	Claystone, gy, sandy w/ ls nods		ak, cm, em		0.00
1.00	283.80	284.80	Sandstone, gy, churned		cs, es	y	1.00
3.30	284.80	288.10	Sandstone, gy / sh stks		cs, es	y	3.30
2.10	288.10	290.20	Claystone, gy, sandy w/ ls nods		ak, cm, em		0.00
2.50	290.20	292.70	Sandstone, gy / sh stks		cs, es	y	2.50

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ATTACHMENT 13

DIAMOND DRILL HOLE: AEC-2001-14

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
3.70	292.70	296.40	Shale, gy w/ ss stks		cs, es		0.00
3.00	296.40	299.40	Shale, gy		cm, em		0.00
0.10	299.40	299.50	Limestone, shaley, layered		ak, cs, es	y	0.10
4.40	299.50	303.90	Claystone, gy		cv, ev		0.00
1.40	303.90	305.30	Shale, blk w/ coal stks		ac, cv, ev		0.00
1.45	305.30	306.75	**Coal w/ bone stks, WASHINGTON No. 12**		ac, cv, ev		0.00
0.50	306.75	307.25	Shale, dk gy		ac, cv, ev		0.00
1.25	307.25	308.50	**Coal w/ bone stks**		ac, cv, ev		0.00
14.50	308.50	323.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
8.30	323.00	331.30	Claystone, gy, sandy w/ ls nods		ak, cm, em		0.00
16.30	331.30	347.60	Sandstone, gy w/ crossbeds		cs, es	y	16.30
4.50	347.60	352.10	Shale, gy w/ ss stks and ls nods		ak, cs, es		0.00
2.90	352.10	355.00	Shale, gy w/ ss stks		cs, es		0.00
0.35	355.00	355.35	Shale, dk gy, layered		cm, em		0.00
1.95	355.35	357.30	Shale, gy		cm, em		0.00
0.20	357.30	357.50	Shale, dk gy		cm, em		0.00
1.40	357.50	358.90	**Coal w/ bone stks, LITTLE WASHINGTON**		ac, cv, ev		0.00
0.10	358.90	359.00	Shale, blk		ac, cv, ev		0.00
3.50	359.00	362.50	**Coal w/ sh layers**		ac, cv, ev		0.00
0.20	362.50	362.70	Shale, blk		ac, cv, ev		0.00
1.40	362.70	364.10	**Coal w/ bone stks, pyritic**		ac, cv, ev		0.00
0.90	364.10	365.00	Claystone, blk		ac, cv, ev		0.00
2.20	365.00	367.20	Limestone, shaley, layered		ak, cs, es	y	2.20
9.90	367.20	377.10	Claystone, gy w/ ls nods		ak, cv, ev		0.00
5.20	377.10	382.30	Shale, gy w/ ss stks		cs, es		0.00
2.20	382.30	384.50	Shale, gy		cm, em		0.00
0.90	384.50	385.40	Claystone, gy		cv, ev		0.00
1.60	385.40	387.00	Limestone, shaley, layered		ak, cs, es	y	1.60
7.70	387.00	394.70	Sandstone, gy		cs, es	y	7.70
2.50	394.70	397.20	Shale, gy w/ ss stks		cs, es		0.00
1.60	397.20	398.80	Shale, dk gy		cm, em		0.00
0.70	398.80	399.50	Shale, blk		ac, cv, ev		0.00
1.05	399.50	400.55	Shale, dk gy		cm, em		0.00
5.05	400.55	405.60	Limestone, shaley, layered		ak, cs, es	y	5.05
0.30	405.60	405.90	Sandstone, gy w/ sh stks		cs, es	y	0.30
3.30	405.90	409.20	Claystone, dk gy		cv, ev		0.00
0.90	409.20	410.10	Shale, dk gy		cm, em		0.00
0.75	410.10	410.85	Shale, blk w/ coal stks		ac, cm, em		0.00
1.35	410.85	412.20	Claystone, gy		cv, ev		0.00
0.60	412.20	412.80	Shale, gy		cm, em		0.00
8.50	412.80	421.30	Shale, gy w/ ss stks		cs, es		0.00
0.70	421.30	422.00	Shale, dk gy, layered		cm, em		0.00
0.38	422.00	422.38	Shale, dk gy w/ coal stks		cm, em		0.00
0.22	422.38	422.60	**Coal w/ bone stks, WAYNESBURGH No. 11**		ac, cv, ev		0.00
1.10	422.60	423.70	Claystone, dk gy		cv, ev		0.00
4.50	423.70	428.20	Claystone, gy		cv, ev		0.00
0.40	428.20	428.60	Shale, dk gy w/ ss stks		cs, es		0.00
19.00	428.60	447.60	Limestone, shaley, layered		ak, cs, es	y	19.00
8.10	447.60	455.70	Claystone, gy w/ ls nods		ak, cv, ev		0.00
1.80	455.70	457.50	Limestone, shaley, layered		ak, cs, es	y	1.80
1.10	457.50	458.60	Claystone, grn		cv, ev		0.00
0.70	458.60	459.30	Shale, blk w/ coal stks		cm, em		0.00
0.40	459.30	459.70	Claystone, dk gy		cv, ev		0.00
2.70	459.70	462.40	Claystone, gy w/ ss stks		cm, em		0.00
1.60	462.40	464.00	Sandstone, gy, churned		cs, es	y	1.60
0.60	464.00	464.60	Shale, gy w/ ss stks		cs, es		0.00
4.60	464.60	469.20	Shale, red/ grn		cm, em		0.00
10.40	469.20	479.60	Limestone, shaley, layered		ak, cs, es	y	10.40
0.50	479.60	480.10	Claystone, gy		cv, ev		0.00
2.00	480.10	482.10	Shale, gy, sandy		cs, es		0.00
19.60	482.10	501.70	Limestone, shaley, layered		ak, cs, es	y	19.60
2.70	501.70	504.40	Shale, gy w/ ss stks		cs, es		0.00
1.30	504.40	505.70	Claystone, gy		cv, ev		0.00
10.00	505.70	515.70	Limestone, shaley, layered		ak, cs, es	y	10.00

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ATTACHMENT 13

DIAMOND DRILL HOLE: AEC-2001-14

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)
3.30	515.70	519.00	Claystone, gy w/ ls nods		ak, cv, ev		0.00
17.70	519.00	536.70	Limestone, shaley, layered		ak, cs, es	y	17.70
2.70	536.70	539.40	Claystone, gy		cv, ev		0.00
5.10	539.40	544.50	Claystone, gy/ grn		cv, ev		0.00
11.40	544.50	555.90	Limestone, shaley, layered		ak, cs, es	y	11.40
4.60	555.90	560.50	Claystone, gy/ grn		cv, ev		0.00
9.50	560.50	570.00	Limestone, shaley, layered		ak, cs, es	y	9.50
1.00	570.00	571.00	Claystone, dk gy		cv, ev		0.00
1.00	571.00	572.00	Shale, blk w/ coal stks		ac, cv, ev		0.00
0.45	572.00	572.45	Sandstone, gy, churned		cs, es	y	0.45
0.45	572.45	572.90	Shale, blk/ dk gy		cm, em		0.00
5.10	572.90	578.00	Claystone, gy, sandy, w/ ls nods		al, cm, em		0.00
16.00	578.00	594.00	Shale, gy w/ ss stks		cs, es		0.00
1.70	594.00	595.70	Sandstone, gy w/ sh stks		cs, es	y	1.70
2.00	595.70	597.70	Shale, gy w/ ss stks		cs, es		0.00
3.30	597.70	601.00	Shale, dk gy		cm, em		0.00
0.40	601.00	601.40	Shale, dk gy, layered		cm, em		0.00
0.60	601.40	602.00	Shale, blk w/ coal stks		ac, cv, ev		0.00
0.75	602.00	602.75	**Coal w/ bone stks, pyritic, SEWICKLEY No. 9**		ac, cv, ev		0.00
0.55	602.75	603.30	Shale, blk w/ coal stks		ac, cv, ev		0.00
1.40	603.30	604.70	**Coal w/ sh layers**		ac, cv, ev		0.00
18.90	604.70	623.60	Limestone, shaley, layered		ak, cs, es	y	18.90
2.80	623.60	626.40	Sandstone, gy w/ sh stks		cs, es	y	2.80
6.80	626.40	633.20	Shale, gy		cm, em		0.00
0.50	633.20	633.70	Sandstone, gy w/ sh stks		cs, es	y	0.50
2.00	633.70	635.70	Shale, dk gy		cm, em		0.00
3.10	635.70	638.80	Limestone, shaley, layered		ak, cs, es	y	3.10
0.40	638.80	639.20	Shale, dk gy		cm, em		0.00
1.00	639.20	640.20	Claystone, grn		cv, ev		0.00
1.80	640.20	642.00	Shale, blk w/ coal stks		ac, cv, ev		0.00
1.20	642.00	643.20	Claystone, gy		cv, ev		0.00
0.60	643.20	643.80	Claystone, gy, sandy		cm, em		0.00
5.55	643.80	649.35	Limestone, shaley, massive		ak, cs, es	y	5.55
0.60	649.35	649.95	Claystone, dk gy w/ ls nods		ak, cm, em		0.00
4.60	649.95	654.55	Limestone, nodular		ak, cs, es	y	4.60
0.70	654.55	655.25	Shale, dk gy w/ ls nods		ak, cm, em		0.00
2.55	655.25	657.80	Limestone, nodular		ak, cs, es	y	2.55
3.10	657.80	660.90	Claystone, dk gy/ gy		cv, ev		0.00
0.25	660.90	661.15	Limestone, shaley, nodular		ak, cs, es	y	0.25
1.05	661.15	662.20	Claystone, gy		cv, ev		0.00
0.70	662.20	662.90	Claystone, gy w/ ls nods		ak, cv, ev		0.00
0.40	662.90	663.30	Limestone, shaley, mosaic		ak, cs, es	y	0.40
1.65	663.30	664.95	Claystone, grn		cv, ev		0.00
1.95	664.95	666.90	Claystone, brn/ blk		cv, ev		0.00
0.25	666.90	667.15	Shale, blk w/ coal stks		ac, cv, ev		0.00
1.05	667.15	668.20	**Coal w/ bone, pyritic, ROOF COAL**		ac, cv, ev		0.00
0.49	668.20	668.69	Shale, blk/ dk gy		ac, cv, ev		0.00
0.25	668.69	668.94	Shale, brn/ blk		cm, em		0.00
0.15	668.94	669.09	Limestone, shaley, layered		ak, cs, es	y	0.15
4.88	669.09	673.97	**Coal w/ bone stks, PITTSBURGH No. 8**		ac, cv, ev		0.00
0.68	673.97	674.65	**Coal, pyritic**		ac, cv, ev		0.00
0.10	674.65	674.75	Shale, dk gy		cm, em		0.00
0.40	674.75	675.15	Shale, gy		cm, em		0.00
0.50	675.15	675.65	Shale, gy w/ ls nods		ak, cm, em		0.00
1.55	675.65	677.20	Limestone, nodular		ak, cs, es	y	0.00
2.30	677.20	679.50	Claystone, gy w/ ls nods		ak, cv, ev		0.00
1.20	679.50	680.70	Claystone, gy, sandy		cm, em		0.00
2.30	680.70	683.00	Shale, gy w/ ls nods		ak, cm, em		0.00
2.80	683.00	685.80	Sandstone, gy		cs, es	y	2.80
Total Depth		685.80					220.20

ATTACHMENT 13

DIAMOND DRILL HOLE: AEC-2001-14

Thickness (ft.)	Depth From (ft.)	To (ft.)	Strata	Water Bearing	Physical Properties	HR	Thickness of Hard Rock (ft.)

Acid Producing: ac
Alkaline Producing: ak
Compactible: c (v-very, m-moderate, s-slight)
Erodible: e (v-very, m-moderate, s-slight)

Total Thickness of Hard Rock Overlying Mining Unit 220.20

Thickness and Percentage of Hard and Soft Rock Overlying Mining Unit 32%

	Thickness (Ft.)	Percent (%)
Hard Rock:	220.20	32%
Soft Rock:	465.60	68%
	685.80	

ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 Coalbed

Stratum	Neutralization Potential, tons/1000 tons as CaCO3	Total Sulphur %	Pyritic Sulphur %	Potential Acidity, tons /1000 tons as $CaCO_3$ (Total Sul.)	CaCO3 Deficiency, tons/1000 tons as $CaC0_3$ (Total Sul.)
Roof, 10 ft.	193.31	1.90	1.62	59.4	-133.9
Coal	6.13	5.11	2.21	160.00	153.9
Bottom, 10 ft.	146.10	3.37	2.53	105.05	-41.1

TOVCC 19753

COAL MINING AND RECLAMATION PERMIT APPLICATION TO REVISE A PERMIT (ARP)

Issued To: OHIO VALLEY COAL CO
56854 PLEASANT RIDGE ROAD
ALLEDONIA, OH 43902

Telephone: (740) 926-1351

ARP Type:
Slurry Line

Permit Number: D-360
Application Number: R-0360-55

Effective: 07/01/2003
Expires: 06/19/2004

The issuance of this ARP means only that the application to conduct a coal mining operation meets the requirements of Chapter 1513 of the Revised Code, and as such DOES NOT RELIEVE the operator of any obligation to meet other federal, state or local requirements.

This ARP is issued in accordance with and subject to the provisions, conditions, and limitations of Chapter 1513 of the Revised Code and Chapters 1501:13-1, 1501:13-3 through 1501:13-14 of the Administrative Code.

The approved water monitoring plan for this ARP is:

Quality: N/A
Quantity: N/A

Note: Any previous condition(s) imposed on this permit, or subsequent adjacent areas, also apply to this ARP unless noted otherwise.

Signature: Michael G. Sponsler by [illegible] **Date:** 07/01/2003
Chief, Mineral Resources Management

OPERATOR

F100 Rev: 07/01/2001

2/96

_____ New Submittal
__x__ Revised Submittal

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

APPLICATION TO REVISE A COAL MINING PERMIT

Note: Refer to the Division's "General Guideline for Processing ARPs" and "Requirements for Specific Types of Common ARPs" for guidance on submitting and processing ARPs.

1. Applicant's Name THE OHIO VALLEY COAL COMPANY .
   Address 56854 PLEASANT RIDGE ROAD
   City ALLEDONIA State Ohio Zip 43902
   Telephone Number 740 - 926 - 1351
2. Permit Number D-0360

3. Section of mining and reclamation plan to be revised:

   PART 3, PAGE 23, ITEM A(14)(a)

4. Describe in detail the proposed revision and submit any necessary drawings, plans, maps, etc.:

   THIS REVISION INCLUDES CHANGES TO THE REFUSE DISPOSAL PLAN

5. Describe in detail the reason for requesting the revision:

   THIS REVISION SHOWS THAT REFUSE FROM THE NEARBY CENTURY MINE WILL BE DISPOSED OF AT THE NO. 6 MINE (D-0360 PERMIT AREA).

6. Will this revision constitute a significant alternation from the mining and reclamation operation contemplated in the original permit? _____ Yes, __X__ No.
   (**Note:** refer to paragraph (E) (2) of 1501:13-04-06 of the Ohio Administrative Code to determine if a revision is deemed significant.)

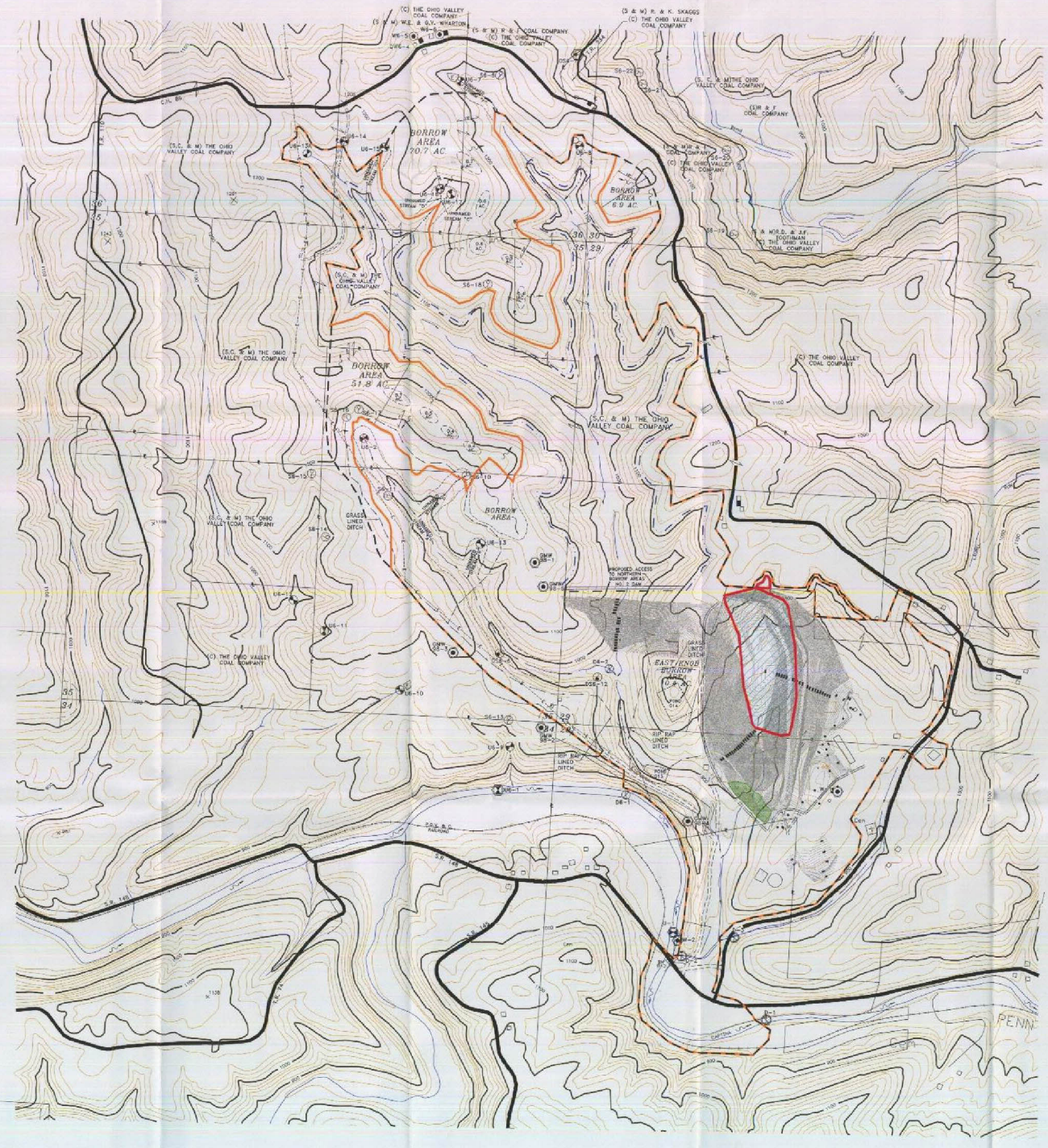
   If "yes," complete the following items 7 through 9.

OPERATOR

ADDENDUM TO ARP ITEM 4
THE OHIO VALLEY COAL COMPANY
PERMIT D-0360

Coal mine waste will be transported to the Ohio Valley Coal Company via a pipeline or by truck for disposal at its facilities. The disposal facilities have a current capacity of over 19 million tons of coarse and fine (slurry) refuse. Future facilities are planned to continue this operation once the current facilities are completed. Attachment 13's from the Century Mine show the nature of the roof, floor, and coal at the Century Mine. Refuse from the Century Mine is expected to be comprised of these materials or parts of these materials. The refuse disposal facilities at No. 6 have a life expectancy of two years for slurry and 8 years for coarse refuse.

All refuse will be disposed at the Powhatan No. 6 facilities in accordance with approved plans and specifications. Reclamation of these facilities is discussed in the original permit application and in application D-0360-8.



#8 COAL SEAM

LOCATION MAP
SCALE: 1" = 1 MILE
MAPPING FROM: ARMSTRONGS MILLS & HUNTER QUADS
DRAINAGE BASIN: CAPTINA CREEK

LEGEND

- OCCUPIED DWELLING
- UNOCCUPIED DWELLING
- PUBLIC, COMMUNITY, INSTITUTIONAL BUILDING
- SCHOOL
- CHURCH
- COMMERCIAL/BUSINESS BUILDING
- WELL (GAS/OIL)
- ROADS OUTSIDE PERMIT AREA
- ELECTRIC UTILITY LINE
- PROPERTY LINE
- BEGIN MINING
- END MINING
- SLOPE MEASUREMENTS
- TEST BORING
- ENTRANCE SIGN
- FINAL HIGHWALL
- EXISTING HIGHWALL
- COAL OUTCROP
- PREVIOUS MINING AREA
- CROPLAND
- AUGER AREA
- PRIME FARMLAND
- EXISTING WATER IMPOUNDMENT
- PERENNIAL STREAM
- INTERMITTENT STREAM
- CONSTRUCTED DRAINWAY
- DIRECTION OF FLOW
- 100' STREAM BUFFER ZONE
- WATER TREATMENT FACILITY
- SEDIMENT POND
- TOPSOIL STORAGE
- AFFECTED AREA - *BOUNDED*
- (S) SURFACE OWNER
- (C) COAL OWNER
- (M) MINERAL OWNER
- (L) LESSEE
- 1000' LIMITS
- PUBLIC WATER LINE
- SOURCE OF PUBLIC WATER SUPPLY
- SEEP, SEEPAGE ZONE, SWAMP
- U- UPSTREAM SAMPLING STATION
- D- DOWNSTREAM SAMPLING STATION
- W- DRILLED WELL (LOG AVAILABLE)
- W- DRILLED WELL (NO LOG AVAILABLE)
- DW- DUG WELL
- DS- DEVELOPED SPRING
- S- UNDEVELOPED SPRING
- W- WATER IMPOUNDMENT
- BACKGROUND SAMPLING STATION
- DM- DEEP MINE ENTRY (WATER DISCHARGE)
- DEEP MINE ENTRY
- PERMIT BOUNDARY
- MONITORING STATION
- HOUSE NUMBERS FOR BLASTING PLAN
- PERMIT D-0360 (EXISTING COAL REFUSE DISPOSAL AREA) PROPOSED REFUSE DISPOSAL AREA
- EXISTING COAL REFUSE DISPOSAL SLURRY POND
- BORROW AREAS
- AREAS TO BE RECLAIMED

SEDIMENT PONDS

POND #	SURF. AC.	AC. FT.

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS MAP IS CORRECT, AND SHOWS TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL THE INFORMATION REQUIRED BY CHAPTER 1513 OF THE REVISED CODE AND RULES PROMULGATED THEREUNDER.

CHARLES R. FRISCHKORN
REGISTERED
No. 6,759
REGISTERED PROFESSIONAL SURVEYOR
STATE OF OHIO

REG. SURVEYOR #

ACKNOWLEDGED BEFORE ME A NOTARY PUBLIC THIS 19th DAY OF Jan, 2001

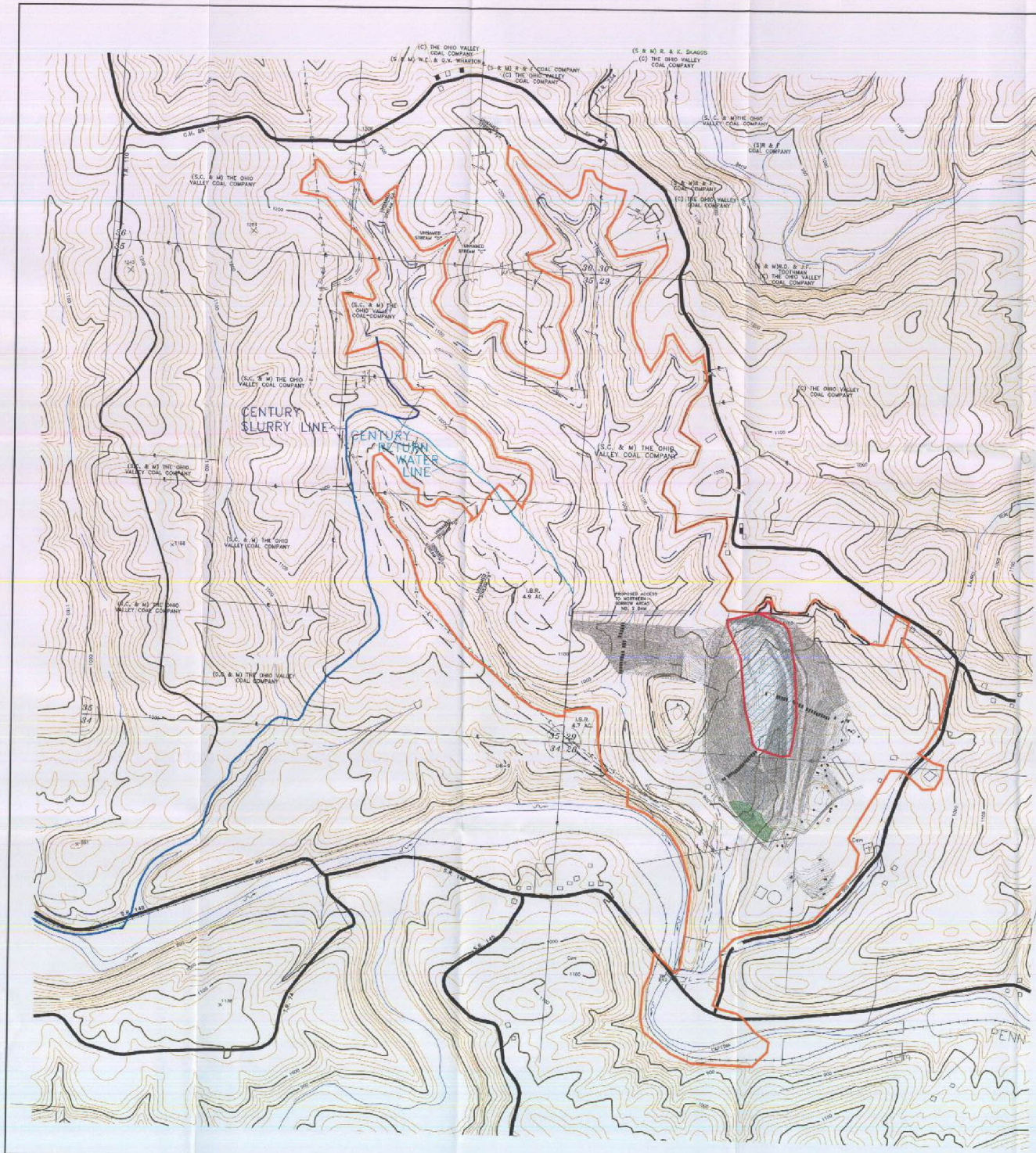
16
4 Ray
0 Ct

NOTARY PUBLIC

ANNUAL MAP - YEAR 16	
THE OHIO VALLEY COAL COMPANY	PERMIT D-0360
SECTIONS: 28, 29, 30, 35, 36 T.- 5N R.- 4W	
TWP.- WASHINGTON	COUNTY: BELMONT
SCALE: 1" = 400'	CONTOUR INTERVAL: 20'
DATE PREPARED: JUNE 14, 2000	
JACK A. HAMILTON & ASSOCIATES, INC. FLUSHING, OHIO	

OPERATOR

TOPOC 13757



LOCATION MAP
SCALE 1" = 1 MILE
MAPPING FROM: ARMSTRONGS MILLS & HUNTER QUADS
DRAINAGE BASIN CAPTINA CREEK

LEGEND

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- DEEP MINE ENTRY
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- MONITORING STATION
- HOUSE NUMBERS FOR BLASTING PLAN
- PERMIT D-0360 (EXISTING COAL REFUSE DISPOSAL AREA) PROPOSED REFUSE DISPOSAL AREA
- EXISTING COAL REFUSE DISPOSAL SLURRY POND
- BORROW AREAS
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Charles E. Nelson 7109
REG. SURVEYOR

ACKNOWLEDGED BEFORE ME A NOTARY PUBLIC THIS 7th DAY OF April, 2003

Debra J. Edward
NOTARY PUBLIC

ARP MAP WITH CENTURY SLURRY LINE	
THE OHIO VALLEY COAL COMPANY	PERMIT D-0360
SECTIONS: 88, 29, 30, 25, 36 T- 3N	R- 4W
TWP.- WASHINGTON	COUNTY: BELMONT
SCALE: 1" = 400'	CONTOUR INTERVAL-20'
DATE PREPARED: MARCH 17, 2003	

REVISIONS
4/4/03

TOTCI 15758