# COAL MINING AND RECLAMATION PERMIT

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

**Telephone:** (740) 926-1351

**Permit Number:** D-360
**Application Number:** D-0360-13
**Acreage:** 0
**Underground Acreage:** 38.6

**Effective:** 10/21/2002
**Expires:** 06/19/2009

**Type of Operation:** Underground (Room and Pillar)

**LOCATION IS NOT AVAILIABLE**

The issuance of this permit 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 permit 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 water monitoring plan for this permit shall be:

**Quality:** See Page 26, F3 of the Permit Application
**Quantity:** See Page 26, F3 of the Permit Application

**Note:** These monitoring requirements are separate from NPDES monitoring requirements.

**Signature:** **Date:** 10/21/2002

Chief, Mineral Resources Management

F46 Rev: 07/01/2001

# APPROVED UNDERGROUND
# COAL MINING PERMIT APPLICATION

## Applicant:

**Name:** OHIO VALLEY COAL CO
**Address:** 56854 PLEASANT RIDGE ROAD
ALLEDONIA, OH 43902
**Telephone:** (740) 926-1351

**Application Number:** D-0360-13

**Number of acres in underground workings:** 38.6

**Number of surface acres to be affected:** 0

**The water monitoring plan for this permit shall be:**

**Quality:** See Page 26, F3 of the Permit Application
**Quantity:** See Page 26, F3 of the Permit Application

**Note:** These monitoring requirements are separate from NPDES monitoring requirements.

This application is APPROVED since it demonstrates and the Division has found that the criteria in paragraph (E) of rule 1501: 13-5-01 of the Administrative Code have been met.

**Signature:** Michael G Sponsler by R W Cox **Date:** 10-21-02

OPERATOR

F63 Rev: 07/01/2001

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

June 19, 2002

The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Gentlemen:

The Division has reviewed coal mining and reclamation permit application # D-0360-13 and revisions are required before processing can continue. Please comply with the following application requirements.

A. Application Review

1. Page 2, F: Provide the printed name, date, signature, title and notarization acknowledging these revisions.

2. Page 4, A(10): Revise the Attachment 5 for American Energy Corporation by deleting permit D-1125 and adding permit D-1159.

B. Engineering Review

1. Revise to provide the strength of the clay stone floor under saturated conditions simulating a flooded mine. Contrary to previous statements included in the permit application, water will accumulate and fill the mine when it is abandoned. Obtain a sample of the claystone floor from one of the adjacent permits and subject that sample to the testing requested and revise your response to include the results of these tests as requested in the previous revision letter. A sample of the floor material could also be saturated in the lab and tested. Evaluate the bearing capacity of the floor under the pillar.

C. Hydrology Review

1. Attachment 14A: Revise the pH of the sample of D37-000 collected on 9/12/01, as the indicated value of 87.72 is incorrect.

2. Attachment 14C:

a. Why was the supplying aquifer for W-172 changed to zone C? Note that this is inconsistent with the Attachment 14A, which indicates that zone D recharges this well.

b. Per comment **B7d** of the previous revision letter, revise to indicate that DW-173 is located on the *S*. Rice property.

wl-168?

Changed to W294?

c. Submit a revised log #221729, as the previously submitted log correlated this log with well W-294, which the cover letter indicated was incorrect.

3. Page 14, E(1-3): Delete the entire Literature section of the narrative on pages 6 and 7, as this narrative pertains strictly to the impacts of longwall mining on ground water, which is not applicable with this application.

4. Page 18, F(2): Revise the 1st full paragraph on page 2 which incorrectly states that the OVCC will only replace developed supplies that are being used at the time of undermining. A temporarily inactive supply undergoing repair or maintenance or used as a back-up supply should not be considered unused, as neither the OAC rules nor the Division PPD's regarding water replacement place this stringent restriction.

5. Page 26, F(3):

a. Delete reference to only monitoring *utilized* streams, as there is no precedent or regulatory or scientific justification for this limited stream monitoring. Note that very few streams would ever be monitored if only utilized streams were monitored, and the original submittal did not impose this monitoring restriction.

b. Revise the 1st sentence of the Ground Water portion of the narrative, as the word "full" creates confusion, possibly implying full coal recovery, which is not proposed. .

c. Indicate that OVCC will submit a Request to Cease Monitoring prior to discontinuing monitoring. Note that cessation of monitoring is not automatic following 12 months of monitoring after undermining.

D. Application/Hydrology Map Review

1. Provide a revised map date. 4?

2. Show the undeveloped spring located in hollow between the drainages occupied by spring S-41 and stream U-34-001 (on the property owned by Funkhouser). Note that this spring is near the 1100 foot contour and within the hydrologic boundary.

15

3. Ownership of the property west of State Route 147 (on either side of Township Road 211) is still not clearly shown; therefore, add a property hook through State Route 147 to show that F. Simpson owns the property on both sides of this road.

When submitting the above revisions, please submit three copies of the requested revisions. Two copies will be sent to the field for review. Three additional copies of the application will be requested at a later date. If you have any questions, feel free to e-mail me at deborah.bates@dnr.state.oh.us or call me at (614) 265-6654.

Sincerely,

Deborah S Bates

Deborah S. Bates
Environmental Specialist
Division of Mineral Resources Management

cc: Joe Noonan
George Mychkovsky
Kevin Ricks

**THE OHIO VALLEY COAL COMPANY**
**FAX TRANSMISSION**
August 2, 2002

To: Debbie Bates, Joe Noonan

From: David L. Bartsch, P.E.

Subject: Compressive Strength – Floor Rock

Number of pages: 4

Debbie and Joe,

We received the strength table from DLZ Corp of Columbus, Ohio which included an additional sample that was saturated for 28 days. I have changed the text of the addendum (attached) to reflect that additional data. Please let me know if you need any additional information. Debbie, after I hear from Randy Keitz, I'll send you the map.
Dave

David L. Bartsch, P.E.
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, OH 43902
Phone: 740-926-1351
Fax: 740-926-9112

ADDENDUM TO PAGE 29, K4(g)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

Strength Of Floor Rock Under Saturated Conditions

The strength of the floor rock beneath the pillars is a concern in the long-term stability of areas of the mine where pillars are to remain. The floor at the Powhatan No. 6 Mine is comprised of about a foot of interbedded shale, clay stone, limestone, and limey shales in layers of a few hundredths to a few tenths of a foot in thickness. As such, there it is not possible to test the strength of the interbedded material, and given its thickness (about a foot), even if it became saturated, it is unlikely to cause surface subsidence.

Underlying that layer of interbedded rock, is a layer of limey shale or sandy shale with a thickness of about three (3) ft. This member comprises the main floor of the mine. Previous applications have presented test results of the compressive strength of this floor rock (see Addendum to Page 29, Park 3, K(4). The strength varied from just under 4,000 psi to just over 12,500 psi. There have been questions about the strength of this rock under saturated conditions and its ability to support the surface.

Ohio Valley collected available core samples of floor rock from test holes in the vicinity of Dysart Woods (located just to the west of the Ohio University Property). One sample was saturated for 24 hours and another sample from the same core was left in its original dry condition. One sample was large enough to extract a third sample, which was saturated for 28 days. All samples were then tested to determine their compressive strength according to ASTM D-2938 (Unconfined Compressive Strength Of Intact Raw Core). The results are shown in Table A.

TABLE A
Compressive strength of floor rock – Powhatan No. 6 Mine*

| Boring | Condition @ test | Unit Weight (pcf) | Compressive Strength (psi) |
|---|---|---|---|
| S-1A | Dry | 166.32 | 4,877 |
| S-1B | Saturated 24 hr | 165.33 | 5,614 |
| S-1C | Saturated 28 days | 167.40 | 6,566 |
| S-2A | Dry | 164.56 | 5,460 |
| S-2B | Saturated 24 hr | 165.05 | 14,665 |
| S-3A | Dry | 167.72 | 9,997 |
| S-3B | Saturated 24 hr | 163.68 | 7,879 |
| S-4A | Dry | 163.52 | 4,863 |
| S-4B | Saturated 24 hr | 166.94 | 4,500 |
| Average Dry | | | 6,299 |
| Average Sat. | | | 7,845 |

o - Samples tested by DLZ Corporation of Columbus, Ohio.

The results indicate that there is no decrease in strength due to the presence of water (inundation or saturation). The rock appears to be a competent in all conditions and there is not expected to be any subsidence as a result of saturation of this rock member. Results are similar for one sample saturated for 28 days.

# Unconfined Compression of Rock Core Specimens
(ASTM D-2938)

DLZ Project No.: 0221-3003.01

Project Name: Ohio Valley Coal

Client: Ohio Valley Coal Company

Date: 7/30/02

| Boring | Time in water | Condition @ test | $D_1$ | $D_2$ | $D_3$ | $D_{(ave)}$ | $L_1$ | $L_2$ | $L_3$ | $L_{(ave)}$ | L/D | Volume ($ft^3$) | Mass (Gram) | Unit Wt.(pcf) | Load (lbs) | Strength (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-1A | 0 | dry | 1.989 | 1.986 | 1.990 | 1.990 | 4.329 | 4.330 | 4.324 | 4.328 | 2.175 | 0.007782 | 587.06 | 166.32 | 15,160 | 4,877 |
| | | | 1.986 | 1.994 | 1.992 | | | | | | | | | | | |
| S-1B | 24h | wet | 1.987 | 1.991 | 1.991 | 1.989 | 4.268 | 4.289 | 4.272 | 4.276 | 2.150 | 0.007684 | 576.26 | 165.33 | 17,440 | 5,614 |
| | | | 1.983 | 1.990 | 1.991 | | | | | | | | | | | |
| S-1C | 28d | wet | 1.991 | 1.993 | 1.991 | 1.991 | 4.127 | 4.127 | 4.123 | 4.126 | 2.072 | 0.007432 | 564.35 | 167.40 | 20,450 | 6,566 |
| | | | 1.992 | 1.991 | 1.990 | | | | | | | | | | | |
| S-2A | 0 | dry | 1.993 | 1.992 | 1.987 | 1.991 | 4.836 | 4.840 | 4.840 | 4.839 | 2.431 | 0.008709 | 650.10 | 164.56 | 16,990 | 5,460 |
| | | | 1.986 | 1.993 | 1.992 | | | | | | | | | | | |
| S-2B | 24h | wet | 1.990 | 1.997 | 1.990 | 1.992 | 4.912 | 4.926 | 4.922 | 4.920 | 2.469 | 0.008872 | 664.20 | 165.05 | 45,720 | 14,665 |
| | | | 1.993 | 1.994 | 1.990 | | | | | | | | | | | |
| S-3A | 0 | dry | 1.990 | 1.989 | 1.991 | 1.990 | 4.982 | 4.990 | 4.988 | 4.987 | 2.506 | 0.008971 | 682.50 | 167.72 | 31,030 | 9,977 |
| | | | 1.988 | 1.990 | 1.992 | | | | | | | | | | | |
| S-3B | 24h | wet | 1.993 | 1.989 | 1.993 | 1.991 | 4.473 | 4.478 | 4.470 | 4.474 | 2.247 | 0.008059 | 598.36 | 163.68 | 24,540 | 7,879 |
| | | | 1.993 | 1.988 | 1.992 | | | | | | | | | | | |

DLZ

Engineers * Architects * Scientists

6121 Huntley Road * Columbus, Ohio * 43229-1003 * Phone: (614) 888-0576 * Fax (614) 888-6415

# Unconfined Compression of Rock Core Specimens

(ASTM D-2938)

DLZ Project No.: 0221-3001.00

Client: Ohio Valley Coal Company

Project Name: Ohio Valley Coal

Date: 7/30/02

| Boring | Time in water | Condition @ test | $D_1$ | $D_2$ | $D_3$ | $D_{(ave)}$ | $L_1$ | $L_2$ | $L_3$ | $L_{(ave)}$ | L/D | Volume ($ft^3$) | Mass (Grams) | Unit Wt.(pcf) | Load (lbs) | Strength (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-4A | 0 | dry | 1.993 | 1.997 | 1.993 | 1.992 | 4.473 | 4.478 | 4.470 | 4.474 | 2.245 | 0.008067 | 598.36 | 163.52 | 15,160 | **4,863** |
| | | | 1.991 | 1.988 | 1.992 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| S-4B | 24h | wet | 1.989 | 1.993 | 1.992 | 1.990 | 3.998 | 3.992 | 3.995 | 3.995 | 2.007 | 0.00719 | 544.41 | 166.94 | 14,000 | 4,500 |
| | | | 1.987 | 1.991 | 1.99 | | | | | | | | | | | |

DLZ

Engineers * Architects * Scientists

6121 Huntley Road * Columbus, Ohio * 43229-1003 * Phone: (614) 888-0576 * Fax (614) 888-6415

August 5, 2002

Ms. Debbie Bates
Environmental Specialist
Division of Mineral Resources Management
Ohio Department of Natural Resources
1855 Fountain Square Court
Columbus OH 43224

Dear Debbie:

Enclosed are three copies of the final revisions for the D-0360-13 application. They address the following:

The application map has been revised to add a spring north of Well W-458 (designated S-42) and a property hook has been added across SR 147.

The addendum to Page 29, K(4) has been revised to show the final results of compressive strength on floor rock, and a laboratory report is enclosed.

The addendum to Page 26, F(3) has been revised to remove other references to utilized streams.

If you have any questions, please contact me.

Sincerely,
THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: File

56854 PLEASANT RIDGE ROAD ◦ ALLEDONIA OHIO 43902
(740) 926-1351 ◦ FAX (740) 926-1615

September 4, 2002

Ms. Debbie Bates
Environmental Specialist
Division of Mineral Resources Management
1855 Fountain Square Court
Columbus OH 43224

Dear Debbie:

Enclosed are the final three (3) copies of the D-0360-13 application as requested. If you have any questions, please contact me.

Sincerely,
THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: File

56854 PLEASANT RIDGE ROAD • ALLEDONIA OHIO 43902
(740) 926-1351 • FAX (740) 926-1615

ADDENDUM TO PART 3, PAGE 26, F
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## GROUND WATER AND SURFACE WATER MONITORING PLANS

### 1. Ground Water Monitoring Plan

All legitimately developed, used ground water supplies will be monitored quarterly for quality and monthly for quantity for at least one year prior to full recovery mining, and at least one year subsequent to mining unless access is denied by the land owner. This monitoring will include wells and springs used for domestic purposes. Weekly quantity monitoring will be conducted whenever the longwall face is within three weeks of undermining the supply and no less than three weekly pre-mining and post-mining measurements will be made. Ground water supplies located within 500 feet (measured horizontally) of the perimeter of the active longwall panel will be monitored as if they were located on the panel. Monitoring will be continued for at least one year subsequent to full recovery mining contingent upon review by the Division of Mines and Reclamation. Daily precipitation data will be submitted quarterly to evaluate spring flow. This monitoring will include areas designated in this application as partial recovery mining areas.

### 2. Surface Water Monitoring Plan

Various surface water locations depicted on the application/hydrology map will be sampled monthly for flow and quarterly for quality. The quality requirements of OAC 1501:13-3-14(F)(2) and the other QMR parameters as stated on the QMR report sheets will apply to the surface water analysis. Each surface monitoring station will be monitored for at least one year prior to full coal recovery mining. Monitoring will be continued for at least one year subsequent to full recovery mining contingent upon review by the Division of Mines and Reclamation. Daily precipitation data will be submitted quarterly to evaluate stream flow. This monitoring will include areas designated in this application as partial recovery mining areas.

With each quarterly monitoring report of ground and surface water, a map depicting the progression of the longwall face will be attached to indicate the sampling points in the full recovery areas. Notes will be submitted indicating the position relative to the longwall face, with "+" indicating the station is in advance of the face and a "-" indicating a position behind the face. An attempt will be made to monitor and sample as outlined above, however, some sources may not be accessible. These locations, if encountered, will be documented in the quarterly reports. All samples will be taken as outlined to the extent that existing well construction allows. Any samples that are unobtainable will be documented as such in the quarterly report.

OVCC will monitor all ground and surface locations in accordance with the quarterly monitoring plan outlined above regardless of the saturated zones that they access. All developed supplies have been identified and have been indicated on the application/hydrology map.

ADDENDUM TO PAGE 26, F(3)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT 0360

GROUND AND SURFACE WATER MONITORING

Although the D-0360-13 application is for underground works only and not surface operations, ground water and surface water monitoring as previously approved for Powhatan No. 6 Mine ( Permit D-0360) will continue with respect to the surface operations. Ground water and surface water monitoring over underground areas of the mine is proposed to determine the impacts of underground mining on these areas. The proposed plan presented below is to be used in lieu of all previously proposed and existing plans for such areas.

**Surface Water**

For mining areas, intermittent and perennial streams that are utilized and that originate within the mining area will be monitored where the stream leaves the area; and utilized streams crossing through the mining area will be monitored for flow monthly both upstream and downstream of the property where they are being used, for a year prior to and after the area has been undermined. Monitored streams will be sampled quarterly and the water analyzed for quarterly parameters. Utilized streams will be monitored once a week for 3 weeks prior to the mining proceeding past a source and once a week for 3 weeks after the mining has past a source.

**Ground Water**

For full all coal mining areas, ground water monitoring will consist of monitoring and sampling all developed water sources, with the permission of the landowner, in the following manner:

> Monthly monitoring will be done for quantity (static water level/flow) for a one-year period before and after mining for developed springs and wells. This information will be reported quarterly but is available at the OVCC office.
>
> For all mining areas, quarterly monitoring will be conducted for quality for a one-year period before and after mining for developed springs, wells, and stream monitoring points. This information will be reported quarterly.
>
> Daily precipitation data from the mining area will be submitted to evaluate its impact on spring and stream flow. This information will be submitted quarterly but will be available at the OVCC office.

An attempt will be made to sample as outlined above, however, some sources may not be accessible should a landowner deny permission to sample, a well may be buried, etc. These locations, if encountered, will be documented in the quarterly reports.

ADDENDUM TO PAGE 26, F(3)
PAGE TWO

All samples will be taken as outlined to the extent that existing well construction allows. Any samples that are unobtainable will be documented as such in the quarterly report.

OVCC will monitor all developed supplies in accordance with the monitoring plan outlined above regardless of the aquifers and/or saturated zones that they access. All developed supplies have been identified and have been indicated on the Application Map. All wells, both drilled and dug have been identified. Developed springs, consisting of a french drain and catchment basin, have been shown. A map will be included in the quarterly monitoring report showing the location of the wells, streams, and springs monitored and their position relative to the active mining areas of OVCC

TOVCC 116744

## INTRODUCTION

Since 1987, three partial recovery and seven full recovery application areas of the Powhatan No. 6 Mine have been evaluated relative to the Probable Hydrologic Consequences (PHC) of mining activities. One combination area has been evaluated relative to the PHC. They are:

| Application Area | Year Prepared | Prepared By |
|---|---|---|
| R-0360-1 | 1989 | William Siplivy P.E. & C.P.G. (partial recovery) |
| R-0360-2 | 1989 | Moody and Associates, Inc. (full recovery) |
| D-0360-1 | 1990 | Moody and Associates, Inc. (partial recovery) |
| D-0360-2 | 1991 | Moody and Associates, Inc. (full recovery) |
| D-0360-3 | 1992 | William Siplivy P.E. & C.P.G. (Two additional applications were prepared by OVCC using this PHC for two small areas within the D-0360-3 area. They were identified as D-0360-4 and D-0360-5). (full recovery) |
| D-0360-6 | 1996 | Moody and Associates, Inc. (full recovery) (One additional application was prepared by OVCC using this PHC for one small area within the D-0360-6 area. It was identified as D-0360-10) (full recovery). |
| D-0360-7 | 1998 | Moody and Associates, Inc. (full recovery) |
| D-0360-9 | 1998 | Moody and Associates, Inc. (partial recovery) |
| D-0360-11 | 1999 | Moody and Associates, Inc. (full recovery) |
| D-0360-12 | 2001 | Moody and Associates, Inc. (full and partial recovery |

This PHC for the longwall Application Area D-0360-13 has been prepared on behalf of the Ohio Valley Coal Company by Moody and Associates, Incorporated. The information developed during the preparation of the previous PHC's has been used in the preparation of this PHC.



TOVCC 11675

## TOPOGRAPHIC SETTING

The Powhatan No. 6 Mine is located in Belmont County in southeastern Ohio. The topography of the entire application area is typical of the Appalachian Plateau Province and is characterized by narrow rounded ridges and deep V-shaped valleys dissecting the terrain, which is underlain by essentially horizontal sedimentary rocks. Topographic relief within the D-0360-13 application area is approximately 240 feet. The lowest elevation is approximately 1070 feet in a tributary to Williams Creek in the mid-east portion of the application area. The highest elevation is 1310 feet on a hilltop in the center of the application area.

The surface drainage within the application area is to the south and east. The drainage in the western portion of the application area is through unnamed tributaries to Miller's Run and Joy Fork, which are part of the Captina Creek drainage area. The eastern drainage is through Williams Creek. Williams Creek is a tributary of McMahon Creek.

Most of the developed water supplies (wells and springs) are located along the roads in the application area. There is a concentration of supplies along State Route 147, Hart Road, and Dunfee Road. There is a large group of water supplies along State Route 9 just east of the application area. There are large areas of the Joy Fork and Miller's Run drainage area, which have no identified water supplies. All of the identified water supplies are listed on the ATTACHMENT 14C.

## GEOLOGIC SETTING

A detailed discussion of the stratigraphic and structural setting of the Application Area is provided in the Geologic Section of this application. However, those properties of the geologic setting pertinent to ground water occurrence and movement are described here.

The bedrock units that outcrop in the Application Area belong to the Dunkard Group that is Upper Pennsylvanian to Permian in age. The rocks consist of interbedded sandstone, siltstone, shale, mudstone, clay, fresh to brackish water limestone and coal. The Monongahela Formation (Pennsylvanian) underlies the Dunkard Group and consists of similar rock types. The Pittsburgh (No. 8) Coal seam, which is the seam to be mined, marks the bottom of the Monongahela



TOVCC 11676

Formation. According to Mr. James M. Raab, a hydrogeologist with the Ohio Department of Natural Resources, in correspondence to Dave Bartsch of the Ohio Valley Coal Company dated January 30, 1989, water below 250 feet beneath the stream bottoms is brackish.

In addition, there is considerable horizontal and vertical variability of the rock units. Rapid facies and hydrologic property changes tend to limit the horizontal continuity of the individual rock units. With the exception of major coal seams, very few lithologic units are continuous across the proposed application area. Horizontal facies changes and corresponding changes in hydrologic properties of the rocks tend to enhance the importance of localized flow systems. In addition, most available ground water in this region is limited to the first 100 feet of the surface where enhanced secondary permeability associated with rock fracturing is present. This information is supported by the OVCC drilling records and from locally developed wells and springs. Ground water recharge in the upland or ridge top areas results in downward migration primarily within this shallow saturated zone. Because the topographic relief between ridge tops often exceeds 100 feet, there are localized flow systems under the hilltops that are not in hydrologic communication with adjacent hilltops. While the ground water under any given ridge top can be viewed as being continuous, the continuity generally does not extend to adjacent hilltops.

The geologic structures in the Application Area consist of gently folded rocks that dip to the southeast at approximately 30 feet per mile. Overburden thickness above the Pittsburgh coal seam ranges from a low of approximately 300 feet along the Williams Creek valley to a high of approximately 535 feet along the hilltops in the center of the area. Geologic structure can influence regional ground water flow patterns but local variations in hydraulic properties of the rocks tend to accentuate localized flow systems.

## GENERAL HYDROLOGIC SETTING

The source of all ground and surface water in the mine plan area is precipitation. Upon reaching the land surface, water that is not part of direct surface runoff or evapotranspiration infiltrates into the subsurface and contributes to soil moisture and ground water.

Within the bedrock aquifer system, ground water occurs in primary and secondary openings. Primary openings are pore spaces between sand, silt and clay grains formed at the time of sediment



TOVCC 11677

depositions. Primary permeability is the ability of water to move between pore spaces. In this area, primary permeability is very low and limited ground water movement occurs in hard or soft rocks as a result of primary openings (Stoner 1983, Siplivy 1992).

Secondary porosity and permeability is formed by fractures or partings in the rock mass. Most available ground water in the application area occurs within the first 100 feet below the surface within these secondary openings and the success of a water well in terms of yield potential is dependent upon the well encountering water filled fracture zone(s) that transmit enough water to the well bore to meet the well's intended use (Schmitt et al, 1983; Waite, 1987).

Fractures are not ubiquitous in the area, however, and are not interconnected over large areas. For these reasons, it is very difficult to identify aquifers over large areas and the ground water flow system tends to be made up of small, localized fracture controlled systems. While fractures in hard rocks tend to stay open better than fractures in soft rock, the horizontal and vertical variability of even the hard rock units tend to produce hydraulically isolated areas.

In addition, fractures tend to close at increasing depths due to overlying lithostatic pressures, thereby limiting the effective depth of the ground water flow system (Stoner, 1983). This condition is evident throughout the Powhatan No. 6 Mine. The mine, in general, is very dry with very minor amounts of water inflow limited to the low cover areas (generally less than 200 feet). The overburden thickness in the application area ranges from 300 feet to 535 feet. No water inflow into the mine is expected in this application area.

Based on an evaluation of the geologic units presently supplying water to wells or springs in the Application Area, four aquifer units have been identified within the D-0360-13 hydrologic boundary. These units, which are also outlined on Form 14B of this application, are summarized below:

**Aquifer A: Unconsolidated Material**

Includes the layer of weathered bedrock above solid bedrock and unconsolidated deposits along stream valleys.



TOVCC 11678

**Aquifer B: Washington No. 12 Cyclothem**

Includes the rock sequence from the Washington Coal Bed to the surface of the consolidated bedrock. Occurs from approximately 350 feet to 500 feet above the No. 8 Pittsburgh Coal Bed.

**Aquifer C: Waynesburg No. 11 Cyclothem**

Includes the rock sequence from the Waynesburg No. 11 Coal Bed to the Washington No. 12 Coal Bed. Occurs from approximately 250 feet to 350 feet above the No. 8 Pittsburgh Coal Bed.

**Aquifer D: Sewickley No. 9 Cyclothem**

Includes the rock sequence from the Sewickley No. 9 Coal Bed to the Waynesburg No. 11 Coal Bed. Occurs from approximately 90 feet to 250 feet above the No. 8 Pittsburgh Coal Bed.

These units are only recognized as aquifers where they occur within 100 feet of the surface where secondary porosity and permeability is greatest.

## WATER SUPPLIES

The water supplies that serve domestic and agricultural needs have been inventoried within the hydrologic boundary of the Application Area. The Application Map illustrates the location of these supplies. ATTACHMENT 14C lists both the used and unused supplies identified in the Application area. Only the used supplies are discussed in the PHC.

There are no impacts to any of the used or unused supplies that serve domestic and agricultural areas as a result of the mining within this application area.

In addition, used ponds are shown on Attachment 14D.



TOVCC 11679

## EVALUATION OF HYDROLOGIC IMPACT IN PREVIOUSLY MINED AREAS

### Quantity Impacts In Previously Mined Areas

The monitoring data from wells and springs in the previously mined areas at the Powhatan No. 6 mine indicate that there will be no impacts to wells or springs from gate entry development. Earlier water losses in room-and-pillar areas were due to unplanned subsidence where the safety factor for the pillars was not high enough. Safety factors for the gate entry pillars are well above 2:1, and no subsidence or water loss is anticipated from this operation.

A similar evaluation was performed for the developed springs that were undermined in the previously mined areas of the Powhatan No. 6 Mine. No impacts were observed from gate entry development.

Hydrographs are presented for one developed spring and four wells undermined or adjacent to main or gate development entries. In each case, there was no impact from being mined under by the development entries. No impacts to water quantity in the D-0360-13 application area are anticipated.

### Quality Impacts In Previously Mined Areas

The water quality effects of gate entry development areas do not vary from pre-mining levels due to the mining of development (mains and gate) entries. Table 1 shows water quality before and after being mined by development entries. No impacts to water quality in the D-0360-13 application area are anticipated.



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## PROBABLE HYDROLOGIC CONSEQUENCES SUMMARY

### Surface Water

Based on a review of past data collected at the Powhatan No. 6 Mine, no surface water impacts are anticipated since there will be no subsidence associated with main or gate entry development mining.

### Ground Water

The data from earlier mined areas shows that there are no impacts from main or gate entry development mining. Water impacts are only evident when an area is subsided, and no subsidence from mining is anticipated in this application area.

### Post Mining Water Breakouts

The area with the lowest cover is located in the middle-east portion of Application Area D-0360-13, in the Williams Creek valley. The lowest surface elevation in the Application Area is approximately 1070 feet msl. The maximum coal elevation in the Application Area is approximately 800 feet msl. or 270 feet below the lowest surface elevation. The lowest surface opening elevation for the entire Powhatan No. 6 Mine is 847 feet msl. The maximum coal elevation in Application Area D-0360-13 is approximately 800 feet msl. or 47 feet below the lowest surface opening. The highest coal elevation in the Powhatan No. 6 Mine is approximately 845 msl. or 2 feet below the lowest surface opening in the Powhatan No. 6 Mine. The 845 foot coal elevation is located in the D-0360-7 Application Area to the north of the D-0360-13 area. No post mining water breakouts are predicted to occur due to mining in the D-0360-13 area.

### Water Supplies

The potential impacts on the used water supplies by mining have been evaluated based on monitoring of springs and wells located over the D-0360 approved mining areas and a review of pertinent literature.



TOVCC 11681

Since there will be no subsidence associated with gate entry development mining, there are no impacts anticipated from mining within the D-0360-13 application area. The data clearly shows that impacts only occur when subsidence occurs.



TOVCC 11682

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**EVALUATION OF HYDROLOGIC IMPACT IN PREVIOUSLY MINED AREAS** ..... 6
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TABLE 1 - Groundwater Quality Summary

# Probable Hydrologic Consequences

Addendum to Page 14, E(1-3)
Ohio Valley Coal Company
Powhatan No. 6 Mine
Application Area D-0360-13

December 10, 2001
May 14, 2002 (Revised)

*Prepared For:*

**The Ohio Valley Coal Company**
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

*Prepared By:*

David M. Anderson, P.G.
Moody and Associates, Inc.
11548 Cotton Road
Meadville, PA, 16335

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 14C**
**(WELL/SPRING INVENTORY)**

Applicant's Name THE OHIO VALLEY COAL COMPANY (D-0360-13)

| Well/Spring Identification Number | Name of Owner of Well/Spring | Surface Elevation of Well/Spring | Depth of Well in Feet Below Land Surface | Static Water Level of Well in Feet Below Land Surface | Lithology of Supplying Aquifer/ Waterbearing Zone | Known Uses of Well/Spring (if spring give discharge rate) |
|---|---|---|---|---|---|---|
| WL-168 | A. FUNKHOUSER | 1112 | 62' | 37' | C | DOMESTIC |
| DW-169 | A. FUNKHOUSER | 1100 | 25' | 19' | A | DOMESTIC |
| W-172 | A. MAY | 1106 | 116' | 20' | C | NOT IN USE |
| DW-173 | R. RICE | 1166 | 25' | 16' | A | OCCASIONAL DOMESTIC |
| W-294 | J. WILSON | 1125 | 57' | 45' | C | DOMESTIC |
| W-323 | F. FUNKHOUSER | 1138 | 120' | 61' | D | DOMESTIC |
| W-396 | C. WORKMAN | 1305 | 70' | 37' | B | DOMESTIC |
| W-405 | F. SIMPSON | 1322 | 103' | 77' | B | NOT IN USE |
| DW-406 | F. SIMPSON | 1322 | 24' | 22' | A | NOT IN USE |
| W-407 | F. SIMPSON | 1306 | 63' | 57' | B | NOT IN USE |
| DW-408 | F. SIMPSON | 1305 | 33' | 26' | A | DOMESTIC |
| DS-223 | S. RICE | 1130 | N/A | N/A | B | AGRICULTURAL 1.11 GPM |
| DS-242 | R. SAFFELL | 1090 | N/A | N/A | C | AGRICULTURAL 3.1 GPM |
| DS-282 | F. SIMPSON | 1268 | N/A | N/A | B | NONE 4.35 GPM |
| DS-286 | F. SIMPSON | 1220 | N/A | N/A | B | UNUSED/1.4 GPM |
| DS-287 | F. SIMPSON | 1220 | N/A | N/A | B | UNUSED/.89 GPM |

F. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature _____ ; Date _____

Sworn before me and subscribed in my presence this

_____ day of _____, _____.

_____
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

Employer Identification No. (EIN) 34-1041310, or

Social Security No. (SSN), _____

(2) Indicate business structure of applicant and additional information:

_____ Single proprietorship,
_____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
_____ Association, _____ Other, specify _____

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____-_____-_____

EIN _____, or SSN _____

Beginning date of ownership _____

ACORD™ CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YY) 06/07/2001

PRODUCER (724)349-1300 FAX (724)349-1446
Reschini Agency Inc
922 Philadelphia Street
P.O. Box 449
Indiana, PA 15701

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURERS AFFORDING COVERAGE

INSURED
The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, OH 43902

| | |
|---|---|
| INSURER A: | Federal Insurance Company |
| INSURER B: | |
| INSURER C: | |
| INSURER D: | |
| INSURER E: | |

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

| INSR LTR | TYPE OF INSURANCE | POLICY NUMBER | POLICY EFFECTIVE DATE (MM/DD/YY) | POLICY EXPIRATION DATE (MM/DD/YY) | LIMITS | |
|---|---|---|---|---|---|---|
| A | GENERAL LIABILITY<br>[X] COMMERCIAL GENERAL LIABILITY<br>[ ] CLAIMS MADE [X] OCCUR<br>GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [ ] PRO-JECT [ ] LOC | 37104410 | 06/01/2001 | 06/01/2002 | EACH OCCURRENCE | $ 1,000,000 |
| | | | | | FIRE DAMAGE (Any one fire) | $ 100,000 |
| | | | | | MED EXP (Any one person) | $ 10,000 |
| | | | | | PERSONAL & ADV INJURY | $ 1,000,000 |
| | | | | | GENERAL AGGREGATE | $ 2,000,000 |
| | | | | | PRODUCTS - COMP/OP AGG | $ 1,000,000 |
| | AUTOMOBILE LIABILITY<br>[ ] ANY AUTO<br>[ ] ALL OWNED AUTOS<br>[ ] SCHEDULED AUTOS<br>[ ] HIRED AUTOS<br>[ ] NON-OWNED AUTOS | | | | COMBINED SINGLE LIMIT (Ea accident) | $ |
| | | | | | BODILY INJURY (Per person) | $ |
| | | | | | BODILY INJURY (Per accident) | $ |
| | | | | | PROPERTY DAMAGE (Per accident) | $ |
| | GARAGE LIABILITY<br>[ ] ANY AUTO | | | | AUTO ONLY - EA ACCIDENT | $ |
| | | | | | OTHER THAN AUTO ONLY: EA ACC | $ |
| | | | | | AGG | $ |
| | EXCESS LIABILITY<br>[ ] OCCUR [ ] CLAIMS MADE<br>[ ] DEDUCTIBLE<br>[ ] RETENTION $ | | | | EACH OCCURRENCE | $ |
| | | | | | AGGREGATE | $ |
| | | | | | | $ |
| | | | | | | $ |
| | | | | | | $ |
| | WORKERS COMPENSATION AND EMPLOYERS' LIABILITY | | | | [ ] WC STATUTORY LIMITS [ ] OTHER | |
| | | | | | E.L. EACH ACCIDENT | $ |
| | | | | | E.L. DISEASE - EA EMPLOYEE | $ |
| | | | | | E.L. DISEASE - POLICY LIMIT | $ |
| A | OTHER<br>Pollution Liability | 73170889 | 06/01/2001 | 06/01/2002 | $1,000,000 Per Occurrence<br>$1,000,000 Aggregate | |

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS
Degradation, loss, diminution of quality and quantity of public and private water supplies covered.
Damage caused by use of explosives or damage caused by blasting is covered.

CERTIFICATE HOLDER | ADDITIONAL INSURED; INSURER LETTER

Ohio Department of Natural Resources
The Division of Reclamation
Foundation Square
Columbus, OH 43224

CANCELLATION

Written notice will be provided to the certificate holder at least 30 days prior to substantive changes being made in the policy, or prior to termination or failure to renew.

AUTHORIZED REPRESENTATIVE
Karen Williams/KAREN Karen Williams

ACORD 25-S (7/97)

©ACORD CORPORATION 1988

TOVCC 11687

11-69

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF RECLAMATION

## ATTACHMENT 22
## (CERTIFICATE OF LIABILITY INSURANCE)

**Name of Insured** The Ohio Valley Coal Company

This is to certify that the policy of insurance listed below has been issued to the above named insured and is in force at this time. The policy provides bodily injury and property damage insurance for all coal mining and reclamation operations of the insured in the State of Ohio as required by paragraph (B) of rule 1501:13-7-07 of the Administrative Code stated below.

**Name of Insurer** Federal Insurance Company
**Policy Number** 37104410
**Policy Period** 6/1/2001 - 6/1/2002
**Name of Underwriting Agent** Karen Williams
**Address of Underwriting Agent** 922 Philadelphia Street, Indiana, PA 15701
**Telephone Number of Underwriting Agent** ( 724 ) 349 - 1300

In the event of cancellation or non-renewal of this policy, including non-payment of policy premiums, the insurer agrees to promptly notify:

The Division of Reclamation
Foundation Square
Columbus, OH 43224

6/7/01
Date

Karen Williams
Signature of Underwriting Agent

This certificate is issued as a matter of information only and confers no rights upon the Division of Reclamation. This certificate does not amend, extend, or alter the coverage afforded by the policy listed above.

---

**1501:13-7-07(B) The Public Liability Insurance Policy shall:**

1.) **Be in effect during the term of the permit or any renewal, including the length of all reclamation operations;**

2.) **Provide for personal injury and property damage protection in amounts adequate to compensate any persons injured or property damaged as a result of coal mining and reclamation operations, including the use of explosives. The minimum insurance coverage for bodily injury and property damage shall be three hundred thousand dollars for each occurrence and five hundred thousand dollars in the aggregate; and**

3.) **Include a rider requiring that the insurer notify the Chief whenever substantive changes are made in the policy, including any termination or failure to renew.**

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

DATE: April 17, 2002

TO: Cambridge District Office and Applicant

FROM: Mike Sponsler, Chief
Division of Mineral Resources Management

RE: Coal Mine Permit Application No. D-0360-13

Applicant Ohio Valley Coal Company

56854 Pleasant Ridge Road

Alledonia, OH 43902

Application Location:

County Belmont Township Smith

Section 22, 28, & 34 Lot n/a

The Division of Mineral Resources Management has received comment(s) as provided for by Section 1513.071(A) and (B) of the Ohio Coal Mining and Reclamation Law concerning the above referenced application.

A copy of the comment(s) is attached for your review. An informal conference, if requested, will be scheduled within 60 days of the end of the public comment period.

# DLZ FACSIMILE TRANSMISSION COVER SHEET

Date: 7/3/02

To: Dave Bartsch

Organization: O.V.C.C.

Phone: —

Fax: (740) 926-9112

From: Eugene J. Sabic

Number of Pages Transmitted Including This Page:

If there is any difficulty encountered with this transmission, please call (614) 888-0040. (FAX: 614-888-6415)

Project: OVCC

DLZ Account No.: 0221-3001.00

Subject:

Water appears to have very little to no effect on this type of rock. We will still test 1C & 4C @ 28 days.

COVER SHEET

# FAX

**To:** George Mychkovsky

**From:** Dave Bartsch

**Subject:** Add. to p 26, F(3)

**Date:** 8-2-02

**Fax #:**

**Pages:** 2

COMMENTS: Just to make sure.

Dave

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

July 31, 2002

Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia OH 43902

RE: Conditional Clearance Historic and Prehistoric Properties
Application: #D-0360-13 38.6 acres

Dear Applicant:

This is to inform you that the Division has given your proposed mining project a conditional clearance. The conditions include the following: Prior to any surface affectment or surface or historic structure repair from the unforeseen affects of this room and pillar underground mining operation further coordination is necessary with the Division and the Ohio Historic Preservation Office.

It is your responsibility to notify the Division prior to actual affectment of the avoided historic and prehistoric properties. The Division will inform you of the necessary steps required to remove the above conditions.

If you have any questions or need additional information, please contact me at (614) 265-6641.

Sincerely,

Jeffrey C. Reichwein, Ph.D.
Archaeologist
Division of Mineral Resources Management

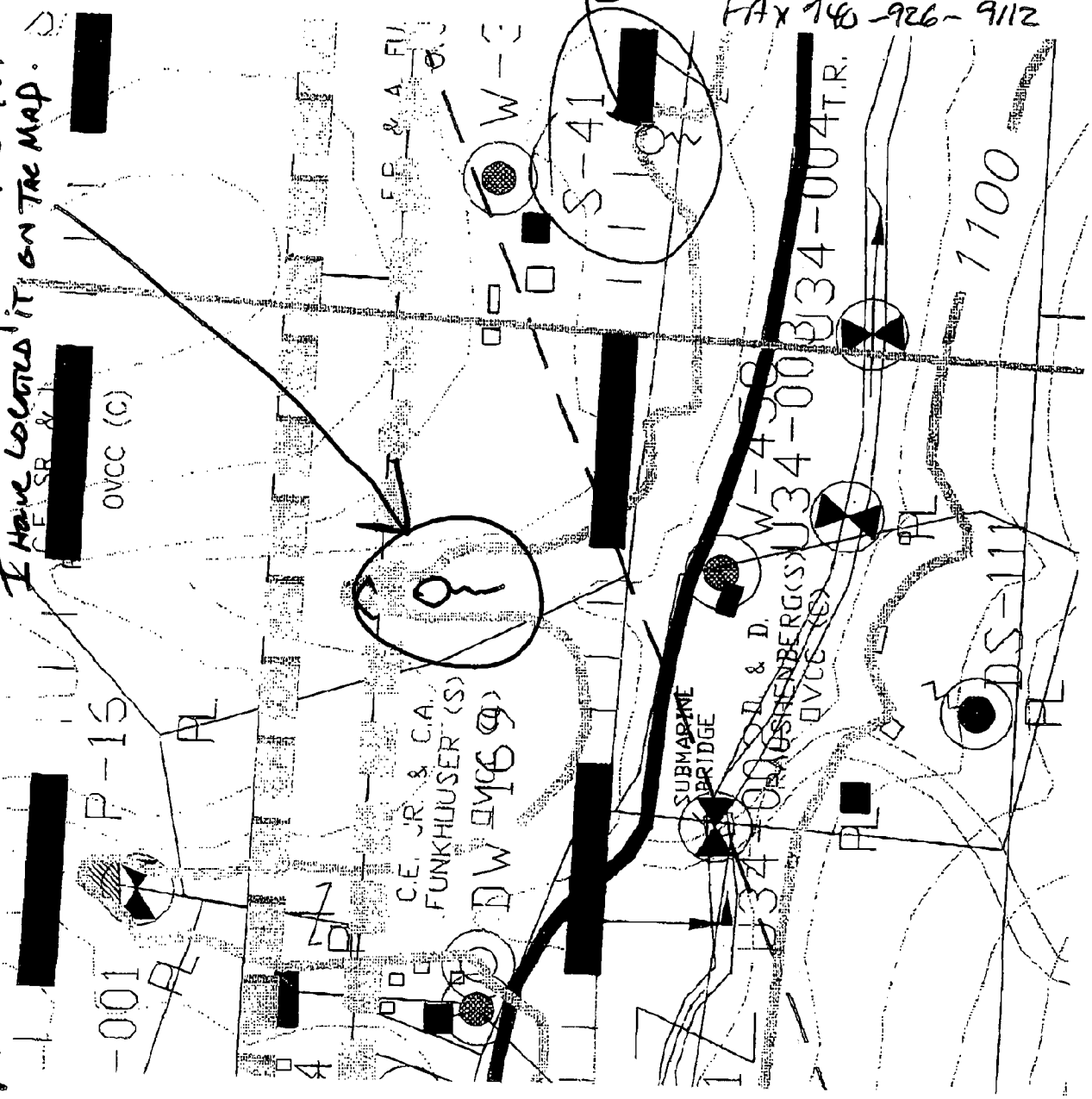
JCR:pat
Enclosure
cc: Ohio Historic Preservation Office
Inspector: Cambridge District Office
File

DNR 0001

TOVCC 11692

TO KEVIN RICKS
FROM DAVE BARTSCH
KEVIN - ① IS WHERE THE LANDOWNER ID'D the location of under. spring. Do you have another location? IF so please mark it on map + FAX BACK I'll confirm in field Thanks,
Dave Bartsch
Please Call 740-926-1351
FAX 740-926-9112

TO: DAVE BARTSCH - DAVE, THE SPRING IS IN THE HOLLOW DIRECTLY WEST OF S-41. I HAVE LOCATED IT ON THE MAP.
FROM: KEVIN RICKS



# INTEROFFICE MEMORANDUM

**TO:** DEBBIE BATES/APPLICATION MANAGER

**FROM:** KEVIN RICKS

**SUBJECT:** COMMENTS, 2ND REVISIONS/OVCC/APPLICATION D-0360-13

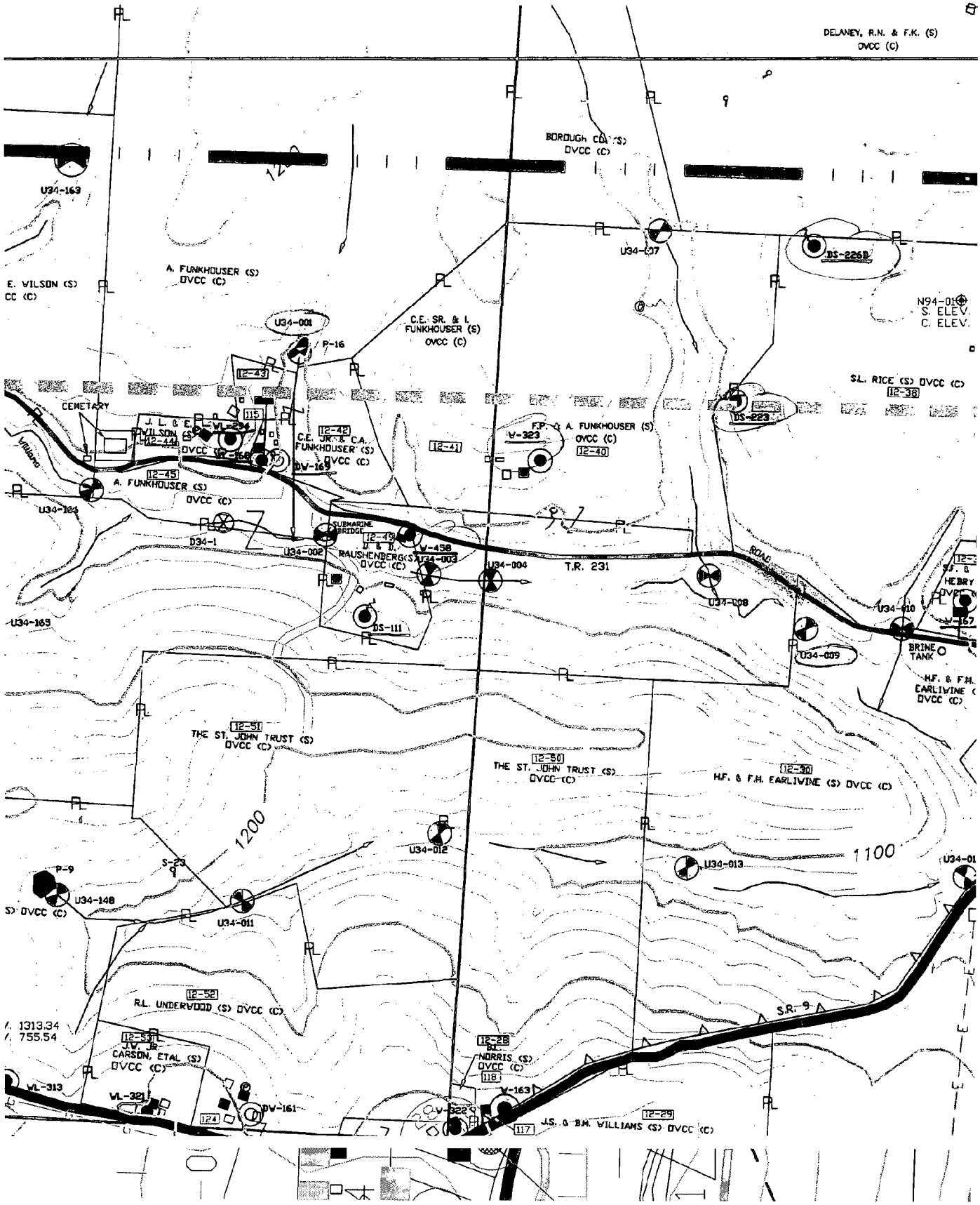
**DATE:** JULY 26, 2002

---

A. Application/Hydrology Map Review

1. The additional undeveloped spring located on the property owned by Funkhouser has still not been properly identified. This spring is located near the 1100 foot contour in hollow directly north of well W-458. Revise to show this spring.

2. Ownership of the property west of State Route 147 is still not clearly shown; therefore, **add a property hook through State Route 147** to show that F. Simpson owns the property on both sides of this road.


DELANEY, R.N. & F.K. (S)
OVCC (C)
BOROUGH CO. (S)
OVCC (C)
U34-163
U34-007
DS-226B
A. FUNKHOUSER (S)
OVCC (C)
E. WILSON (S)
CC (C)
N94-01
S. ELEV.
C. ELEV.
U34-001
P-16
C.E. SR. & I.
FUNKHOUSER (S)
OVCC (C)
12-43
S.L. RICE (S) OVCC (C)
12-38
CEMETARY
115
J. L. & E.
WILSON (S)
12-44
WL-294
12-42
C.E. JR. & C.A.
FUNKHOUSER (S)
OVCC (C)
12-41
F.P. & A. FUNKHOUSER (S)
OVCC (C)
W-323
12-40
DS-223
DW-169
12-45
A. FUNKHOUSER (S)
OVCC (C)
U34-164
D34-1
SUBMARINE
BRIDGE
12-49
U34-002
RAUSHENBERG (S)
OVCC (C)
W-458
U34-003
U34-004
T.R. 231
ROAD
U34-008
U34-010
HEBRY
U34-165
DS-111
U34-009
BRINE
TANK
H.F. & F.M.
EARLIWINE
OVCC (C)
12-51
THE ST. JOHN TRUST (S)
OVCC (C)
12-50
THE ST. JOHN TRUST (S)
OVCC (C)
12-30
H.F. & F.M. EARLIWINE (S) OVCC (C)
1200
U34-012
1100
U34-013
P-9
S-23
U34-148
U34-011
12-52
R.L. UNDERWOOD (S) OVCC (C)
S.R. 9
1313.34
755.54
12-53
J.W. JR.
CARSON, ETAL (S)
OVCC (C)
12-28
B.L.
NORRIS (S)
OVCC (C)
118
W-163
WL-313
WL-321
124
DW-161
W-322
117
12-29
J.S. & B.M. WILLIAMS (S) OVCC (C)

TOVCC 11695

ADDENDUM TO PAGE 18, PART 2, F(2)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## ALTERNATIVE WATER SUPPLY INFORMATION

### Adjacent Areas Above Partial Recovery Mining

The PHC contained in this application indicate a low potential for diminution and/or interruption of ground water supplies in areas above and contiguous to full recovery mining operations. No contamination of such water supplies is expected. In the highly-unlikely event that a utilized source is disrupted or contaminated, the following plan will be utilized.

Notwithstanding its mining rights and without waiving any of its mining rights, where water diminution, contamination, or interruption results from its mining, The Ohio Valley Coal Company will repair or install a replacement source in the adjacent area at its own expense in a manner mutually satisfactory to OVCC, the water user, and the Division of Mineral Resources Management, and to a level sufficient to meet the water user's pre-mining quantity and quality levels which will be determined by monitoring information gathered in accordance with the Monitoring Plan. While it will be the policy of OVCC to replace a water source, payment of water bills will be the responsibility of the water user, unless otherwise agreed upon by OVCC and the water user.

The steps which OVCC would take to repair or replace affected water sources in the adjacent area include:

1. Repair damaged cisterns after OVCC has determined that damage is complete;

2. On a site specific basis, re-drill existing wells, drill new wells, or connect the water user to public water supplies (if no public water supply exists, OVCC may install a line of sufficient size to service those affected by OVCC's mining operation);

3. On a site specific basis, developed springs will be replaced by a farm pond built according to accepted engineering practices, drilling of a new well, development of another spring in close proximity to the original spring, or connect the water user to public water supplies (if no public water supply exists, OVCC may install a line of sufficient size to service those affected by OVCC's mining operation);

4. Repair damaged farm ponds so as to be comparable to their pre-mining conditions;

5. Install an interim water supply until affected water supplies are replaced. Interim supplies may include hauled water or a tap to public water. OVCC will only install temporary, replacement water using a public water supply if it can be connected within 48 hours. OVCC routinely uses the local fire department to haul county water for temporary replacement supplies. This practice is expected to continue. The local fire department can haul water within a matter of hours after receiving a request. Temporary tanks and water troughs for livestock are kept in stock to facilitate quick installations. Payment of interim water bills shall be the responsibility of the water user unless otherwise agreed upon by OVCC and the water user.

6. Such other proven, cost effective, and reasonable techniques as OVCC may now, or in the future, deem appropriate.

It is OVCC's intention to bear the cost of the installation only of both interim and permanent replacement of developed water sources being used at the time of undermining. If contamination, diminution, or interruption of a water user's ground or surface water supply used for domestic use occurs as a proximate result of the mine's operation, OVCC will repair such water supply or install a replacement supply at OVCC's expense. OVCC will not be responsible for non-developed sources or developed sources not being used at the time of undermining. A source is considered to be developed if it has been fully developed (i.e., water delivery system and drinking facilities) and is well maintained such that it is usable at the time of undermining.

OVCC will install, at OVCC's expense, an alternate water supply system (within 48 hours) to be used until repair or replacement is completed or will reimburse the water user for the reasonable cost of obtaining a water supply from the date of any such contamination, diminution, or interruption until the supply is repaired or replaced. In cases where temporary water cannot be provided within 48 hours, OVCC will immediately notify the Chief of the Division of Mines and Reclamation who will determine if the circumstances warrant an extension of the 48 hours.

OVCC will provide the affected water user with no less of an available water supply than the water user had before mining, based on the pre-mining measurements. If required, OVCC will notify the Division of Mineral Resources Management immediately after it has been informed of the loss of developed water (ground or surface water) due to its mining activities.

As previously stated, the elevation of alternative water sources is unpredictable until the water system in the area again attains equilibrium after mining. Therefore, the alternative water supplies to be developed will be identified when the need arises.

Those supplies may include but not be limited to re-development of an existing well, spring, or pond, or replacement of the source with the County Water System. The County Water System has been contacted by OVCC and has assured us that there is capacity to replace each developed source with county water. A letter to that effect is enclosed.

If a water user believes that his or her underground or surface water source which is used for domestic use has been contaminated, diminished, or interrupted as a proximate result of the mine's operation, he or she should notify OVCC by calling (614) 926-1351. (After normal business hours, dial extension 221) OVCC will make a determination of liability no later than sixty (60) days after notification of the contamination, diminution, or interruption of a water supply as a proximate result of the mine's operation.

Work on installing a temporary alternate water supply will be complete within 48 hours (unless an extension of the 48 hour time frame is granted by the Chief) after OVCC learns of the contamination, diminution, or interruption to a domestic-use water supply proximately caused by the mining operation. OVCC will pay for installation costs only for a temporary, alternate water supply. Permanent repair or the installation of a replacement water supply for an affected water supply shall be completed no later than eighteen (18) months after it has been determined that the supply has been contaminated, diminished, or interrupted as a proximate result of the mine's operation. The costs of repair of the original water supply and/or the installation of a replacement supply system to provide the affected water user with no less of an available water supply than was being used before mining, based on the pre-mining measurements, shall be paid for by OVCC. If the water user opts to do so, he may install his own temporary water supply system. OVCC will reimburse the water user for the costs of installing a temporary water supply system. Payment for domestic water will be the responsibility of the water user unless otherwise agreed upon by OVCC and the water user.

In repairing or replacing a water user's ground or surface water supply system used for domestic use which is damaged as a proximate result of the mine's operation, OVCC's first preference is to repair the affected supply system. If that is neither effective nor feasible, OVCC's second preference is to replace the affected supply system with a like supply system. For example, a damaged pond, if not repairable, would be replaced with a new pond. If that is not feasible, OVCC will replace the affected supply systen with a similar supply system. For example, a damaged dug well, if not repairable or replaceable with another dug well, would be replaced by a potable-type cistern, a drilled well or a similar supply system.

It should be recognized that property sites differ in such elements as geologic and hydrologic composition. Thus, the determination of whether repair of an affected water supply system is feasible or whether replacement by a specific type of water supply system is feasible must be made on a case-by-case, site specific basis by OVCC. OVCC, in the past, has always attempted to consult and negotiate with the affected water user concerning the selection of the type of water replacement system and its site. This is done at the request of water users who prefer this procedure to that of

OVCC making unilateral decisions about replacement supplies and sites. However, OVCC, if required by the Division of Mineral Resources Management, will make these decisions unilaterally.

In some cases, OVCC reaches pre-subsidence agreements with water users, who are normally represented by counsel and in all cases have full opportunity to consult with counsel or anyone else of their choosing. These agreements, which are typically negotiated by OVCC employees, normally cover all potential damage claims. In situations where such an agreement is reached, OVCC will comply with the water replacement terms contained in the agreement. Such an agreement will satisfy, at a minimum, this permit and ORC 1513.162.

In any situation where OVCC determines that the contamination, diminution, or interruption of a water supply was not proximately caused by the mining operation, based on evidence such as the proximity of the supply to the mining operation, site specific geologic and surface conditions, or climatological conditions, OVCC will provide the Division of Mineral Resources Management with notice of its determination and the proof in support of that determination to allow the Division of Mineral Resources Management to issue a Chief's Order deciding the issue. This Chief's Order is then appealable in accordance with O.R.C. §1513.13. The water user's water supply system will continue in operation during the time OVCC seeks review of this matter pursuant to O.R.C. §1513.13. If it is determined that contamination, diminution, or interruption of a supply is the proximate result of the mine's operation, OVCC shall bear the costs of installing temporary water system. OVCC reserves the right to proceed against the water user to recover costs incurred if it is determined that OVCC is not liable for the contamination, diminution, or interruption of the affected water supply.

ADDENDUM TO PART 2, PAGE 16, B(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## GEOLOGY DESCRIPTION

Stratigraphy of the proposed permit area is formed by the Monongahela formation of the Pennsylvania period, and the Dunkard group of Permian time. The primary strata of both sections consists of an alternating sequence of limestone, sandstone, siltstone, shale, claystone, and coal.

The Monongahela formation is approximately 245 feet thick. In ascending order, it occupies the interval from the Pittsburgh No. 8 to the Waynesburg No. 11 coal bed. The primary rock units are limestone, shale, and claystone. Limestone forms 44 to 68 percent of this stratigraphic interval.

The Dunkard group is 250 to 300 feet thick, occupying the interval from the Waynesburg No. 11 coal bed to the ground surface. The primary rock units here are shale and claystone. These soft units form about 85 percent of this stratigraphic interval. This strata is primarily located within the constrained zone of disturbance resulting from longwall mining.

The rock strata of Belmont County typically form a gentle monocline that dips southeasterly at grades less than one percent (Figure 2) and in the application area is southward to southeasterly. The base elevation of the No. 8 seam ranges from approximately 765 ft. in the southeast corner of the application area to approximately 800 ft. in the northwest corner.

The orientation of the major joints in rock and face cleat in coal is approximately N 75° W. The minor joints and butt cleats are generally perpendicular to these ( N 15° E).

Geology and Coal Resources of Belmont County, Ohio, Geological Survey Professional Paper 380, reports that a small dome-shaped anticline lies in eastern Belmont County, primarily in Mead Township. This structure is located over three miles east of the Powhatan No. 6 Mine application area and, therefore, is not expected to have an impact on ground water flow in the application area.

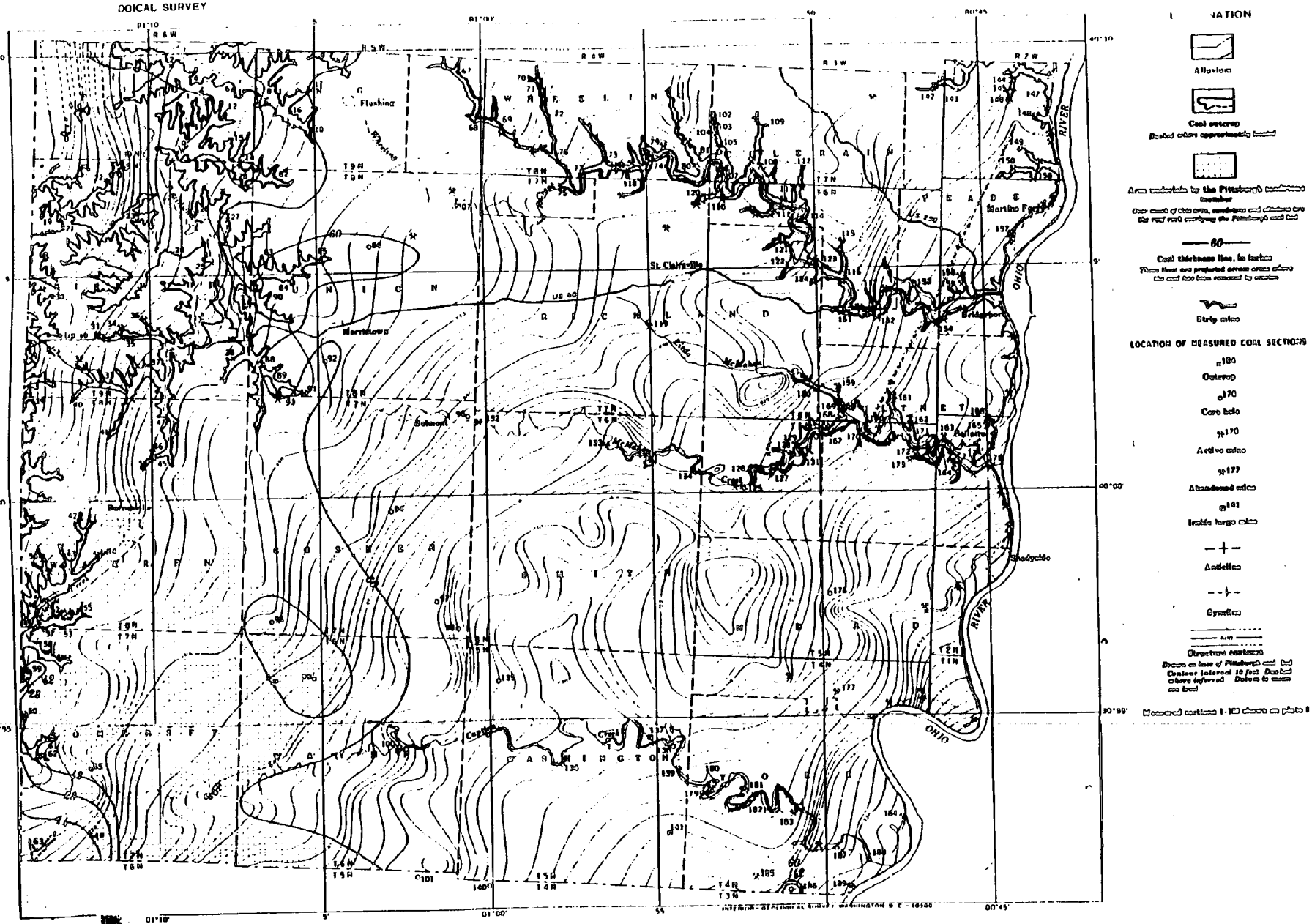
In addition, there is a graben structure that passes through the Powhatan No. 6 Mine Reserve. This graben has been tracked through the adjacent Powhatan No. 3 Mine and enters the No. 6 reserve on the eastern boundary. It proceeds in a southwesterly direction, turns approximately 90 degrees, proceeds in a northwesterly direction, then turns again and proceeds in a general westerly direction off the mine property. The graben is located to the south of the application area and is not expected to have an impact on the ground water flow in the area.

ADDENDUM TO PART 2, PAGE 16, B(1)
PAGE TWO

The structural contours of the No. 8 Seam indicate that the graben is made up of a series of slumps in the deposit, indicated by a thickening of the seam at the bottom of the structure. This structure apparently affected the structural contours to the north of the graben, but these effects do not extend into the application area. Locally, these effects may be seen as areas where incidental water pools in the mine. This water is generally only a nuisance and does not require pumping. Most of the water found underground at the No. 6 mine is man-made during the mining cycle from water sprays (used for dust suppression) and cooling water for motors.

UNITED STA PARTMENT OF THE INTERIOR
OGICAL SURVEY

PLATE 6




MAP OF THE PITTSBURGH (NO. 8) COAL BED SHOWING DISTRIBUTION AND THE STRUCTURE AND THICKNESS OF THE LOWER BENCH OF THE BED IN BELMONT COUNTY, OHIO

TOVCC 11702

and in the application area is southward to southeasterly. The base elevation of the No. 8 seam ranges from approximately 725 ft. in the southeast corner of the application area to approximately 800 ft. in the northwest corner.

The orientation of the major joints in rock and face cleat in coal is approximately N 75° W. The minor joints and butt cleats are generally perpendicular to these ( N 15° E).

Geology and Coal Resources of Belmont County, Ohio, Geological Survey Professional Paper 380, reports that a small dome-shaped anticline lies in eastern Belmont County, primarily in Mead Township. This structure is located over three miles east of the Powhatan No. 6 Mine application area and, therefore, is not expected to have an impact on ground water flow in the application area.

In addition, there is a graben structure that passes through the Powhatan No. 6 Mine Reserve. This graben has been tracked through the adjacent Powhatan No. 3 Mine and enters the No. 6 reserve on the eastern boundary. It proceeds in a southwesterly direction, turns approximately 90 degrees, proceeds in a northwesterly direction, then turns again and proceeds in a general westerly direction off the mine property. The graben is located to the south of the application area and is not expected to have an impact on the ground water flow in the area.

The structural contours of the No. 8 Seam indicate that the graben is made up of a series of slumps in the deposit, indicated by a thickening of the seam at the bottom of the structure. This structure apparently affected the structural contours to the north of the graben, but these effects do not extend into the application area. Locally, these effects may be seen as areas where incidental water pools in the mine. This water is generally only a nuisance and does not require pumping. Most of the water found underground at the No. 6 mine is man-made during the mining cycle from water sprays (used for dust suppression) and cooling water for motors.

ADDENDUM TO PAGE 26, F(3)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT 0360

## GROUND AND SURFACE WATER MONITORING

Although the D-0360-13 application is for underground works only and not surface operations, ground water and surface water monitoring as previously approved for Powhatan No. 6 Mine (Permit D-0360) will continue with respect to the surface operations. Ground water and surface water monitoring over underground areas of the mine is proposed to determine the impacts of underground mining on these areas. The proposed plan presented below is to be used in lieu of all previously proposed and existing plans for such areas.

### Surface Water

For mining areas, intermittent and perennial streams and that originate within the mining area will be monitored where the stream leaves the area; and streams crossing through the mining area will be monitored for flow monthly both upstream and downstream of the property where they are being used, for a year prior to and after the area has been undermined. Monitored streams will be sampled quarterly and the water analyzed for quarterly parameters. Streams will be monitored once a week for 3 weeks prior to the mining proceeding past a source and once a week for 3 weeks after the mining has past a source.

### Ground Water

For all coal mining areas, ground water monitoring will consist of monitoring and sampling all developed water sources, with the permission of the landowner, in the following manner:

> Monthly monitoring will be done for quantity (static water level/flow) for a one-year period before and after mining for developed springs and wells. This information will be reported quarterly but is available at the OVCC office.
>
> For all mining areas, quarterly monitoring will be conducted for quality for a one-year period before and after mining for developed springs, wells, and stream monitoring points. This information will be reported quarterly.
>
> Daily precipitation data from the mining area will be submitted to evaluate its impact on spring and stream flow. This information will be submitted quarterly but will be available at the OVCC office.

An attempt will be made to sample as outlined above, however, some sources may not be accessible should a landowner deny permission to sample, a well may be buried, etc. These locations, if encountered, will be documented in the quarterly reports.

ADDENDUM TO PAGE 26, F(3)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT 0360

## GROUND AND SURFACE WATER MONITORING

Ground water and surface water monitoring as previously proposed for Powhatan No. 6 Mine will continue with respect to the surface operations. Ground water and surface water monitoring over longwall areas of the underground operations is proposed to determine the impacts of underground mining on these areas. The proposed plan presented below is to be used in lieu of all previously proposed and existing plans for such areas.

### Surface Water

For full recovery mining areas, intermittent and perennial streams originating within the mining area will be monitored where the stream leaves the area; and ~~utilized~~ streams crossing through the mining area will be monitored for flow monthly both upstream and downstream of the property where they are being used, for a year prior to and after the area has been undermined. Monitored streams will be sampled quarterly and the water analyzed for quarterly parameters. Streams will be monitored once a week for 3 weeks prior to the mining proceeding past a source and once a week for 3 weeks after the mining has past a source.

### Ground Water

For full recovery mining areas, ground water monitoring will consist of monitoring and sampling all developed water sources, with the permission of the landowner, in the following manner:

Monthly monitoring will be done for quantity (static water level/flow) for a one year period before and after mining for developed springs and wells. This information will be reported quarterly but is available at the OVCC office.

ADDENDUM TO PAGE 26, F(3)
PAGE TWO

For full recovery mining areas, quarterly monitoring will be conducted for quality for a one year period before and after mining for developed springs, wells, and stream monitoring points. This information will be reported quarterly.

For full recovery mining areas, weekly monitoring will be conducted for all developed springs and wells once a week for 3 weeks prior to the mining passing beneath or adjacent to (within 500 ft horizontally) the source. Weekly monitoring will continue once a week for three weeks after the mining has past the source.

Daily precipitation data from the mining area will be submitted to evaluate its impact on spring and stream flow. This information will be submitted quarterly but will be available at the OVCC office.

An attempt will be made to sample as outlined above, however, some sources may not be accessible should a landowner deny permission to sample, a well may be buried, etc. These locations, if encountered, will be documented in the quarterly reports.

All samples will be taken as outlined to the extent that existing well construction allows. Any samples that are unobtainable will be documented as such in the quarterly report.

OVCC will monitor all developed supplies in accordance with the monitoring plan outlined above regardless of the aquifers and/or saturated zones that they access. All developed supplies have been identified and have been indicated on the Application Map. All wells, both drilled and dug have been identified. Developed springs, consisting of a french drain and catchment basin, have been shown. A map will be included in the quarterly monitoring report showing the location of the wells, streams, and springs monitored and their position relative to the active mining areas of OVCC

# COAL MINING AND RECLAMATION PERMIT

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

**Telephone:** (740) 926-1351

**Permit Number:** D-360
**Application Number:** D-0360-13
**Acreage:** 0
**Underground Acreage** 38.6

**Effective:** 10/21/2002
**Expires:** 06/19/2004

**Type of Operation:** Underground (Room and Pillar)

The issuance of this permit 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 permit 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 water monitoring plan for this permit shall be:

**Quality:** See Page 26, F3 of the Permit Application
**Quantity** See Page 26, F3 of the Permit Application

**Note:** These monitoring requirements are separate from NPDES monitoring requirements.

**Signature:** Michael T Sponsler by [signature] **Date:** 10/21/2002
Chief, Mineral Resources Management

OPERATOR

F46 Rev: 07/01/2001

TOVCC 11707

11/92

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF RECLAMATION**

**UNDERGROUND COAL MINING AND RECLAMATION**
**PERMIT APPLICATION**

Applicant The Ohio Valley Coal Company

A. Type of Operation (check appropriate space(s)):

_____ Shaft, _____ Slope, _____ Drift,
_X_ Room and Pillar, _____ Pillar Extraction,
_____ Longwall, _____ Combined Surface and Underground

B. Type of Application (check appropriate space(s)):

(1) _____ New
(2) _____ Initial Underground Workings to Existing Permit
(3) _X_ Additional Underground Workings

C. Address the following if applicable:

(1) Permit Number D-0360
(2) Date Issued 6/20/84

D. Did a person other than an employee of the applicant prepare this application? _____ Yes, _X_ No. If "yes," provide:

Preparer's Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____-_____-_____

E. I, the undersigned, a responsible official of the applicant, do hereby verify the information in the complete permit application as true and correct to the best of my information and belief.

Printed Name John R. Forrelli; Title President & General Manager

Signature _____; Date December 10, 2001

Sworn before me and subscribed in my presence this 10th day of Dec, 2001.

Notary Public

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

F. **For Revision Review Only.** This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature David L. Bartsch ; Date 5-9-02

Sworn before me and subscribed in my presence this 9th day of May, 2002.

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

Denise Jackson
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

Employer Identification No. (EIN) 34-1041310, or

Social Security No. (SSN), _____

(2) Indicate business structure of applicant and additional information:

____ Single proprietorship,
____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
____ Association, ____ Other, specify _____

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

Beginning date of ownership _____

F. **For Revision Review Only.** This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature David L. Bartsch ; Date 5-9-02

Sworn before me and subscribed in my presence this 9th day of May, 2002.

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

Denise Jackson
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

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Social Security No. (SSN), _____

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____ Single proprietorship,
____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
____ Association, ____ Other, specify _____

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

Beginning date of ownership _____

F. **For Revision Review Only.** This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature David L. Bartsch ; Date 1-30-02

Sworn before me and subscribed in my presence this

30th day of Jan., 2002.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2008

Claude L. Luke
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

Employer Identification No. (EIN) 34-1041310, or

Social Security No. (SSN), _____

(2) Indicate business structure of applicant and additional information:

____ Single proprietorship,
____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
____ Association, ____ Other, specify _____

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

Beginning date of ownership _____

I. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature David L. Bartsch ; Date 6-22-02

Sworn before me and subscribed in my presence this 22nd day of June, 2002.

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

Denise R. Jackson
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

Employer Identification No. (EIN) 34-1041310, or

Social Security No. (SSN), _____

(2) Indicate business structure of applicant and additional information:

____ Single proprietorship,
____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
____ Association, ____ Other, specify _____

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

Beginning date of ownership _____

I. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature David L. Bartsch ; Date 8-5-02

Sworn before me and subscribed in my presence this

5th day of Aug., 2002.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

Employer Identification No. (EIN) 34-1041310, or

Social Security No. (SSN), _____

(2) Indicate business structure of applicant and additional information:

____ Single proprietorship,
____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
____ Association, ____ Other, specify _____

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

Beginning date of ownership _____

John R. Forrelli
President & General Manager

November 5, 2001

Mr. Michael S. Sponsler, Chief
Division of Mineral Resources Management
Ohio Department of Natural Resources
1855 Fountain Square Court
Columbus, OH 43224

Dear Mr. Sponsler:

This letter is to certify that

David L. Bartsch, P.E.

Is authorized to sign application revisions for The Ohio Valley Coal Company. Permit D-0360 will be the subject of applications to add underground mining areas. In his job as the Environmental Coordinator and Permit Administrator, Mr. Bartsch acts as a responsible official of this company. If you have any questions, please contact me.

Sincerely,
THE OHIO VALLEY COAL COMPANY

John R. Forrelli
President and General Manager

56854 PLEASANT RIDGE ROAD • ALLEDONIA OHIO 43902
(740) 926-1351 • FAX (740) 926-1615

(4) If the applicant is a business entity other than a single proprietorship, provide the following for the applicant's statutory agent and submit Attachment 1.

Agent's Name A&H Statutory

Address 1100 Huntington Building

City Cleveland State OH Zip 44115

Telephone 216 - 969 - 1100

EIN 34-104130, or SSN (optional) _____

(5) Is the operator of the mine to be a person different from the applicant? _____ Yes, X No. If "yes," provide the operator's name and submit Attachment 17. (Note: if more than one operator, indicate operator's name and submit a separate attachment for each.)

Operator's Name _____

(6) Provide the following for the person who will pay the abandoned mine land reclamation fee for the applicant.

Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State OH Zip 43902

Telephone 740 - 926 - 1351

EIN 34-1041310, or SSN (optional) _____

(7) Provide the following for all persons having the authority or ability to commit the financial, real property assets, or working resources of the applicant who are not otherwise identified as officers, directors, or owners of the applicant. If none, check box: [ ]. If any person listed is a business entity and not an individual, also complete Attachment 1 for that person.

Name Robert E. Murray

Address 29325 Chagrin Boulevard, Suite 300

City Pepper Pike State OH Zip 44122

Telephone 216 - 765 - 1240

EIN _____, or SSN 295-36-8852

Date O & C relationship began/ended (if applicable)

5/25/88 / _____

Submit and identify additional pages necessary to complete response. See Attachment 1's

(8) Provide the following for all persons owning or controlling the coal to be mined by another person under a lease, sublease, or other contract and (a) having the right to receive the coal after mining, or (b) having the authority to determine the manner in which another person conducts coal mining operations. If none, check box: [ x ]. If any person listed is a business entity and not an individual, also complete Attachment 1 for that person.

Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

O & C relationship to entity _____

Date O & C relationship began/ended (if applicable)

_____ / _____

Submit and identify additional pages necessary to complete response.

(9) List below the person or persons primarily responsible for ensuring that the applicant will comply with Chapter 1513. of the Revised Code and the rules adopted pursuant thereto while mining and reclaiming the area for which this permit is requested.

Robert E. Murray

(10) Has the applicant, any person listed under items A(3), (7), and (8), or any person listed on Attachment 1 who "owned or controlled" or "owns or controls" as defined in 1501:13-4-03(A), held a coal mining permit in the United States within the five years preceding the date of the application? __X__ Yes, _____ No. If "yes," submit Attachment 5. See Attachment 5's

(11) Does the applicant, any person listed under items A(3), (7), and (8), or any person listed on Attachment 1 have a pending coal mining application in any state of the United States? __X__ Yes, _____ No. If "yes," submit Attachment 23. See Attachment 23's

(12) Indicate name of mine Powhatan No. 6 Mine

(13) List below the MSHA identification numbers for the mine and for all mine-associated structures requiring MSHA approval on the proposed permit area.

33-01159
1210-0H8-0025-003
1210-0H8-0025-004
1210-0H8-0025-005

(14) Submit Attachment 22, Certificate of Liability Insurance. See Attachment 22

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 1
(OWNERS AND CONTROLLERS)

Applicant's Name THE OHIO VALLEY COAL COMPANY

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that entity.

Name of business entity THE OHIO VALLEY COAL COMPANY

Name STEPHEN C. ELLIS
Street address 1100 HUNTNGTON BLDG
City CLEVELAND State OH Zip 44115
EIN SSN (Optional) 279-42-7396
Title of position within entity SECRETARY
Date position assumed/ended (if appropriate) 05/25/88 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name OHIO VALLEY RESOURCES INC.
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional)
Title of position within entity SHAREHOLDER
Date position assumed/ended (if appropriate) 05/25/88 /
Percent of ownership 100 Date of ownership 05/28/88
Location in organizational structure SHAREHOLDER

Name MICHAEL D. LOIACONO
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 206-36-6784
Title of position within entity ASST SECY & CORP. COMPT., TREASURER
Date position assumed/ended (if appropriate) 03/10/95 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name ROBERT E. MURRAY
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 295-36-8852
Title of position within entity PRESIDENT, CEO
Date position assumed/ended (if appropriate) 05/25/88 / 10/31/99
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Submit and identify additional pages necessary to complete response.

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 1
(OWNERS AND CONTROLLERS)

Applicant's Name THE OHIO VALLEY COAL COMPANY

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that entity.

Name of business entity THE OHIO VALLEY COAL COMPANY

Name ROBERT E. MURRAY
Street address 53854 PLEASANT RIDGE ROAD
City ALLEDONIA State OH Zip 43902
EIN SSN (Optional) 232-86-2688
Title of position within entity DIRECTOR
Date position assumed/ended (if appropriate) 03/10/95
Percent of ownership 0 Date of ownership
Location in organizational structure DIRECTOR

Name JOHN R. FORRELLI
Street address 53854 PLEASANT RIDGE ROAD
City ALLEDONIA State OH Zip 43902
EIN SSN (Optional) 232-90-2378
Title of position within entity PRESIDENT AND GENERAL MANAGER
Date position assumed/ended (if appropriate) 11/01/99 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name ROBERTA K. HEIL
Street address 56854 PLEASANT RIDGE ROAD
City ALLEDONIA State OH Zip 43902
EIN SSN (Optional) 004-72-8632
Title of position within entity ASSISTANT SECRETARY
Date position assumed/ended (if appropriate) 11/01/99 /
Percent of ownership 0 Date of ownership
Location in organizational structure ASSISTANT SECRETARY

Name BONNIE M FROEHLICH
Street address 56854 PLEASANT RIDGE ROAD
City ALLEDONIA State OH Zip 43902
EIN SSN (Optional) 004-72-8632
Title of position within entity ASSISTANT SECRETARY AND ASSISTANT TREASURER
Date position assumed/ended (if appropriate) 06/25/2001 /
Percent of ownership 0 Date of ownership
Location in organizational structure ASSISTANT SECRETARY AND ASSISTANT TREASURER

Submit and identify additional pages necessary to complete response.

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 1
(OWNERS AND CONTROLLERS)

Applicant's Name THE OHIO VALLEY COAL COMPANY

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that entity.

Name of business entity OHIO VALLEY RESOURCES INC.

Name MICHAEL D. LOIACONO
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 206-36-6784
Title of position within entity TREASURER
Date position assumed/ended (if appropriate) 11/01/99 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name MICHAEL D. LOIACONO
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 206-36-6784
Title of position within entity ASSISTANT SECRETARY
Date position assumed/ended (if appropriate) 10/30/89 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name MICHAEL D. LOIACONO
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 206-36-6784
Title of position within entity CORPORATE COMPTROLLER
Date position assumed/ended (if appropriate) 04/02/91 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name ROBERT E. MURRAY
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 295-36-8852
Title of position within entity PRESIDENT, CEO, TREASURER
Date position assumed/ended (if appropriate) 03/29/88 / 10/31/99
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Submit and identify additional pages necessary to complete response.

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 1
(OWNERS AND CONTROLLERS)

Applicant's Name THE OHIO VALLEY COAL COMPANY

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that entity.

Name of business entity OHIO VALLEY RESOURCES INC.

Name STEPHEN C. ELLIS
Street address 1100 HUNTINGTON BLDG
City CLEVELAND State OH Zip 44115
EIN SSN (Optional) 279-42-7396
Title of position within entity SECRETARY
Date position assumed/ended (if appropriate) 12/20/90 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name JOHN R. FORRELLI
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 232-86-2688
Title of position within entity PRESIDENT
Date position assumed/ended (if appropriate) 11/01/99 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name ROBERT E. MURRAY
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 295-36-8852
Title of position within entity DIRECTOR/SHAREHOLDER
Date position assumed/ended (if appropriate) 03/10/95 /
Percent of ownership 100 Date of ownership
Location in organizational structure DIRECTOR/SHAREHOLDER

Name
Street address
City State Zip
EIN SSN (Optional)
Title of position within entity
Date position assumed/ended (if appropriate) /
Percent of ownership Date of ownership
Location in organizational structure

Submit and identify additional pages necessary to complete response.

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: The American Coal Company
Address: 29325 Chagrin Blvd Suite 300
City: Pepper Pike State: OH Zip: 43122
Telephone: 216 - 765 - 1240
EIN: 73-1546124 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| 02 | IL | Office of Mines And Minerals | 11-02752 10/14/98 |
| 255 | IL | Office of Mines And Minerals | 11-02752 10/14/98 |
| 257 | IL | Office of Mines and Minerals | 11-02752 10/14/98 |
| 306 | IL | Office of Mines and Minerals | 11-02752 10/14/98 |
| 344 | IL | Office of Mines and Minerals | 11-02752 10/14/98 |
| 352 | IL | Office of Mines and Minerals | 11-02752 10/14/98 (to replace #344 soon) |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray President

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: The Oklahoma Coal Company
Address: 29325 Chagrin Blvd, Suite 300
City: Pepper Pike State: OH Zip: 44122
Telephone: 216 - 765 - 1240
EIN: 34-1673480 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-0230 | OH | DMRM | |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray, Director

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: The Ohio Valley Coal Company
Address: 56854 Pleasant Ridge Road
City: Alledonia State: OH Zip: 43902
Telephone: 740 - 926 - 1351
EIN: 34-104130 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-0360 | OH | DMRM | 33-01159 5/25/88 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: UtahAmerican Energy, Inc.
Address: P. O. Box 187
City: St. Clairsville State: OH Zip: 43950
Telephone: 435 - 613 - 0393
EIN: 34-1874726 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| ACT/007/013 | UT | DOGM | Horse Canyon Mine 42-00100 12/24/78<br>Lila Canyon Mine 42-02241 4/15/99 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray, Director

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: Belmont Coal Company
Address: P. O. Box 146
City: Powhatan Point State: OH Zip: 43942
Telephone: 714 - 795 - 5200
EIN: 31-1536602 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-1020 | OH | DMRM | 33-04397 7/31/97 |
| D-0241 | OH | DMRM | 33-03048 7/2/93 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray, Shareholder, 100%

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: MonValley Transportation Center, Inc.
Address: P.O. Box 135 – 1060 Ohio Ave.
City: Glassport State: PA Zip: 15045
Telephone: 412 - 673 - 1500
EIN: 15-1490495 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| 02851602 | PA | DEP | 36-08678 06/08/95 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray - Director

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: Maple Creek Mining Company
Address: 981 Route 917
City: Bentleyville State: PA Zip: 15314
Telephone: 724 - 258 - 2056
EIN: 25-1755305 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| 63841302 | PA | DEP | 36-00970 – June 30, 1995 |
| 63733706 | PA | DEP | 36-00970 – June 30, 1995 |
| 63723707 | PA | DEP | 36-00970 – June 30, 1995 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray – Director

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: UMCO Energy, Inc.
Address: 981 Route 917
City: Bentleyville State: PA Zip: 15314
Telephone: 724 - 258 - 2056
EIN: 52-1615668 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| 63921301 | PA | DEP | 36-08375 June 08, 1994 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray – Director

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: American Energy Corporation
Address: 43521 Mayhugh Hill Road, TWP Highway 88
City: Beallsville State: OH Zip: 43716
Telephone: 740 - 926 - 9152
EIN: 31-1550443 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-0425 | OH | DMRM | 33-01070 11/6/00 |
| D-1159 | OH | DMRM | 33-01070 11/6/00 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES AND RECLAMATION**

**ATTACHMENT 5**
**PERMIT LISTING**

APPLICANT'S NAME THE OHIO VALLEY COAL COMPANY

SUBMIT THE FOLLOWING INFORMATION FOR EACH COAL MINING OPERATION OWNED OR CONTR EITHER THE APPLICANT OR BY ANY PERSON WHO OWNS OR CONTROLS THE APPLICANT

Name of business entity Energy Resources Incorporated
Address PO Box 259
City Brockway State PA Zip 15824
Telephone 814-265-8021
EIN 31-1044044 SSN

| PERMIT NO. | STATE | NAME OF REGULATORY AGENCY | MSHA NO. AND DATE ISSUED | |
|---|---|---|---|---|
| 33840123 | PA | DEP | 36-02695 | 05/25/88 |
| 33860102 | PA | DEP | 36-02695 | 05/25/88 |
| 17880102 | PA | DEP | 36-02695 | 05/25/88 |
| 33870113 | PA | DEP | 36-02695 | 05/25/88 |
| 33830115 | PA | DEP | 36-02695 | 05/25/88 |
| 24880101 | PA | DEP | 36-02695 | 05/25/88 |
| 24880103 | PA | DEP | 36-02695 | 05/25/88 |
| 24890101 | PA | DEP | 36-02695 | 05/25/88 |
| 24890102 | PA | DEP | 36-02695 | 05/25/88 |
| 24890108 | PA | DEP | 36-02695 | 05/25/88 |
| 24900102 | PA | DEP | 36-02695 | 05/25/88 |
| 24900104 | PA | DEP | 36-02695 | 05/25/88 |
| 24900103 | PA | DEP | 36-02695 | 05/25/88 |
| 24960101 | PA | DEP | 36-02695 | 05/25/88 |
| 24970102 | PA | DEP | 36-02695 | 05/25/88 |
| 24970103 | PA | DEP | 36-02695 | 05/25/88 |
| 24980101 | PA | DEP | 36-02695 | 05/25/88 |
| 24970101 | PA | DEP | 36-02695 | 05/25/88 |
| 24305006 | PA | DEP | 36-02695 | 05/25/88 |

If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including percent of ownership and location in organization structure:

Owned by Parent Entity

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 5**
**(PERMIT LISTING)**

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: American Energy Corporation
Address: 43521 Mayhugh Hill Road, TWP Highway 88
City: Beallsville State: OH Zip: 43716
Telephone: 740 - 926 - 9152
EIN: 31-1550443 or SSN: _____

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-0425 | OH | DMRM | 33-01070 11/6/00 |
| D-1125 | OH | DMRM | 33-01070 11/6/00 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

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12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 23**
**(PENDING PERMIT APPLICATIONS)**

Applicant's Name THE OHIO VALLEY COAL COMPANY

Provide the following information for each pending coal mining application for either the applicant or any person who owns or controls the applicant.

Indicate the business entity for which this listing has been completed BELMONT COAL COMPANY INC.

| Application No. | Name of Regulatory Authority | State |
|---|---|---|
| 10168 | DMRM | OH |
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**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 23**
**(PENDING PERMIT APPLICATIONS)**

Applicant's Name THE OHIO VALLEY COAL COMPANY

Provide the following information for each pending coal mining application for either the applicant or any person who owns or controls the applicant.

Indicate the business entity for which this listing has been completed UTAHAMERICAN ENERGY INC.

| Application No. | Name of Regulatory Authority | State |
|---|---|---|
| ACT/007/013 | DOGM | UT |
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**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 23**
**(PENDING PERMIT APPLICATIONS)**

Applicant's Name THE OHIO VALLEY COAL COMPANY

Provide the following information for each pending coal mining application for either the applicant or any person who owns or controls the applicant.

Indicate the business entity for which this listing has been completed The Ohio Valley Coal Company

| Application No. | Name of Regulatory Authority | State |
|---|---|---|
| D-0360-12 | DMRM | OH |
| D-0360-13 | DMRM | OH |
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12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 23**
**(PENDING PERMIT APPLICATIONS)**

Applicant's Name The Ohio Valley Coal Company

Provide the following information for each pending coal mining application for either the applicant or any person who owns or controls the applicant.

Indicate the business entity for which this listing has been completed The Ohio Valley Coal Company

| Application No. | Name of Regulatory Authority | State |
|---|---|---|
| D-0360-9 | DMR | OHIO |
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11-89

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 22
## (CERTIFICATE OF LIABILITY INSURANCE)

**Name of Insured** The Ohio Valley Coal Company

This is to certify that the policy of insurance listed below has been issued to the above named insured and is in force at this time. The policy provides bodily injury and property damage insurance for all coal mining and reclamation operations of the insured in the State of Ohio as required by paragraph (B) of rule 1501:13-7-07 of the Administrative Code stated below.

**Name of Insurer** Federal Insurance Company
**Policy Number** 3710 4410
**Policy Period** 6/1/02-6/1/03
**Name of Underwriting Agent** Reschini Agency, Inc.
**Address of Underwriting Agent** 922 Philadelphia St., Indiana, PA 15701
**Telephone Number of Underwriting Agent** ( 800 ) 828 - 5040

In the event of cancellation or non-renewal of this policy, including non-payment of policy premiums, the insurer agrees to promptly notify:

The Division of Reclamation
Foundation Square
Columbus, OH 43224

Karen L. Williams
Signature of Underwriting Agent

Date

This certificate is issued as a matter of information only and confers no rights upon the Division of Reclamation. This certificate does not amend, extend, or alter the coverage afforded by the policy listed above.

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**1501:13-7-07(B) The Public Liability Insurance Policy shall:**

1.) Be in effect during the term of the permit or any renewal, including the length of all reclamation operations;

2.) Provide for personal injury and property damage protection in amounts adequate to compensate any persons injured or property damaged as a result of coal mining and reclamation operations, including the use of explosives. The minimum insurance coverage for bodily injury and property damage shall be three hundred thousand dollars for each occurrence and five hundred thousand dollars in the aggregate; and

3.) Include a rider requiring that the insurer notify the Chief whenever substantive changes are made in the policy, including any termination or failure to renew.

B. COMPLIANCE INFORMATION

(1) Has the applicant, any subsidiary, affiliate, or persons controlled by or under common control with the applicant:

(a) Had a federal or state coal mining permit suspended or revoked in the five years preceding the data of submission of this application? _____ Yes, __X__ No. If "yes," submit Attachment 6.

(b) Forfeited a mining bond or similar security deposited in lieu of bond? _____ Yes, __X__ No. If "yes," submit Attachment 6.

(2) Has the applicant been issued a notice of violation (NOV) in connection with any coal mining and reclamation operation during the three years preceding the date of submission of this application for violations of Chapter 1513. of the Revised Code or these rules, or of any federal or state law, rule, or regulation pertaining to air or water environmental protection? __X__ Yes, _____ No. If "yes," submit Attachment 7A.

(3) Have any unabated federal or state cessation orders (COs) and unabated air and water quality notices of violations (NOVs) been received prior to the submission date of this application by any coal mining and reclamation operation owned or controlled by either the applicant or by any person who owns or controls the applicant? _____ Yes, __X__ No. If "yes," submit Attachment 7B.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES & RECLAMATION

ATTACHMENT 7A
(NOTICES OF VIOLATION)

Applicant's Name The Ohio Valley Coal Company

| Permit No. | Violation Number | Date of Issuance | Issuing Agency | State | Brief Description of N.O.V. | Action Taken to Abate N.O.V. | Current Status of N.O.V. (*) |
|---|---|---|---|---|---|---|---|
| D-0360 | 25510 | 5/5/99 | DMRM | OH | Fail to follow approved mining plan - installed underdrains and culvert | Submitted D-0360-8 | Terminated |
| D-0360 | 21173 | 4/23/99 | DMRM | OH | Fail to follow approved mining plan - installed culvert under refuse pile | Designed adjacent fill to fill valley to convert culvert to underdrain and submitted IBR | Terminated |
| D-0360 | 25444 | 4/25/00 | DMRM | OH | Failure to maintain a sediment control measure using BTA to prevent additional accumulation of sediment | Stopped flow immediately | Terminated |

(*) If administrative or judicial proceedings have been initiated concerning any of the violations, identify the violation and provide an addendum indicating the date, location, type of proceeding, and current status.

C. RIGHT OF ENTRY INFORMATION

(1)(a) Provide the following information for every legal or equitable owner of record, surface and mineral, of the property to be mined on the permit area (i.e. areas affected by surface operations and facilities), indicating whether the ownership is of surface, coal, or noncoal mineral. N/A - No Permit Area

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Deed Parcel No. _____

C.(1)(b) Provide the following information for every legal or equitable owner of the property to be mined covered by the underground workings indicating whether ownership is for the surface or coal.

Name The Ohio Valley Coal Company
Address 56854 Pleasant Ridge Road
City Alledonia State OH Zip 43902
Surface _____, Coal X (No. 8 Seam)
Deed Parcel No. 76, 77-1, 104-1, 105, 106, 109, 103, 1-24-1, 1-24-2, 1-22-52

Name E. & S. Simpson
Address 44680 Belmont-Centerville Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 1-22-52

Name F. T. Hart
Address 45239 Hart Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 109

Name L. L. Griffith
Address 57079 Steele Road
City Alledonia State OH Zip 43902
Surface X, Coal _____
Deed Parcel No. 106

Name J.W. & J.E. Carson
Address 45745 Belmont-Centerville Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 105, 106

Name J.L. & E. Wilson
Address 45837 Hart Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 105, 104-1

Name A. Funkhouser
Address 45839 Hart Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 104-1


Surface owners also own the No. 9, 10, 11, and 12 if present

C.(1)(b) Provide the following information for every legal or equitable owner of the property to be mined covered by the underground workings indicating whether ownership is for the surface or coal.

Name C.E. Jr. & C.A. Funkhouser
Address 45843 Hart Road
City Belmont State OH Zip 43718
Surface X , Coal _____
Deed Parcel No. 104-1

Name F.P. & A. Funkhouser
Address 45839 Hart Road
City Belmont State OH Zip 43718
Surface X , Coal _____
Deed Parcel No. 77-1

Name C.E. Sr. & I. Funkhouser
Address 45837 Hart Road
City Belmont State OH Zip 43718
Surface X , Coal _____
Deed Parcel No. 104-1

Name S.L. Rice
Address 62800 Centerville-Warnock Road
City Belmont State OH Zip 43718
Surface X , Coal _____
Deed Parcel No. 76

Name T.N. & E.M. Rubel
Address 45021 Belmont-Centerville Road
City Belmont State OH Zip 43718
Surface X , Coal _____
Deed Parcel No. 103

Name F. Simpson
Address 44680 Belmont-Centerville Road
City Belmont State OH Zip 43718
Surface X , Coal _____
Deed Parcel No. 1-24-1, 1-24-2

Name _____
Address _____
City _____ State _____ Zip _____
Surface _____ , Coal _____
Deed Parcel No. _____


Surface owners also own the No. 9, 10, 11, and 12 if present

ADDENDUM TO PAGE 7, C(1)(b)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

The Ohio Valley Coal Company owns or leases the Pittsburgh (No. 8) coal seam in this application area. The surface owners generally own the other mineral rights, unless otherwise indicated.

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 3**
**(IDENTIFICATION OF OTHER BUSINESS ENTITIES)**

Applicant's Name The Ohio Valley Coal Company

This attachment is to be completed and submitted with the permit application if the response to item C.(4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity The Ohio Valley Coal Company

Statutory agent A&H Statutory

Street Address 1100 Huntington Bldg

City Cleveland State OH Zip 44115

Person's name Robert E. Murray Position Director

Street Address Suite 111, 29525 Chagrin Blvd

City Pepper Pike State OH Zip 44122

Person's name Stephen C. Ellis Position Secretary

Street Address 1100 Huntington Bldg

City Cleveland State OH Zip 44115

Person's name Michael D. Loiacono Position Treas., Asst. Sec'y and Corp. Comptroller

Street Address Suite 111, 29525 Chagrin Blvd

City Pepper Pike State OH Zip 44122

Person's name Ohio Valley Resources, Inc. Position Shareholder

Street Address Suite 111, 29525 Chagrin Blvd

City Pepper Pike State OH Zip 44122

Person's name John R. Forrelli Position President/Gen. Manager

Street Address 56854 Pleasant Ridge Road

City Alledonia State OH Zip 43902

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 3**
**(IDENTIFICATION OF OTHER BUSINESS ENTITIES)**

Applicant's Name The Ohio Valley Coal Company

This attachment is to be completed and submitted with the permit application if the response to item C.(4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity The Ohio Valley Coal Company

Person's name Bonnie M. Froelich Position Asst. Sec'y and Asst. Treasurer

Street Address 56854 Pleasant Ridge Road

City Alledonia State OH Zip 43902

Person's name Roberta K. Heil Position Secretary

Street Address 56854 Pleasant Ridge Road

City Alledonia State OH Zip 43902

Person's name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

C. (2) Provide the following information for the holders of record of any leasehold interest in the coal to be mined or property to be affected by surface operations or facilities, indicating whether the held interest is of surface, coal, or noncoal rights.

Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Surface X, Coal X, Noncoal _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Submit and identify additional pages necessary to complete response.

(3) Are there purchasers of record under a real estate contract of the coal to be mined or property to be affected by surface operations and facilities?
_____ Yes, X No. If "yes," submit Attachment 2.

(4) Is any owner, holder, or purchaser listed in items C(1)(a and b), (2), or (3) respectively, a business entity other than a single proprietorship?
X Yes, _____ No. If "yes," submit Attachment 3.
See Attachment 3

(5) Is any part of the proposed permit area adjacent to any lands which are not owned by those persons identified in item C(1)(a)? _____ Yes, _____ No. If "yes," submit Attachment 4. N/A No Permit Area

(6) Does the applicant hold lands, interests in lands, options, or pending bids on interests for lands which are contiguous to the property to be mined?
_____ Yes, X No. If "yes," provide a description of the lands.

(7) Is it anticipated that individual mining permits will be sought for any of those lands described in item C(6) above? _____ Yes, X No. If "yes," submit as an addendum and identify those lands to include the size, sequence, and timing of future mining permits, utilizing a map pursuant to 1501:13-4-13(J)(29), Ohio Administrative Code.

It is anticipated that all mining in lands adjacent to the D-0360 Permit will be mined from the D-0360 permit. I.e. no new permits.

c. (8)(a) Provide either of the following to allow for coal mining operations on the **permit area**:

N/A - No Permit Area

(i) A copy of the documents, or

(ii) An affidavit wherein the documents are described.

AFFIDAVIT

State of Ohio, _____ County, ss. _____ being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document _____

Execution Date _____

Expiration Date _____

Parties: From _____ To _____

Description of land: No. Acres _____

County _____ Township _____

Sections _____ Lots _____

Parcel #_____

Explanation of legal rights claimed _____

_____

_____

Pending litigation _____ Yes, _____ No.

_____ _____

Signature of Affiant Date

_____

Position

Sworn before me and subscribed in my presence this

_____ day of _____, 19_____.

_____

Notary Public

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company,

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 22 Lots: ____

Parcel#: 76

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 1

Pending Litigation: ___Yes X No

David L. Bartsch
Signature of Affiant

12-7-01
Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

## RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 22 Lots: ____

Parcel#: 77-1

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 2

Pending Litigation: ___Yes X No

David L Bartsch
Signature of Affiant

12-7-01
Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 2001.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

## RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corporation To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 103

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 3

Pending Litigation: ___ Yes X No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 2001.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 104-1

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 4

Pending Litigation: ___Yes X No

David L. Bartsch 1-30-02
Signature of Affiant Date

Environmental Coordinator and Permit Administrator

Position

Sworn before me and subscribed in my presence this 30th day of January 20 02.

Denise R. Jackson
Notary Public

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

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 105

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 5

Pending Litigation: ___ Yes X No

David L. Bartsch
Signature of Affiant

12-7-01
Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 106

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 6

Pending Litigation: ___Yes X No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 109

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 7

Pending Litigation: ___Yes X No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: Consolidated Land Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 34 Lots: _____

Parcel#: 1-22-52

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 8

Pending Litigation: ___ Yes X No

David L Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 2001.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L Luke
Notary Public

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: Consolidated Land Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 34 Lots: _____

Parcel#: 1-24-1

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 9

Pending Litigation: ___ Yes X No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: Consolidated Land Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 34 Lots: _____

Parcel#: 1-24-2

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 10

Pending Litigation: __Yes_X_ No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2008

Claude L. Luke
Notary Public

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360
ADDENDUM TO PAGE 10, PART 1, C(8)(b)

## MINING RIGHTS

Item 1 - Mining Rights to Tract No. 76 - Together with the free and uninterrupted right of way into, on and under said land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating by air shafts and otherwise and of carrying away the coal, together with the privilege of mining and removing through said described premises, other coal belonging to said grantee, its successors or assigns, or which may hereafter be acquired, together with any other mining rights, options and privileges now owned by the grantors in connection with the above described coal.

Item 2 - Mining Rights to Tract No. 77-1 and -2 - Party of the Second part to have the free and uninterrupted right of way into, upon, and under said land at such points, and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal, (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 3 - Mining Rights to Tract No. 103 - Party of Second part to have the free and uninterrupted right of way into and under said land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 4 - Mining Rights to Tract No. 104-1 - Party of Second part to have the free and uninterrupted right of way - and under said land, at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 5 - Mining Rights to Tract No. 105 - Party of Second part to have the free and uninterrupted right of way into, upon, and under said land at such points, and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of

mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 6 - Mining Rights to Tract No. 106 - Party of Second part to have the free and uninterrupted right of way into and under said land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 7 - Mining Rights to Tract No. 109 - Party of Second part to have the free and uninterrupted right of way into and under said land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining, and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 8 - Mining Rights to Tract No. 1-22-52 - Party of Second part to have the free and uninterrupted right of way into, upon, and under said land at such points, and in such manner as may be proper and necessary for the purpose of digging, mining, draining, and ventilating and carrying away said coal (hereby waiving all surface damages or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 9 - Mining Rights to Tract No. 1-24-1 - Together with the right in perpetuity of mining, taking out and removing such coal; also the further right in perpetuity to remove coal to and from any other land or lands through entries, shafts, air-ways and mine openings of any and every kind whatever, with the same rights, in removing coal to or from such other lands, to use the surface, entries, shafts, air-ways, mine openings and other appliances for mining upon, in, through, or under the lands herein described, as are herein granted for the mining and removal of the coal hereby conveyed; mining of said coal by the stripping method is prohibited.

Provided, further, that said Grantee, its successors and assigns, shall have the right to purchase from time to time so much of, and such parts of the surface over the aforesaid described coal rights, except that situated within 500 feet from the brick residence located on the west side of State Route 147 and the adjacent barn, and the frame house located on the east side of State Route 147, presently on said surface, as said Grantee, its successors and assigns may desire and as may be necessary for shafts, slopes, buildings, structures and appurtenances thereunto, drill holes for power or water, drains, reservoirs, roads, industrial tracks, storage yards, and machinery, to facilitate the taking out, mining and removing of such coal, paying therefor at

the rate of One Hundred Dollars ($100.00) per acre; it is, however, understood and agreed by Grantors and Grantee herein, that the total acreage of surface that may be purchased in accordance with the above rights shall not exceed 40.0 acres; Grantee, its successors and assigns, shall separate any surface so purchased from the remaining surface by a legal fence.

And the said Grantors, for themselves and their heirs, executors, administrators and assigns covenant and agree with the said Grantee, its successors and assigns, that the said Grantors, their heirs, executors, administrators and assigns, will from time to time, upon demand and payment aforesaid, for the amount and part and parts of said surface demanded, execute and deliver unto the said Grantee herein, its successors and assigns, a good and sufficient deed of GENERAL WARRANTY, conveying, in fee simple, free and clear of liens and encumbrance, such amount and such part and parts of the surface of the above described lands, except that which is above reserved, or is in excess of 40.0 acres as above provided, as Grantee, its successors and assigns, may from time to time demand; together with the further right to enter upon said land at any time for the purpose of testing for said coal.

The said Grantors, for themselves and for their heirs, executors, administrators and assigns, hereby waive and release any and all claims and demands which we may now or hereafter have, or claim to have, against said Grantee, its successors and assigns, by reason of or in any way resulting from the removal of coal from, under, and over said premises, or any part thereof.

Item 10 – Mining Rights to Tract No. 1-24-2 – Together with the right in perpetuity of mining, taking out and removing such coal; also the further right in perpetuity to remove coal to and from any other land or lands through entries, shafts, air-ways and mine openings of any and every kind whatever, with the same rights, in removing coal to or from such other lands, to use the surface, entries, shafts, air-ways, mine openings and other appliances for mining upon, in, through, or under the lands herein described, as are herein granted for the mining and removal of the coal hereby conveyed; mining of said coal by the stripping method is prohibited.

Provided, further, that said Grantee, its successors and assigns, shall have the right to purchase from time to time so much of, and such parts of the surface over the aforesaid described coal rights, except that situated within 500 feet from the brick residence located on the west side of State Route 147 and the adjacent barn, and the frame house located on the east side of State Route 147, presently on said surface, as said Grantee, its successors and assigns may desire and as may be necessary for shafts, slopes, buildings, structures and appurtenances thereunto, drill holes for power or water, drains, reservoirs, roads, industrial tracks, storage yards, and machinery, to facilitate the taking out, mining and removing of such coal, paying therefor at the rate of One Hundred Dollars ($100.00) per acre; it is, however, understood and agreed by Grantors and Grantee herein, that the total acreage of surface that may be purchased in accordance with the above rights shall not exceed 40.0 acres; Grantee, its successors and assigns, shall separate any surface so purchased from the remaining surface by a legal fence.

And the said Grantors, for themselves and their heirs, executors, administrators and assigns covenant and agree with the said Grantee, its successors and assigns, that the said Grantors, their heirs, executors, administrators and assigns, will from time to time, upon demand and payment aforesaid, for the amount and part and parts of said surface demanded, execute and deliver unto the said Grantee herein, its successors and assigns, a good and sufficient deed of GENERAL WARRANTY, conveying, in fee simple, free and clear of liens and encumbrance, such amount and such part and parts of the surface of the above described lands, except that which is above reserved, or is in excess of 40.0 acres as above provided, as Grantee, its successors and assigns, may from time to time demand; together with the further right to enter upon said land at any time for the purpose of testing for said coal.

The said Grantors, for themselves and for their heirs, executors, administrators and assigns, hereby waive and release any and all claims and demands which we may now or hereafter have, or claim to have, against said Grantee, its successors and assigns, by reason of or in any way resulting from the removal of coal from, under, and over said premises, or any part thereof.

c. (9)(a) **List below the following information for each surface owner of land within the proposed permit area.**

N/A No Permit Area

| OWNER NAME | COUNTY | TOWNSHIP | SEC./LOT | T- ,R- |
|---|---|---|---|---|
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C. (9)(b) List the following information for each surface owner of land within the proposed underground workings.

| OWNER NAME | COUNTY | TOWNSHIP | SEC./LOT | T- R- |
|---|---|---|---|---|
| Floyd & Shirley Simpson | Belmont | Smith | 34 | 6N/4W |
| F. T. Hart | Belmont | Smith | 28 | 6N/4W |
| L. L. Griffith | Belmont | Smith | 28 | 6N/4W |
| J.W. & J.D. Carson | Belmont | Smith | 28 | 6N/4W |
| J.L. & E. Wilson | Belmont | Smith | 28 | 6N/4W |
| A. Funkhouser | Belmont | Smith | 28 | 6N/4W |
| C.E. Jr. & C.A. Funkhouser | Belmont | Smith | 28 | 6N/4W |
| T.N. & E.M. Rubel | Belmont | Smith | 28 | 6N/4W |
| C.E. Sr. & I. Funkhouser | Belmont | Smith | 28 | 6N/4W |
| F.P. & A. Funkhouser | Belmont | Smith | 22 | 6N/4W |
| S.L. Rice | Belmont | Smith | 22 | 6N/4W |
| F. Simpson | Belmont | Smith | 34 | 6N/4W |

D. AREAS WHERE MINING IS PROHIBITED OR LIMITED-Permit Area

(1) Does the permit area included in this permit application include any area dedicated as a nature preserve pursuant to Chapter 1517., Ohio Revised Code? _____ Yes, _____ No. If "yes," submit proof of valid existing right. N/A No Permit Area

(2) Does the permit area included in this permit application include any area within one thousand feet of the waterlines of any wild, scenic, or recreational river dedicated pursuant to Chapter 1501., Ohio Revised Code? _____ Yes, _____ No. If "yes," submit proof of valid existing right. N/A No Permit Area

(3) Does the permit area included in this permit application include any area within the boundaries of the following systems: national park, national wildlife refuge, national trails, national wilderness preservation, national recreational areas, or wild and scenic rivers or river corridors, including those rivers under study? _____ Yes, _____ No. If "yes," submit proof of valid existing right.

N/A No Permit Area

(4) Does the permit area included in this permit application include any federal lands within the boundaries of any national forest? _____ Yes, _____ No. If "yes," submit approval of the U.S. Secretary of Interior of proof of valid existing right.

N/A No Permit Area

(5) Will operations in the permit area conducted under this permit adversely affect any publicly owned park or places included on the National Register of Historic Places? _____ Yes, _____ No. If "yes," submit joint approval from the chief and the federal, state, or local agency with jurisdiction over the park or places or proof of valid existing right.

N/A No Permit Area

(6) Will operations in the permit area conducted under this permit affect land within one hundred feet of the outside right-of-way of a public highway? _____ Yes, _____ No. If "yes," list the highway(s) in the space below and submit Attachment 9 or proof of valid existing right.

N/A No Permit Area

D. (7) Will operations in the permit area conducted under this permit affect land within three hundred feet of any occupied dwelling? _____ Yes, _____ No. If "yes," list the name of the owner(s) in the space below and submit Attachment 10 or proof of valid existing right.

N/A No Permit Area

(8) Will operations in the permit area conducted under this permit affect land within three hundred feet of any public building, school, church, community or institutional building, or public park? _____ Yes, _____ No. If "yes," submit proof of valid existing right. N/A No Permit Area

(9) Will operations in the permit area conducted under this permit affect land within one hundred feet of a cemetery? _____ Yes, _____ No. If "yes," submit proof of valid existing right or appropriate authorization to relocate the cemetery. N/A No Permit Area

(10) Will operations conducted during this permit result in the extension of any part of the pit within fifty feet of horizontal distance to any adjacent land or water in which the applicant does not own either the surface or mineral rights? _____ Yes, _____ No. If "yes," list below the name(s) of the adjacent owner(s) and submit Attachment 11. N/A No Permit Area

E. **AREAS WHERE MINING IS PROHIBITED OR LIMITED-Permit and Shadow Area**

Are there areas within the proposed permit area, shadow area, or adjacent areas designated unsuitable for coal mining operations under rule 1501:13-3-07 of the Administrative Code or under study for designation in an administrative proceeding under this rule?
_____ Yes, __X__ No.

(1) If "yes" to the item above, did the applicant make substantial legal and financial commitments in the proposed areas prior to January 4, 1977?
_____ Yes, _____ No. N/A

(2) If "yes" to item (1) above, submit as an addendum to the permit application information supporting the assertions that the commitments were made prior to January 4, 1977.

N/A

F. PERMIT TERM AND EXTENT-**Permit and Underground Workings**

(1) Anticipated/actual date for:

(a) Starting mining operations 8/1/2002

(b) Terminating mining operations N/A

(2) Does the applicant propose a permit term in excess of five (5) years? _____ Yes, X No. If "yes," submit an addendum with the information required by 1501:13-4-03(E)(3), Ohio Administrative Code.

(3) Indicate the following acreage figures:

(a) Total Acres 0 (Permit area)

(b) Total Acres 38.6 (Underground Workings)

(4) Horizontal extent of underground workings over life of permit in acres:

(a) Full Coal Recovery _____

(b) Room and Pillar 38.6

G. PUBLIC NOTICE-**Permit and Shadow Area**

(1) In the space below, provide the name and address of the public office where a complete copy of this permit application is to be filed.

Recorder's Office
Belmont County Court House
Main Street
St. Clairsville, OH 43950

(2) In the space below, list the name and address of the newspaper and submit an addendum providing the text of the advertisement that is to be published in a newspaper of general circulation in the locality of the proposed operation. Note: The advertisement is to provide the information required by paragraph (A) of rule 1501:13-5-01 of the Administrative Code.

The Times Leader
200 South Fourth Street
Martins Ferry, OH 43935

ADDENDUM TO PAGE 15, PART 1, G(2)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

**Public Notice**

The Ohio Valley Coal Company, Powhatan No. 6 Mine, 56854 Pleasant Ridge Road, Alledonia, Ohio 43902, has submitted an underground coal mining application for Permit D-0360, designated as D-0360-13 to the Ohio Department of Natural Resources, Division of Mineral Resources Management. The proposed additional underground acreage for Permit D-0360 is located in Belmont County, Smith Township, Sections 22, 28, and 34. The area is located on the Armstrong Mills and Hunter 7 ½ minute USGS quadrangle maps, approximately 1.2 miles north of Centerville, Ohio. The proposed underground workings encompass 38.6 acres. This area will be mined using partial-recovery methods from which there will be no surface subsidence.

This application is on file at the Belmont County Recorder's Office, located at the County Court House on Main Street in St. Clairsville for public viewing. Written comments or requests for an informal conference may be sent to the Division of Mineral Resources Management, 1855 Fountain Square Court, Columbus, Ohio 43224 within thirty days of the last date of publication of this notice.

*PROOF OF PUBLICATION*

The State of Ohio
County of Belmont, ss:

The undersigned, being sworn, says that he or she is an employee of Eastern Ohio Newspapers, Inc., A Corporation, publisher of the Times Leader a newspaper published in Martins Ferry, Belmont County, Ohio, each day of the week except Saturday and of general circulation in said city and county; that it is a newspaper meeting the requirements of sections 7.12 and 5721.01 Ohio Revised Code as amended effective September 24, 1957; that affiant has custody of the records and files of said newspaper; and that the advertisement of which the annexed is a true copy, was published in said newspaper on each of the days in the month and year stated, as follows:

Feb. 15, 22,
Mar 1, 8 2002
Audrey Blaze

Subscribed by Affiant and sworn to before me, this 8th day of Mar, A.D. 2002.

Rebecca L Anderson
Notary Public

NOTARIAL SEAL STATE OF OHIO

REBECCA L. ANDERSON
Notary Public, State of Ohio
My Commission Expires Nov. 25, 2006

Printer's Fee $ 200.20

Notary's Fee $_____

The Times Leader
Martins Ferry, Ohio

Public Notice

The Ohio Valley Coal Company, Powhatan No. 6 Mine, 56854 Pleasant Ridge Road, Alledonia, Ohio 43902, has submitted an underground coal mining application for Permit D-0360, designated as D-0360-13 to the Ohio Department of Natural Resources, Division of Mineral Resources Management. The proposed additional underground acreage for Permit D-0360 is located in Belmont County, Smith Township, Sections 22, 28, and 34. The area is located on the Armstrong Mills and Hunter 7 1/2 minute USGS quadrangle maps, approximately 1.2 miles north of Centerville, Ohio. The proposed underground workings encompass 38.6 acres. This area will be mined using partial-recovery methods from which there will be no surface subsidence.

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TL - ADV. - 4 FRI. - FEB. 15, 22, MARCH 1, 8.

PART 2 ENVIRONMENTAL RESOURCES INFORMATION

A. CULTURAL, HISTORIC, AND ARCHEOLOGICAL INFORMATION-**Permit and Planned Subsidence Area**

(1) Are there any cultural or historic resources or structures listed or eligible for listing on the National Register of Historic Places within the proposed permit or planned subsidence area? _X___ Yes, _____ No. If "yes," submit an addendum describing the resources and structures including the location and submit Attachment 27 or 27A as appropriate. No subsidence areas.

(2) Are there any known archeological sites within the proposed permit or planned subsidence area? _____ Yes, __X__ No. If "yes," submit an addendum describing the site including the location and submit Attachment 27 or 27A as appropriate.

(3) If applicable, based upon the review of the proposed planned subsidence areas and the completed Attachment 27A for the initial six months of projected mining, have any properties listed or eligible for listing on the National Register of Historic Places been identified? _____ Yes, __X__ No. If "yes," submit an addendum listing each property identified.

(4) Submit an addendum indicating the method to be used to identify historic properties on planned subsidence areas as mining progresses. No subsidence areas.

B. GEOLOGY DESCRIPTION-**Permit and Shadow Area**

(1) Submit an addendum describing the geology within the proposed permit area and shadow area down to and including the first stratum below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely affected by mining. The description shall also include information on the areal and structural geology of the permit and shadow area and any other geologic parameters which may influence the probable hydrologic consequences and protection of the hydrologic balance from material damage outside of the permit area.
See Addendum to Page 16, Part 2, B.(1)

(2) Submit an addendum describing how the areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially affected surface and ground waters per paragraph (C) of rule 1501:13-4-13 of the Administrative Code.
See Addendum to Page 16, Part 2, B.(2)

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-2

State Plane Coords: X2430539.19 Y731089.68 Surface Elevation 1079.26 ~~1085~~

| LITHOLOGY | H20* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| CASING | | 20.00 | |
| SHALE | | 0.95 | COMP |
| SANDSTONE | | 0.80 | ALK, HARD |
| SHALE | | 1.80 | COMP |
| LIMESTONE | | 1.75 | ALK |
| SHALE | | 3.92 | COMP |
| SHALE | | 0.31 | COMP, EROD |
| SHALE | | 1.92 | ALK, COMP, EROD |
| SHALE | | 1.78 | COMP, EROD |
| (CORE LOST) | | 3.30 | |
| SILTSTONE | | 0.65 | COMP, EROD |
| SHALE | | 1.35 | COMP, EROD |
| SANDSTONE | | 1.12 | HARD |
| SHALE | | 0.35 | COMP, EROD |
| SHALE | | 1.45 | COMP |
| SANDSTONE | | 0.20 | HARD |
| SHALE | | 1.88 | COMP, HARD |
| SANDSTONE | | 1.20 | HARD |
| SHALE | | 2.20 | COMP, HARD |
| SANDSTONE | | 1.20 | HARD |
| SHALE | | 2.89 | COMP, HARD |
| SANDSTONE | | 0.12 | HARD |
| SHALE | | 0.88 | COMP, HARD |
| SHALE | | 1.10 | COMP |
| SHALE | | 0.82 | COMP, HARD |
| SHALE | | 0.30 | COMP |
| **COAL (NO. 11)** | | **3.04** | AC, EROD |
| SANDSTONE | | 0.05 | HARD |
| SHALE | | 0.30 | COMP, EROD |
| SHALE | | 2.37 | COMP, EROD |
| SHALE | | 6.39 | ALK, COMP |
| SANDSTONE | | 2.40 | ALK, HARD |
| LIMESTONE | | 11.41 | ALK |
| SHALE | | 15.07 | COMP |
| **COAL (NO. 10)** | | **2.76** | AC, EROD |
| SHALE | | 0.17 | COMP |
| LIMESTONE | | 1.80 | ALK |
| SHALE | | 1.70 | COMP |
| CLAYSTONE | * | 2.65 | COMP, EROD |
| SHALE | | 4.62 | ALK, COMP |

ATTACHMENT 13
(GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-2

State Plane Coords: X2430539.19 Y731089.68 Surface Elevation 1085

| LITHOLOGY | H20* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| CLAYSTONE | * | 1.50 | COMP, EROD |
| SILTSTONE | | 1.30 | COMP, EROD |
| SHALE | | 0.60 | COMP |
| SANDSTONE | | 1.20 | HARD |
| SHALE | | 6.43 | COMP |
| CLAYSTONE | | 1.35 | ALK, COMP, EROD |
| LIMESTONE | | 10.12 | ALK |
| CLAYSTONE | * | 0.25 | ALK, COMP, EROD |
| LIMESTONE | | 6.75 | ALK |
| CLAYSTONE | | 7.23 | ALK, COMP, EROD |
| LIMESTONE | | 4.00 | ALK |
| CLAYTONE | * | 0.55 | ALK, COMP, EROD |
| CLAYSTONE | | 3.70 | ALK, COMP, EROD |
| LIMESTONE | | 4.85 | ALK |
| CLAYSTONE | | 1.20 | COMP, EROD |
| LIMESTONE | | 20.40 | ALK |
| LIMESTONE | | 6.20 | ALK |
| LIMESTONE | | 3.60 | ALK |
| CLAYSTONE | | 1.05 | ALK, COMP, EROD |
| LIMESTONE | | 8.75 | ALK |
| LIMESTONE | | 3.35 | ALK |
| LIMESTONE | | 0.95 | ALK, COMP |
| LIMESTONE | | 0.17 | ALK |
| SHALE | | 4.52 | COMP, EROD |
| COAL (N0. 9) | | 3.90 | AC, EROD |
| SHALE | | 1.44 | COMP, EROD |
| LIMESTONE | | 1.80 | ALK, COMP |
| LIMESTONE | | 3.87 | ALK |
| LIMESTONE | | 1.90 | ALK |
| SHALE | | 10.60 | ALK, COMP, EROD |
| LIMESTONE | | 0.30 | ALK |
| SHALE | | 0.67 | COMP, EROD |
| LIMESTONE | | 0.95 | ALK |
| SHALE | | 0.45 | COMP, EROD |
| SHALE | | 0.80 | AC, COMP, EROD |
| SHALE | | 0.70 | ALK, COMP, EROD |
| LIMESTONE | | 14.73 | ALK |
| CLAYSTONE | | 1.25 | ALK, COMP, EROD |
| LIMESTONE | | 4.38 | ALK |
| CLAYSTONE | | 0.62 | ALK, COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-2

State Plane Coords: X2430539.19 Y731089.68 Surface Elevation 1085

| LITHOLOGY | H20* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| LIMESTONE | | 2.65 | ALK |
| LIMESTONE | | 2.95 | ALK |
| CLAYSTONE | | 2.35 | ALK, COMP, EROD |
| LIMESTONE | | 1.70 | ALK |
| CLAYSTONE | | 1.10 | ALK, COMP, EROD |
| CLAYSTONE | | 1.50 | ALK, COMP, EROD |
| SHALE | | 2.40 | COMP, EROD |
| LIMESTONE | | 8.00 | ALK |
| LIMESTONE | | 3.15 | ALK |
| SHALE | | 0.63 | ALK, COMP, EROD |
| LIMESTONE | | 1.40 | ALK |
| SHALE | | 0.75 | ALK, COMP, EROD |
| LIMESTONE | | 0.17 | ALK |
| CLAYSTONE | | 2.10 | ALK, COMP, EROD |
| SHALE | | 1.80 | ALK, COMP, EROD |
| CLAYSTONE | | 3.10 | COMP, EROD |
| CLAYSTONE | | 0.80 | COMP, EROD |
| **COAL (NO. 8)** | | **7.12** | AC, EROD |
| CLAYSTONE | | 4.78 | ALK, COMP, EROD |
| SHALE | | 2.20 | ALK, COMP, EROD |
| CLAYSTONE | | 2.00 | COMP, EROD |

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam

| Stratum | Total Sulfur % | Pyrite Sulfur % | Potential Acidity Mg/l as CaCO3 | Neutralization Potential (/1000 Tons) | CaCO3 Deficiency (/1000 Tons) |
|---|---|---|---|---|---|
| Roof | 1.26 | 0.87 | 39.4 | 351 | -312 |
| Coal | 4.73 | 2.30 | 148 | 10.78 | 71.8 |
| Bottom | 1.86 | 1.56 | 58.1 | 451 | -393 |

**Legend:**
AC = ACID PRODUCING
ALK = ALKALINE PRODUCING
COMP = COMPACTIBLE
EROD = ERODIBLE

* – Indicates water bearing stratum under column labelled H2O

Stratum thickness is measured in feet.

# DIAMOND DRILL HOLE N94-2

GEOLOGIST: HOMER McEVERS
ELEVATION: ~~1085.0~~ 1079.26 (ALTIMETER)
EXCHANGE COORDINATES: N ~~-9906.55~~ -4888.61, E ~~-66938.88~~ -66964.94 (NOT SURVEYED)

DRILLER: L. J. HUGHES & SONS, INC., FUZZY SALISBURY

TOWNSHIP: SMITH
SECTION: 28, NE 1/4
COUNTY: BELMONT

SURF. OWNER: R. SAFFLE
DATE STARTED: 6/23/94
DATE FINISHED: 6/28/94

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 20.00 | CASINGS | 20.00 | 1065.00 |
| 0.95 | SHALE, GRAY, MEDIUM | 20.95 | 1064.05 |
| 0.80 | SANDSTONE, GRAY, CALCAREOUS, HARD | 21.75 | 1063.25 |
| 1.80 | SHALE, GRAY, LAMINATED, MEDIUM | 23.55 | 1061.45 |
| 1.75 | LIMESTONE, GRAY, HARD | 25.30 | 1059.70 |
| 3.92 | SHALE, GRAY, MEDIUM | 29.22 | 1055.78 |
| 0.31 | SHALE, GRAY, LAMINATED, SOFT | 29.53 | 1055.47 |
| 1.92 | SHALE, GRAY, CALCAREOUS, SOFT | 31.45 | 1053.55 |
| 1.78 | SHALE, GRAY, LAMINATED, SOFT | 33.23 | 1051.77 |
| 3.30 | (CORE LOST) | 36.53 | 1048.47 |
| 0.65 | SILTSTONE, LIGHT BROWN, SOFT | 37.18 | 1047.82 |
| 1.35 | SHALE, GRAY, SOFT | 38.53 | 1046.47 |
| 1.12 | SANDSTONE, GRAY, HARD | 39.65 | 1045.35 |
| 0.35 | SHALE, GRAY, SOFT | 40.00 | 1045.00 |
| 1.45 | SHALE, GRAY, MEDIUM | 41.45 | 1043.55 |
| 0.20 | SANDSTONE, GRAY, HARD | 41.65 | 1043.35 |
| 1.88 | SHALE, SANDY, GRAY, HARD | 43.53 | 1041.47 |
| 1.20 | SANDSTONE, GRAY, HARD | 44.73 | 1040.27 |
| 2.20 | SHALE, SANDY, GRAY, HARD | 46.93 | 1038.07 |
| 1.20 | SANDSTONE, GRAY, HARD | 48.13 | 1036.87 |
| 2.89 | SHALE, SANDY, GRAY, HARD | 51.02 | 1033.98 |
| 0.12 | SANDSTONE, GRAY, HARD | 51.14 | 1033.86 |
| 0.88 | SHALE, SANDY, GRAY, HARD | 52.02 | 1032.98 |
| 1.10 | SHALE, BLACK, MEDIUM | 53.12 | 1031.88 |
| 0.82 | SHALE, SANDY, GRAY, HARD | 53.94 | 1031.06 |
| 0.30 | SHALE, BLACK, MEDIUM | 54.24 | 1030.76 |
| **3.04** | **COAL W/PARTINGS (NO. 11)** | **57.28** | **1027.72** |
| 0.05 | SANDSTONE, GRAY, HARD | 57.33 | 1027.67 |
| 0.30 | SHALE, BLACK | 57.63 | 1027.37 |
| 2.37 | SHALE, GRAY, SOFT | 60.00 | 1025.00 |
| 6.39 | SHALE, SANDY, W/LIMESTONE NODULES, GRAY, MEDIUM | 66.39 | 1018.61 |
| 2.40 | SANDSTONE, CALCAREOUS, GRAY, HARD | 68.79 | 1016.21 |
| 11.41 | LIMESTONE, GRAY GREEN, HARD | 80.20 | 1004.80 |
| 15.07 | SHALE, GRAY, MEDIUM | 95.27 | 989.73 |
| **2.76** | **1.65 COAL (NO. 10)** | **98.03** | **986.97** |
| | **0.02 SANDSTONE, GRAY** | | |
| | **0.10 COAL** | | |
| | **0.06 BONE COAL** | | |
| | **0.11 COAL** | | |

(Continued)

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| | 0.15 SHALE, BLACK (NO. 10 COAL CONTINUED) | | |
| | 0.67 COAL | | |
| 0.17 | SHALE, BLACK, MEDIUM | 98.20 | 986.80 |
| 1.80 | LIMESTONE, GRAY, HARD | 100.00 | 985.00 |
| 1.70 | SHALE, SANDY, GRAY, MEDIUM | 101.70 | 983.30 |
| 2.65 | CLAYSTONE, W/IRON STAINS, GRAY SOFT | 104.35 | 980.65 |
| 4.62 | SHALE, GRAY, W/LIMESTONE NODULES, MEDIUM | 108.97 | 976.03 |
| 1.50 | CLAYSTONE, W/IRON STAINS, GRAY, SOFT | 110.47 | 974.53 |
| 1.30 | SILTSTONE, GRAY, SOFT | 111.77 | 973.23 |
| 0.60 | SHALE, SANDSTONE, GRAY, MEDIUM | 112.37 | 972.63 |
| 1.20 | SANDSTONE, GRAY, HARD | 113.57 | 971.43 |
| 6.43 | SHALE, GRAY, MEDIUM | 120.00 | 965.00 |
| 1.35 | CLAYSTONE, CALAREOUS, GRAY, SOFT | 121.35 | 963.65 |
| 10.12 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 131.47 | 953.53 |
| 0.25 | CLAYSTONE, CALCAREOUS, W/IRON STAINS, GRAY, SOFT | 131.72 | 953.28 |
| 6.75 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 138.47 | 946.53 |
| 7.23 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 145.70 | 939.30 |
| 4.00 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 149.70 | 935.30 |
| 0.55 | CLAYTONE, GREEN, CALCAREOUS, W/IRON STAINS, SOFT | 150.25 | 934.75 |
| 3.70 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 153.95 | 931.05 |
| 4.85 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 158.80 | 926.20 |
| 1.20 | CLAYSTONE, GREEN, SOFT | 160.00 | 925.00 |
| 20.40 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 180.40 | 904.60 |
| 6.20 | LIMESTONE, SANDY, GRAY, HARD | 186.60 | 898.40 |
| 3.60 | LIMESTONE, SANDY, GRAY GREEN, HARD | 190.20 | 894.80 |
| 1.05 | CLAYSTONE, GREEN, CALCAREOUS, MEDIUM | 191.25 | 893.75 |
| 8.75 | LIMESTONE, LIGHT BROWN, HARD | 200.00 | 885.00 |
| 3.35 | LIMESTONE, LIGHT BROWN, HARD | 203.35 | 881.65 |
| 0.95 | LIMESTONE, SHALEY, GRAY, MEDIUM | 204.30 | 880.70 |
| 0.17 | LIMESTONE, LIGHT BROWN, MEDIUM | 204.47 | 880.53 |
| 4.52 | SHALE, BLACK, BROKEN, SOFT | 208.99 | 876.01 |
| **3.90** | **COAL (N0. 9) W/PARTINGS** | **212.89** | **872.11** |
| 1.44 | SHALE, BLACK, SOFT | 214.33 | 870.67 |
| 1.80 | LIMESTONE, SHALEY, GRAY, MEDIUM | 216.13 | 868.87 |
| 3.87 | LIMESTONE, LIGHT BROWN, HARD | 220.00 | 865.00 |
| 1.90 | LIMESTONE, LIGHT BROWN, HARD | 221.90 | 863.10 |
| 10.60 | SHALE, BLACK, CALCAREOUS, SOFT | 232.50 | 852.50 |
| 0.30 | LIMESTONE, LIGHT BROWN, HARD | 232.80 | 852.20 |
| 0.67 | SHALE, GRAY, SOFT | 233.47 | 851.53 |
| 0.95 | LIMESTONE, LIGHT BROWN, HARD | 234.42 | 850.58 |
| 0.45 | SHALE, GRAY, SOFT | 234.87 | 850.13 |
| 0.80 | SHALE, BLACK W/COAL STREAKS,SOFT | 235.67 | 849.33 |
| 0.70 | SHALE, BLACK, CALCAREOUS, SOFT | 236.37 | 848.63 |
| 14.73 | LIMESTONE, LIGHT BROWN , HARD | 251.10 | 833.90 |
| 1.25 | CLAYSTONE, GREEN, CALCAREOUS, SOFT, | 252.35 | 832.65 |
| 4.38 | LIMESTONE, LIGHT BROWN, HARD | 256.73 | 828.27 |

(Continued)

| THICK. (FT) | DESCRIPTION. | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 0.62 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 257.35 | 827.65 |
| 2.65 | LIMESTONE, LIGHT BROWN, HARD | 260.00 | 825.00 |
| 2.95 | LIMESTONE, LIGHT BROWN, HARD | 262.95 | 822.05 |
| 2.35 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 265.30 | 819.70 |
| 1.70 | LIMESTONE, LIGHT BROWN, HARD | 267.00 | 818.00 |
| 1.10 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 268.10 | 816.90 |
| 1.50 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 269.60 | 815.40 |
| 2.40 | SHALE, BLACK, SOFT | 272.00 | 813.00 |
| 8.00 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 280.00 | 805.00 |
| 3.15 | LIMESTONE, LIGHT BROWN, HARD | 283.15 | 801.85 |
| 0.63 | SHALE, BLACK, CALCAREOUS, SOFT | 283.78 | 801.22 |
| 1.40 | LIMESTONE, LIGHT BROWN, HARD | 285.18 | 799.82 |
| 0.75 | SHALE, GRAY/GREEN, CALCAREOUS, SOFT | 285.93 | 799.07 |
| 0.17 | LIMESTONE, LIGHT BROWN, HARD | 286.10 | 798.90 |
| 2.10 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 288.20 | 796.80 |
| 1.80 | SHALE, GRAY/GREEN, CALCAREOUS, SOFT | 290.00 | 795.00 |
| 3.10 | CLAYSTONE, GREEN, SOFT | 293.10 | 791.90 |
| 0.80 | CLAYSTONE, GRAY/BLACK, SOFT | 293.90 | 791.10 |
| 7.12 | **0.95 COAL (NO. 8)** | 301.02 | 783.98 |
| | **0.81 SHALE, GRAY** | | |
| | **0.20 COAL** | | |
| | **0.03 SHALE, W/PYRITE** | | |
| | **5.13 COAL** | | |
| 4.78 | CLAYSTONE, GREEN/GRAY, CALCAREOUS, SOFT | 305.80 | 779.20 |
| 2.20 | SHALE, GRAY, CALCAREOUS, SOFT | 308.00 | 777.00 |
| 2.00 | CLAYSTONE, GREEN, SOFT | 310.00 | 775.00 |

AMOUNT OF HARD ROCK ABOVE NO. 8 SEAM

HARD ROCK: 139.60 FT. (47.5%) OF CORE

SOFT ROCK: 154.30 FT. (52.5%) OF CORE

PROJECTED AQUIFERS

1. 104.35 TO 110.47 (MINOR)
2. 131.47 TO 150.25

ADDENDUM TO PART 2, PAGE 16, B(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## GEOLOGY DESCRIPTION

Stratigraphy of the proposed permit area is formed by the Monongahela formation of the Pennsylvania period, and the Dunkard group of Permian time. The primary strata of both sections consists of an alternating sequence of limestone, sandstone, siltstone, shale, claystone, and coal.

The Monongahela formation is approximately 245 feet thick. In ascending order, it occupies the interval from the Pittsburgh No. 8 to the Waynesburg No. 11 coal bed. The primary rock units are limestone, shale, and claystone. Limestone forms 44 to 68 percent of this stratigraphic interval.

The Dunkard group is 250 to 300 feet thick, occupying the interval from the Waynesburg No. 11 coal bed to the ground surface. The primary rock units here are shale and claystone. These soft units form about 85 percent of this stratigraphic interval. This strata is primarily located within the constrained zone of disturbance resulting from longwall mining.

The rock strata of Belmont County typically form a gentle monocline that dips southeasterly at grades less than one percent and in the application area is southward to southeasterly. The base elevation of the No. 8 seam ranges from approximately 765 ft. in the southeast corner of the application area to approximately 800 ft. in the northwest corner.

The orientation of the major joints in rock and face cleat in coal is approximately N 75° W. The minor joints and butt cleats are generally perpendicular to these ( N 15° E).

Geology and Coal Resources of Belmont County, Ohio, Geological Survey Professional Paper 380, reports that a small dome-shaped anticline lies in eastern Belmont County, primarily in Mead Township. This structure is located over three miles east of the Powhatan No. 6 Mine application area and, therefore, is not expected to have an impact on ground water flow in the application area.

In addition, there is a graben structure that passes through the Powhatan No. 6 Mine Reserve. This graben has been tracked through the adjacent Powhatan No. 3 Mine and enters the No. 6 reserve on the eastern boundary. It proceeds in a southwesterly direction, turns approximately 90 degrees, proceeds in a northwesterly direction, then turns again and proceeds in a general westerly direction off the mine property. The graben is located to the south of the application area and is not expected to have an impact on the ground water flow in the area.

ADDENDUM TO PART 2, PAGE 16, B(1)
PAGE TWO

The structural contours of the No. 8 Seam indicate that the graben is made up of a series of slumps in the deposit, indicated by a thickening of the seam at the bottom of the structure. This structure apparently affected the structural contours to the north of the graben, but these effects do not extend into the application area. Locally, these effects may be seen as areas where incidental water pools in the mine. This water is generally only a nuisance and does not require pumping. Most of the water found underground at the No. 6 mine is man-made during the mining cycle from water sprays (used for dust suppression) and cooling water for motors.

# LJ HUGHES & SONS, INC.

DIAMOND CORE DRILLING
Pressure Grouting, Foundation & Soil Borings
320 Turnpike Road, Summersville, West Virginia 26651 (304) 872-1111


DRILL HOLE NO. N-86-19 DRILLER: DANIEL HAMRICK

DRILLING FOR: THE NACCO MINING COMPANY, POWHATAN POINT, OHIO

SURFACE ELEVATION:

STARTED: NOVEMBER 25, 1986
COMPLETED: DECEMBER 1, 1986

LOCATION: OHIO, BELMONT COUNTY
SMITH TOWNSHIP
SECTION 22
SOUTHWEST 1/4.

| FORMATION | STRATA THICKNESS | | DEPTH FROM SURFACE |
|---|---|---|---|
| CASING | 23.00 | | 23.00 CA |
| CHIPPED | 7.00 | | ~~30.00~~ |
| GRAY CLAYSTONE | 13.50 | | 43.50 CY |
| COAL . . . . . | 2.10 | WAYNESBURG (No.11) | 45.60 CO WY11 |
| GRAY CLAYSTONE | 9.40 | | 55.00 CY |
| GREEN SANDY SHALE WITH LIME | 15.00 | | 70.00 SY |
| GRAY SANDSTONE | 15.00 | | 85.00 SS |
| GRAY SHALE | 1.80 | | 86.80 SH |
| COAL . . . . . | 1.50 | UNIONTOWN (No.10) | 88.30 CO UNTN |
| GREEN CLAYSTONE | 7.00 | | ~~95.30~~ |
| GRAY LIMY CLAYSTONE | 7.10 | | ~~102.40~~ |
| GREEN CLAYSTONE | 3.00 | | 105.40 CY |
| GRAY SANDSTONE | 5.80 | | 111.20 SS |
| GREEN CLAYSTONE | 1.20 | | 112.40 CY |
| LIMESTONE | 1.60 | | 114.00 LS |
| GREEN CLAYSTONE | 1.00 | | 115.00 CY |
| LIMESTONE WITH SHALE | 15.00 | | 130.00 LS |
| GREEN LIMY SHALE | 6.00 | | 136.00 SL |
| LIMESTONE WITH SHALE | 4.00 | | 140.00 LS |
| GREEN CLAYSTONE WITH LIME | 5.00 | | 145.00 CY |
| LIMESTONE WITH SHALE | 50.00 | | 195.00 LS |
| GRAY CLAYSTONE | 5.00 | | 200.00 CY |
| COAL . . . . . | 2.75 | SEWICKLEY (No.9) | 202.75 CO SWKY |
| GRAY LIMY SHALE | 9.25 | | 212.00 SL |
| GRAY SHALE | 10.00 | | 222.00 SH |
| LIMESTONE WITH SHALE | 34.80 | | 256.80 LS |
| GREEN CLAYSTONE | 6.50 | | ~~263.30~~ |
| LIMESTONE | 1.70 | | ~~265.00~~ TD LOG |



TOVCC 11777

# LJ HUGHES & SONS, INC.

THE NACCO MINING COMPANY

CONTINUATION OF DRILL HOLE NO. N-86-19

| FORMATION | STRATA THICKNESS | | DEPTH FROM SURFACE |
|---|---|---|---|
| | | | 265.00 |
| LIMESTONE WITH SHALE | 16.00 | | 281.00 |
| GRAY CLAYSTONE | 3.30 | | 284.30 |
| BONY COAL | 0.33 | | 284.63 |
| GRAY SHALE | 0.23 | | 284.86 |
| COAL . . . . . | 0.85 | ROOF COAL | 285.71 |
| GRAY SHALE | 0.86 | | 286.57 |
| COAL . . . . . | 5.10 | PITTSBURGH (No.8) | 291.67 |
| GRAY LIMY SHALE | 13.33 | | 305.00 |

TOTAL DEPTH: 305 FEET

12 BAGS CEMENT PLACED IN HOLE



TOVCC 11778

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360
ATTACHMENT 13 FOR TEST HOLE N86-19

STATE PLANE COORDS.
X -2,431,056.72
Y - 729,033.72
SURF. ELEV = 1055.45

| FORMATION | THICKNESS | DEPTH | COMMENT | STRATA ELEV. |
|---|---|---|---|---|
| CASING | 23.00 | 23.00 | CASING | 1032.45 |
| CHIPPED | 7.00 | 30.00 | S, C, E | 1025.45 |
| GRAY CLAYSTONE | 13.50 | 43.50 | S, C, E | 1011.95 |
| **COAL - NO. 11** | **2.70** | **45.60** | **S, C, E, AC** | **1009.85** |
| GRAY CLAYSTONE | 9.40 | 55.00 | S, C, E | 1000.45 |
| GREEN SANDY SHALE W/LIMESTONE | 15.00 | 70.00 | S, C, E, ALK | 985.45 |
| GRAY SANDSTONE | 15.00 | 85.00 | H, NC, NE | 970.45 |
| GREEN SHALE | 1.80 | 86.80 | S, C, E | 968.65 |
| **COAL - NO. 10** | **1.50** | **88.30** | **S, C, E, AC** | **967.15** |
| GREEN CLAYSTONE | 7.00 | 95.30 | S, C, E | 960.15 |
| GRAY LIMY CLAYSTONE | 7.10 | 102.40 | S, C, E, ALK | 953.05 |
| GREEN CLAYSTONE | 3.00 | 105.40 | S, C, E | 950.05 |
| GRAY SANDSTONE | 5.80 | 111.20 | H, NC, NE | 944.25 |
| GREEN CLAYSTONE | 1.20 | 112.40 | S, C, E | 943.05 |
| LIMESTONE | 1.60 | 114.00 | H, NC, NE | 941.45 |
| GREEN CLAYSTONE | 1.00 | 115.00 | S, C, E | 940.45 |
| LIMESTONE W/ SHALE | 15.00 | 130.00 | H, NC, E, ALK | 925.45 |
| GREEN LIMY SHALE | 6.00 | 136.00 | S, C, E, ALK | 919.45 |
| LIMESTONE W/SHALE | 4.00 | 140.00 | H, NC, E, ALK | 915.45 |
| GREEN CLAYSTONE W/ LIME | 5.00 | 145.00 | S, C, E, ALK | 910.45 |
| LIMESTONE W/SHALE | 50.00 | 195.00 | H, NC, E, ALK | 860.45 |
| GRAY CLAYSTONE | 5.00 | 200.00 | S, C, E | 855.45 |
| **COAL - NO. 9** | **2.75** | **202.75** | **S, C, E, AC** | **852.70** |
| GRAY LIMY SHALE | 9.25 | 212.00 | S, C, E, ALK | 843.45 |
| GRAY SHALE | 10.00 | 222.00 | S. C. E | 833.45 |
| LIMESTONE W/SHALE | 34.80 | 256.80 | H, NC, E, ALK | 798.65 |
| GREEN CLAYSTONE | 6.50 | 263.30 | S. C. E | 792.15 |
| LIMESTONE | 1.70 | 265.00 | H, NC, NE, ALK | 790.45 |
| LIMESTONE W/SHALE | 16.00 | 281.00 | H, NC, E, ALK | 774.45 |
| GRAY CLAYSTONE | 3.30 | 284.30 | S, C, E | 771.15 |
| BONE COAL | 0.33 | 284.63 | S, C, E, AC | 770.82 |
| GRAY SHALE | 0.23 | 284.86 | S, C, E | 770.59 |
| COAL | 0.85 | 285.71 | S, C, E, AC | 769.74 |
| GRAY SHALE | 0.86 | 286.57 | S, C, E | 768.88 |
| **COAL - NO. 8** | **5.10** | **291.67** | **S, C, E, AC** | **763.78** |
| GRAY LIMY SHALE | 13.30 | 305.00 | S, C, E, ALK | 750.45 |

PERCENT SOFT ROCK 50.90 PERCENT
PERCENT HARD ROCK 49.10 PERCENT

S = SOFT ROCK
H = HARD ROCK
C = COMPACTIBLE
NC = NON-COMPACTIBLE
E = ERODIBLE
NE = NON=ERODIBLE
AC = ACIDIC
ALK = ALKALINE

| | TOT. S % | PYRITE S % | POT ACIDITY MG/L AS CACO3 | NEUT. POT (/1000 TONS) | CACO3 DEF (1000 TONS |
|---|---|---|---|---|---|
| ROOF | | | | | |
| COAL | | | | | |
| BOTTOM | | | | | |



TOVCC 11779

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1198.34 ~~1195~~

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| CASING | | 20.00 | |
| SILTSTONE | | 5.35 | ALK, COMP, EROD |
| SHALE | | 4.65 | ALK, COMP, EROD |
| LIMESTONE | * | 4.75 | ALK |
| LIMESTONE | | 5.25 | ALK |
| SHALE | | 5.40 | COMP, EROD |
| SHALE | * | 2.64 | COMP, EROD |
| SHALE | | 1.50 | COMP |
| SHALE | | 1.30 | COMP |
| SHALE | * | 1.25 | COMP, EROD |
| SHALE | | 2.30 | COMP |
| LIMESTONE | | 1.65 | ALK |
| SHALE | | 1.52 | COMP, EROD |
| LIMESTONE | | 0.32 | ALK |
| SHALE | | 1.42 | COMP |
| SHALE | | 0.70 | COMP |
| LIMESTONE | | 2.10 | ALK |
| SHALE | | 8.20 | COMP |
| SHALE | | 1.10 | COMP |
| COAL (NO. 12) | | 3.40 | AC, EROD |
| SHALE | | 5.20 | COMP, EROD |
| SHALE | | 2.85 | COMP, EROD |
| COAL | | 0.82 | COMP, EROD |
| SHALE | | 0.25 | COMP, EROD |
| SHALE | | 6.85 | ALK, COMP |
| SANDSTONE | | 5.30 | ALK |
| SANDSTONE | | 3.93 | HARD |
| SANDSTONE | | 14.42 | ALK |
| LIMESTONE | | 2.85 | ALK |
| LIMESTONE | | 0.46 | ALK |
| CLAYSTONE | | 2.01 | ALK, COMP, EROD |
| CLAYSTONE | | 5.19 | COMP, EROD |
| SHALE | | 2.38 | ALK, COMP, EROD |
| LIMESTONE | | 3.90 | ALK |
| SHALE | | 4.29 | ALK, COMP |
| SANDSTONE | | 0.90 | HARD |
| SHALE | | 1.16 | COMP |
| SANDSTONE | | 2.70 | ALK |
| SANDSTONE | | 5.44 | HARD |
| SHALE | | 0.92 | COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1195

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| SHALE | | 0.59 | COMP, EROD |
| SHALE | | 0.50 | COMP, EROD |
| SHALE | | 0.20 | COMP, EROD |
| LIMESTONE | | 4.26 | ALK |
| SANDSTONE | | 3.62 | ALK, EROD |
| SHALE | | 1.71 | COMP, EROD |
| CLAYSTONE | | 0.14 | COMP, EROD |
| LIMESTONE | | 0.32 | ALK |
| CLAYSTONE | | 3.45 | ALK, COMP, EROD |
| SHALE | | 0.58 | ALK, COMP |
| SANDSTONE | | 6.28 | ALK |
| CLAYSTONE | | 0.75 | ALK, COMP, EROD |
| SHALE | | 10.98 | COMP, EROD |
| **COAL (NO. 11)** | | **3.41** | AC, EROD |
| CLAYSTONE | | 11.69 | ALK, COMP, EROD |
| LIMESTONE | | 4.10 | ALK |
| SHALE | | 7.10 | ALK, COMP, EROD |
| SANDSTONE | | 4.37 | HARD |
| SHALE | | 0.98 | COMP, EROD |
| SANDSTONE | | 1.57 | HARD |
| SHALE | | 5.81 | COMP, EROD |
| SHALE | | 2.59 | COMP, EROD |
| **COAL (NO. 10)** | | **2.86** | AC, EROD |
| CLAYSTONE | | 2.26 | ALK, COMP, EROD |
| SANDSTONE | | 0.32 | ALK |
| CLAYSTONE | | 3.28 | COMP, EROD |
| CLAYSTONE | | 8.26 | ALK, COMP, EROD |
| SHALE | | 0.34 | COMP |
| SHALE | | 2.55 | ALK, COMP |
| SANDSTONE | | 1.48 | ALK |
| SHALE | | 2.33 | ALK, COMP, EROD |
| CLAYSTONE | | 0.62 | ALK, COMP, EROD |
| SHALE | | 5.40 | ALK, COMP |
| LIMESTONE | | 6.20 | ALK |
| CLAYSTONE | | 0.64 | ALK, COMP, EROD |
| SHALE | | 0.33 | ALK, COMP, ALK |
| SHALE | | 0.74 | ALK, COMP, EROD |
| LIMESTONE | | 0.60 | ALK |
| SHALE | | 1.98 | ALK, COMP, EROD |
| LIMESTONE | | 1.83 | ALK |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94–1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1195

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| CLAYSTONE | | 2.35 | ALK, COMP, EROD |
| LIMESTONE | | 0.36 | ALK |
| CLAYSTONE | | 3.08 | ALK, COMP, EROD |
| SHALE | | 1.62 | ALK, COMP |
| LIMESTONE | | 3.11 | ALK |
| CLAYSTONE | | 0.33 | COMP, EROD |
| LIMESTONE | | 1.57 | ALK |
| CLAYSTONE | | 0.44 | COMP, EROD |
| LIMESTONE | | 0.90 | ALK |
| SILTSTONE | | 1.32 | COMP, EROD |
| SILTSTONE | | 0.78 | COMP, EROD |
| LIMESTONE | | 4.81 | ALK |
| SILTSTONE | | 1.24 | COMP, EROD |
| LIMESTONE | | 13.09 | ALK |
| LIMESTONE | | 2.99 | ALK |
| CLAYSTONE | | 0.72 | ALK, COMP, EROD |
| LIMESTONE | | 1.17 | ALK |
| CLAYSTONE | | 0.58 | COMP, EROD |
| SHALE | | 1.39 | ALK, COMP, EROD |
| LIMESTONE | | 6.20 | ALK |
| SHALE | | 0.98 | ALK, COMP, EROD |
| LIMESTONE | | 4.05 | ALK |
| SHALE | | 0.92 | ALK, COMP |
| SHALE | | 0.19 | ALK |
| LIMESTONE | | 14.10 | ALK |
| CLAYSTONE | | 2.69 | COMP, EROD |
| SHALE | | 0.24 | COMP, EROD |
| COAL (NO. 9) | | 3.85 | AC, EROD |
| CLAYSTONE | | 0.10 | COMP, EROD |
| SHALE | | 1.05 | COMP, EROD |
| LIMESTONE | | 4.63 | ALK |
| LIMESTONE | | 1.75 | ALK |
| LIMESTONE | | 3.84 | ALK |
| SHALE | | 1.50 | COMP, EROD |
| SHALE | | 2.96 | ALK, COMP, EROD |
| CLAYSTONE | | 0.13 | ALK, COMP, EROD |
| SILTSTONE | | 1.94 | ALK, COMP, EROD |
| SHALE | | 0.90 | COMP, EROD |
| LIMESTONE | | 0.38 | ALK |
| CLAYSTONE | | 0.80 | ALK, COMP, EROD |

ATTACHMENT 13
(GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1195

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| LIMESTONE | | 0.81 | ALK, COMP |
| CLAYSTONE | | 0.95 | COMP, EROD |
| COAL | | 0.23 | AC, EROD |
| SHALE | | 0.63 | ALK, COMP, EROD |
| LIMESTONE | | 3.02 | ALK |
| SHALE | | 0.40 | COMP, EROD |
| LIMESTONE | | 0.75 | ALK |
| SHALE | | 0.05 | COMP, EROD |
| LIMESTONE | | 7.45 | ALK |
| SHALE | | 0.54 | ALK, COMP |
| CLAYSTONE | | 0.70 | COMP, EROD |
| LIMESTONE | | 2.70 | ALK |
| SHALE | | 1.03 | COMP, EROD |
| LIMESTONE | | 1.42 | ALK |
| LIMESTONE | | 0.50 | ALK |
| LIMESTONE | | 1.87 | ALK |
| CLAYSTONE | | 0.65 | COMP, EROD |
| LIMESTONE | | 4.39 | ALK |
| CLAYSTONE | | 1.87 | ALK, COMP, EROD |
| SHALE | | 0.76 | ALK, COMP |
| LIMESTONE | | 2.98 | ALK |
| CLAYSTONE | | 2.46 | ALK, COMP, EROD |
| SHALE | | 1.17 | ALK, COMP, EROD |
| CLAYSTONE | | 0.51 | COMP, EROD |
| SHALE | | 1.32 | COMP, EROD |
| SHALE | | 0.49 | AC, COMP, EROD |
| LIMESTONE | | 11.78 | ALK |
| CLAYSTONE | | 0.72 | ALK, COMP, EROD |
| LIMESTONE | | 1.16 | ALK |
| CLAYSTONE | | 1.30 | COMP, EROD |
| LIMESTONE | | 0.42 | ALK |
| CLAYSTONE | | 0.55 | COMP, EROD |
| LIMESTONE | | 0.35 | ALK |
| CLAYSTONE | | 0.05 | COMP, EROD |
| LIMESTONE | | 0.35 | ALK |
| CLAYSTONE | | 4.33 | COMP, EROD |
| SHALE | | 0.55 | COMP, EROD |
| COAL (NO. 8) | | 7.53 | AC, EROD |
| SHALE | | 0.38 | ALK, COMP, EROD |
| SHALE | | 1.39 | ALK, COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94–1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1195

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| LIMESTONE | | 0.50 | ALK |
| SHALE | | 0.66 | COMP, EROD |
| CLAYSTONE | | 0.16 | COMP, EROD |
| LIMESTONE | | 0.74 | ALK |
| SHALE | | 0.64 | COMP, EROD |
| LIMESTONE | | 1.60 | ALK |
| SHALE | | 1.70 | ALK, COMP |
| LIMESTONE | | 3.10 | ALK |
| LIMESTONE | | 1.07 | ALK |

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam

| Stratum | Total Sulfur % | Pyrite Sulfur % | Potential Acidity Mg/l as CaCO3 | Neutralization Potential (/1000 Tons) | CaCO3 Deficiency (/1000 Tons) |
|---|---|---|---|---|---|
| Roof | 1.55 | 1.08 | 48.4 | 318 | –270 |
| Coal | 5.44 | 2.64 | 170 | 10.43 | 159 |
| Bottom | 1.44 | 0.99 | 45.0 | 647 | –602 |

**Legend:**
AC = ACID PRODUCING
ALK = ALKALINE PRODUCING
COMP = COMPACTIBLE
EROD = ERODIBLE

* – Indicates water bearing stratum under column labelled H2O

Stratum thickness is measured in feet.

# DIAMOND DRILL HOLE N94-1

GEOLOGIST: HOMER McEVERS

ELEVATION: ~~1195.00~~ 1198.34 (ALTIMETER)

COORDINATES: N ~~-9450.67~~ -9424.68; E ~~-62828.48~~ -62483.61 (~~NOT SURVEYED~~) EXCHANGE

TOWNSHIP: SMITH

SECTION: 22, NW 1/4

COUNTY: BELMONT

SURF. OWNER: R. RICE

DATE STARTED: 6/21/94

DATE FINISHED: 6/23/94

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 20.00 | CASING | 20.00 | 1175.00 |
| 5.35 | SILTSTONE, LT. BROWN, CALC, SOFT, WEATHERED | 25.35 | 1169.65 |
| 4.65 | SHALE, GRAY, CALCAREOUS, SOFT | 30.00 | 1165.00 |
| 4.75 | LIMESTONE, WITH IRON STAINS, GRAY, MEDIUM | 34.75 | 1160.25 |
| 5.25 | LIMESTONE, GRAY, MEDIUM | 40.00 | 1155.00 |
| 5.40 | SHALE, GRAY, MEDIUM | 45.40 | 1149.60 |
| 2.64 | SHALE, W/IRON STAINS, MEDIUM | 48.04 | 1146.96 |
| 1.50 | SHALE, GRAY, MEDIUM | 49.54 | 1145.46 |
| 1.30 | SHALE, GRAY, MEDIUM/HARD | 50.84 | 1144.16 |
| 1.25 | SHALE, GRAY, BROKEN W/IRON STAINS, MEDIUM | 52.09 | 1142.91 |
| 2.30 | SHALE, GRAY, MEDIUM | 54.39 | 1140.61 |
| 1.65 | LIMESTONE, GRAY, HARD | 56.04 | 1138.96 |
| 1.52 | SHALE, GRAY, MEDIUM | 57.56 | 1137.44 |
| 0.32 | LIMESTONE, GRAY, HARD | 57.88 | 1137.12 |
| 1.42 | SHALE, GRAY, LAMINATED, MEDIUM | 59.30 | 1135.70 |
| 0.70 | SHALE, GRAY, MEDIUM | 60.00 | 1135.00 |
| 2.10 | LIMESTONE, GRAY, HARD | 62.10 | 1132.90 |
| 8.20 | SHALE, GRAY, MEDIUM | 70.30 | 1124.70 |
| 1.10 | SHALE, GRAY, BROKEN, MEDIUM | 71.40 | 1123.60 |
| 3.40 | 0.50 BONE COAL (NO. 12) | 74.80 | 1120.20 |
| | 2.80 COAL | | |
| | 0.10 BONE COAL | | |
| 5.20 | SHALE, GRAY. LAMINATED, SOFT | 80.00 | 1115.00 |
| 2.85 | SHALE, LAMINATED, SOFT | 82.85 | 1112.15 |
| 0.82 | COAL | 83.67 | 1111.33 |
| 0.25 | SHALE, BLACK, LAMINATED, SOFT | 83.92 | 1111.08 |
| 6.85 | SHALE, CALCAREOUS, MEDIUM, GRAY | 90.77 | 1104.23 |
| 5.30 | SANDSTONE, GRAY W/LS NODULES, HARD | 96.07 | 1098.93 |
| 3.93 | SANDSTONE, GRAY, HARD | 100.00 | 1095.00 |
| 14.42 | SANDSTONE, GRAY, MEDIUM, CALCAREOUS, LAMINATED | 114.42 | 1080.58 |
| 2.85 | LIMESTONE, GRAY, HARD | 117.27 | 1077.73 |
| 0.46 | LIMESTONE, LIGHT BROWN, HARD | 117.73 | 1077.27 |
| 2.01 | CLAYSTONE, CALCAREOUS, GRAY, BROKEN, SOFT | 119.74 | 1075.26 |
| 5.19 | CLAYSTONE, GRAY, SOFT | 124.93 | 1070.07 |
| 2.38 | SHALE, CALCAREOUS, MEDIUM, GRAY | 127.31 | 1067.69 |
| 3.90 | LIMESTONE, GRAY, MEDIUM | 131.21 | 1063.79 |
| 4.29 | SHALE, GRAY, MEDIUM, W/LIMESTONE NODULES | 135.50 | 1059.50 |
| 0.90 | SANDSTONE, GRAY, HARD, LAMINATED | 136.40 | 1058.60 |
| 1.16 | SHALE, SANDY, GRAY, LAMINATED, MEDIUM | 137.56 | 1057.44 |
| 2.70 | SANDSTONE, CALCAREOUS, HARD, GRAY | 140.26 | 1054.74 |
| 5.44 | SANDSTONE, HARD, GRAY, LAMINATED | 145.70 | 1049.30 |

DIAMOND DRILL HOLE N94-1

(Continued)

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 0.92 | SHALE, GRAY, SOFT | 146.62 | 1048.38 |
| 0.77 | CLAYSTONE, GRAY, LAMINATED, SOFT | 147.39 | 1047.61 |
| 0.59 | SHALE, GRAY, LAMINATED, SOFT | 147.98 | 1047.02 |
| 0.50 | SHALE, BLACK, SOFT | 148.48 | 1046.52 |
| 0.20 | SHALE, GRAY, MEDIUM | 148.68 | 1046.32 |
| 4.26 | LIMESTONE, GRAY, W/SANDSTONE STREAKS, HARD | 152.94 | 1042.06 |
| 3.62 | SANDSTONE, LS NODULES, LAM. W/SHALE, GRAY, HARD | 156.56 | 1038.44 |
| 1.71 | SHALE, GRAY, LAMINATED, SOFT | 158.27 | 1036.73 |
| 0.14 | CLAYSTONE, DARK GRAY, SOFT | 158.41 | 1036.59 |
| 0.32 | LIMESTONE, LIGHT GRAY, HARD | 158.73 | 1036.27 |
| 3.45 | CLAYSTONE, GRAY, SOFT, CALCAREOUS | 162.18 | 1032.82 |
| 0.58 | SHALE, W/SANDSTONE STREAKS, CALCAREOUS, GRAY, MEDIUM | 162.76 | 1032.24 |
| 6.28 | SANDSTONE, GRAY, LAMINATED, CALCAREOUS | 169.04 | 1025.96 |
| 0.75 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 169.79 | 1025.21 |
| 10.98 | SHALE, GRAY, SOFT | 180.77 | 1014.23 |
| **3.41** | **0.18 BONE COAL (NO. 11)** | **184.18** | **1010.82** |
| | **3.23 COAL, W/PYRITE STREAKS** | | |
| 11.69 | CLYSTN, GRAY, SOFT, W/COAL STREAKS, CALC, BROKEN | 195.87 | 999.13 |
| 4.10 | LIMESTONE, GREEN, HARD | 199.97 | 995.03 |
| 7.10 | SHALE, GREEN, SANDY, W/LIMESTONE NODULES, SOFT | 207.07 | 987.93 |
| 4.37 | SANDSTONE, GRAY, LAMINATED, HARD | 211.44 | 983.56 |
| 0.98 | SHALE, GRAY, LAMINATED, SOFT | 212.42 | 982.58 |
| 1.57 | SANDSTONE, GRAY, LAMINATED, HARD | 213.99 | 981.01 |
| 5.81 | SHALE, SANDY, LAMINATED | 219.80 | 975.20 |
| 2.59 | SHALE, GRAY | 222.39 | 972.61 |
| **2.86** | **2.00 COAL (NO. 10)** | **225.25** | **969.75** |
| | **0.15 CLAYSTONE, GRAY** | | |
| | **0.71 COAL** | | |
| 2.26 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 227.51 | 967.49 |
| 0.32 | SANDSTONE, GRAY, CALCAREOUS, HARD | 227.83 | 967.17 |
| 3.28 | CLAYSTONE, GRAY, BROKEN, SOFT | 231.11 | 963.89 |
| 8.26 | CLAYSTONE, CALCAREOUS, GRAY, SOFT | 239.37 | 955.63 |
| 0.34 | SHALE, GRAY, MEDIUM | 239.71 | 955.29 |
| 2.55 | SHALE, GREEN, MEDIUM, CALCAREOUS, LAMINATED | 242.26 | 952.74 |
| 1.48 | SAND STONE, GRAY, HARD, CALCAREOUS, LAMINATED | 243.74 | 951.26 |
| 2.33 | SHALE, GRAY, SOFT, CALCAREOUS | 246.07 | 948.93 |
| 0.62 | CLAYSTONE, GRAY, SOFT, CALCAREOUS | 246.69 | 948.31 |
| 5.40 | SHALE, GRAY, MEDIUM, CALCAREOUS | 252.09 | 942.91 |
| 6.20 | LIMESTONE, GRAY, HARD | 258.29 | 936.71 |
| 0.64 | CLAYSTONE, GRAY, SOFT, CALCAREOUS | 258.93 | 936.07 |
| 0.33 | SHALE, GRAY, LAMINATED, CALCAREOUS, SOFT | 259.26 | 935.74 |
| 0.74 | SHALE, GRAY, LAMINATED, CALCAREOUS, SOFT | 260.00 | 935.00 |
| 0.60 | LIMESTONE, GRAY, HARD | 260.60 | 934.40 |
| 1.98 | SHALE, GRAY, SOFT, LAMINATED, CALCAREOUS | 262.58 | 932.42 |
| 1.83 | LIMESTONE, GRAY, HARD | 264.41 | 930.59 |
| 2.35 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 266.76 | 928.24 |

(Continued)

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 0.36 | LIMESTONE, GRAY, HARD | 267.12 | 927.88 |
| 3.08 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 270.20 | 924.80 |
| 1.62 | SHALE, CALCAREOUS, GRAY, MEDIUM | 271.82 | 923.18 |
| 3.11 | LIMESTONE, GRAY, JOINTED, HARD | 274.93 | 920.07 |
| 0.33 | CLAYSTONE, GRAY, SOFT | 275.26 | 919.74 |
| 1.57 | LIMESTONE, GRAY, HARD | 276.83 | 918.17 |
| 0.44 | CLAYSTONE, GREEN, SOFT | 277.27 | 917.73 |
| 0.90 | LIMESTONE, GRAY, HARD | 278.17 | 916.83 |
| 1.32 | SILTSTONE, MEDIUM, GREEN, LAMINATED | 279.49 | 915.51 |
| 0.78 | SILTSTONE, GREEN, LAMINATED, SOFT | 280.27 | 914.73 |
| 4.81 | LIMESTONE, GRAY, HARD | 285.08 | 909.92 |
| 1.24 | SILTSTONE, SOFT, GREEN | 286.32 | 908.68 |
| 13.09 | LIMESTONE, GRAY, HARD | 299.41 | 895.59 |
| 2.99 | LIMESTONE, GRAY, MEDIUM | 302.40 | 892.60 |
| 0.72 | GREEN, CLAYSTONE, SOFT, CALCAREOUS | 303.12 | 891.88 |
| 1.17 | LIMESTONE, GRAY, MEDIUM | 304.29 | 890.71 |
| 0.58 | GREEN CLAYSTONE, SOFT | 304.87 | 890.13 |
| 1.39 | SHALE, CALCAREOUS, SOFT, GRAY | 306.26 | 888.74 |
| 6.20 | LIMESTONE, GRAY, LAMINATED | 312.46 | 882.54 |
| 0.98 | SHALE, GRAY, W/ LIMESTONE NODULES | 313.44 | 881.56 |
| 4.05 | LIMESTONE, MEDIUM, GRAY, LAMINATED | 317.49 | 877.51 |
| 0.92 | GREEN SHALE, CALCAREOUS, MEDIUM | 318.41 | 876.59 |
| 0.19 | GRAY SHALE, LAMINATED, CALCAREOUS, HARD | 318.60 | 876.40 |
| 14.10 | GRAY LIMESTONE, HARD | 332.70 | 862.30 |
| 2.69 | GRAY CLAYSTONE, SOFT | 335.39 | 859.61 |
| 0.24 | GRAY SHALE, SOFT | 335.63 | 859.37 |
| 3.85 | COAL (NO. 9), SS PARTINGS W/PYRITE | 339.48 | 855.52 |
| 0.10 | GRAY CLAYSTONE, SOFT | 339.58 | 855.42 |
| 1.05 | SHALE, BLACK, SOFT | 340.63 | 854.37 |
| 4.63 | LIMESTONE, GRAY, MEDIUM, LAMINATED | 345.26 | 849.74 |
| 1.75 | LIMESTONE, WHITE, HARD | 347.01 | 847.99 |
| 3.84 | LIMESTONE, GRAY, MEDIUM, LAMINATED | 350.85 | 844.15 |
| 1.50 | SHALE, GRAY SOFT | 352.35 | 842.65 |
| 2.96 | SHALE, GRAY, SOFT, LAMINATED, CALCAREOUS | 355.31 | 839.69 |
| 0.13 | CLAYSTONE, GRAY, SOFT, CALCAREOUS | 355.44 | 839.56 |
| 1.94 | SILTSTONE, GRAY, SOFT, LAMINATED, CALCAREOUS | 357.38 | 837.62 |
| 0.90 | GRAY, SHALE, SOFT | 358.28 | 836.72 |
| 0.38 | WHITE LIMESTONE, HARD | 358.66 | 836.34 |
| 0.80 | GRAY CLAYSTONE, SOFT, CALCAREOUS, | 359.46 | 835.54 |
| 0.81 | LIMESTONE, GRAY, MEDIUM | 360.27 | 834.73 |
| 0.95 | GRAY CLAYSTONE, SOFT | 361.22 | 833.78 |
| 0.23 | COAL | 361.45 | 833.55 |
| 0.63 | SHALE, GRAY, LAMINATED, CALCAREOUS, SOFT | 362.08 | 832.92 |
| 3.02 | LIMESTONE, GRAY, HARD | 365.10 | 829.90 |
| 0.40 | SHALE, BLACK, SOFT | 365.50 | 829.50 |
| 0.75 | LIMESTONE, GRAY, HARD | 366.25 | 828.75 |

(Continued)

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 0.05 | SHALE, BLACK, SOFT | 366.30 | 828.70 |
| 7.45 | LIMESTONE, GRAY, HARD | 373.75 | 821.25 |
| 0.54 | SHALE, CALCAREOUS, HARD, GRAY, LAMINATED | 374.29 | 820.71 |
| 0.70 | CLAYSTONE, GRAY, SOFT | 374.99 | 820.01 |
| 2.70 | LIMESTONE, LIGHT GRAY, HARD | 377.69 | 817.31 |
| 1.03 | SHALE, GREY, LAMINATED, SOFT | 378.72 | 816.28 |
| 1.42 | LIMESTONE, LIGHT GRAY, HARD | 380.14 | 814.86 |
| 0.50 | LIMESTONE, GRAY, HARD, LAMINATED | 380.64 | 814.36 |
| 1.87 | LIMESTONE, LIGHT GRAY | 382.51 | 812.49 |
| 0.65 | CLAYSTONE, GREEN, SOFT | 383.16 | 811.84 |
| 4.39 | LIMESTONE, GRAY, HARD | 387.55 | 807.45 |
| 1.87 | CLAYSTONE, GREEN, SOFT, CALCAREOUS | 389.42 | 805.58 |
| 0.76 | SHALE, CALCAREOUS, GRAY, MEDIUM | 390.18 | 804.82 |
| 2.98 | LIMESTONE, LIGHT GRAY, HARD | 393.16 | 801.84 |
| 2.46 | CLAYSTONE, GREEN, SOFT, CALCAREOUS | 395.62 | 799.38 |
| 1.17 | SHALE, BLACK, SOFT, CARBONACEOUS | 396.79 | 798.21 |
| 0.51 | CLAYSTONE, GREY, SOFT | 397.30 | 797.70 |
| 1.32 | SHALE, DARK GREY, SOFT | 398.62 | 796.38 |
| 0.49 | SHALE, CARBONACEOUS, SOFT | 399.11 | 795.89 |
| 11.78 | LIMESTONE, LIGHT GRAY, HARD | 410.89 | 784.11 |
| 0.72 | GREEN CLAYSTONE, SOFT, CALCAREOUS | 411.61 | 783.39 |
| 1.16 | LIMESTONE, LIGHT GRAY, LAMINATED | 412.77 | 782.23 |
| 1.30 | CLAYSTONE, GREEN, SOFT | 414.07 | 780.93 |
| 0.42 | LIGHT GRAY LIMESTONE, HARD | 414.49 | 780.51 |
| 0.55 | GREEN CLAYSTONE, SOFT | 415.04 | 779.96 |
| 0.35 | LIMESTONE, LIGHT GRAY, HARD | 415.39 | 779.61 |
| 0.05 | GREEN CLAYSTONE, SOFT | 415.44 | 779.56 |
| 0.35 | LIMESTONE, LIGHT GRAY, HARD | 415.79 | 779.21 |
| 4.33 | CLAYSTONE, GREEN, LAMINATED, SOFT W/SLICKENSIDES | 420.12 | 774.88 |
| 0.55 | SHALE, DARK GREY, LAMINATED, SOFT | 420.67 | 774.33 |
| **7.53** | **0.99 ROOF COAL (NO. 8) W/SULFUR STREAKS** | **428.20** | **766.80** |
| | **0.90 CLAYSTONE, GRAY** | | |
| | **5.64 COAL W/SULFUR STREAKS** | | |
| 0.38 | SHALE, CALCAREOUS, LAMINATED, GRAY, SOFT | 428.58 | 766.42 |
| 1.39 | SHALE, CALCAREOUS, DARK GRAY, SOFT | 429.97 | 765.03 |
| 0.50 | LIMESTONE, LIGHT GRAY, HARD | 430.47 | 764.53 |
| 0.66 | SHALE, DARK GRAY, SOFT | 431.13 | 763.87 |
| 0.16 | CLAYSTONE, GRAY, SOFT | 431.29 | 763.71 |
| 0.74 | LIMESTONE, GRAY, HARD | 432.03 | 762.97 |
| 0.64 | SHALE, GRAY, SOFT | 432.67 | 762.33 |
| 1.60 | LIMESTONE, GRAY, HARD | 434.27 | 760.73 |
| 1.70 | SHALE, W/LIMESTONE NODULES, GRAY, MEDIUM | 435.97 | 759.03 |
| 3.10 | LIMESTONE, GRAY, LAMINATED, HARD | 439.07 | 755.93 |
| 1.07 | LIMESTONE, GREEN, HARD | 440.14 | 754.86 |

AMOUNT OF HARD ROCK ABOVE NO. 8 SEAM

HARD ROCK: 205.71 FT (48.9%) OF CORE

SOFT ROCK: 214.96 FT. (51.1%) OF CORE

PROJECTED AQUIFERS:

1. 30.00 TO 34.75 (MINOR)
2. 45.40 TO 52.09 (MINOR)

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation ~~1303~~ 1,299.87

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| CASING | | 29.00 | |
| SANDSTONE | * | 4.40 | HARD |
| SHALE | * | 1.00 | COMP, EROD |
| SHALE | * | 0.65 | COMP, EROD |
| SHALE | | 1.22 | COMP, EROD |
| SHALE | | 0.47 | COMP, EROD, ALK |
| SHALE | * | 2.26 | COMP, EROD |
| SHALE | | 3.10 | COMP, EROD |
| SHALE | | 1.55 | COMP, EROD, ALK |
| CLAYSTONE | | 2.20 | COMP, EROD |
| SHALE | * | 1.15 | COMP, EROD |
| SHALE | | 3.90 | COMP, EROD, ALK |
| SHALE | | 4.10 | COMP, EROD, ALK |
| SHALE | | 3.60 | COMP, EROD |
| CLAYSTONE | | 1.00 | COMP, EROD |
| SHALE | | 2.10 | COMP, EROD |
| CLAYSTONE | | 1.15 | COMP, EROD |
| SHALE | | 1.50 | COMP, EROD |
| SHALE | * | 0.50 | COMP, EROD |
| SHALE | | 1.85 | COMP, EROD |
| CLAYSTONE | | 1.01 | COMP, EROD |
| SHALE | | 1.20 | COMP, EROD |
| SHALE | | 1.40 | COMP, EROD |
| SHALE | | 1.69 | COMP, EROD |
| SHALE | | 0.95 | COMP, EROD |
| SHALE | | 1.91 | COMP, EROD |
| SHALE | | 0.65 | COMP, EROD, ALK |
| CLAYSTONE | | 0.60 | COMP, EROD |
| SHALE | | 4.20 | COMP, EROD, ALK |
| SHALE | | 0.95 | COMP, EROD |
| SHALE | | 2.00 | COMP, EROD, ALK |
| SANDSTONE | | 1.74 | HARD |
| SHALE | | 4.25 | COMP, EROD |
| SHALE | | 0.61 | COMP, EROD |
| LIMESTONE | | 3.00 | HARD, ALK |
| SHALE | | 4.15 | COMP, EROD, ALK |
| SHALE | | 0.95 | COMP, EROD |
| LIMESTONE | | 0.90 | HARD, ALK |
| SHALE | | 6.14 | COMP, EROD, ALK |
| SHALE | | 7.30 | COMP, EROD, ALK |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation 1303

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| SHALE | | 1.10 | COMP, EROD |
| SHALE | | 5.40 | COMP, EROD, ALK |
| SHALE | | 5.00 | COMP, EROD |
| SHALE | | 1.20 | COMP, EROD, ALK |
| SHALE | | 0.90 | COMP, EROD, ALK |
| SHALE | | 1.00 | COMP, EROD, ALK |
| SHALE | | 1.25 | COMP, EROD |
| SHALE | | 3.60 | COMP, EROD, ALK |
| LIMESTONE | | 2.20 | HARD, ALK |
| SHALE | | 4.50 | COMP, EROD, ALK |
| SHALE | | 6.75 | COMP, EROD, ALK |
| SHALE | | 3.10 | COMP, EROD |
| SHALE | | 6.70 | COMP, EROD, ALK |
| CLAYSTONE | | 3.53 | COMP, EROD, ALK |
| SHALE | | 0.63 | COMP, EROD, AC |
| SHALE | | 0.56 | COMP, EROD |
| SHALE | | 0.33 | COMP, EROD, AC |
| LIMESTONE | | 5.00 | HARD, ALK |
| CLAYSTONE | | 5.05 | COMP, EROD |
| COAL (NO. 12) | | 4.90 | EROD, AC |
| SHALE | | 2.60 | COMP, EROD |
| SANDSTONE | | 2.30 | HARD |
| SHALE | | 3.80 | COMP, EROD |
| BONE COAL | | 0.35 | AC, EROD |
| SHALE | | 1.30 | COMP, EROD |
| COAL | | 0.20 | ALK, COMP, EROD |
| SHALE | | 0.68 | COMP, EROD |
| SHALE | | 5.37 | COMP, EROD, ALK |
| SHALE | | 3.40 | COMP, EROD, ALK |
| SHALE | | 6.05 | COMP, EROD, ALK |
| SHALE | | 10.45 | COMP, EROD |
| SHALE | | 0.57 | COMP, EROD |
| SHALE | | 0.22 | COMP, EROD |
| SHALE | | 0.32 | COMP, EROD |
| SHALE | | 0.45 | COMP, EROD |
| SHALE | | 1.94 | COMP, EROD |
| SHALE | | 0.20 | COMP, EROD |
| SHALE | | 1.40 | COMP, EROD |
| SHALE | | 0.50 | COMP, EROD |
| SHALE | | 5.55 | COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94–6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation 1303

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| CLAYSTONE | | 3.00 | COMP, EROD |
| SHALE | | 0.80 | COMP, EROD, AC |
| SHALE | | 3.12 | COMP, EROD, ALK |
| SHALE | | 1.70 | COMP, EROD, ALK |
| SHALE | | 2.45 | COMP, EROD, ALK |
| SHALE | | 1.28 | COMP, EROD |
| SHALE | | 7.85 | COMP, EROD |
| SHALE | | 1.00 | COMP, EROD, ALK |
| SHALE | | 5.65 | COMP, EROD |
| SHALE | | 1.35 | COMP, EROD |
| SHALE | | 4.15 | COMP, EROD, ALK |
| SHALE | | 0.40 | COMP, EROD |
| SHALE | | 0.82 | COMP, EROD, ALK |
| SHALE | | 0.73 | COMP, EROD |
| SHALE | | 2.23 | COMP, EROD |
| SHALE | | 3.50 | COMP, EROD |
| SANDSTONE | | 1.62 | HARD |
| SHALE | | 10.70 | COMP, EROD |
| SHALE | | 2.13 | COMP, EROD |
| SHALE | | 0.53 | COMP, EROD |
| COAL (NO. 11) | | 2.85 | COMP, EROD, AC |
| SHALE | | 1.35 | COMP, EROD |
| SHALE | | 13.14 | COMP, EROD, ALK |
| SHALE | | 10.50 | COMP, EROD, ALK |
| SANDSTONE | | 1.70 | HARD |
| SHALE | | 8.50 | COMP, EROD |
| SHALE | | 5.70 | COMP, EROD |
| SHALE | | 0.10 | COMP, EROD, AC |
| SHALE | | 0.10 | COMP, EROD |
| COAL (NO. 10) | | 1.85 | COMP, EROD, AC |
| SHALE | | 6.40 | COMP, EROD, ALK |
| CLAYSTONE | | 1.25 | COMP, EROD |
| SHALE | | 3.90 | COMP, EROD, ALK |
| SHALE | | 1.40 | COMP, EROD, ALK |
| CLAYSTONE | | 0.65 | COMP, EROD |
| SHALE | | 9.55 | COMP, EROD |
| SANDSTONE | | 1.90 | HARD |
| SHALE | | 1.13 | COMP, EROD, ALK |
| LIMESTONE | | 2.07 | HARD, ALK |
| SHALE | | 3.30 | COMP, EROD, ALK |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94–6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation 1303

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| LIMESTONE | | 4.30 | HARD, ALK |
| CLAYSTONE | | 0.31 | COMP, EROD |
| SHALE | | 1.60 | COMP, EROD, ALK |
| CLAYSTONE | | 0.22 | COMP, EROD |
| LIMESTONE | | 0.70 | HARD, ALK |
| SHALE | | 12.05 | COMP, EROD, ALK |
| SHALE | | 0.82 | COMP, EROD, ALK |
| SHALE | | 1.25 | COMP, EROD, ALK |
| LIMESTONE | | 0.22 | HARD, ALK |
| SHALE | | 0.60 | COMP, EROD, ALK |
| LIMESTONE | | 1.78 | HARD, ALK |
| SHALE | | 3.25 | COMP, EROD |
| LIMESTONE | | 11.40 | HARD, ALK |
| LIMESTONE | | 1.50 | HARD, ALK |
| LIMESTONE | | 11.30 | HARD, ALK |
| SHALE | | 1.30 | COMP, EROD, ALK |
| LIMESTONE | | 7.73 | HARD, ALK |
| SHALE | | 3.20 | COMP, EROD, ALK |
| SHALE | | 1.25 | COMP, EROD, ALK |
| SHALE | | 5.22 | COMP, EROD, ALK |
| SHALE | | 1.30 | COMP, EROD, ALK |
| LIMESTONE | | 2.10 | HARD, ALK |
| SHALE | | 4.75 | COMP, EROD, ALK |
| CLAYSTONE | | 2.40 | COMP, EROD |
| SHALE | | 0.22 | COMP, EROD |
| COAL (NO. 9) | | 4.24 | COMP, EROD, AC |
| SHALE | | 0.25 | COMP, EROD |
| SHALE | | 1.40 | COMP, EROD |
| SHALE | | 3.34 | COMP, EROD, ALK |
| SHALE | | 1.50 | COMP, EROD, ALK |
| LIMESTONE | | 2.60 | HARD, ALK |
| SHALE | | 6.90 | COMP, EROD, ALK |
| SHALE | | 1.90 | COMP, EROD |
| SHALE | | 3.00 | COMP, EROD, ALK |
| SHALE | | 1.50 | COMP, EROD |
| SHALE | | 2.60 | COMP, EROD, ALK |
| LIMESTONE | | 11.95 | HARD, ALK |
| SHALE | | 1.20 | COMP, EROD, ALK |
| LIMESTONE | | 3.62 | HARD, ALK |
| SHALE | | 0.30 | COMP, EROD, ALK |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation 1303

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| LIMESTONE | | 2.93 | HARD, ALK |
| LIMESTONE | | 0.85 | HARD, ALK |
| SHALE | | 0.30 | COMP, EROD, ALK |
| LIMESTONE | | 1.35 | HARD, ALK |
| SHALE | | 0.50 | COMP, EROD |
| CLAYSTONE | | 1.20 | COMP, EROD |
| SHALE | | 1.35 | COMP, EROD, ALK |
| LIMESTONE | | 2.52 | HARD, ALK |
| CLAYSTONE | | 2.15 | COMP, EROD |
| SHALE | | 2.43 | COMP, EROD |
| LIMESTONE | | 12.65 | HARD, ALK |
| CLAYSTONE | | 1.83 | COMP, EROD, ALK |
| SHALE | | 0.82 | COMP, EROD, ALK |
| CLAYSTONE | | 2.05 | COMP, EROD, ALK |
| CLAYSTONE | | 1.46 | COMP, EROD |
| SHALE | | 1.50 | COMP, EROD |
| BONE COAL | | 0.23 | COMP, EROD, AC |
| SHALE | | 0.38 | COMP, EROD |
| COAL (NO. 8) | | 7.08 | COMP, EROD, AC |
| SHALE | | 1.67 | COMP, EROD |
| LIMESTONE | | 0.54 | HARD, ALK |
| CLAYSTONE | | 1.00 | COMP, EROD |
| SHALE | | 1.70 | COMP, EROD, ALK |
| CLAYSTONE | | 0.80 | COMP, EROD |
| LIMESTONE | | 0.70 | HARD, ALK |

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam

| Stratum | Total Sulfur % | Pyrite Sulfur % | Potential Acidity Mg/l as CaCO3 | Neutralization Potential (/1000 Tons) | CaCO3 Deficiency (/1000 Tons) |
|---|---|---|---|---|---|
| Roof | 3.44 | 2.64 | 107 | 7.71 | 99.3 |
| Coal | 6.41 | 3.27 | 200 | 7.83 | 192 |
| Bottom | 2.44 | 1.09 | 76.2 | 254 | -178 |

**Legend:**
AC = ACID PRODUCING
ALK = ALKALINE PRODUCING
COMP = COMPACTIBLE
EROD = ERODIBLE

* – Indicates water bearing stratum under column labelled H2O

Stratum thickness is measured in feet.

# DIAMOND DRILL HOLE N94-6

GEOLOGIST: HOMER McEVERS

ELEVATION: ~~1303 FT. (ALTIMETER)~~ 1299.87

COORDINATES: ~~-9872.53 S, -70047.97 E (NOT SURVEYED)~~ -9854.16; -70,166.03

TOWNSHIP: SMITH

SECTION: 28, W 1/4

COUNTY: BELMONT

SURF. OWNER: HART

DATE STARTED: 9/1/94

DATE FINISHED: 9/8/94

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 29.00 | CASING | 29.00 | 1274.00 |
| 4.40 | SANDSTONE, GRAY, BROKEN, IRON STAINS | 33.40 | 1269.60 |
| 1.00 | SHALE, BROKEN, IRON STAINS | 34.40 | 1268.60 |
| 0.65 | SHALE, BROKEN, IRON STAINS | 35.05 | 1267.95 |
| 1.22 | SHALE, GRAY, SANDY | 36.27 | 1266.73 |
| 0.47 | SHALE, GRAY, CALCAREOUS, SANDY | 36.74 | 1266.26 |
| 2.26 | SHALE, SANDY, BROKEN, IRON STAINS | 39.00 | 1264.00 |
| 3.10 | SHALE, GRAY | 42.10 | 1260.90 |
| 1.55 | SHALE, GRAY, CALCAREOUS | 43.65 | 1259.35 |
| 2.20 | CLAY STONE, GRAY | 45.85 | 1257.15 |
| 1.15 | SHALE, GRAY, BROKEN, IRON STAINS | 47.00 | 1256.00 |
| 3.90 | SHALE, GRAY, CALCAREOUS | 50.90 | 1252.10 |
| 4.10 | SHALE, RED/BROWN, CALCAREOUS | 55.00 | 1248.00 |
| 3.60 | SHALE, RED/GRAY | 58.60 | 1244.40 |
| 1.00 | CLAYSTONE, GRAY | 59.60 | 1243.40 |
| 2.10 | SHALE, RED | 61.70 | 1241.30 |
| 1.15 | CLAYSTONE, GRAY | 62.85 | 1240.15 |
| 1.50 | SHALE, SANDY, GRAY | 64.35 | 1238.65 |
| 0.50 | SHALE, RED, IRON STAINS | 64.85 | 1238.15 |
| 1.85 | SHALE, GRAY | 66.70 | 1236.30 |
| 1.01 | CLAYSTONE, RED/GRAY | 67.71 | 1235.29 |
| 1.20 | SHALE, GRAY | 68.91 | 1234.09 |
| 1.40 | SHALE, RED/GRAY | 70.31 | 1232.69 |
| 1.69 | SHALE, RED/BROWN, SOFT | 72.00 | 1231.00 |
| 0.95 | SHALE, RED | 72.95 | 1230.05 |
| 1.91 | SHALE, GRAY | 74.86 | 1228.14 |
| 0.65 | SHALE, CALCAREOUS, GRAY | 75.51 | 1227.49 |
| 0.60 | CLAYSTONE, GRAY | 76.11 | 1226.89 |
| 4.20 | SHALE, SANDY, CALCAREOUS, GRAY | 80.31 | 1222.69 |
| 0.95 | SHALE, SANDY, GRAY | 81.26 | 1221.74 |
| 2.00 | SHALE, SANDY, CALCAREOUS, GRAY | 83.26 | 1219.74 |
| 1.74 | SANDSTONE, SHALEY, GRAY | 85.00 | 1218.00 |
| 4.25 | SHALE, GRAY, SOFT | 89.25 | 1213.75 |
| 0.61 | SHALE, GRAY/RED | 89.86 | 1213.14 |
| 3.00 | LIMESTONE, GRAY | 92.86 | 1210.14 |
| 4.15 | SHALE, CALCAREOUS, GRAY | 97.01 | 1205.99 |
| 0.95 | SHALE, IRON STAINS, BROKEN | 97.96 | 1205.04 |
| 0.90 | LIMESTONE, GRAY | 98.86 | 1204.14 |
| 6.14 | SHALE, SANDY, CALCAREOUS, GRAY | 105.00 | 1198.00 |
| 7.30 | SHALE, W/LIMESTONE STREAKS, GRAY | 112.30 | 1190.70 |
| 1.10 | SHALE, GRAY | 113.40 | 1189.60 |

(Continued)

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 5.40 | SHALE, W/LIMESTONE STREAKS, GRAY | 118.80 | 1184.20 |
| 5.00 | SHALE, RED/GRAY/RED | 123.80 | 1179.20 |
| 1.20 | SHALE, CALCAREOUS, GRAY | 125.00 | 1178.00 |
| 0.90 | SHALE, CALCAREOUS, BLACK/GRAY | 125.90 | 1177.10 |
| 1.00 | SHALE, W/LIMESTONE STREAKS, GRAY | 126.90 | 1176.10 |
| 1.25 | SHALE, GRAY | 128.15 | 1174.85 |
| 3.60 | SHALE, W/LIMESTONE STREAKS, GRAY | 131.75 | 1171.25 |
| 2.20 | LIMESTONE, W/SHALE STREAKS, GRAY | 133.95 | 1169.05 |
| 4.50 | SHALE, W/LIMESTONE STREAKS, GRAY | 138.45 | 1164.55 |
| 6.75 | SHALE, W/LIMESTONE NODULES, GRAY | 145.20 | 1157.80 |
| 3.10 | SHALE, SANDY, GRAY | 148.30 | 1154.70 |
| 6.70 | SHALE, W/LIMESTONE NODULES, GRAY | 155.00 | 1148.00 |
| 3.53 | CLAYSTONE, GRAY | 158.53 | 1144.47 |
| 0.63 | SHALE, CARBONACEOUS, BLACK | 159.16 | 1143.84 |
| 0.56 | SHALE, GRAY | 159.72 | 1143.28 |
| 0.33 | SHALE, CARBONACEOUS, BLACK | 160.05 | 1142.95 |
| 5.00 | LIMESTONE, GRAY | 165.05 | 1137.95 |
| 5.05 | CLAYSTONE, GRAY | 170.10 | 1132.90 |
| **4.90** | **SHALE, BLACK W/COAL STREAKS - NO. 12 COAL** | **175.00** | **1128.00** |
| | **1.10 BONE COAL** | | |
| | **1.85 SHALE, BLACK** | | |
| | **0.35 COAL** | | |
| | **1.17 SHALE, BLACK** | | |
| | **0.37 BONE COAL** | | |
| | **0.06 SHALE, BLACK** | | |
| 2.60 | SHALE, GRAY | 177.60 | 1125.40 |
| 2.30 | SANDSTONE, W/SHALE STREAKS, GRAY | 179.90 | 1123.10 |
| 3.80 | SHALE, GRAY | 183.70 | 1119.30 |
| 0.35 | BONE COAL W/PYRITE | 184.05 | 1118.95 |
| 1.30 | SHALE GRAY | 185.35 | 1117.65 |
| 0.20 | COAL | 185.55 | 1117.45 |
| 0.68 | SHALE, GRAY | 186.23 | 1116.77 |
| 5.37 | SHALE, CALCAREOUS, GRAY | 191.60 | 1111.40 |
| 3.40 | SHALE, SANDY, CALCAREOUS, GRAY | 195.00 | 1108.00 |
| 6.05 | SHALE, W/LIMESTONE NODULES, GRAY, W/SS STREAKS | 201.05 | 1101.95 |
| 10.45 | SHALE, GRAY | 211.50 | 1091.50 |
| 0.57 | SHALE, RED | 212.07 | 1090.93 |
| 0.22 | SHALE, GRAY | 212.29 | 1090.71 |
| 0.32 | SHALE, RED | 212.61 | 1090.39 |
| 0.45 | SHALE, GRAY | 213.06 | 1089.94 |
| 1.94 | SHALE, RED | 215.00 | 1088.00 |
| 0.20 | SHALE, RED, SOFT | 215.20 | 1087.80 |
| 1.40 | SHALE, GRAY | 216.60 | 1086.40 |
| 0.50 | SHALE, RED | 217.10 | 1085.90 |
| 5.55 | SHALE, GRAY | 222.65 | 1080.35 |
| 3.00 | CLAYSTONE, GRAY, SOFT | 225.65 | 1077.35 |

(Continued)

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 0.80 | SHALE, CARBONACEOUS, BLACK | 226.45 | 1076.55 |
| 3.12 | SHALE, CALCAREOUS, GRAY | 229.57 | 1073.43 |
| 1.70 | SHALE, RED, CALCAREOUS | 231.27 | 1071.73 |
| 2.45 | SHALE, GREEN W/RED STREAKS, CALCAREOUS | 233.72 | 1069.28 |
| 1.28 | SHALE, GRAY/GREEN | 235.00 | 1068.00 |
| 7.85 | SHALE, SANDY, GRAY | 242.85 | 1060.15 |
| 1.00 | SHALE, SANDY, CALCAREOUS, GRAY | 243.85 | 1059.15 |
| 5.65 | SHALE, SANDY, GRAY | 249.50 | 1053.50 |
| 1.35 | SHALE, GRAY, BROKEN, SOFT | 250.85 | 1052.15 |
| 4.15 | SHALE, SANDY, CALCAREOUS, GRAY | 255.00 | 1048.00 |
| 0.40 | SHALE, SANDY, GRAY | 255.40 | 1047.60 |
| 0.82 | SHALE, W/LIMESTONE NODULES, GRAY | 256.22 | 1046.78 |
| 0.73 | SHALE, RED | 256.95 | 1046.05 |
| 2.23 | SHALE, GRAY/BLACK/GRAY | 259.18 | 1043.82 |
| 3.50 | SHALE, SANDY, GRAY | 262.68 | 1040.32 |
| 1.62 | SANDSTONE, W/SHALE STREAKS, GRAY | 264.30 | 1038.70 |
| 10.70 | SHALE, SANDY, GRAY | 275.00 | 1028.00 |
| 2.13 | SHALE, GRAY | 277.13 | 1025.87 |
| 0.53 | SHALE, BLACK | 277.66 | 1025.34 |
| **2.85** | **COAL (NO. 11)** | **280.51** | **1022.49** |
| 1.35 | SHALE, GRAY | 281.86 | 1021.14 |
| 13.14 | SHALE, CALCAREOUS, GRAY | 295.00 | 1008.00 |
| 10.50 | SHALE, SANDY, W/LIMESTONE NODULES, GRAY | 305.50 | 997.50 |
| 1.70 | SANDSTONE, W/SHALE, GRAY | 307.20 | 995.80 |
| 8.50 | SHALE, GRAY | 315.70 | 987.30 |
| 5.70 | SHALE, DARK GRAY | 321.40 | 981.60 |
| 0.10 | SHALE, CARBONACEOUS, BLACK | 321.50 | 981.50 |
| 0.10 | SHALE, GRAY | 321.60 | 981.40 |
| **1.85** | **COAL (NO. 10)** | **323.45** | **979.55** |
| | **1.15 COAL** | | |
| | **0.20 SHALE, GRAY** | | |
| | **0.50 COAL** | | |
| 6.40 | SHALE, CALCAREOUS, GRAY | 329.85 | 973.15 |
| 1.25 | CLAYSTONE, GRAY | 331.10 | 971.90 |
| 3.90 | SHALE, SANDY, CALCAREOUS, GRAY | 335.00 | 968.00 |
| 1.40 | SHALE, CALCAREOUS, GRAY | 336.40 | 966.60 |
| 0.65 | CLAYSTONE, GRAY | 337.05 | 965.95 |
| 9.55 | SHALE, SANDY, GRAY | 346.60 | 956.40 |
| 1.90 | SANDSTONE, GRAY | 348.50 | 954.50 |
| 1.13 | SHALE, SANDY, CALCAREOUS, GRAY | 349.63 | 953.37 |
| 2.07 | LIMESTONE, GRAY | 351.70 | 951.30 |
| 3.30 | SHALE, SANDY, CALCAREOUS, GRAY | 355.00 | 948.00 |
| 4.30 | LIMESTONE, GRAY | 359.30 | 943.70 |
| 0.31 | CLAYSTONE, GREEN | 359.61 | 943.39 |
| 1.60 | SHALE, CALCAREOUS, GRAY | 361.21 | 941.79 |
| 0.22 | CLAYSTONE, GREEN | 361.43 | 941.57 |

(Continued)

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 0.70 | LIMESTONE, GRAY | 362.13 | 940.87 |
| 12.05 | SHALE, CALCAREOUS, W/LIMESTONE NODULES, GRAY | 374.18 | 928.82 |
| 0.82 | SHALE, CALCAREOUS, GRAY | 375.00 | 928.00 |
| 1.25 | SHALE, CALCAREOUS, GRAY | 376.25 | 926.75 |
| 0.22 | LIMESTONE, GRAY | 376.47 | 926.53 |
| 0.60 | SHALE, CALCAREOUS, GRAY | 377.07 | 925.93 |
| 1.78 | LIMESTONE, GRAY | 378.85 | 924.15 |
| 3.25 | SHALE, GREEN/GRAY | 382.10 | 920.90 |
| 11.40 | LIMESTONE, SHALEY, GRAY | 393.50 | 909.50 |
| 1.50 | LIMESTONE, GRAY | 395.00 | 908.00 |
| 11.30 | LIMESTONE, GRAY, HARD | 406.30 | 896.70 |
| 1.30 | SHALE, CALCAREOUS, GRAY | 407.60 | 895.40 |
| 7.73 | LIMESTONE, GRAY | 415.33 | 887.67 |
| 3.20 | SHALE, CALCAREOUS, SANDY, GRAY | 418.53 | 884.47 |
| 1.25 | SHALE, CALCAREOUS, GREEN | 419.78 | 883.22 |
| 5.22 | SHALE, CALCAREOUS, SANDY, GRAY | 425.00 | 878.00 |
| 1.30 | SHALE, CALCAREOUS, SANDY, GRAY/GREEN | 426.30 | 876.70 |
| 2.10 | LIMESTONE, SHALEY, GRAY | 428.40 | 874.60 |
| 4.75 | SHALE, SANDY, CALCAREOUS, GRAY | 433.15 | 869.85 |
| 2.40 | CLAYSTONE, GRAY | 435.55 | 867.45 |
| 0.22 | SHALE, BLACK | 435.77 | 867.23 |
| **4.24** | **COAL (NO. 9)** | **440.01** | **862.99** |
| | **2.50 COAL** | | |
| | **0.40 SHALE, GRAY** | | |
| | **1.30 BONE COAL** | | |
| 0.25 | SHALE, BLACK | 440.26 | 862.74 |
| 1.40 | SHALE, DARK GRAY | 441.66 | 861.34 |
| 3.34 | SHALE, SANDY, CALCAREOUS, GRAY | 445.00 | 858.00 |
| 1.50 | SHALE, CALCAREOUS, GRAY | 446.50 | 856.50 |
| 2.60 | LIMESTONE, GRAY | 449.10 | 853.90 |
| 6.90 | SHALE, SANDY, CALCAREOUS, GRAY | 456.00 | 847.00 |
| 1.90 | SHALE, DARK GRAY | 457.90 | 845.10 |
| 3.00 | SHALE, CALCAREOUS, GRAY | 460.90 | 842.10 |
| 1.50 | SHALE, BLACK | 462.40 | 840.60 |
| 2.60 | SHALE, SANDY, CALCAREOUS, GRAY | 465.00 | 838.00 |
| 11.95 | LIMESTONE, GRAY | 476.95 | 826.05 |
| 1.20 | SHALE, CALCAREOUS, GRAY | 478.15 | 824.85 |
| 3.62 | LIMESTONE, GRAY | 481.77 | 821.23 |
| 0.30 | SHALE, CALCAREOUS, GRAY | 482.07 | 820.93 |
| 2.93 | LIMESTONE, GRAY | 485.00 | 818.00 |
| 0.85 | LIMESTONE, GRAY/GREEN | 485.85 | 817.15 |
| 0.30 | SHALE, BLACK, CALCAREOUS | 486.15 | 816.85 |
| 1.35 | LIMESTONE, GRAY | 487.50 | 815.50 |
| 0.50 | SHALE, GREEN | 488.00 | 815.00 |
| 1.20 | CLAYSTONE, GRAY/GREEN | 489.20 | 813.80 |
| 1.35 | SHALE, CALCAREOUS, GRAY | 490.55 | 812.45 |

(Continued)

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 2.52 | LIMESTONE, GRAY | 493.07 | 809.93 |
| 2.15 | CLAYSTONE, GRAY | 495.22 | 807.78 |
| 2.43 | SHALE, BLACK | 497.65 | 805.35 |
| 12.65 | LIMESTONE, GRAY | 510.30 | 792.70 |
| 1.83 | CLAYSTONE, W/LIMESTONE NODULES, GRAY | 512.13 | 790.87 |
| 0.82 | SHALE, SANDY, CALCAREOUS, GRAY | 512.95 | 790.05 |
| 2.05 | CLAYSTONE, W/LIMESTONE NODULES, GRAY | 515.00 | 788.00 |
| 1.46 | CLAYSTONE, GRAY | 516.46 | 786.54 |
| 1.50 | SHALE, BLACK | 517.96 | 785.04 |
| 0.23 | BONE COAL | 518.19 | 784.81 |
| 0.38 | SHALE, GRAY | 518.57 | 784.43 |
| 7.08 | COAL (NO. 8) | 525.65 | 777.35 |
| | 0.99 COAL | | |
| | 0.88 SHALE, GRAY | | |
| | 1.89 COAL | | |
| | 0.12 SHALE W/PYRITE | | |
| | 3.20 COAL | | |
| 1.67 | SHALE, GRAY | 527.32 | 775.68 |
| 0.54 | LIMESTONE, GRAY | 527.86 | 775.14 |
| 1.00 | CLAYSTONE, GRAY | 528.86 | 774.14 |
| 1.70 | SHALE, CALCAREOUS, GRAY | 530.56 | 772.44 |
| 0.80 | CLAYSTONE, GRAY | 531.36 | 771.64 |
| 0.70 | LIMESTONE, GRAY | 532.06 | 770.94 |

AMOUNT OF HARD ROCK ABOVE NO. 8 SEAM

HARD ROCK: 135.33 FT. (25.75%) OF CORE

SOFT ROCK: 390.32 FT. (74.25%) OF CORE

PROJECTED AQUIFERS

1. 0.00 TO 35.05
2. 36.74 TO 39.00 (MINOR)
3. 45.85 TO 47.00 (MINOR)
4. 64.35 TO 64.85 (MINOR)

ATTACHMENT 13

**DIAMOND DRILL HOLE: N97-02**

ENGINEER: W. J. SIPLIVY, PE, CPG
ELEVATION: 1304.86
STATE PLANE COORDINATES: E 2,420,421 N 731,278

DRILLER: L. J. Hughes & Sons, Inc., Dale Jarvis

TOWNSHIP: Smith
SECTION: SE ¼ Sec 34
COUNTY: Belmont

SURFACE OWNER: Simpson
DATE STARTED: 13 March 1997
DATE COMPLETED: 14 March 1997

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 20.00 | 20.00 | Non-coring | | |
| 3.00 | 23.00 | Shale, brown, sandy w/ Fe-stained joints | yes | CM, EM |
| 0.30 | 23.30 | Sandstone, l. gray w/Fe-stained joint | yes | CS, ES |
| 4.40 | 27.70 | Shale, brown, sandy w/ Fe-stained joints | yes | CM, EM |
| 1.35 | 29.05 | Sandstone, l. gray w/Fe-stained joints | yes | CS, ES |
| 2.55 | 31.60 | Shale, m-dk. gray w/Fe-stains | yes | CM, EM |
| 0.60 | 32.20 | Limestone, l. gray w/Fe-stains | yes | AK, CS, ES |
| 2.75 | 34.95 | Claystone, m. gray, w/Ls nodules, Fe-stained | yes | AK, CV, EV |
| 1.55 | 36.50 | Claystone, red, Fe-stained | yes | CV, EV |
| 9.50 | 46.00 | Claystone, red-gray | | CV, EV |
| 5.80 | 51.80 | Shale, m-dk. gray-brown w/Fe-stains | yes | CM, EM |
| 3.20 | 55.00 | Sandstone, l. gray, silty | | CS, ES |
| 2.70 | 57.70 | Shale, m-dk. gray w/Fe-stains | yes | CM, EM |
| 1.50 | 59.20 | Sandstone, l. gray-brown w/Fe-stained joints | yes | CS, ES |
| 6.40 | 65.60 | Shale, m. gray | | CM, EM |
| 0.20 | 65.80 | Shale, black, carbonaceous | | AC, CM, EM |
| 2.70 | 68.50 | Claystone, m. gray, w/Ls nodules | | CV, EV |
| 1.50 | 70.00 | Limestone, l. gray | | AK, CS, ES |
| 2.90 | 72.90 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 1.60 | 74.50 | Limestone, l. gray | | AK, CS, ES |
| 4.30 | 78.80 | Claystone, m. gray-green | | CV, EV |
| 4.20 | 83.00 | Shale, m. gray & red | | CM, EM |
| 0.75 | 83.75 | Limestone, l. gray | | AK, CS, ES |
| 0.60 | 84.35 | Shale, m. gray | | CM, EM |
| 1.25 | 85.60 | Limestone, l. gray | | AK, CS, ES |
| 4.20 | 89.80 | Claystone, m. gray | | CV, EV |
| 1.50 | 91.30 | Limestone, l. gray | | AK, CS, ES |
| 25.25 | 116.55 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.50 | 117.05 | Limestone, l. gray | | AK, CS, ES |
| 3.35 | 120.40 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 1.70 | 122.10 | Limestone, l. gray | | AK, CS, ES |
| 1.60 | 123.70 | Claystone, m. gray | | CV, EV |
| 1.40 | 125.10 | Limestone, l. gray | | AK, CS, ES |
| 6.10 | 131.20 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.60 | 131.80 | Sandstone, l. gray, silty | | CS, ES |
| 12.00 | 143.80 | Shale, m. gray | | CM, EM |
| 1.60 | 145.40 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 1.60 | 147.00 | Claystone, m. gray | | CV, EV |
| 0.35 | 147.35 | Limestone, l. gray | | AK, CS, ES |
| 1.10 | 148.45 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 3.05 | 151.50 | Limestone, l. gray | | AK, CS, ES |
| 7.60 | 159.10 | Claystone, m-dk gray | | CV, EV |
| 0.65 | 159.75 | Shale, black w/thin coal ptgs. | | AC, CM, EM |
| 6.25 | 166.00 | Shale, dk. gray-black | | CM, EM |
| 1.40 | 167.40 | Sandstone, l. gray w/Sh ptgs. | | CS, ES |
| 1.80 | 169.20 | Shale, dk. gray-black | | CM, EM |
| 0.08 | 169.28 | Coal | | AC, CM, EM |
| 0.72 | 170.00 | Claystone, m. gray | | CV, EV |
| 4.60 | 174.60 | Shale, m. gray, silty | | CM, EM |
| 3.00 | 177.60 | Claystone, m. gray | | CV, EV |
| 2.45 | 180.05 | Shale, m. gray | | CM, EM |
| 0.83 | 180.88 | Shale, black w/thin coal ptgs. | | AC, CM, EM |
| 19.32 | 200.20 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.85 | 201.05 | Shale, m. gray, silty | | CM, EM |
| 2.95 | 204.00 | Sandstone, l. gray w/thin Sh ptgs. | | CS, ES |
| 3.40 | 207.40 | Shale, m. gray, silty | | CM, EM |

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 6.60 | 214.00 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 2.05 | 216.05 | Shale, m. gray, silty | | CM, EM |
| 2.45 | 218.50 | Sandstone, l. gray | | CS, ES |
| 1.50 | 220.00 | Claystone, m. gray | | CV, EV |
| 0.55 | 220.55 | Shale, m. gray | | CM, EM |
| 15.75 | 236.30 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 10.10 | 246.40 | Shale, m. gray | | CM, EM |
| 0.45 | 246.85 | Limestone, l. gray | | AK, CS, ES |
| 3.15 | 250.00 | Claystone, m. gray | | CV, EV |
| 4.50 | 254.50 | 0.07 bone | | 0 |
| 2.05 | 256.55 | Sandstone, l. gray, silty | | CS, ES |
| 4.45 | 261.00 | Shale, m. gray w/occ. Ss ptgs. | | CM, EM |
| 1.90 | 262.90 | Sandstone, l. gray | | CS, ES |
| 3.15 | 266.05 | Shale, m-dk. gray | | CM, EM |
| 0.50 | 266.55 | Shale, black, carbonaceous | | AC, CM, EM |
| 2.61 | 269.16 | **Coal, WAYNESBURG No. 11** | | AC, CM, EM |
| | | 0.35 coal | | |
| | | 0.07 bone | | |
| | | 1.17 coal | | |
| | | 0.06 bone | | |
| | | 0.73 coal | | |
| | | 0.05 bone | | |
| | | 0.18 coal | | |
| | | **2.61 total seam thickness** | | |
| 1.44 | 270.60 | Claystone, dk. gray | | CV, EV |
| 0.07 | 270.67 | **Coal** | | AC, CM, EM |
| 10.53 | 281.20 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 5.90 | 287.10 | Shale, m. gray | | CM, EM |
| 6.40 | 293.50 | Shale, m. gray w/occ. Ss ptgs. | | CM, EM |
| 5.70 | 299.20 | Shale, m. gray | | CM, EM |
| 2.80 | 302.00 | Sandstone, l. gray w/thin Sh ptgs. | | CS, ES |
| 2.80 | 304.80 | Shale, m. gray w/occ. thin Ss ptgs. | | CM, EM |
| 0.80 | 305.60 | Sandstone, l. gray | | CS, ES |
| 6.25 | 311.85 | Shale, m. gray w/occ. thin Ss ptgs. | | CM, EM |
| 2.00 | 313.85 | **Coal, UNIONTOWN No. 10** | | AC, CM, EM |
| | | 0.19 bone coal | | |
| | | 0.63 coal w/bone ptgs. | | |
| | | 0.09 bone | | |
| | | 0.24 coal w/pyrite lense | | |
| | | 0.10 shale | | |
| | | 0.07 bone | | |
| | | 0.58 coal | | |
| | | 0.10 coal w/sh ptgs. | | |
| | | **2.00 total seam thickness** | | |
| 2.65 | 316.50 | Claystone, dk. gray | | CV, EV |
| 0.80 | 317.30 | Sandstone, l. gray, silty | | CS, ES |
| 10.20 | 327.50 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 4.30 | 331.80 | Sandstone, l. gray | | CS, ES |
| 7.60 | 339.40 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.60 | 340.00 | Limestone, l. gray | | AK, CS, ES |
| 3.10 | 343.10 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 3.90 | 347.00 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 2.10 | 349.10 | Claystone, m. gray-green | | CV, EV |
| 1.90 | 351.00 | Limestone, l. gray | | AK, CS, ES |
| 7.15 | 358.15 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.70 | 358.85 | Limestone, l. gray | | AK, CS, ES |
| 1.85 | 360.70 | Shale, m. gray, calc. | | AK, CM, EM |
| 2.45 | 363.15 | Limestone, l. gray | | AK, CS, ES |
| 0.85 | 364.00 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 1.45 | 365.45 | Limestone, l. gray, nodular | | AK, CS, ES |
| 14.75 | 380.20 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 0.70 | 380.90 | Limestone, l. gray | | AK, CS, ES |
| 8.10 | 389.00 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 1.50 | 390.50 | Limestone, l. gray | | AK, CS, ES |

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 0.90 | 391.40 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 0.85 | 392.25 | Limestone, l. gray | | AK, CS, ES |
| 0.75 | 393.00 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 1.00 | 394.00 | Limestone, l. gray | | AK, CS, ES |
| 3.85 | 397.85 | Shale, m. gray-green wLs ptgs. | | AK, CM, EM |
| 2.15 | 400.00 | Limestone, l. gray | | AK, CS, ES |
| 10.40 | 410.40 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 7.00 | 417.40 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 3.75 | 421.15 | Claystone, m. gray | | CV, EV |
| 3.58 | 424.73 | **Coal, SEWICKLEY No. 9** | | AC, CM, EM |
| | | 0.13 bone | | |
| | | 1.90 coal w/bone ptgs. | | |
| | | 0.84 bone | | |
| | | 0.63 coal | | |
| | | 0.08 bone w/coal | | |
| | | **3.58 total seam thickness** | | |
| 1.07 | 425.80 | Claystone, dk. gray | | CV, EV |
| 3.55 | 429.35 | Shale, m. gray | | CM, EM |
| 0.50 | 429.85 | Limestone, l. gray | | AK, CS, ES |
| 2.55 | 432.40 | Shale, m. gray, calc. | | AK, CM, EM |
| 1.00 | 433.40 | Limestone, l. gray | | AK, CS, ES |
| 1.00 | 434.40 | Shale, m. gray, calc. | | AK, CM, EM |
| 9.10 | 443.50 | Shale, m. gray w/occ. thin Ss ptg | | CM, EM |
| 0.70 | 444.20 | Limestone, l. gray | | AK, CS, ES |
| 0.70 | 444.90 | Claystone, m. gray | | CV, EV |
| 0.60 | 445.50 | Limestone, l. gray | | AK, CS, ES |
| 1.30 | 446.80 | Claystone, dk. gray | | CV, EV |
| 0.50 | 447.30 | Shale, black, carbonaceous | | AC, CM, EM |
| 0.85 | 448.15 | Shale, m. gray, calc. | | AK, CM, EM |
| 8.55 | 456.70 | Limestone, m. gray, silty, hard | | AK, CS, ES |
| 3.30 | 460.00 | Flintclay, gray-tan, hard | | CM,EM |
| 3.20 | 463.20 | Shale, m. gray-green | | CM, EM |
| 3.60 | 466.80 | Limestone, l. gray | | AK, CS, ES |
| 1.10 | 467.90 | Claystone, green | | CV, EV |
| 4.70 | 472.60 | Limestone, l. gray | | AK, CS, ES |
| 4.40 | 477.00 | Claystone, green | | CV, EV |
| 1.90 | 478.90 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 2.80 | 481.70 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.55 | 482.25 | Shale, black, carbonaceous | | AC, CM, EM |
| 1.75 | 484.00 | Claystone, m. gray | | CV, EV |
| 3.00 | 487.00 | Limestone, l. gray | | AK, CS, ES |
| 1.10 | 488.10 | Shale, m. gray | | CM, EM |
| 1.90 | 490.00 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 3.10 | 493.10 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 1.70 | 494.80 | Limestone, l. gray | | AK, CS, ES |
| 9.50 | 504.30 | Claystone, m. gray | | CV, EV |
| 0.16 | 504.46 | Claystone, dk. gray, carbonaceous | | AC, CV, EV |
| 1.49 | 505.95 | **Coal, ROOF COAL** | | AC, CM, EM |
| | 505.95 | 0.19 coal | | |
| | 505.95 | 0.17 shale | | |
| | 505.95 | 0.95 coal | | |
| | | 0.11 shale w/coal | | |
| | | 0.07 coal | | |
| | | **1.49 total seam thickness** | | |
| 0.85 | 506.80 | Claystone, m. gray | | CV, EV |
| 5.06 | 511.86 | **Coal, PITTSBURGH No. 8** | | AC, CM, EM |
| | | 0.15 bone | | |
| | | 2.16 coal | | |
| | | 0.04 bone | | |
| | | 2.46 coal | | |
| | | 0.25 coal w/bone ptgs. | | |
| | | **5.06 total seam thickness** | | |
| 0.39 | 512.25 | Shale, dk. gray | | CM, EM |
| 0.45 | 512.70 | Limestone, m. gray | | AK, CS, ES |

## DIAMOND DRILL HOLE: N97-02

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 0.60 | 513.30 | Claystone, m. gray | | CV, EV |
| 0.30 | 513.60 | Limestone, m. gray | | AK, CS, ES |
| 0.15 | 513.75 | Claystone, m. gray | | CV, EV |
| 0.55 | 514.30 | Limestone, m. gray | | AK, CS, ES |
| 0.75 | 515.05 | Claystone, m. gray | | CV, EV |
| 1.00 | 516.05 | Limestone, m. gray | | AK, CS, ES |
| 0.55 | 516.60 | Claystone, m. gray | | CV, EV |
| 1.50 | 518.10 | Limestone, m. gray | | AK, CS, ES |
| 1.90 | 520.00 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |

**Amount of hard and soft rock overlying Pittsburgh No. 8 coalbed:**

1. Hard rock: 95.7 feet or 18.97%
2. Soft rock: 408.76 feet or 81.02%

**ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 coalbed**

| Stratum | Neutralization Potential (/1000 tons) | Total Sulphur % | Pyritic Sulphur % | Potential Acidity Mg/l as CaCO3 | CaCO3 Deficiency (/1000 tons) |
|---|---|---|---|---|---|
| Roof | 86.00 | 3.16 | 1.15 | 98.70 | 12.68 |
| Coal | 6.30 | 4.40 | 2.07 | 137.00 | 131.00 |
| Bottom | 551.00 | 3.00 | 2.12 | 93.70 | -458.00 |

**Physical Properties Legend**

AC - Acid Producing
AK - Alkaline Producing
C - Compactible (V - very, M - moderate, S - slight)
E - Erodible (V - very, M - moderate, S- slight)

**DIAMOND DRILL HOLE: N98-26**

ENGINEER: W. J. Siplivy
ELEVATION: 1303.00
STATE PLANE COORDINATES (1927): N 730,519.25 E 2,423,536.14

DRILLER: Kerogen Resources, Kim Cecil

TOWNSHIP: Smith
SECTION: 28, W 1/2
COUNTY: Belmont

SURFACE OWNER: Stanley W. Hart
DATE STARTED: 1 July 1998
DATE COMPLETED: 1 July 1998

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 1.30 | 1.30 | Silty loam, brown, rooted | | CV, EV |
| 2.90 | 4.20 | Clay loam, brown | | CV, EV |
| 1.20 | 5.40 | Shale, sandy, brown, weathered, broken | | CS, ES |
| 28.00 | 33.40 | Sandstone, brown w/Fe-stains, broken | yes | CS, ES |

END OF LOG

| Physical Properties Legend |
|---|
| AC - Acid Producing |
| AK - Alkaline Producing |
| C - Compactible (V - very, M - moderate, S - slight) |
| E - Erodible (V - very, M - moderate, S- slight) |

ADDENDUM TO PAGE 16, B(2)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

Geological Impact of Coal Removal Upon Ground Water

The geological impact of coal removal, according to the PHC, is expected to vary from short term to long term. The Pittsburgh (No. 8) coal seam will be mined, and in this area has dip of approximately 40 ft per mile to the southeast, with the strike to the northeast. Ground water occurs in this area in several disconnected saturated zones associated with the occurrence of the coal seams and underlying clay stone units that prevent downward migration of the ground water. Ground water is generally limited to within the first 100 ft of the surface. Since primary porosity in the rock units is poor, nearly all of the ground water in this area of Ohio occurs as secondary porosity in the joints, cleats, fractures, and bedding planes of the rocks.

This area will be mined using partial-recovery mining techniques from which there will be no subsidence or disruption of ground water. There will be no impact of coal removal upon ground water anticipated. Safety factors are sufficiently high and extraction ratio sufficiently low to assure no subsidence during mining of the gate section. Impacts to individual water supplies are addressed in the Addendum to Page 18 F(1). The PHC addresses impacts to aquifers.

George V. Voinovich • Governc
Donald C. Anderson • Directo

DATE August 18, 1998

## ANALYSIS OF EXISTING GROUND WATER FILE DATA

PREPARED BY: Bill Haiker BH , HYDROGEOLOGIST

OPERATOR: Ohio Valley Coal Company

COUNTY: Belmont

TOWNSHIP: Smith

SECTION (S): 21, 22, 27, 28, 33, 34

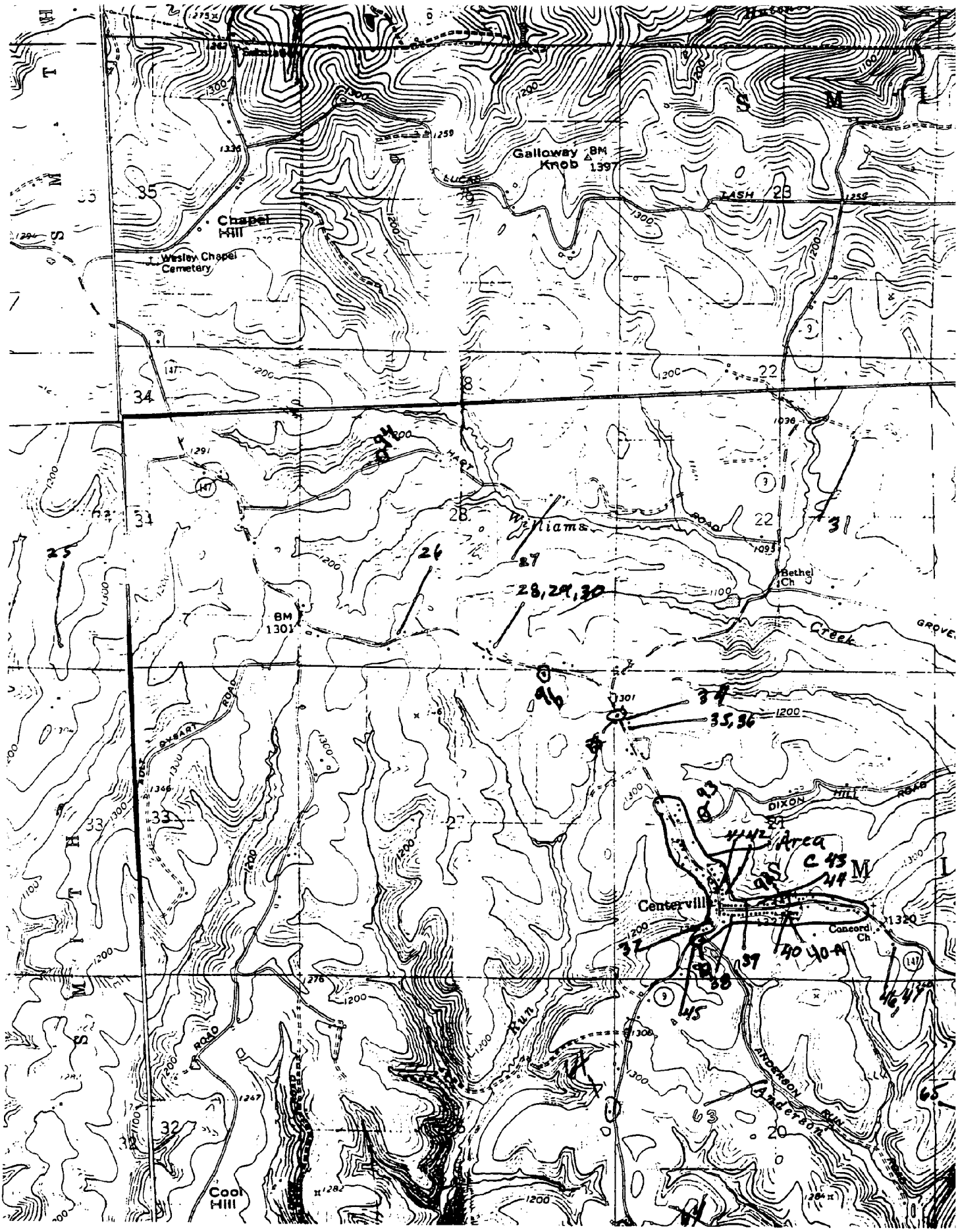
NUMBER OF WATER WELL LOGS WITHIN 1,000 FOOT RADIUS OF SITE (COPIES ATTACHED) 26 : FIELD LOCATED: 26

GENERAL DESCRIPTION OF LOCAL HYDROLOGY:
(USE ADDITIONAL SHEET IF NECESSARY)

Ground water is generally obtained from interbedded shale, sandstone and limestone bedrock. Well depths range from 35 to 150 feet with sustained yields of less than 2 gallons per minute.

AREAS OF PARTICULAR CONCERN:
(USE ADDITIONAL SHEET IF NECESSARY)

Longwall mining the #8 coal seam at an elevation of 718 to 800 feet M.S.L. will adversely affect wells within the permit boundary. All wells should be monitored for any quantity or quality changes.


Galloway Knob
BM 1397
Chapel Hill
Wesley Chapel Cemetery
LUCAS
LASH
HART
Williams
ROAD
Bethel Ch
Creek
GROVE
BM 1301
DIXON HILL ROAD
Area
Centerville
Concord Ch
1320
ANDERSON RUN
Anderson
Run
Cool Hill
ROAD
25
26
27
28,29,30
31
34
35,36
32
37
40
40-A
45
46,47
65

TOVCC 11807

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 221729

County Belmont Township Smith Section of Township 28

Owner Foster Funkhouser Address Warnock Ohio Rt

Location of property Farm House, on Co. Rd. off Route 9.

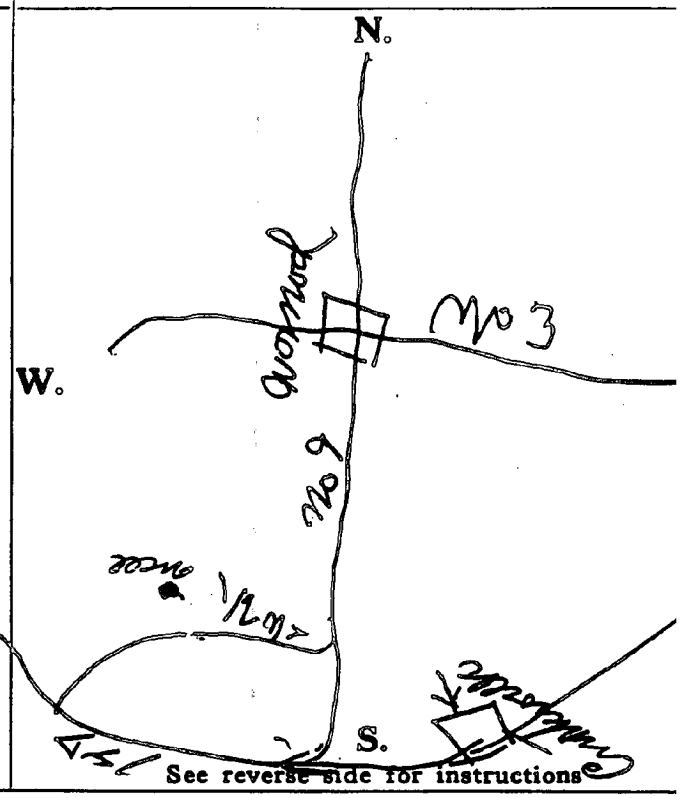
| CONSTRUCTION DETAILS | BAILING OR PUMPING TEST |
|---|---|
| Casing diameter 10" Length of casing 20'6" | Pumping rate 1 G.P.M. Duration of test |
| Type of screen Length of screen | Drawdown 23 ft. Date |
| Type of pump | Developed capacity 1 gal per min. |
| Capacity of pump | Static level—depth to water 37 |
| Depth of pump setting – | Pump installed by |
| Date of completion | |

WELL LOG

| Formations Sandstone, shale, limestone, gravel and clay | From | To |
|---|---|---|
| Clay | 0 Feet | 3 Ft. |
| Sand Rock | 3 | 10 |
| quick sand | 10 | 14 |
| Sand Rock | 14 | 18 |
| gray slate | 18 | 25 |
| Coal Blossom | 25 | 27 |
| gray slate | 27 | 37 |
| Rock | 37 | 39 |
| gray slate | 39 | 51 |
| Rock | 51 | 55 |
| Slate Rock | 55 | 60 |

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads,




See reverse side for instructions

Drilling Firm McDougal & Wilhelm Date 7-23-59

Address 106 Taylor Lane Signed C. W. McDougal

St Clairsville, Ohio

TR 246

WL-168

TOVCC 11808

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 221729

County Belmont Township Smith Section of Township 2 E

Owner Foster Funkhouser Address Warnock Ohio Rt 1

Location of property Farm House, on Co. Rd. off Route 9.

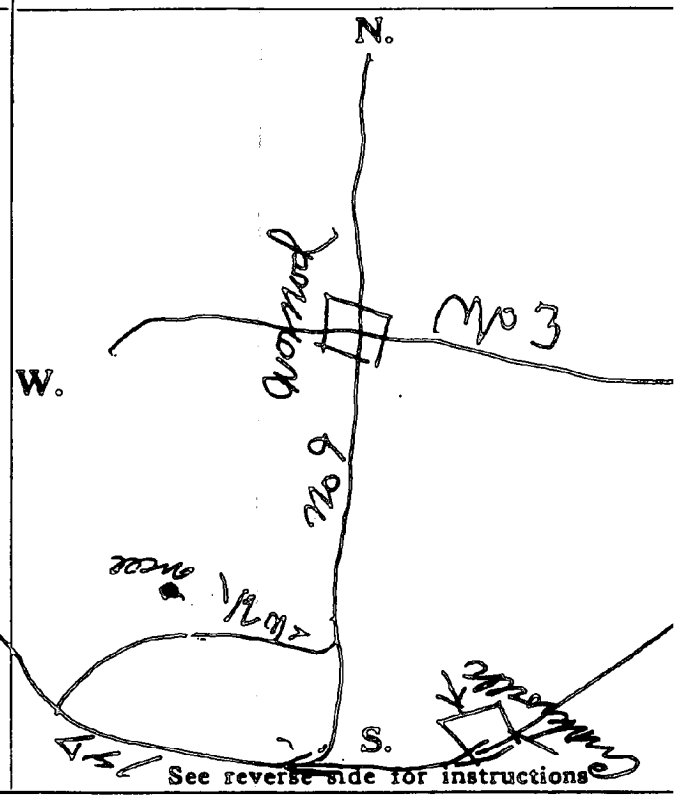
| CONSTRUCTION DETAILS | BAILING OR PUMPING TEST |
|---|---|
| Casing diameter 10" Length of casing 20'6" | Pumping rate 1 G.P.M. Duration of test |
| Type of screen Length of screen | Drawdown 23 ft. Date |
| Type of pump | Developed capacity 1 gal per min. |
| Capacity of pump | Static level—depth to water 37 |
| Depth of pump setting – | Pump installed by |
| Date of completion | |

WELL LOG

| Formations Sandstone, shale, limestone, gravel and clay | From | To |
|---|---|---|
| Clay | 0 Feet | 3 Ft. |
| Sand Rock | 3 | 10 |
| quick sand | 10 | 14 |
| Sand Rock | 14 | 18 |
| gray slate | 18 | 25 |
| Coal Blossom | 25 | 27 |
| gray slate | 27 | 37 |
| Rock | 37 | 39 |
| gray slate | 39 | 51 |
| Rock | 51 | 55 |
| Slate Rock | 55 | 60 |

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads,




See reverse side for instructions

Drilling Firm McDougal & Wilhelm Date 7-23-59

Address 106 Taylor Lane Signed C. W. McDougal

St Clairsville, Ohio

TR 246

WL-168

TOVCC 11809

B. (3) For those areas to be affected by underground mining surface operations where removal of the overburden down to the level of the coal seam will occur, submit Attachment 12(s) as required by paragraphs (C)(2)(a) and (c) of rule 1501:13-4-13 of the Administrative Code. N/A

(4) For those areas within the shadow area where the stratum above the coal seam to be mined will not be removed, submit Attachment 13(s) as required by paragraphs (C)(2)(d) and (e) of rule 1501:13-4-13 of the Administrative Code. See Attachment 13's

C. GROUND WATER INFORMATION-Permit, Shadow Area, and Adjacent Area

(1) Submit an Attachment 14B which describes the ground water hydrology of the proposed permit area, shadow area, and adjacent area. The Attachment 14B is to include information on each waterbearing stratum or zone as required by paragraph (D) of rule 1501:13-4-13 of the Administrative Code, including the first waterbearing stratum below the coal to be mined.
See Attachment 14B

(2) Are there any wells on the proposed permit area, shadow area, and adjacent area? X Yes, _____ No. If "yes," submit Attachment 14C.
See Attachment 14C

(3) Are there any springs on the proposed permit area, or developed springs on the shadow area and adjacent area? X Yes, _____ No. If "yes," submit Attachment 14C.
See Attachment 14C

(4) Are there any public water supply sources on the proposed permit area, shadow area, and adjacent area? _____ Yes, X No. If "yes," submit Attachment 14A, Attachment 14D, and show location on the hydrology map.
See Attachment 14D and Hydrology Map

(5) Submit Attachment 14A for representative wells and developed springs as required by paragraph (D)(4) of rule 1501:13-4-13. Based on this data identify the seasonal variations of ground water quality and quantity. See Attachment 14A and Addenda

D. SURFACE WATER INFORMATION-Permit, Shadow Area, and Adjacent Area

(1) List the name of the watershed that will receive water discharges from the proposed permit, shadow, and adjacent areas as listed in the "Gazetteer of Ohio Streams" published by the Ohio Department of Natural Resources. McMahon Creek , Captina Creek

(2) Are there any perennial or intermittent streams or other surface water bodies on the proposed permit, shadow area, and adjacent area? X Yes, _____ No. If "yes," submit Attachment 14A and Attachment 14D and show location on application and hydrology map.
See Attachments 14A, 14D and Hydrology Map.

ADDENDUM TO PAGE 17, C
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## GROUNDWATER INFORMATION

Naturally occurring groundwater in this area resides primarily in consolidated (rock) aquifers that are partially or wholly confined and lie within the geologic interval above the Pittsburgh No. 8 Coal.

The rock aquifers are primarily sandstones, limestones and coals, but may also include shales, claystones, and siltstones. All units transmit water primarily by secondary porosity or hydraulic conductivity (joints and other fractures, bedding partings). In general, primary permeabilities are low to very low for these materials. In fact, there are no "aquifers" in the application area. Rather, the ground water is generally limited to the first 50 to 100 ft. of the strata. Larger openings in the rock strata saturated zones may be identified by limonitic (iron) stained or alkaline stained rocks in the test holes. The saturated zone is recharged through infiltration and percolation at outcrop zones and in some cases, by vertical flows through discontinuities and locally permeable overlying strata. The stratigraphy identified in the Geology Description section shows numerous lithologic units that are probably capable of transmitting water. However, confining pressures tend to keep lower strata rock discontinuities closed or "tight" so that useful aquifers tend to lie close to the ground surface. Wells penetrating near surface rock aquifers typically exhibit yields of less than one half gallon per minute. Well yield tends to be lower in the valleys than on the ridge tops due to confining pressures that tend to close bedding planes and fractures. However, the saturated zones in valleys may extend deeper due to the presence of the local water table, as evidenced by streams located in the valleys.

Numerous aquicludes comprised of claystones, mudstones, underclays, limestones with clay lenses, and some shales and siltstones are interbedded with the more permeable water bearing units. These less permeable strata strongly influence horizontal and vertical water movements. A portion of the springs flowing from valley walls below the ridge lines probably originate in the saturated zone and many can probably be identified as adjacent to (usually above) the less permeable strata.

Groundwater quality data obtained from these rock aquifer springs and the wells generally indicate pH ranges from 6.1 to 9.0, alkalinities in excess of acidities, high hardness, and low metals concentrations.

Wells and springs located within the application area are identified on the Attachment 14A and C forms included with this application. Their locations are shown on the Application Map.

ADDENDUM TO PAGE 17, PART 2, D
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## SEASONAL VARIATIONS OF WATER QUALITY AND QUANTITY

Surface and groundwater data contained in the Attachment 14A and C forms included with this application indicate the seasonal variances of quality and quantity of the water in this area.

The water wells existing in the area give a fairly representative indication of the near surface water bearing zones that can be found in this region. The Probable Hydrologic Consequences of mining gives a detailed description of these characteristics.

Precipitation is one of the principal factors influencing water systems. Infiltration of precipitation increases soil moisture and influences groundwater chemical composition. The time required for infiltrating precipitation to reach lower water bearing zones increases with increasing depth. Depending on the morphological structure, character of surface vegetation, and intensity of precipitation the amounts of infiltration also vary greatly. Amounts of infiltration subsequently influences the dissolved solids contents of groundwater which, in most cases, become more dilute during periods of prolonged precipitation. Rainfall data collected at or near the Powhatan No. 6 Mine has been included in this application.

All the data will show that an increased water quantity and a decrease in chemical constituent levels is realized during times of increased precipitation and snow melt of winter and spring seasons; while a decrease in water quantity and increase in chemical constituent levels is realized in dry summer and early autumn seasons.

2827013.9
730333.5
ADJ

# ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name The Ohio Valley Coal Company LOG # 221729

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | WL-168 | WL-168 | WL -168 | WL -168 | WL-168 | WL-168 |
| 2. | Lab Identification Number | W-L2 | W-L2 | W-L2 | W-L2 | W-L2 | W-L2 |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1112 | 1112 | 1112 | 1112 | 1112 | 1112 |
| 5. | Depth of Well below Land Surface (feet) | 62' | 62' | 62' | 62' | 62' | 62' |
| 6. | Static Water Level of Well below Land Surface (feet) | 45' | 42' | 43' | 45' | 18' | 30' |
| 7. | Flow for Spring/Stream (gpm or cfs) | ---- | ---- | ---- | ---- | ---- | ---- |
| 8. | Date Above Measurements Made | 11-2 | 12-11 | 1-7 | 2-5 | 3-5 | 4-8 |
| 9. | Aquifer/Zone Identification for Well/Spring | C | C | C | C | C | C |
| 10. | pH (Standard Units) | 7.3 | 7.2 | 7.5 | 7.3 | 7.3 | 7.1 |
| 11. | Total Acidity (mg/l CAC03) | 0 | 0 | 0 | 19.76 | 17.10 | 20.14 |
| 12. | Total Alkalinity (mg/l CAC03) | 188 | 190 | 160 | 163.59 | 158.84 | 194.94 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 460 | 450 | 400 | 180 | 357 | 399 |
| 14. | Total Dissolved Solids (mg/l) | ---- | ---- | ---- | ---- | ---- | ---- |
| 15. | Total Manganese (mg/l) | 0.03 | 0.08 | 0.02 | <0.02 | <0.02 | <0.02 |
| 16. | Total Sulfates (mg/l) | 46 | 48 | 44 | 16 | 37 | 29 |
| 17. | Total Iron (mg/l) | 0.21 | 0.14 | 0.08 | 0.18 | 0.16 | <0.04 |
| 18. | Total Suspended Solids (mg/l) | 0.3 | 0.3 | 3.6 | 3.0 | 4.0 | 2.0 |
| 19. | Total Hardness (mg/l CAC03) | 156 | 82.9 | 132.8 | 180 | 176 | 210 |
| 20. | Nitrates (mg/l) | 15.4 | 11.0 | 10.12 | 1.80 | 3.38 | 4.00 |
| 21. | Date Sampled for Analysis | 11-2-90 | 12-11-90 | 1-7-91 | 2-5-91 | 3-5-91 | 4-8-91 |
| 22. | Date Last Precipitaiton Event Occurred | 10-24-90 | 12-4-90 | 1-5-91 | 1-31-91 | 3-3-91 | 4-5-91 |

Laboratory Name ERI Labs
Address P. O. Box 259 City Brockway
State Pennsylvania Zip 15824

Note: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A, a statement giving the reasons why the information is unobtainable.
Note: For each sample provide data for either item 13 or item 14.

2427079.2
730337.4
ADJ

# ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-169 | DW-169 | DW-169 | DW-169 | DW-169 | DW-169 |
| 2. | Lab Identification Number | W-K2 | W-K2 | W-K2 | W-K2 | W-K2 | W-K2 |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1100 | 1100 | 1100 | 1100 | 1100 | 1100 |
| 5. | Depth of Well below Land Surface (feet) | 25' | 25' | 25' | 25' | 25' | 25' |
| 6. | Static Water Level of Well below Land Surface (feet) | 19' | 18' | 19' | 19' | 19' | 19' |
| 7. | Flow for Spring/Stream (gpm or cfs) | ---- | ---- | ---- | ---- | ---- | ---- |
| 8. | Date Above Measurements Made | 11-2-90 | 12-11-90 | 1-7-91 | 2-5-91 | 3-5-91 | 4-8-91 |
| 9. | Aquifer/Zone Identification for Well/Spring | A | A | A | A | A | A |
| 10. | pH (Standard Units) | 7.0 | 6.9 | 7.3 | 7.3 | 7.2 | 7.0 |
| 11. | Total Acidity (mg/l CAC03) | 0 | 0 | 0 | 18.05 | 24.51 | 17.67 |
| 12. | Total Alkalinity (mg/l CAC03) | 204 | 194 | 60 | 158.65 | 103.93 | 113.81 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 500 | 500 | 255 | 410 | 270 | 347 |
| 14. | Total Dissolved Solids (mg/l) | ---- | ---- | ---- | ---- | ---- | ---- |
| 15. | Total Manganese (mg/l) | 0.17 | 0.11 | 0.06 | 0.02 | 0.03 | <0.02 |
| 16. | Total Sulfates (mg/l) | 58 | 68 | 37 | 20.0 | 45.0 | 38.0 |
| 17. | Total Iron (mg/l) | 0.79 | 0.29 | 0.84 | 0.19 | 3.33 | 0.07 |
| 18. | Total Suspended Solids (mg/l) | 0.3 | 4.0 | 21.3 | 4.0 | 18 | 1.0 |
| 19. | Total Hardness (mg/l CAC03) | 178 | 103.6 | 70.2 | 176 | 136 | 132 |
| 20. | Nitrates (mg/l) | 1.72 | 13.6 | 12.32 | 1.93 | 4.18 | 5.39 |
| 21. | Date Sampled for Analysis | 11-2-90 | 12-11-90 | 1-7-91 | 2-5-91 | 3-5-91 | 4-8-91 |
| 22. | Date Last Precipitaiton Event Occurred | 10-24-90 | 12-4-90 | 1-5-91 | 1-31-91 | 3-3-91 | 4-5-91 |

Laboratory Name ERI Labs
Address P. O. Box 259 City Brockway
State Pennsylvania Zip 15824

Note: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A, a statement giving the reasons why the information is unobtainable.
Note: For each sample provide data for either item 13 or item 14.

W-172
2431433.1
730316.25
ADJ

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | W-172 | W-172 | W-172 | W-172 | W-172 | W-172 |
| 2. | Lab Identification Number | W-W2 | W-W2 | W-W2 | W-W2 | W-W2 | W-W2 |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1106 | 1106 | 1106 | 1106 | 1106 | 1106 |
| 5. | Depth of Well below Land Surface (feet) | 116 | 116 | 116 | 116 | 116 | 116 |
| 6. | Static Water Level of Well below Land Surface (feet) | 21 | 19 | 17 | 20 | 17 | 25 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 11/05/90 | 10/12/90 | 01/22/91 | 02/05/91 | 03/18/91 | 04/26/91 |
| 9. | Aquifer/Zone Identification for Well/Spring | D | D | D | D | D | D |
| 10. | pH (Standard Units) | 7.0 | 6.9 | 7.0 | 7.0 | 7.0 | 7.0 |
| 11. | Total Acidity (mg/l CAC03) | 0.00 | 0.00 | 0.00 | 20.90 | 18.62 | 13.49 |
| 12. | Total Alkalinity (mg/l CAC03) | 176.00 | 180.00 | 150.00 | 156.37 | 154.85 | 175.37 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 610 | 603 | 475 | 588 | 441 | 630 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | .09 | .07 | .02 | 0 | 0 | 0 |
| 16. | Total Sulfates (mg/l) | 50.0 | 58.0 | 58.0 | 40.0 | 18.0 | 45.0 |
| 17. | Total Iron (mg/l) | 1.48 | 0.12 | 0.06 | 0.09 | 0.04 | 0.0 |
| 18. | Total Suspended Solids (mg/l) | 11.0 | 0.3 | 2.3 | 3.0 | 2.0 | 4. |
| 19. | Total Hardness (mg/l CAC03) | 220 | 130.3 | 154.3 | 230 | 200 | 26 |
| 20. | Nitrates (mg/l) | 36.5 | 25.96 | 16.28 | 3.69 | 6.18 | 5.6 |
| 21. | Date Sampled for Analysis | 11/05/90 | 10/12/90 | 01/22/91 | 02/05/91 | 03/18/91 | 04/26/9 |
| 22. | Date Last Precipitaiton Event Occurred | 10/24/90 | 12/04/90 | 01/02/91 | 01/31/91 | 03/17/91 | 04/24/9 |

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE
State WEST VIRGINIA Zip 26038

W-173
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PAN

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-173 | DW-173 | DW-173 | DW-173 | DW-173 | DW-173 |
| 2. | Lab Identification Number | W-J2 | W-J2 | W-J2 | W-J2 | W-J2 | W-J2 |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1166 | 1166 | 1166 | 1166 | 1166 | 1166 |
| 5. | Depth of Well below Land Surface (feet) | 25 | 25 | 25 | 25 | 25 | 25 |
| 6. | Static Water Level of Well below Land Surface (feet) | 17 | 18 | 13 | 16 | 17 | 15 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 11/02/90 | 12/11/90 | 01/04/91 | 02/04/91 | 03/18/91 | 04/11/91 |
| 9. | Aquifer/Zone Identification for Well/Spring | A | A | A | A | A | A |
| 10. | pH (Standard Units) | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.0 |
| | Total Acidity (mg/l CAC03) | 0.00 | 0.00 | 0.00 | 27.55 | 25.27 | 18.24 |
| 12. | Total Alkalinity (mg/l CAC03) | 240.00 | 254.00 | 260.00 | 245.86 | 245.67 | 235.03 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 550 | 520 | 560 | 567 | 473 | 483 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | .23 | .34 | .06 | .06 | 0 | .02 |
| 16. | Total Sulfates (mg/l) | 47.0 | 56.0 | 61.0 | 35.0 | 34.0 | 34.0 |
| 17. | Total Iron (mg/l) | 0.19 | 0.15 | 0.16 | 0.34 | 0.00 | 0.04 |
| 18. | Total Suspended Solids (mg/l) | 1.7 | 4.0 | 3.6 | 18.0 | 6.0 | 5.0 |
| 19. | Total Hardness (mg/l CAC03) | 219 | 134.6 | 205.3 | 275 | 268 | 252 |
| 20. | Nitrates (mg/l) | 15.4 | 13.6 | 9.24 | 1.89 | 4.48 | 3.91 |
| 21. | Date Sampled for Analysis | 11/02/90 | 12/11/90 | 01/04/91 | 02/04/91 | 03/18/91 | 04/11/9 |
| 22. | Date Last Precipitaiton Event Occurred | 10/24/90 | 12/04/90 | 12/30/90 | 01/31/91 | 03/17/91 | 04/09/9 |

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE
State WEST VIRGINIA Zip 26038

9/88

W-323
2428247.8
730732.16
ADJ

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

STATE PLANE COORDINATES: X 2,428,446 Y 730,695

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | W-323 | W-323 | | | | |
| 2. Lab Identification Number | 94-06-994 | 94-07-665 | | | | |
| 3. High (H)/Low (L) Designation (if applicable) | I | I | | | | |
| 4. Surface Elevation for Sampling Station (msl) | 1138 | 1138 | | | | |
| 5. Depth of Well below Land Surface (feet) | 120 | 120 | | | | |
| 6. Static Water Level of Well below Land Surface (feet) | 59 | 62 | | | | |
| 7. Flow for Spring/Stream (gpm or cfs) | - | - | | | | |
| 8. Date Above Measurements M. | 06/25/94 | 07/26/94 | | | | |
| 9. Aqu: .r/Zone Identification for Well/Spring | D | D | | | | |
| 10. pH (Standard Units) | 8.3 | 8.9 | | | | |
| 11. Total Acidity (mg/l CAC03) | 0.0 | 0 | | | | |
| 12. Total Alkalinity (mg/l CAC03) | 344.80 | 351 | | | | |
| 13. Specific Conductivity (μmhos/cm at 25°C) | 663 | 665 | | | | |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | <0.02 | <0.02 | | | | |
| 16. Total Sulfates (mg/l) | <10.0 | 5.0 | | | | |
| 17. Total Iron (mg/l) | 0.06 | 0.62 | | | | |
| 18. Total Suspended Solids (mg/l) | 3.0 | 14.0 | | | | |
| 19. Total Hardness (mg/l CAC03) | 80.0 | 682 | | | | |
| 20. Nitrates (mg/l) | 3.16 | <0.50 | | | | |
| 21. Date Sampled for Analysis | 06/25/94 | 07/26/94 | | | | |
| 22. Date Last Precipitaiton Event Occurred | 06/24/94 | 07/25/94 | | | | |

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE
State WEST VIRGINIA Zip 26038

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | W-396 | W-396 | W-396 | W-396 | W-396 | W-396 |
| 2. Lab Identification Number | 9701306 | 9702311 | 9703259 | 9704337 | 9705259 | 9706282 |
| 3. High (H)/Low (L) Designation (if applicable) | L | H | H | H | L | L |
| 4. Surface Elevation for Sampling Station (msl) | 1305 | 1305 | 1305 | 1305 | 1305 | 1305 |
| 5. Depth of Well below Land Surface (msl) | 70 | 70 | 70 | 70 | 70 | 70 |
| 6. Static Water Level of Well below Land Surface (msl) | 37 | 37 | 36 | 37 | 38 | 39 |
| 7. Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. Date Above Measurements Made | 01/30/97 | 02/27/97 | 03/22/97 | 04/25/97 | 05/22/97 | 06/27/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 7.3 | 7.3 | 7.2 | 7.3 | 7.3 | 7.5 |
| 11. Total Acidity (mg/l CAC03) | 34 | 9 | 17 | 12 | 9.4 | 9.1 |
| 12. Total Alkalinity (mg/l CAC03) | 180 | 170 | 170 | 200 | 200 | 190 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 380 | 430 | 440 | 480 | 460 | 510 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16. Total Sulfates (mg/l) | 54 | 58 | 57 | 54 | 44 | 52 |
| 17. Total Iron (mg/l) | 0 | 0 | 0 | 0.07 | 0 | 0 |
| 18. Total Suspended Solids (mg/l) | 0 | 0 | 0 | 0 | 0 | 0 |
| 19. Total Hardness (mg/l CAC03) | 240 | 240 | 190 | 250 | 240 | 250 |
| 20. Nitrates (mg/l) | 2.4 | 2.6 | 2 | 11 | 1.6 | 2.4 |
| 21. Date Sampled for Analysis | 01/30/97 | 02/27/97 | 03/22/97 | 04/25/97 | 05/22/97 | 06/27/97 |
| 22. Date Last Precipitaiton Event Occurred | 01/28/97 | 02/26/97 | 03/18/97 | 04/25/97 | 05/19/97 | 06/26/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | W-405 | W-405 | W-405 | W-405 | W-405 | W-405 |
| 2. Lab Identification Number | 9702136 | 9703236 | 9704290 | 9705228 | 9707014 | 9707257 |
| 3. High (H)/Low (L) Designation (if applicable) | L | H | H | L | L | L |
| 4. Surface Elevation for Sampling Station (msl) | 1322 | 1322 | 1322 | 1322 | 1322 | 1322 |
| 5. Depth of Well below Land Surface (msl) | 103 | 103 | 103 | 103 | 103 | 103 |
| 6. Static Water Level of Well below Land Surface (msl) | 76 | 74 | 78 | 77 | 78 | 78 |
| 7. Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 7 | 7.3 | 7.3 | 7.3 | 7.7 | 7.7 |
| 11. Total Acidity (mg/l CAC03) | 14 | 8.6 | 8.6 | 11 | 6.3 | 5.8 |
| 12. Total Alkalinity (mg/l CAC03) | 180 | 270 | 190 | 170 | 180 | 180 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 460 | 440 | 440 | 430 | 480 | 410 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.08 | 0.37 | 0.02 | 0.00 | 0.03 | 0.00 |
| 16. Total Sulfates (mg/l) | 49 | 45 | 49 | 45 | 50 | 49 |
| 17. Total Iron (mg/l) | 2 | 12 | 1 | 0.3 | 0.76 | 0.23 |
| 18. Total Suspended Solids (mg/l) | 26 | 740 | 7.3 | 11 | 6 | 0 |
| 19. Total Hardness (mg/l CAC03) | 250 | 330 | 220 | 180 | 250 | 210 |
| 20. Nitrates (mg/l) | 2.6 | 1.8 | 4.7 | 4.4 | 3.1 | 5 |
| 21. Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 22. Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | DW-406 | DW-406 | DW-406 | DW-406 | DW-406 | DW-406 |
| 2. Lab Identification Number | 9702120 | 9703237 | 9704291 | 9705229 | 9707015 | 9707258 |
| 3. High (H)/Low (L) Designation (if applicable) | I | H | H | I | I | I |
| 4. Surface Elevation for Sampling Station (msl) | 1322 | 1322 | 1322 | 1322 | 1322 | 1322 |
| 5. Depth of Well below Land Surface (msl) | 24 | 24 | 24 | 24 | 24 | 24 |
| 6. Static Water Level of Well below Land Surface (msl) | 22 | 20 | 22 | 21 | 22 | 23 |
| 7. Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 9. Aquifer/Zone Identification for Well/Spring | A | A | A | A | A | A |
| 10. pH (Standard Units) | 6.9 | 7 | 7.3 | 7.3 | 7.2 | 7.3 |
| 11. Total Acidity (mg/l CAC03) | 25 | 7.4 | 4.7 | 19 | 11 | 8.5 |
| 12. Total Alkalinity (mg/l CAC03) | 100 | 94 | 94 | 76 | 120 | 120 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 350 | 360 | 350 | 420 | 430 | 390 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.04 | 0.00 | 0.00 | 0.00 | 0.05 | 0.04 |
| 16. Total Sulfates (mg/l) | 46 | 47 | 42 | 53 | 45 | 45 |
| 17. Total Iron (mg/l) | 0.21 | 0.08 | 0.5 | 0.68 | 1.1 | 0.47 |
| 18. Total Suspended Solids (mg/l) | 4 | 0 | 13 | 0 | 0 | 0 |
| 19. Total Hardness (mg/l CAC03) | 170 | 140 | 140 | 150 | 290 | 160 |
| 20. Nitrates (mg/l) | 5 | 4.8 | 4.6 | 6.5 | 7 | 5 |
| 21. Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 22. Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | W-407 | W-407 | W-407 | W-407 | W-407 | W-407 |
| 2. | Lab Identification Number | 9702127 | 9703239 | 9704292 | 9705230 | 9707016 | 9707260 |
| 3. | High (H)/Low (L) Designation (if applicable) | I | H | H | I | I | I |
| 4. | Surface Elevation for Sampling Station (msl) | 1306 | 1306 | 1306 | 1306 | 1306 | 1306 |
| 5. | Depth of Well below Land Surface (msl) | 63 | 63 | 63 | 63 | 63 | 63 |
| 6. | Static Water Level of Well below Land Surface (msl) | 56 | 58 | 56 | 56 | 58 | 59 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 9. | Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. | pH (Standard Units) | 7.3 | 7.3 | 7.2 | 7.2 | 7.1 | 7.3 |
| 11. | Total Acidity (mg/l CAC03) | 16 | 12 | 9.6 | 28 | 39 | 28 |
| 12. | Total Alkalinity (mg/l CAC03) | 180 | 190 | 200 | 220 | 230 | 240 |
| 13. | Specific Conductivity (µmhos/cm at 25°C) | 970 | 910 | 880 | 1000 | 1100 | 930 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | 0.30 | 0.02 | 1.30 | 0.38 | 0.13 | 1.90 |
| 16. | Total Sulfates (mg/l) | 72 | 77 | 88 | 78 | 8 | 77 |
| 17. | Total Iron (mg/l) | 0.55 | 0.12 | 1 | 0.17 | 0.3 | 0.91 |
| 18. | Total Suspended Solids (mg/l) | 5.3 | 0 | 0 | 0 | 0 | 10 |
| 19. | Total Hardness (mg/l CAC03) | 450 | 450 | 480 | 530 | 460 | 500 |
| 20. | Nitrates (mg/l) | 10 | 15 | 1.3 | 13 | 7.6 | 4 |
| 21. | Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 22. | Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-408 | DW-408 | DW-408 | DW-408 | DW-408 | DW-408 |
| 2. | Lab Identification Number | 9702122 | 9703238 | 9704293 | 9705226 | 9707009 | 9707259 |
| 3. | High (H)/Low (L) Designation (if applicable) | I | H | H | I | I | I |
| 4. | Surface Elevation for Sampling Station (msl) | 1305 | 1305 | 1305 | 1305 | 1305 | 1305 |
| 5. | Depth of Well below Land Surface (msl) | 33 | 33 | 33 | 33 | 33 | 33 |
| 6. | Static Water Level of Well below Land Surface (msl) | 26 | 22 | 27 | 27 | 27 | 28 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 9. | Aquifer/Zone Identification for Well/Spring | A | A | A | A | A | A |
| 10. | pH (Standard Units) | 7.3 | 7.1 | 7.2 | 6.9 | 7 | 7.3 |
| 11. | Total Acidity (mg/l CAC03) | 12 | 8 | 4.9 | 22 | 16 | 9.9 |
| 12. | Total Alkalinity (mg/l CAC03) | 90 | 87 | 98 | 86 | 110 | 130 |
| 13. | Specific Conductivity (µmhos/cm at 25°C) | 660 | 610 | 640 | 450 | 720 | 680 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16. | Total Sulfates (mg/l) | 59 | 58 | 53 | 49 | 41 | 55 |
| 17. | Total Iron (mg/l) | 0.12 | 1.7 | 0.06 | 0.29 | 0 | 0.23 |
| 18. | Total Suspended Solids (mg/l) | 0 | 0 | 1.3 | 0 | 0 | 0 |
| 19. | Total Hardness (mg/l CAC03) | 270 | 230 | 240 | 160 | 250 | 270 |
| 20. | Nitrates (mg/l) | 7 | 7.3 | 11 | 7.8 | 10 | 11 |
| 21. | Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 22. | Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

2429599.4
730712.48
ADJ

ATTACHMENT 14A

Stream flow = CFS

(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DS 223 | DS 223 | DS 223 | DS 223 | DS 223 | DS 223 |
| 2. | Lab Identification Number | | | | | | |
| 3. | High (H)/Low (L) Designation (if applicable) | I | I | I | L | L | L |
| 4. | Surface Elevation for Sampling Station (msl) | 1130 | 1130 | 1130 | 1130 | 1130 | 1130 |
| 5. | Depth of Well below Land Surface (feet) | ---- | ---- | ---- | ---- | ---- | ---- |
| 6. | Static Water Level of Well below Land Surface (feet) | ---- | ---- | ---- | ---- | ---- | ---- |
| 7. | Flow for Spring/Stream (gpm or cfs) | 2.0 | .5 | .75 | .326 | .326 | .227 |
| 8. | Date Above Measurements Made | 5-30-91 | 6-25-91 | 7-30-91 | 8-22-91 | 9-13-91 | 10-29-91 |
| 9. | Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. | pH (Standard Units) | 7.5 | 6.8 | 6.9 | 6.9 | 7.8 | 7.0 |
| 11. | Total Acidity (mg/l CAC03) | 8.93 | 12.92 | 8.36 | 14.63 | 11.59 | 7.60 |
| 12. | Total Alkalinity (mg/l CAC03) | 127.49 | 174 | 174 | 147.6 | 183 | 191.14 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 310 | 389 | 347 | 347 | 399 | 378 |
| 14. | Total Dissolved Solids (mg/l) | ---- | ---- | ---- | ---- | ---- | ---- |
| 15. | Total Manganese (mg/l) | 0.03 | < 0.02 | < 0.02 | 0.06 | 0.03 | 0.07 |
| 16. | Total Sulfates (mg/l) | 11.0 | 21.0 | <10.0 | <10.0 | 14.0 | 20.0 |
| 17. | Total Iron (mg/l) | < 0.04 | 0.08 | 0.04 | 0.16 | 0.26 | 0.48 |
| 18. | Total Suspended Solids (mg/l) | 4.0 | 1.0 | 7.0 | 2.0 | 10.0 | 56.0 |
| 19. | Total Hardness (mg/l CAC03) | 162 | 152 | 159 | 132 | 183 | 189 |
| 20. | Nitrates (mg/l) | 4.11 | 0.51 | 0.69 | 0.69 | 0.88 | <1.00 |
| 21. | Date Sampled for Analysis | 5-30-91 | 6-25-91 | 7-30-91 | 8-22-91 | 9-13-91 | 10-29-91 |
| 22. | Date Last Precipitaiton Event Occurred | 5-28-91 | 6-16-91 | 7-25-91 | 8-21-91 | 9-11-91 | 10-26-91 |

Laboratory Name ERI Labs

Address P. O. Box 259 City Brockway

State Pennsylvania Zip 15824

Note: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A, a statement giving the reasons why the information is unobtainable.

Note: For each sample provide data for either item 13 or item 14.

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | DS-282 | DS-282 | DS-282 | DS-282 | DS-282 | DS-282 |
| 2. Lab Identification Number | 9702123 | 9703240 | 9704294 | 9705227 | 9706291 | 9707261 |
| 3. High (H)/Low (L) Designation (if applicable) | L | H | H | L | L | L |
| 4. Surface Elevation for Sampling Station (msl) | 1268 | 1268 | 1268 | 1268 | 1268 | 1268 |
| 5. Depth of Well below Land Surface (msl) | | | | | | |
| 6. Static Water Level of Well below Land Surface (msl) | | | | | | |
| 7. Flow for Spring/Stream (gpm or cfs) | 2.7 | 8.5 | 1.75 | 1 | 1 | 0.19 |
| 8. Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/27/97 | 07/20/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 6.9 | 6.8 | 7 | 7 | 6.9 | 7.2 |
| 11. Total Acidity (mg/l CAC03) | 22 | 24 | 13 | 6.4 | 17 | 14 |
| 12. Total Alkalinity (mg/l CAC03) | 150 | 150 | 160 | 86 | 170 | 170 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 570 | 610 | 600 | 450 | 690 | 630 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16. Total Sulfates (mg/l) | 57 | 57 | 56 | 48 | 53 | 51 |
| 17. Total Iron (mg/l) | 0.06 | 0.06 | 0.28 | 0.22 | 0.12 | 0.11 |
| 18. Total Suspended Solids (mg/l) | 2.7 | 0 | 1.3 | 0 | 2 | 0 |
| 19. Total Hardness (mg/l CAC03) | 240 | 260 | 240 | 210 | 260 | 260 |
| 20. Nitrates (mg/l) | 5.1 | 6.6 | 6.6 | 7.8 | 4.1 | 5.3 |
| 21. Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/27/97 | 07/20/97 |
| 22. Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | DS-286 | DS-286 | DS-286 | DS-286 | DS-286 | DS-286 |
| 2. Lab Identification Number | 9703267 | 9704295 | 9705231 | | | |
| 3. High (H)/Low (L) Designation (if applicable) | H | H | I | I | I | L |
| 4. Surface Elevation for Sampling Station (msl) | 1220 | 1220 | 1220 | 1220 | 1220 | 1220 |
| 5. Depth of Well below Land Surface (msl) | | | | | | |
| 6. Static Water Level of Well below Land Surface (msl) | | | | | | |
| 7. Flow for Spring/Stream (gpm or cfs) | 2.6 | 0.37 | 1.25 | 0 | 0 | 0 |
| 8. Date Above Measurements Made | 03/20/97 | 04/23/97 | 05/22/97 | 06/28/97 | 07/20/97 | 08/23/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 6.9 | 7.1 | 7.1 | | | |
| 11. Total Acidity (mg/l CAC03) | 12 | 9.4 | 16 | | | |
| 12. Total Alkalinity (mg/l CAC03) | 140 | 170 | 82 | | | |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 390 | 400 | 240 | | | |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.00 | 0.02 | 0.00 | | | |
| 16. Total Sulfates (mg/l) | 31 | 36 | 32 | | | |
| 17. Total Iron (mg/l) | 0 | 0.81 | 0 | | | |
| 18. Total Suspended Solids (mg/l) | 0 | 9.3 | 0 | | | |
| 19. Total Hardness (mg/l CAC03) | 180 | 200 | 140 | | | |
| 20. Nitrates (mg/l) | 13 | 3.7 | 1.4 | | | |
| 21. Date Sampled for Analysis | 03/20/97 | 04/23/97 | 05/22/97 | 06/28/97 | 07/20/97 | 08/23/97 |
| 22. Date Last Precipitaiton Event Occurred | 03/18/97 | 04/23/97 | 05/19/97 | 06/26/97 | 07/09/97 | 08/21/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name: THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | DS-287 | DS-287 | DS-287 | DS-287 | DS-287 | DS-287 |
| 2. Lab Identification Number | 9703268 | 9704296 | 9705232 | 9707017 | 9707255 | 9708219 |
| 3. High (H)/Low (L) Designation (if applicable) | I | H | H | I | I | L |
| 4. Surface Elevation for Sampling Station (msl) | 1220 | 1220 | 1220 | 1220 | 1220 | 1220 |
| 5. Depth of Well below Land Surface (msl) | | | | | | |
| 6. Static Water Level of Well below Land Surface (msl) | | | | | | |
| 7. Flow for Spring/Stream (gpm or cfs) | 2.4 | 0.25 | 1.15 | 0.75 | 0.68 | 0.11 |
| 8. Date Above Measurements Made | 03/20/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 | 08/23/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 7 | 7.3 | 7.3 | 7.1 | 7.6 | 7.6 |
| 11. Total Acidity (mg/l CAC03) | 12 | 8.4 | 12 | 14 | 7.8 | 8.7 |
| 12. Total Alkalinity (mg/l CAC03) | 120 | 150 | 120 | 160 | 170 | 160 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 370 | 530 | 400 | 630 | 580 | 520 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.06 |
| 16. Total Sulfates (mg/l) | 37 | 39 | 33 | 38 | 38 | 41 |
| 17. Total Iron (mg/l) | 0.07 | 0 | 0.08 | 0.18 | 0.12 | 0.24 |
| 18. Total Suspended Solids (mg/l) | 0 | 0 | 0 | 0 | 0 | 0 |
| 19. Total Hardness (mg/l CAC03) | 200 | 250 | 200 | 290 | 230 | 270 |
| 20. Nitrates (mg/l) | 7.2 | 2.8 | 2.1 | 2 | 2.2 | 1.6 |
| 21. Date Sampled for Analysis | 03/20/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 | 08/23/97 |
| 22. Date Last Precipitaiton Event Occurred | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 | 08/21/97 |

Laboratory Name: Tradet, Inc.
Address: P.O. Box 2019
State: Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

DIVISION OF RECLAMATION

ATTACHMENT 14A

(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| STATE PLANE COORDINATES: | X 2,427,826.06 | Y 730,804.51 | LOCATION | ADJ | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | U34-001 | U34-001 | U34-001 | U34-001 | U34-001 | U34-001 |
| 2. Lab Identification Number | NA | NA | NA | NA | NA | NA |
| 3. High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. Surface Elevation for Sampling Station (msl) | 1100 | 1100 | 1100 | 1100 | 1100 | 1100 |
| 5. Depth of Well below Land Surface (msl) | NA | NA | NA | NA | NA | NA |
| 6. Static Water Level of Well below Land Surface (msl) | NA | NA | NA | NA | NA | NA |
| 7. Flow for Spring/Stream (gpm or cfs) | 0.03 | 0.33 | 0.00 | 0.00 | 0.00 | 0.02 |
| 8. Date Above Measurements Made | 11/02/90 | 12/11/90 | 01/01/91 | 02/05/91 | 03/05/91 | 04/08/91 |
| 9. Aquifer/Zone Identification for Well/Spring | NA | NA | NA | NA | NA | NA |
| 10. pH (Standard Units) | 7.7 | 7.4 | 7 | 7 | 7.6 | 7.5 |
| 11. Total Acidity (mg/l CAC03) | 0.00 | 0.00 | 0.00 | 2.66 | 17.86 | 10.45 |
| 12. Total Alkalinity (mg/l CAC03) | 108 | 196 | 80 | 42.37 | 74.48 | 113.05 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 260 | 250 | 230 | 100 | 160 | 260 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.12 | 0.59 | 1.79 | 0.15 | 0.27 | 0.4 |
| 16. Total Sulfates (mg/l) | 29 | 28 | 36 | | 16 | 18 |
| 17. Total Iron (mg/l) | 0.43 | 0.8 | 3.43 | 0.14 | 0.45 | 1.59 |
| 18. Total Suspended Solids (mg/l) | 3.7 | 17 | 4.3 | 6 | 13 | 28 |
| 19. Total Hardness (mg/l CAC03) | 94 | 91 | 69.4 | 40 | 80 | 114 |
| 20. Nitrates (mg/l) | 1.1 | 2.77 | 4.84 | 0.00 | 1.46 | 2.32 |
| 21. Date Sampled for Analysis | 11/02/90 | 12/11/90 | 01/01/91 | 02/05/91 | 03/05/91 | 04/08/91 |
| 22. Date Last Precipitation Event Occurred | 11/01/90 | 12/04/90 | 12/30/90 | 02/05/91 | 03/03/91 | 04/08/91 |

Laboratory Name ERI LABS
Address PO BOX 259
State bROCKWAY, PA 15824

SPRING FLOW = GPM
STREAM FLOW = CFS

2431387.9
730854.8
ADJ

DIVISION OF RECLAMATION

ATTACHMENT 14A

(HYDROLOGIC MEASUREMENTS AND ANALYSES)

plicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| . | Identification No. of Sampling Station from Hydrology Map | U34-143 | U34-143 | U34-143 | U34-143 | U34-143 | U34-143 |
| 2. | Lab Identification Number | | | | | | |
| 3. | High (H)/Low (L) Designation (if applicable) | I | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1110 | 1110 | 1110 | 1110 | 1110 | 1110 |
| 5. | Depth of Well below Land Surface (feet) | | | | | | |
| 6. | Static Water Level of Well below Land Surface (feet) | | | | | | |
| 7. | Flow for Spring/Stream (gpm or cfs) | 0.006 cfs | 0.033 cfs | 0.066 cfs | 0.044 cfs | 0.033 cfs | 0.022 cfs |
| 8. | Date Above Measurements Made | 11/30/90 | 12/26/90 | 01/15/91 | 02/04/91 | 03/08/91 | 04/24/91 |
| 9. | Aquifer/Zone Identification for Well/Spring | | | | | | |
| 10. | pH (Standard Units) | 7.7 | 7.9 | 7.9 | 7.8 | 8.0 | 8.1 |
| 11. | Total Acidity (mg/l CAC03) | 0.00 | 0.00 | 0.00 | 13.11 | 7.03 | 18.43 |
| . | Total Alkalinity (mg/l CAC03) | 236.00 | 200.00 | 170.00 | 196.46 | 198.55 | 215.65 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 400 | 440 | 420 | 472 | 441 | 441 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | 0.65 | 0.22 | 0.14 | 0.26 | 0.07 | 0.51 |
| 16. | Total Sulfates (mg/l) | 34.0 | 40.0 | 37.0 | 26.0 | 27.0 | 17.0 |
| 17. | Total Iron (mg/l) | 2.50 | 0.94 | 0.94 | 2.66 | 0.37 | 5.60 |
| 18. | Total Suspended Solids (mg/l) | 10.0 | 0.3 | 24.3 | 22.0 | 10.0 | 37.0 |
| 19. | Total Hardness (mg/l CAC03) | 188.0 | 119.6 | 157.1 | 230.0 | 204.0 | 228.0 |
| 20. | Nitrates (mg/l) | 4.05 | 7.04 | 3.78 | 1.40 | 2.42 | 3.26 |
| 21. | Date Sampled for Analysis | 11/30/90 | 12/26/90 | 01/15/91 | 02/04/91 | 03/08/91 | 04/24/91 |
| 22. | Date Last Precipitaiton Event Occurred | 11/27/90 | 12/24/90 | 01/14/91 | 01/31/91 | 03/06/91 | 04/22/91 |

Laboratory Name INDUSTRIAL LAB ANALYSIS

Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE

State WEST VIRGINIA Zip 26038

9/88
U34-164
2425273.6
730219.96
ADJ

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | U34-164 | U34-164 | U34-164 | U34-164 | U34-164 | U34- |
| 2. Lab Identification Number | 93-11-969 | 93-12-797 | 94-01-648 | 94-02-687 | 94-03-987 | 94-04 |
| 3. High (H)/Low (L) Designation (if applicable) | I | I | I | H | H | H |
| 4. Surface Elevation for Sampling Station (msl) | 1110 | 1110 | 1110 | 1110 | 1110 | |
| 5. Depth of Well below Land Surface (feet) | N/A | N/A | N/A | N/A | N/A | N/ |
| 6. Static Water Level of Well below Land Surface (feet) | - | - | - | - | - | - |
| 7. Flow for Spring/Stream (gpm or cfs) | .4 | 0.40 | 0.49 | 2.82 | 1.0 | .4 |
| 8. Date Above Measurements Made | 11/30/93 | 12/16/93 | 01/24/94 | 02/21/94 | 03/24/94 | 04 |
| 9. Aquifer/Zone Identification for Well/Spring | N/A | N/A | N/A | N/A | N/A | N/ |
| 10. pH (Standard Units) | 7.8 | 8.1 | 7.8 | 7.3 | 7.8 | 7. |
| 11. Total Acidity (mg/l CAC03) | 4.60 | 1.20 | 2.80 | 5.00 | 5.20 | 5.( |
| 12. Total Alkalinity (mg/l CAC03) | 107.20 | 148.80 | 147.20 | 80.40 | 114.00 | 142 |
| 13. Specific Conductivity (μmhos/cm at 25°C) | 395 | 391 | 452 | 320 | 382 | 37 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.12 | <0.02 | 0.04 | 0.04 | 0.02 | 0.( |
| 16. Total Sulfates (mg/l) | 25.0 | 28.0 | 28.0 | 27.0 | 34.0 | 28 |
| 17. Total Iron (mg/l) | 0.56 | <0.04 | 0.13 | 0.35 | 0.14 | 0. |
| 18. Total Suspended Solids (mg/l) | 30.0 | 8.0 | 4.0 | 10.0 | 6.0 | 6. |
| 19. Total Hardness (mg/l CAC03) | 159.0 | 203.0 | 188.0 | 124.0 | 160.0 | 17( |
| 20. Nitrates (mg/l) | 0.78 | 1.20 | 1.25 | 1.76 | 0.80 | 0. |
| 21. Date Sampled for Analysis | 11/30/93 | 12/16/93 | 01/24/94 | 02/21/94 | 03/25/94 | 0 |
| 22. Date Last Precipitaiton Event Occurred | 11/28/93 | 12/15/93 | 01/24/94 | 02/21/94 | 03/23/94 | 0 |

Laboratory Name INDUSTRIAL LAB ANALYSIS Spring flow = GPM
Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE Stream flow = CFS
State WEST VIRGINIA Zip 26038

9/88
U34-166
2426895.6
730201.94
ADJ

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | U34-166 | U34-166 | U34-166 | U34-166 | U34-166 | U34 |
| 2. Lab Identification Number | 93-11-971 | 93-12-552 | 94-01-742 | 94-02-575 | 94-03-989 | 94-0 |
| 3. High (H)/Low (L) Designation (if applicable) | I | I | I | H | H | H |
| 4. Surface Elevation for Sampling Station (msl) | 1075 | 1075 | 1075 | 1075 | 1075 | |
| 5. Depth of Well below Land Surface (feet) | N/A | N/A | N/A | N/A | N/A | N/ |
| 6. Static Water Level of Well below Land Surface (feet) | - | - | - | - | - | - |
| 7. Flow for Spring/Stream (gpm or cfs) | 2.90 | 2.024 | 29.51 | 3.15 | 8.3 | 3. |
| 8. Date Above Measurements Made | 11/29/93 | 12/15/93 | 01/27/94 | 02/16/94 | 03/24/94 | 0 |
| 9. Aquifer/Zone Identification for Well/Spring | N/A | N/A | N/A | N/A | N/A | N/ |
| 10. pH (Standard Units) | 7.8 | 7.9 | 7.3 | 7.8 | 7.8 | 7. |
| 11. Total Acidity (mg/l CAC03) | 5.40 | 0.60 | 8.40 | 5.00 | 3.80 | 7. |
| 12. Total Alkalinity (mg/l CAC03) | 109.00 | 121.40 | 70.40 | 108.00 | 99.20 | 130 |
| 13. Specific Conductivity (μmhos/cm at 25°C) | 310 | 354 | 250 | 310 | 290 | 31 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.17 | 0.17 | 1.27 | 0.05 | 0.03 | 0. |
| 16. Total Sulfates (mg/l) | 41.0 | 21.0 | 25.0 | 30.0 | 35.0 | 33 |
| 17. Total Iron (mg/l) | 1.24 | 0.31 | 9.80 | 0.17 | 0.22 | 0. |
| 18. Total Suspended Solids (mg/l) | 44.0 | 9.0 | 41.0 | 4.0 | 3.0 | 40 |
| 19. Total Hardness (mg/l CAC03) | 150.0 | 161.0 | 95.0 | 161.0 | 132.0 | 15 |
| 20. Nitrates (mg/l) | 0.84 | 0.62 | 1.33 | 0.61 | 0.67 | 0. |
| 21. Date Sampled for Analysis | 11/29/93 | 12/15/93 | 01/27/94 | 02/16/94 | 03/25/94 | 0 |
| 22. Date Last Precipitaiton Event Occurred | 11/28/93 | 12/15/93 | 01/27/94 | 02/13/94 | 03/23/94 | 0 |

Laboratory Name INDUSTRIAL LAB ANALYSIS Spring flow = GPM
Address 2240 WILLIAMSBURG FARM. P. O. BOX 81, GLEN DALE Stream flow = CFS
State WEST VIRGINIA Zip 26038

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | W -294 | W -294 | W -294 | W -294 | W -294 | W -294 |
| 2. Lab Identification Number | 93-11-605 | 93-12-560 | 94-01-743 | 94-02-560 | 94-03-1380 | 94-04-980 |
| 3. High (H)/Low (L) Designation (if applicable) | I | I | I | H | H | H |
| 4. Surface Elevation for Sampling Station (msl) | 1125 | 1125 | 1125 | 1125 | 1125 | 1125 |
| 5. Depth of Well below Land Surface (msl) | 57 | 57 | 57 | 57 | 57 | 57 |
| 6. Static Water Level of Well below Land Surface (msl) | 42 | 42 | 44 | 43 | 43 | 53 |
| 7. Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. Date Above Measurements Made | 11/17/93 | 12/15/93 | 01/27/94 | 02/16/94 | 03/31/94 | 04/29/94 |
| 9. Aquifer/Zone Identification for Well/Spring | C | C | C | C | C | C |
| 10. pH (Standard Units) | 7.8 | 7.4 | 7.4 | 7.7 | 7.6 | 7.7 |
| 11. Total Acidity (mg/l CAC03) | 0 | 7.2 | 6.6 | 5.6 | 5 | 8.4 |
| 12. Total Alkalinity (mg/l CAC03) | 213.2 | 209.6 | 215.2 | 204 | 181.2 | 210.6 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 426 | 452 | 435 | 413 | 447 | 399 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.00 | 0.03 | 0.02 | 0.00 | 0.12 | 0.00 |
| 16. Total Sulfates (mg/l) | 0 | 5 | 0 | 12 | 12 | 0 |
| 17. Total Iron (mg/l) | 0.1 | 0.56 | 0.53 | 0.14 | 6 | 0.29 |
| 18. Total Suspended Solids (mg/l) | 1 | 5 | 6 | 2 | 15 | 4 |
| 19. Total Hardness (mg/l CAC03) | 0 | 197 | 200 | 197 | 188 | 184 |
| 20. Nitrates (mg/l) | 1 | 0.85 | 0.61 | 0.42 | 0.33 | 0.6 |
| 21. Date Sampled for Analysis | 11/17/93 | 12/15/93 | 01/27/94 | 02/16/94 | 03/31/94 | 04/29/94 |
| 22. Date Last Precipitaiton Event Occurred | 11/17/93 | 12/15/93 | 01/27/94 | 02/12/94 | 03/28/94 | 04/29/94 |

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG FARM. BOX 81
State GLEN DALE. WV 26038

SPRING FLOW = GPM
STREAM FLOW = CFS

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# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT: The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | W-458 | U34-H | U34-001 | U34-009 | W-316 | DS-244 |
| 2. | Identification Number | 0202151 | 0202029 | 0202030 | 0202031 | | 0201430 |
| 3. | High (H)/Low (L)/Intermediate (I) Designation (if applicable) | T/L | T/L | T/L | T/L | T/L | T/L |
| 4. | Surface Elevation for Sampling Station (msl) | 1070 | 1100 | 1100 | 1045 | 1203 | 1290 |
| 5. | Depth of Well below Land Surface (feet) | 25' | | | | 72' | |
| 6. | Static Water Level of Well Below Land Surface (feet) | 6' | | | | 57' | |
| 7. | Flow for Spring and Stream (gpm or cfs) | | .0001 gpm | .07 cfs | 2.7 cfs | | .94 gpm |
| 8. | Date Above Measurements Made | 2/6/02 | 2/1/02 | 2/1/02 | 2/1/02 | 1/30/02 | 1/30/02 |
| 9. | Aquifer/Zone Identification for Well/Spring | B | | | | B | B |
| 10. | pH (Standard Units) | 7.5 | 7.3 | 7.9 | 8.1 | NOT | 7.2 |
| 11. | Total Acidity (mg/l CaCO3) | 13 | 3.8 | 7.6 | 7.6 | ABLE | 5.7 |
| 12. | Total Alkalinity (mg/l CaCO3) | 180 | 10 | 68 | 130 | TO | 240 |
| 13. | Specific Conductivity (µmhos/cm at 25° C) | 430 | 90 | 190 | 300 | GET | 710 |
| 14. | Total Dissolved Solids (mg/l) | | | | | SAMPLE | |
| 15. | Total Manganese (mg/l) | 0.39 | 0.10 | 0.23 | 0.07 | | <0.02 |
| 16. | Total Sulfates (mg/l) | 34 | 26 | 33 | 38 | | 47 |
| 17. | Total Iron (mg/l) | <0.05 | 0.99 | 1.1 | 0.36 | | <0.05 |
| 18. | Total Suspended Solids (mg/l) | <1.0 | 59 | 28 | <1.0 | | <1.0 |
| 19. | Total Hardness (mg/l as CaCO3) | 170 | 20 | 80 | 140 | | 310 |
| 20. | Nitrates (mg/l) | <0.09 | 0.94 | 0.39 | 0.97 | | 2.7 |
| 21. | Date Sampled for Analysis | 2/6/02 | 2/1/02 | 2/1/02 | 2/1/02 | | 1/30/02 |
| 22. | Date Last Precipitation Event Occurred | 2/4/02 | 1/31/02 | 1/31/02 | 1/31/02 | 1/29/02 | 1/29/02 |

Laboratory Name: Tra-Det. Inc
Address: P.O. Box 2019 City Wheeling
State: West Virginia Zip 26003

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT: The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-406 | DS-282 | DS-235 | W-409 | W-409 | |
| 2. | Identification Number | 0201459 | 0201462 | 0201427 | | | |
| 3. | High (H)/Low (L)/Intermediate (I) Designation (if applicable) | T/L | T/L | T/L | T/L | H | |
| 4. | Surface Elevation for Sampling Station (msl) | 1324 | 1268 | 1179 | 1318 | 1318 | |
| 5. | Depth of Well below Land Surface (feet) | 24 | | | 83 | 83 | |
| 6. | Static Water Level of Well Below Land Surface (feet) | 20.5' | | | INACC. | INACC. | |
| 7. | Flow for Spring and Stream (gpm or cfs) | | 2.5 gpm | 0.03 gpm | | | |
| 8. | Date Above Measurements Made | 1/31/02 | 1/31/02 | 1/30/02 | 1/31/02 | 2/26/02 | |
| 9. | Aquifer/Zone Identification for Well/Spring | A | B | B | CASING | CASING | |
| 10. | pH (Standard Units) | 7.2 | 7.0 | 8.0 | IS | IS | |
| 11. | Total Acidity (mg/l CaCO3) | 0 | 5.7 | 3.8 | PINCHED | PINCHED | |
| 12. | Total Alkalinity (mg/l CaCO3) | 52 | 130 | 200 | | | |
| 13. | Specific Conductivity (µmhos/cm at 25° C) | 180 | 490 | 450 | | | |
| 14. | Total Dissolved Solids (mg/l) | | | | | | |
| 15. | Total Manganese (mg/l) | 0.04 | <0.02 | <0.02 | | | |
| 16. | Total Sulfates (mg/l) | 33 | 46 | 36 | | | |
| 17. | Total Iron (mg/l) | 0.85 | 0.08 | <0.05 | | | |
| 18. | Total Suspended Solids (mg/l) | 49 | 2.0 | <1.0 | | | |
| 19. | Total Hardness (mg/l as CaCO3) | 60 | 180 | 210 | | | |
| 20. | Nitrates (mg/l) | 0.87 | 3.00 | 0.39 | | | |
| 21. | Date Sampled for Analysis | 1/31/02 | 1/31/02 | 1/30/02 | | | |
| 22. | Date Last Precipitation Event Occurred | 1/30/02 | 1/30/02 | 1/30/02 | 1/30/02 | 2/25/02 | |

Laboratory Name: Tra-Det, Inc
Address: P.O. Box 2019 City Wheeling
State: West Virginia Zip 26003

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT: The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | W-458 | U34-H | U34-001 | U34-009 | W-316 | DS-244 |
| 2. | Identification Number | 0202151 | 0202029 | 0202030 | 0202031 | | 0201430 |
| 3. | High (H)/Low (L)/Intermediate (I) Designation (if applicable) | T/L | T/L | T/L | T/L | T/L | T/L |
| 4. | Surface Elevation for Sampling Station (msl) | 1070 | 1100 | 1100 | 1045 | 1203 | 1290 |
| 5. | Depth of Well below Land Surface (feet) | 25' | | | | 72' | |
| 6. | Static Water Level of Well Below Land Surface (feet) | 6' | | | | 57' | |
| 7. | Flow for Spring and Stream (gpm or cfs) | | .0001 gpm | .07 cfs | 2.7 cfs | | .94 gpm |
| 8. | Date Above Measurements Made | 2/6/02 | 2/1/02 | 2/1/02 | 2/1/02 | 1/30/02 | 1/30/02 |
| 9. | Aquifer/Zone Identification for Well/Spring | B | | | | B | B |
| 10. | pH (Standard Units) | 7.5 | 7.3 | 7.9 | 8.1 | NOT | 7.2 |
| 11. | Total Acidity (mg/l CaCO3) | 13 | 3.8 | 7.6 | 7.6 | ABLE | 5.7 |
| 12. | Total Alkalinity (mg/l CaCO3) | 180 | 10 | 68 | 130 | TO | 240 |
| 13. | Specific Conductivity (µmhos/cm at 25° C) | 430 | 90 | 190 | 300 | GET | 710 |
| 14. | Total Dissolved Solids (mg/l) | | | | | SAMPLE | |
| 15. | Total Manganese (mg/l) | 0.39 | 0.10 | 0.23 | 0.07 | | <0.02 |
| 16. | Total Sulfates (mg/l) | 34 | 26 | 33 | 38 | | 47 |
| 17. | Total Iron (mg/l) | <0.05 | 0.99 | 1.1 | 0.36 | | <0.05 |
| 18. | Total Suspended Solids (mg/l) | <1.0 | 59 | 28 | <1.0 | | <1.0 |
| 19. | Total Hardness (mg/l as CaCO3) | 170 | 20 | 80 | 140 | | 310 |
| 20. | Nitrates (mg/l) | <0.09 | 0.94 | 0.39 | 0.97 | | 2.7 |
| 21. | Date Sampled for Analysis | 2/6/02 | 2/1/02 | 2/1/02 | 2/1/02 | | 1/30/02 |
| 22. | Date Last Precipitation Event Occurred | 2/4/02 | 1/31/02 | 1/31/02 | 1/31/02 | 1/29/02 | 1/29/02 |

Laboratory Name: Tra-Det, Inc
Address: P.O. Box 2019 City Wheeling
State: West Virginia Zip 26003

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

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# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT: The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-406 | DS-282 | DS-235 | W-409 | W-409 | DS-226B |
| 2. | Identification Number | 0201459 | 0201462 | 0201427 | | | 0202410 |
| 3. | High (H)/Low (L)/Intermediate (I) Designation (if applicable) | T/L | T/L | T/L | T/L | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1324 | 1268 | 1179 | 1318 | 1318 | 1155 |
| 5. | Depth of Well below Land Surface (feet) | 24' | | | 83' | 83' | |
| 6. | Static Water Level of Well Below Land Surface (feet) | 20.5' | | | INACC. | INACC. | |
| 7. | Flow for Spring and Stream (gpm or cfs) | | 2.5 gpm | 0.03 gpm | | | 1.4 gpm |
| 8. | Date Above Measurements Made | 1/31/02 | 1/31/02 | 1/30/02 | 1/31/02 | 2/26/02 | 2/26/02 |
| 9. | Aquifer/Zone Identification for Well/Spring | A | B | B | CASING | CASING | B |
| 10. | pH (Standard Units) | 7.2 | 7.0 | 8.0 | IS | IS | 7.2 |
| 11. | Total Acidity (mg/l CaCO3) | 0 | 5.7 | 3.8 | PINCHED | PINCHED | 20 |
| 12. | Total Alkalinity (mg/l CaCO3) | 52 | 130 | 200 | | | 180 |
| 13. | Specific Conductivity (µmhos/cm at 25° C) | 180 | 490 | 450 | | | 330 |
| 14. | Total Dissolved Solids (mg/l) | | | | | | |
| 15. | Total Manganese (mg/l) | 0.04 | <0.02 | <0.02 | | | 0.03 |
| 16. | Total Sulfates (mg/l) | 33 | 46 | 36 | | | 28 |
| 17. | Total Iron (mg/l) | 0.85 | 0.08 | <0.05 | | | 0.04 |
| 18. | Total Suspended Solids (mg/l) | 49 | 2.0 | <1.0 | | | <1.0 |
| 19. | Total Hardness (mg/l as CaCO3) | 60 | 180 | 210 | | | 180 |
| 20. | Nitrates (mg/l) | 0.87 | 3.00 | 0.39 | | | 0.67 |
| 21. | Date Sampled for Analysis | 1/31/02 | 1/31/02 | 1/30/02 | | | 2/26/02 |
| 22. | Date Last Precipitation Event Occurred | 1/30/02 | 1/30/02 | 1/30/02 | 1/30/02 | 2/25/02 | 2/25/02 |

Laboratory Name: Tra-Det, Inc
Address: P.O. Box 2019 City Wheeling
State: West Virginia Zip 26003

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT: The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DS-223 | W-323 | U37-007 | W-458 | | |
| 2. | Identification Number | 0202411 | 0202412 | 0202415 | 0203091 | | |
| 3. | High (H)/Low (L)/Intermediate (I) Designation (if applicable) | H | H | H | H | | |
| 4. | Surface Elevation for Sampling Station (msl) | 1130 | 1138 | 1110 | 1070 | | |
| 5. | Depth of Well below Land Surface (feet) | | 120' | | 25' | | |
| 6. | Static Water Level of Well Below Land Surface (feet) | | 63' | | 6' | | |
| 7. | Flow for Spring and Stream (gpm or cfs) | 8.3 gpm | | .0004 cfs | | | |
| 8. | Date Above Measurements Made | 2/26/02 | 2/26/02 | 2/25/02 | 3/8/02 | | |
| 9. | Aquifer/Zone Identification for Well/Spring | B | D | | B | | |
| 10. | pH (Standard Units) | 7.1 | 8.5 | 8.0 | 7.5 | | |
| 11. | Total Acidity (mg/l CaCO3) | 11 | 3.7 | 17 | 6.4 | | |
| 12. | Total Alkalinity (mg/l CaCO3) | 120 | 420 | 160 | 190 | | |
| 13. | Specific Conductivity (µmhos/cm at 25° C) | 240 | 790 | 340 | 360 | | |
| 14. | Total Dissolved Solids (mg/l) | | | | | | |
| 15. | Total Manganese (mg/l) | 0.02 | 0.02 | 0.25 | 1.3 | | |
| 16. | Total Sulfates (mg/l) | 24 | 11 | 40 | 34 | | |
| 17. | Total Iron (mg/l) | 0.04 | <0.04 | 0.69 | 0.14 | | |
| 18. | Total Suspended Solids (mg/l) | <1.0 | <1.0 | 35 | <1.0 | | |
| 19. | Total Hardness (mg/l as CaCO3) | 120 | 30 | 180 | 170 | | |
| 20. | Nitrates (mg/l) | 0.26 | <0.09 | 0.16 | 0.11 | | |
| 21. | Date Sampled for Analysis | 2/26/02 | 2/26/02 | 2/25/02 | 3/8/02 | | |
| 22. | Date Last Precipitation Event Occurred | 2/25/02 | 2/25/02 | 2/21/02 | 3/2/02 | | |

Laboratory Name: Tra-Det, Inc
Address: P.O. Box 2019 City Wheeling
State: West Virginia Zip 26003

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-077 | DS-111 | DS-112 | DS-118 | DS-217 | DS-223 |
| 2 | Identification Number | 311809 | 311577 | 311810 | 311747 | 311811 | 311578 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1230 | 1121 | 1082 | 1089 | 1165 | 1122 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .06 GPM | .75 GPM | .16 GPM | 1.5 GPM | 1.3 GPM | 2.8 GPM |
| 8 | Date Above Measurements Made | 7-21-01 | 7-18-01 | 7-21-01 | 7-19-01 | 7-21-01 | 7-18-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | C | C | C | B | B |
| 10 | pH (Standard Units) | 7.78 | 7.39 | 7.58 | 6.66 | 7.43 | 7.22 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 4.00 | 3.00 | 14.00 | 4.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 200.00 | 142.00 | 100.00 | 210.00 | 164.00 | 144.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 499 | 336 | 347 | 440 | 401 | 338 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.029 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 143.23 | 97.13 | 140.76 | 256.83 | 137.47 | 167.93 |
| 17 | Total Iron (mg/l) | <0.03 | 0.151 | <0.03 | 0.425 | <0.03 | 0.053 |
| 18 | Total Suspended Solids (mg/l) | 4 | 2 | <1 | <1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 299.70 | 231.76 | 154.33 | 243.06 | 208.47 | 217.69 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-21-01 | 7-18-01 | 7-21-01 | 7-19-01 | 7-21-01 | 7-18-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-242 | DS-243 | DS-244 | DS-245 | DS-246 | DS-275 |
| 2 | Identification Number | 311581 | 311813 | 311774 | 311814 | 311815 | 311416 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1090 | 1220 | 1290 | 1280 | 1284 | 1230 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | 1 GPM | .94 GPM | .17 GPM | .63 GPM | .13 GPM | .27 GPM |
| 8 | Date Above Measurements Made | 7-18-01 | 7-21-01 | 7-20-01 | 7-21-01 | 7-21-01 | 7-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | B | B | B |
| 10 | pH (Standard Units) | 7.27 | 7.34 | 7.22 | 7.19 | 7.18 | 7.30 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 6.00 | 14.00 | 10.00 | 10.00 | 3.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 190.00 | 164.00 | 244.00 | 160.00 | 172.00 | 210.0 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 554 | 385 | 630 | 800 | 945 | 479 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.067 | <0.01 | 0.109 | <0.01 |
| 16 | Total Sulfates (mg/l) | 121.83 | 151.46 | 128.41 | 168.75 | 194.27 | 115.24 |
| 17 | Total Iron (mg/l) | 0.035 | <0.03 | <0.03 | <0.03 | <0.03 | 0.037 |
| 18 | Total Suspended Solids (mg/l) | <1 | 131 | 2 | <1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 142.61 | 230.46 | 263.26 | 342.75 | 393.08 | 114.62 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-21-01 | 7-20-01 | 7-21-01 | 7-21-01 | 7-12-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-7-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-282 | DS-283 | DS-284 | DS-285 | DS-287 | DS-289 |
| 2 | Identification Number | 312197 | 312198 | 311779 | 311582 | 312199 | 312190 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1268 | 1270 | 1170 | 1190 | 1220 | 1190 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .16 GPM | .75 GPM | .59 GPM | 3.8 GPM | .63 GPM | .54 GPM |
| 8 | Date Above Measurements Made | 7-28-01 | 7-28-01 | 7-20-01 | 7-18-01 | 7-28-01 | 7-26-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | C | B | C |
| 10 | pH (Standard Units) | 7.85 | 7.70 | 7.23 | 7.56 | 7.72 | 7.73 |
| 11 | Total Acidity (mg/l CaCO3) | 12.00 | 10.00 | 12.00 | 2.00 | 12.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 156.00 | 132.00 | 226.00 | 168.00 | 148.00 | 134.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 498 | 683 | 776 | 364 | 545 | 346 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 263.42 | 168.75 | 113.60 | 57.62 | 200.03 | 224.73 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | 0.055 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | <1 | <1 | <1 | 8 | 425 | 23 |
| 19 | Total Hardness (mg/l as CaCO3) | 263.78 | 116.10 | 259.83 | 261.23 | 121.45 | 165.94 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-28-01 | 7-28-01 | 7-20-01 | 7-18-01 | 7-28-01 | 7-26-01 |
| 22 | Date Last Precipitation Event Occurred | 7-28-01 | 7-28-01 | 7-18-01 | 7-18-01 | 7-28-01 | 7-26-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DW-162 | W-164 | W-165 | W-166 | W-167 | WL-168 |
| 2 | Identification Number | 312200 | 311836 | 312181 | 311837 | 311838 | 311608 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1296 | 1200 | 1140 | 1106 | 1105 | 1112 |
| 5 | Depth of Well Below Land Surface (feet) | 29' | 65' | 71' | 108' | 96' | 62' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 26' | 47' | 35' | 68.5' | 66.5' | 42' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-28-01 | 7-21-01 | 7-25-01 | 7-21-01 | 7-21-01 | 7-18-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | A | B | C | D | D | C |
| 10 | pH (Standard Units) | 7.17 | 7.95 | 7.39 | 7.77 | 8.26 | 7.74 |
| 11 | Total Acidity (mg/l CaCO3) | 18.00 | 22.00 | 26.00 | 18.00 | 18.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 152.00 | 252.00 | 266.00 | 160.00 | 500.00 | 224.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 971 | 521 | 518 | 428 | 984 | 415 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 125.12 | 256.83 | 253.54 | 177.81 | 271.65 | 130.88 |
| 17 | Total Iron (mg/l) | <0.03 | 0.038 | <0.03 | 0.036 | 0.033 | 0.045 |
| 18 | Total Suspended Solids (mg/l) | 40 | 6 | <1 | 14 | 3 | 1 |
| 19 | Total Hardness (mg/l as CaCO3) | 98.39 | 376.74 | 112.31 | 230.14 | 51.02 | 262.68 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-28-01 | 7-21-01 | 7-25-01 | 7-21-01 | 7-21-01 | 7-18-01 |
| 22 | Date Last Precipitation Event Occurred | 7-28-01 | 7-18-01 | 7-24-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DW-169 | W-170 | W-172 | DW-173 | W-174 | W-179 |
| 2 | Identification Number | 311587 | 311766 | 311767 | 311739 | 311768 | 311769 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1100 | 1105 | 1106 | 1166 | 1117 | 1060 |
| 5 | Depth of Well Below Land Surface (feet) | 25' | 75' | 116' | 25' | 101' | 34' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 18.5' | 53' | 20' | 21' | 38' | 23.5' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-18-01 | 7-19-01 | 7-19-01 | 7-19-01 | 7-19-01 | 7-19-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | A | C | D | A | D | C |
| 10 | pH (Standard Units) | 7.30 | 7.53 | 7.38 | 7.25 | 7.52 | 7.12 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 12.00 | 14.00 | 12.00 | 12.00 | 12.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 180.00 | 120.00 | 150.00 | 214.00 | 170.00 | 192.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 412 | 1030 | 663 | 503 | 580 | 407 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | 0.033 | 0.073 | 0.046 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 115.24 | 256.83 | 171.22 | 213.20 | 153.93 | 173.69 |
| 17 | Total Iron (mg/l) | 0.038 | 0.197 | 0.089 | <0.03 | <0.03 | 0.125 |
| 18 | Total Suspended Solids (mg/l) | 71 | <1 | 25 | <1 | 16 | 72 |
| 19 | Total Hardness (mg/l as CaCO3) | 290.93 | 37.55 | 292.96 | 277.59 | 264.04 | 226.84 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-19-01 | 7-19-01 | 7-19-01 | 7-19-01 | 7-19-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-292 | W-293 | W -294 | W-295 | W-296 | W-297 |
| 2 | Identification Number | 311842 | 311797 | 311609 | 312205 | 311798 | 311799 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1310 | 1302 | 1125 | 1264 | 1290 | 1280 |
| 5 | Depth of Well Below Land Surface (feet) | 94' | 289' | 57' | 42' | 88' | 90' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 68.5' | 53.5' | 54.5' | 41.5' | 58' | 28.5' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-21-01 | 7-20-01 | 7-18-01 | 7-28-01 | 7-20-01 | 7-20-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | C | C | B | B | B |
| 10 | pH (Standard Units) | 7.88 | 8.25 | 7.78 | 7.56 | 8.38 | 8.41 |
| 11 | Total Acidity (mg/l CaCO3) | 12.00 | 8.00 | 10.00 | 26.00 | 8.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 210.00 | 170.00 | 326.00 | 344.00 | 194.00 | 128.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 465 | 415 | 593 | 601 | 521 | 425 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.017 | <0.01 | 0.036 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 258.48 | 262.60 | 175.34 | 152.29 | 273.30 | 200.86 |
| 17 | Total Iron (mg/l) | <0.03 | 0.060 | 0.047 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 5 | <1 | <1 | <1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 344.46 | 187.83 | 165.50 | 134.21 | 204.20 | 282.47 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-21-01 | 7-20-01 | 7-18-01 | 7-28-01 | 7-20-01 | 7-20-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-28-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | WL-321 | W-323 | W-374 | W-396 | WL-397 | WL-398 |
| 2 | Identification Number | 311854 | 311605 | 311606 | 311430 | 311432 | 311433 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1304 | 1138 | 1285 | 1305 | 1310 | 1303 |
| 5 | Depth of Well Below Land Surface (feet) | 79' | 120' | 51' | 70' | 51' | 60' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 54' | 66' | 44' | 35' | 44.5' | 44' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-21-01 | 7-18-01 | 7-18-01 | 7-12-01 | 7-12-01 | 7-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | D | B | B | B | B |
| 10 | pH (Standard Units) | 7.62 | 8.31 | 7.94 | 7.83 | 7.75 | 7.42 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 2.00 | 4.00 | 4.00 | 2.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 212.00 | 472.00 | 150.00 | 184.00 | 186.00 | 220.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 556 | 889 | 309 | 403 | 433 | 533 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 1366.65 | 167.10 | 116.89 | 78.20 | 73.26 | 63.38 |
| 17 | Total Iron (mg/l) | <0.03 | 0.037 | 0.041 | 0.037 | 0.035 | 0.035 |
| 18 | Total Suspended Solids (mg/l) | 2 | <1 | <1 | 1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 432.29 | 35.02 | 199.09 | 304.15 | 93.28 | 93.28 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-21-01 | 7-18-01 | 7-18-01 | 7-12-01 | 7-12-01 | 7-12-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-7-01 | 7-7-01 | 7-7-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | ✓ | ✓ | ✓ |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DW-399 | W-400 | W-403 | W-405 | DW-406 | W-407 |
| 2 | Identification Number | 311425 | 311431 | 311850 | 312206 | 312201 | 311433 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1315 | 1315 | 1345 | 1322 | 1322 | 1303 |
| 5 | Depth of Well Below Land Surface (feet) | 30' | ~~47~~ 53.5' | 119' | 103' | 24' | 60' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 22' | 45' | 45' | 78' | 22.5' | 44' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-12-01 | 7-12-01 | 7-21-01 | 7-28-01 | 7-28-01 | 7-28-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | A | B | B | B | A | B |
| 10 | pH (Standard Units) | 7.49 | 7.45 | 7.93 | 7.78 | 7.42 | 7.42 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 4.00 | 14.00 | 14.00 | 8.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 154.00 | 164.00 | 206.00 | 248.00 | 102.00 | 220.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 627 | 466 | 527 | 418 | 456 | 533 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 182.75 | 109.48 | 191.80 | 115.24 | 188.51 | 63.38 |
| 17 | Total Iron (mg/l) | 0.035 | 0.043 | 0.031 | <0.03 | <0.03 | 0.035 |
| 18 | Total Suspended Solids (mg/l) | <1 | <1 | <1 | 10 | 5 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 85.91 | 338.50 | 392.79 | 236.78 | 166.95 | 93.28 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-12-01 | 7-12-01 | 7-21-01 | 7-28-01 | 7-28-01 | 7-28-01 |
| 22 | Date Last Precipitation Event Occurred | 7-7-01 | 7-7-01 | 7-18-01 | 7-28-01 | 7-28-01 | 7-28-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DW-408 | WL-419 | DW-420 | DW-481 | W-452 | W-458 |
| 2 | Identification Number | 312202 | 311434 | 311426 | 311588 | 311607 | 311805 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1305 | 1261 | 1241 | 1155 | 1170 | 1170 |
| 5 | Depth of Well Below Land Surface (feet) | 33' | 101' | 23' | 12' | 68.5' | UNKNOWN |
| 6 | Static Water Level of Well Below Land Surface (feet) | 26' | 38' | 19' | 7' | 22' | 8' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-28-01 | 7-12-01 | 7-12-01 | 7-18-01 | 7-18-01 | 7-20-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | A | B | A | A | C | B |
| 10 | pH (Standard Units) | 7.50 | 7.30 | 7.22 | 7.57 | 7.89 | 8.43 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 8.00 | 6.00 | 6.00 | 4.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 98.00 | 210.00 | 140.00 | 234.00 | 252.00 | 160.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 648 | 565 | 479 | 474 | 404 | 407.00 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | --- |
| 15 | Total Manganese (mg/l) | 0.016 | 0.016 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 127.59 | 46.92 | 93.02 | 87.25 | 139.94 | 219.79 |
| 17 | Total Iron (mg/l) | <0.03 | 0.046 | 0.036 | <0.03 | 0.036 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 3 | <1 | <1 | 1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 86.03 | 386.53 | 317.00 | 132.34 | 304.39 | 316.49 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-28-01 | 7-12-01 | 7-12-01 | 7-18-01 | 7-18-01 | 7-20-01 |
| 22 | Date Last Precipitation Event Occurred | 7-28-01 | 7-7-01 | 7-7-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-001 | U34-002 | U34-003 | U34-004 | U34-007 | U34-008 |
| 2 | Identification Number | 311590 | 311591 | 311592 | 311593 | 311594 | 311595 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1100 | 1072 | 1070 | 1069 | 1085 | 1055 |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .01 CFS | 1.35 CFS | 1.35 CFS | 1.35 CFS | .19 CFS | .15 CFS |
| 8 | Date Above Measurements Made | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | --- |
| 10 | pH (Standard Units) | 7.33 | 7.79 | 7.69 | 7.75 | 7.93 | 7.97 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 80.00 | 140.00 | 148.00 | 144.00 | 154.00 | 140.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 217 | 365 | 377 | 357 | 374 | 359 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | -- | --- |
| 15 | Total Manganese (mg/l) | 0.040 | 0.015 | 0.014 | 0.015 | 0.013 | 0.011 |
| 16 | Total Sulfates (mg/l) | 64.14 | 41.98 | 74.91 | 52.68 | 27.98 | 22.22 |
| 17 | Total Iron (mg/l) | 1.57 | 0.418 | 0.395 | 0.400 | 0.265 | 0.289 |
| 18 | Total Suspended Solids (mg/l) | 25 | 28 | 35 | 17 | 15 | 22 |
| 19 | Total Hardness (mg/l as CaCO3) | 112.20 | 200.25 | 208.64 | 208.39 | 216.67 | 206.97 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-143 | U34-145 | U34-146 | U34-147 | U34-149 | U34-150 |
| 2 | Identification Number | 311765 | 312191 | 312192 | 312193 | 311598 | 311599 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1105 | 1182 | 1138 | 1250 | 1190 | 1152 |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .0004 CFS | .02 CFS | .14 CFS | .002 CFS | .18 CFS | .18 CFS |
| 8 | Date Above Measurements Made | 7-19-01 | 7-26-01 | 7-26-01 | 7-26-01 | 7-18-01 | 7-18-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | --- |
| 10 | pH (Standard Units) | 8.02 | 8.01 | 7.85 | 7.98 | 7.87 | 7.93 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 10.00 | 12.00 | 12.00 | 4.00 | 2.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 240.00 | 158.00 | 170.00 | 182.00 | 176.00 | 158.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 520 | 405 | 407 | 685 | 374 | 401 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | -- | --- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.171 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 205.80 | 245.31 | 232.14 | 170.40 | 37.04 | 44.45 |
| 17 | Total Iron (mg/l) | 0.158 | 0.041 | 0.084 | <0.03 | 0.113 | 0.111 |
| 18 | Total Suspended Solids (mg/l) | 29 | 49 | 34 | 95 | 9 | 5 |
| 19 | Total Hardness (mg/l as CaCO3) | 205.49 | 186.07 | 205.78 | 265.27 | 232.28 | 242.52 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-19-01 | 7-26-01 | 7-26-01 | 7-26-01 | 7-18-01 | 7-18-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-26-01 | 7-26-01 | 7-26-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-163 | U34-164 | U34-165 | U34-166 | U34-167 | U34-G |
| 2 | Identification Number | 311600 | 311601 | 311602 | 311603 | 312194 | 311751 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1115 | 1110 | 1112 | 1075 | 1220 | 1085 |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .03 CFS | .04 CFS | .04 CFS | 1.3 CFS | .001 CFS | .0008 CFS |
| 8 | Date Above Measurements Made | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-19-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | --- |
| 10 | pH (Standard Units) | 7.85 | 7.92 | 7.86 | 7.88 | 7.81 | 7.34 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 6.00 | 6.00 | 4.00 | 10.00 | 12.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 156.00 | 174.00 | 150.00 | 178.00 | 134.00 | 170.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 336 | 365 | 303 | 355 | 343 | 405 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | -- | --- |
| 15 | Total Manganese (mg/l) | 0.057 | 0.011 | 0.012 | 0.012 | <0.01 | 0.025 |
| 16 | Total Sulfates (mg/l) | 30.40 | 29.63 | 162.17 | 128.41 | 113.60 | 256.89 |
| 17 | Total Iron (mg/l) | 0.193 | 0.127 | 0.160 | 0.425 | <0.03 | 0.123 |
| 18 | Total Suspended Solids (mg/l) | 2 | 25 | 98 | 46 | 7 | 114 |
| 19 | Total Hardness (mg/l as CaCO3) | 208.79 | 254.73 | 196.23 | 201.29 | 166.60 | 209.78 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-26-01 | 7-19-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-24-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360 - 13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U37-000 | U37-001 | U37-002 | U37-004 | D19-000 | D-19A |
| 2 | Identification Number | 311604 | 311427 | 311428 | 311429 | 311575 | 311413 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1130 | 1135 | 1125 | 1045 | 1135 | 1075 |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .12 CFS | .03 CFS | .11 CFS | .57 CFS | .25 CFS | .14 CFS |
| 8 | Date Above Measurements Made | 7-18-01 | 7-12-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | --- |
| 10 | pH (Standard Units) | 8.02 | 7.94 | 7.02 | 7.85 | 7.78 | 7.99 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 4.00 | 2.00 | 4.00 | 2.00 | 2.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 156.00 | 186.00 | 220.00 | 200.00 | 176.00 | 154.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 340 | 371 | 450 | 393 | 374 | 394 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | -- | --- |
| 15 | Total Manganese (mg/l) | 0.011 | 0.011 | <0.01 | 0.013 | 0.012 | <0.01 |
| 16 | Total Sulfates (mg/l) | 112.77 | 75.73 | 71.61 | 109.48 | 116.07 | 135.82 |
| 17 | Total Iron (mg/l) | 0.266 | 0.047 | 0.052 | 0.097 | 0.256 | 0.062 |
| 18 | Total Suspended Solids (mg/l) | 40 | <1 | 6 | 49 | 34 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 208.45 | 221.28 | 328.94 | 273.16 | 244.39 | 254.87 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-12-01 | 7-12-01 | 7-12-01 | 7-18-01 | 7-12-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-7-01 | 7-7-01 | 7-7-01 | 7-18-01 | 7-7-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | D-21A | D-37A | D34-001 | D37-000 | U19-007 | |
| 2 | Identification Number | 311770 | 311414 | 311576 | 311415 | 311589 | |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | |
| 4 | Surface Elevation for Sampling Station (msl) | 1050 | 1010 | 1075 | 1195 | 1110 | |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | |
| 7 | Flow for Spring and Stream (gpm or cfs) | .42 CFS | 1.4 CFS | 1.34 CFS | .21 CFS | .002 CFS | |
| 8 | Date Above Measurements Made | 7-20-01 | 7-12-01 | 7-18-01 | 7-12-01 | 7-18-01 | |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | |
| 10 | pH (Standard Units) | 7.72 | 8.03 | 7.85 | 7.86 | 7.41 | |
| 11 | Total Acidity (mg/l CaCO3) | 12.00 | 2.00 | 4.00 | 2.00 | 6.00 | |
| 12 | Total Alkalinity (mg/l CaCO3) | 146.00 | 156.00 | 144.00 | 162.00 | 210.00 | |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 406 | 391 | 362 | 416 | 384 | |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | --- | |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.011 | 0.017 | 0.017 | |
| 16 | Total Sulfates (mg/l) | 112.77 | 102.07 | 116.89 | 88.90 | 62.56 | |
| 17 | Total Iron (mg/l) | <0.03 | 0.090 | 0.404 | 0.089 | 0.072 | |
| 18 | Total Suspended Solids (mg/l) | 18 | 13 | 34 | <1 | 24 | |
| 19 | Total Hardness (mg/l as CaCO3) | 255.09 | 256.80 | 203.74 | 278.80 | 287.92 | |
| 20 | Nitrates | --- | --- | --- | — | --- | |
| 21 | Date Sampled for Analysis | 7-20-01 | 7-12-01 | 7-18-01 | 7-12-01 | 7-18-01 | |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-7-01 | 7-18-01 | 7-7-01 | 7-18-01 | |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-223 | DS-226A | DS-226B | DS-227 | DS-229 | DS-230 |
| 2 | Identification Number | 314429 | 315475 | 314430 | 315485 | 315486 | 315487 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1122 | 1173 | 1155 | 1082 | 1290 | 1170 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | 1.2 GPM | .16 GPM | .1 GPM | .1 GPM | .4 GPM | .37 GPM |
| 8 | Date Above Measurements Made | 9-17-01 | 10-3-01 | 10-5-01 | 9-17-01 | 9-12-01 | 9-17-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | B | B | B |
| 10 | pH (Standard Units) | 7.71 | 8.08 | 7.85 | 7.52 | 7.86 | 7.87 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 8.00 | 8.00 | 8.00 | 6.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 170.00 | 242.00 | 162.00 | 216.00 | 158.00 | 198.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 378 | 546 | 369 | 950 | 496 | 488 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 72.44 | 170.40 | 17.28 | 107.13 | 181.92 | 200.37 |
| 17 | Total Iron (mg/l) | <0.03 | 0.036 | 0.158 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 2 | 3 | 25 | 6 | 5 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 207.64 | 279.19 | 221.15 | 106.38 | 251.27 | 254.97 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 10-3-01 | 9-17-01 | 10-4-01 | 10-4-01 | 10-4-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-29-01 | 9-13-01 | 9-29-01 | 9-29-01 | 9-29-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-240 | DS-241 | DS-242 | DS-243 | DS-245 | DS-246 |
| 2 | Identification Number | 315504 | 314431 | 314432 | 315510 | 315511 | 315492 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1170 | 1200 | 1090 | 1220 | 1280 | 1284 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | 1 GPM | .94 GPM | .37 GPM | .45 GPM | .15GPM | .14 GPM |
| 8 | Date Above Measurements Made | 10-5-01 | 9-17-01 | 9-17-01 | 10-8-01 | 10-8-01 | 10-2-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | B | B | B |
| 10 | pH (Standard Units) | 7.74 | 7.69 | 7.73 | 7.56 | 7.48 | 7.71 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 12.00 | 14.00 | 8.00 | 12.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 244.00 | 252.00 | 252.00 | 192.00 | 232.00 | 208.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 576 | 630 | 628 | 440 | 1060 | 1020 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 130.06 | 39.51 | 35.39 | 124.30 | 239.55 | 195.92 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | <1 | 20 | <1 | 1 | <1 | 2 |
| 19 | Total Hardness (mg/l as CaCO3) | 289.63 | 127.95 | 130.42 | 237.88 | 168.71 | 131.66 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 10-5-01 | 9-17-01 | 9-17-01 | 10-8-01 | 10-8-01 | 10-4-01 |
| 22 | Date Last Precipitation Event Occurred | 9-29-01 | 9-13-01 | 9-13-01 | 10-6-01 | 10-6-01 | 9-29-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

### ATTACHMENT 14A
### (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | D-19A | D-21A | D-37A | D34-001 | D37-000 | |
| 2 | Identification Number | 314388 | 314767 | 314390 | 314427 | 314391 | |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | |
| 4 | Surface Elevation for Sampling Station (msl) | 1075 | 1050 | 1010 | 1075 | 1195 | |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | |
| 7 | Flow for Spring and Stream (gpm or cfs) | .004 CFS | .06 CFS | .02 CFS | .02 CFS | .009 CFS | |
| 8 | Date Above Measurements Made | 9-12-01 | 9-22-01 | 9-12-01 | 9-17-01 | 9-12-01 | |
| 9 | Aquifer/Zone Identification For Well/Spring | -- | -- | -- | -- | -- | |
| 10 | pH (Standard Units) | 7.16 | 7.89 | 7.81 | 7.73 | 8.72 | |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 8.00 | 10.00 | 8.00 | 8.00 | |
| 12 | Total Alkalinity (mg/l CaCO3) | 194.00 | 172.00 | 178.00 | 180.00 | 156.00 | |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 420 | 488 | 380 | 420 | 350 | |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | |
| 15 | Total Manganese (mg/l) | <0.01 | 0.015 | 0.064 | 0.141 | 0.093 | |
| 16 | Total Sulfates (mg/l) | 49.39 | 63.38 | 63.38 | 55.15 | 33.75 | |
| 17 | Total Iron (mg/l) | 0.038 | 0.079 | <0.03 | 0.098 | 0.129 | |
| 18 | Total Suspended Solids (mg/l) | 1 | 15 | <1 | 21 | 8 | |
| 19 | Total Hardness (mg/l as CaCO3) | 208.59 | 230.42 | 208.86 | 224.49 | 179.22 | |
| 20 | Nitrates | --- | --- | --- | --- | --- | |
| 21 | Date Sampled for Analysis | 9-12-01 | 9-22-01 | 9-12-01 | 9-17-01 | 9-12-01 | |
| 22 | Date Last Precipitation Event Occurred | 9-10-01 | 9-20-01 | 9-10-01 | 9-13-01 | 9-10-01 | |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-283 | DS-284 | DS-285 | DS-287 | DS-289 | DS-290 |
| 2 | Identification Number | 314760 | 314761 | 314392 | 314762 | 314393 | 314773 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1270 | 1170 | 1190 | 1220 | 1190 | 1185 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .69 GPM | .21 GPM | 1.5 GPM | ..34 GPM | .36 GPM | .54 GPM |
| 8 | Date Above Measurements Made | 9-22-01 | 9-22-01 | 9-12-01 | 9-22-01 | 9-12-01 | 9-22-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | C | B | C | B |
| 10 | pH (Standard Units) | 7.76 | 7.90 | 8.02 | 7.83 | 7.90 | 7.70 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 6.00 | 6.00 | 6.00 | 8.00 | 10.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 158.00 | 168.00 | 184.00 | 168.00 | 150.00 | 218.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 869 | 436 | 406 | 663 | 375 | 577 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 28.82 | 22.81 | 34.57 | 35.39 | 76.55 | 64.20 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 7 | 3 | 17 | 42 | 4 | 9 |
| 19 | Total Hardness (mg/l as CaCO3) | 409.45 | 230.81 | 214.76 | 356.81 | 192.09 | 303.96 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-22-01 | 9-22-01 | 9-12-01 | 9-22-01 | 9-12-01 | 9-22-01 |
| 22 | Date Last Precipitation Event Occurred | 9-20-01 | 9-20-01 | 9-10-01 | 9-20-01 | 9-10-01 | 9-20-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-165 | W-166 | W-167 | WL-168 | DW-169 | W-170 |
| 2 | Identification Number | 314744 | 314445 | 314446 | 314447 | 314433 | 314423 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1140 | 1106 | 1105 | 1112 | 1100 | 1105 |
| 5 | Depth of Well Below Land Surface (feet) | 71' | 108' | 96' | 62' | 25' | 75' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 37.5' | 70' | 70' | 43.5' | 19' | 54' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | C | D | D | C | A | C |
| 10 | pH (Standard Units) | 7.57 | 7.75 | 8.06 | 7.88 | 7.55 | 7.49 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 8.00 | 8.00 | 8.00 | 12.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 272.00 | 200.00 | 432.00 | 212.00 | 198.00 | 100.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 506 | 441 | 941 | 462 | 458 | 789 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.019 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 47.74 | 130.88 | 20.58 | 38.69 | 25.51 | 73.26 |
| 17 | Total Iron (mg/l) | 0.044 | <0.03 | <0.03 | <0.03 | <0.03 | 0.120 |
| 18 | Total Suspended Solids (mg/l) | 6 | <1 | 8 | 26 | 76 | 43 |
| 19 | Total Hardness (mg/l as CaCO3) | 321.29 | 196.35 | 67.93 | 239.58 | 262.93 | 198.31 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-12-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-13-01 | 9-13-01 | 9-13-01 | 9-13-01 | 9-10-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-172 | DW-173 | W-174 | W-179 | DW-180 | W-229 |
| 2 | Identification Number | 314424 | 315477 | 314425 | 314426 | 314411 | 315454 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1106 | 1166 | 1117 | 1060 | 1083 | 1290 |
| 5 | Depth of Well Below Land Surface (feet) | 116' | 25' | 101' | 34' | 32' | 100' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 19.5' | 23.5' | 38.5' | 24' | 24' | 58' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-12-01 | 10-3-01 | 9-12-01 | 9-12-01 | 9-12-01 | 10-2-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | D | A | D | C | A | B |
| 10 | pH (Standard Units) | 7.16 | 7.67 | 7.56 | 7.30 | 6.92 | 7.74 |
| 11 | Total Acidity (mg/l CaCO3) | 14.00 | 8.00 | 12.00 | 10.00 | 12.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 170.00 | 232.00 | 208.00 | 240.00 | 140.00 | 226.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 547 | 561 | 579 | 449 | 378 | 668 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.015 |
| 16 | Total Sulfates (mg/l) | 42.80 | 101.25 | 36.22 | 13.99 | 83.14 | 184.39 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 2 | 23 | 37 | 156 | 87 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 63.00 | 283.19 | 81.45 | 239.77 | 169.90 | 46.88 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-12-01 | 10-3-01 | 9-12-01 | 9-12-01 | 9-12-01 | 10-2-01 |
| 22 | Date Last Precipitation Event Occurred | 9-10-01 | 9-29-01 | 9-10-01 | 9-10-01 | 9-10-01 | 9-29-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-294 | W-295 | W-296 | W-297 | W-299 | W-300 |
| 2 | Identification Number | 315519 | 315460 | 315461 | 315462 | 314802 | 314803 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1125 | 1264 | 1290 | 1280 | 1324 | 1321 |
| 5 | Depth of Well Below Land Surface (feet) | 57' | 42' | 88' | 90' | 103' | 116' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 56' | 41.75' | 61.5' | 32' | 81' | 80' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 10-8-01 | 10-2-01 | 10-2-01 | 10-2-01 | 9-22-01 | 9-22-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | C | B | B | B | B | B |
| 10 | pH (Standard Units) | 7.61 | 7.47 | 7.58 | 7.68 | 7.85 | 7.82 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 10.00 | 8.00 | 6.00 | 8.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 262.00 | 302.00 | 212.00 | 152.00 | 184.00 | 206.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 508 | 829 | 696 | 600 | 576 | 548 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.090 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 152.29 | 113.60 | 153.93 | 65.30 | 83.96 | 71.61 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | <1 | 10 | 12 | 23 | <1 | 5 |
| 19 | Total Hardness (mg/l as CaCO3) | 219.25 | 146.50 | 139.05 | 121.01 | 303.02 | 280.05 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 10-8-01 | 10-2-01 | 10-2-01 | 10-2-01 | 9-22-01 | 9-22-01 |
| 22 | Date Last Precipitation Event Occurred | 10-6-01 | 9-29-01 | 9-29-01 | 9-29-01 | 9-20-01 | 9-20-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-315 | DW-318 | WL-319 | WL-321 | W-322 | W-323 |
| 2 | Identification Number | 314746 | 314763 | 315501 | 315520 | 315517 | 314448 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1280 | 1294 | 1325 | 1304 | 1310 | 1138 |
| 5 | Depth of Well Below Land Surface (feet) | 88' | 18' | 89' | 79' | BURIED | 120' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 43' | 8' | 62' | 60.5' | SEALED | 67' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-17-01 | 9-22-01 | 10-4-01 | 10-8-01 | 10-8-01 | 9-17-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | A | B | B | UNKNOWN | D |
| 10 | pH (Standard Units) | 7.66 | 7.36 | 7.60 | 7.54 | 7.67 | 8.43 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 12.00 | 8.00 | 8.00 | 8.00 | 0.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 230.00 | 240.00 | 204.00 | 190.00 | 168.00 | 408.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 532 | 756 | 560 | 746 | 447 | 938 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | 0.071 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 53.50 | 41.98 | 131.71 | 107.83 | 263.42 | 41.16 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | 0.061 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 22 | 6 | 2 | <1 | 2 | 5 |
| 19 | Total Hardness (mg/l as CaCO3) | 404.59 | 86.66 | 224.19 | 342.78 | 220.20 | 30.38 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 9-22-01 | 10-4-01 | 10-8-01 | 10-8-01 | 9-17-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-20-01 | 9-29-01 | 10-6-01 | 10-6-01 | 9-13-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-374 | W-396 | WL-397 | WL-398 | DW-399 | W-400 |
| 2 | Identification Number | 314405 | 314406 | 314408 | 314409 | 314401 | 314804 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1285 | 1305 | 1310 | 1303 | 1315 | 1315 |
| 5 | Depth of Well Below Land Surface (feet) | 51' | 70' | 51' | 60' | 30' | 47' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 45' | 40.5' | 47.5' | 48' | 23' | 35.5' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-12-01 | 9-12-01 | 9-12-01 | 9-12-01 | 9-12-01 | 9-22-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | B | A | B |
| 10 | pH (Standard Units) | 7.86 | 7.91 | 7.91 | 7.58 | 7.48 | 7.75 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 6.00 | 8.00 | 12.00 | 12.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 142.00 | 202.00 | 210.00 | 216.00 | 280.00 | 204.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 365 | 427 | 429 | 501 | 650 | 554 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 85.61 | 89.72 | 55.97 | 81.49 | 95.49 | 109.48 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 8 | 6 | 12 | 8 | 30 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 191.13 | 260.08 | 262.29 | 313.55 | 73.67 | 309.10 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-12-01 | 9-12-01 | 9-12-01 | 9-12-01 | 9-12-01 | 9-22-01 |
| 22 | Date Last Precipitation Event Occurred | 9-10-01 | 9-10-01 | 9-10-01 | 9-10-01 | 9-10-01 | 9-20-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-403 | W-405 | W-407 | DW-408 | W-419 | DW-420 |
| 2 | Identification Number | 315518 | 314765 | 314766 | 314764 | 314805 | 314777 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1345 | 1322 | 1306 | 1305 | 1261 | 1241 |
| 5 | Depth of Well Below Land Surface (feet) | 119' | 103' | 63' | 33' | 101' | 23' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 45' | 78.5' | 57.5' | 27' | 39' | 22.5' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-12-01 | 9-22-01 | 9-22-01 | 9-22-01 | 9-22-01 | 9-22-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | A | B | A |
| 10 | pH (Standard Units) | 7.57 | 7.48 | 7.41 | 7.92 | 7.68 | 7.43 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 6.00 | 14.00 | 8.00 | 6.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 292.00 | 114.00 | 308.00 | 130.00 | 208.00 | 204.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 656 | 524 | 1100 | 809 | 579 | 639 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | 0.057 | 1.86 | <0.01 | <0.01 | 0.217 |
| 16 | Total Sulfates (mg/l) | 108.66 | 52.68 | 60.91 | 54.33 | 89.72 | 97.13 |
| 17 | Total Iron (mg/l) | <0.03 | 0.035 | 0.050 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | <1 | 81 | 55 | 18 | <1 | 8 |
| 19 | Total Hardness (mg/l as CaCO3) | 337.56 | 223.54 | 234.87 | 345.77 | 312.57 | 312.69 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 10-8-01 | 9-22-01 | 9-22-01 | 9-22-01 | 9-22-01 | 9-22-01 |
| 22 | Date Last Precipitation Event Occurred | 10-6-01 | 9-20-01 | 9-20-01 | 9-20-01 | 9-20-01 | 9-20-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-050 | U34-051 | U34-053 | U34-143 | U34-145 | U34-146 |
| 2 | Identification Number | 314739 | 314740 | 314741 | 314422 | 315495 | 315496 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1160 | 1100 | 1070 | 1105 | 1182 | 1138 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .002 CFS | .008 CFS | .01 CFS | .0003 CFS | .004 CFS | .01 CFS |
| 8 | Date Above Measurements Made | 9-17-01 | 9-17-01 | 9-17-01 | 9-12-01 | 10-4-01 | 10-4-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | -- | -- | -- | -- | -- | -- |
| 10 | pH (Standard Units) | 7.89 | 8.12 | 8.09 | 8.01 | 7.82 | 7.65 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 8.00 | 8.00 | 14.00 | 8.00 | 12.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 150.00 | 234.00 | 214.00 | 256.00 | 204.00 | 240.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 547 | 476 | 466 | 494 | 488 | 577 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.030 | <0.01 | <0.01 | 0.440 | <0.01 | 0.472 |
| 16 | Total Sulfates (mg/l) | 57.62 | 32.10 | 46.92 | 39.51 | 136.65 | 55.15 |
| 17 | Total Iron (mg/l) | 0.038 | 0.034 | <0.03 | 0.039 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 22 | 17 | 15 | 26 | 2 | 4 |
| 19 | Total Hardness (mg/l as CaCO3) | 324.37 | 337.86 | 318.77 | 72.02 | 187.43 | 212.59 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 9-17-01 | 9-17-01 | 9-12-01 | 10-4-01 | 10-4-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-13-01 | 9-13-01 | 9-10-01 | 9-29-01 | 9-29-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-149 | U34-150 | U34-163 | U34-164 | U34-165 | U34-166 |
| 2 | Identification Number | 315506 | 315507 | 314441 | 314442 | 314443 | 314444 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1190 | 1152 | 1115 | 1110 | 1112 | 1075 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .0002 CFS | .02 CFS | .0002 CFS | .009 CFS | .004 CFS | .02 CFS |
| 8 | Date Above Measurements Made | 10-5-01 | 10-5-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | -- | -- | -- | -- | -- | -- |
| 10 | pH (Standard Units) | 7.89 | 8.01 | 7.64 | 7.96 | 7.88 | 8.02 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 10.00 | 10.00 | 8.00 | 8.00 | 10.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 208.00 | 212.00 | 182.00 | 194.00 | 178.00 | 198.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 561 | 556 | 389 | 442 | 375 | 427 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.072 | 0.027 | 0.467 | 0.135 |
| 16 | Total Sulfates (mg/l) | 206.62 | 170.40 | 55.15 | 62.56 | 73.26 | 53.50 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | 0.064 | 0.038 | 0.080 | 0.103 |
| 18 | Total Suspended Solids (mg/l) | 1 | 1 | 36 | 13 | 20 | 8 |
| 19 | Total Hardness (mg/l as CaCO3) | 263.13 | 262.63 | 211.24 | 263.86 | 221.34 | 231.55 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 10-5-01 | 10-5-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 |
| 22 | Date Last Precipitation Event Occurred | 9-29-01 | 9-29-01 | 9-13-01 | 9-13-01 | 9-13-01 | 9-13-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360 -13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-167 | U37-000 | U37-001 | U37-002 | U37-004 | D19-000 |
| 2 | Identification Number | 314742 | 314403 | 314404 | 314800 | 314801 | 314389 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1220 | 1130 | 1135 | 1125 | 1045 | 1135 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .00002 CFS | .0005 CFS | .006 CFS | .009 CFS | .02 CFS | .005 CFS |
| 8 | Date Above Measurements Made | 9-17-01 | 9-12-01 | 9-12-01 | 9-22-01 | 9-22-01 | 9-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | -- | -- | -- | -- | -- | -- |
| 10 | pH (Standard Units) | 7.31 | 7.81 | 8.02 | 8.16 | 8.02 | 7.68 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 8.00 | 6.00 | 6.00 | 6.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 162.00 | 148.00 | 130.00 | 220.00 | 182.00 | 202.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 340 | 384 | 312 | 531 | 451 | 416 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.230 | 0.017 | <0.01 | 0.056 | 0.148 | <0.01 |
| 16 | Total Sulfates (mg/l) | 23.87 | 108.66 | 64.20 | 46.09 | 54.33 | 79.85 |
| 17 | Total Iron (mg/l) | 0.094 | 0.078 | 0.038 | <0.03 | 0.099 | 0.107 |
| 18 | Total Suspended Solids (mg/l) | 26 | 23 | 8 | 10 | 7 | 31 |
| 19 | Total Hardness (mg/l as CaCO3) | 227.41 | 200.04 | 154.82 | 280.87 | 200.70 | 249.61 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 9-12-01 | 9-12-01 | 9-22-01 | 9-22-01 | 9-12-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-10-01 | 9-10-01 | 9-20-01 | 9-20-01 | 9-10-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 14B
(GROUND WATER HYDROLOGY DESCRIPTION)

APPLICANT'S NAME The Ohio Valley Coal Company

| Aquifer/Zone Identification | Aquifer/Zone Lithology | Aquifer/Zone Thickness | Aquifer/Zone Elevation (msl) | Aquifer/Zone Horiz. Extent | Aquifer/Zone Known Uses | Approx. Rate of Discharge/Usage of Aquifer/Zone (gpm or cfs) |
|---|---|---|---|---|---|---|
| (A) Unconsolidated Material | Silt, Sand & Gravel Weathered Bedrock | Up to 30 feet | 980 to 1346 msl | Sand & Gravel Primarily along main stream valleys * Weathered Bedrock Throughout application area | Domestic | Variable-Generally <2 to >20 gpm |
| (B) Washington No. 12 Cyclothem | Silt, Sandstone, Limestone, Coal | Approximately 140 feet | 1080 to 1300 msl | Local-Primarily where less than 100 feet deep | Domestic Livestock | Variable-Generally less than 2 gpm |
| (C) Waynesburg No. 11 Cyclothem | Silt, Sandstone, Limestone, Coal | Approximately 100 feet | 980 to 1150 msl | Local-Primarily where less than 100 feet deep | Domestic Livestock | Variable-Generally less than 2 gpm |
| (D) Sewickley No. 9 Cyclothem | Silt, Sandstone, Limestone, Coal | Approximately 120 feet | 820 to 1050 msl | Local-Primarily where less than 100 feet deep | Domestic | Variable-Generally less than 2 gpm |
| | | | | * - e.g., Captina Creek | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |

TOVCC 11864

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 14C**
**(WELL/SPRING INVENTORY)**

Applicant's Name THE OHIO VALLEY COAL COMPANY (D-0360-13)

| Well/Spring Identification Number | Name of Owner of Well/Spring | Surface Elevation of Well/Spring | Depth of Well in Feet Below Land Surface | Static Water Level of Well in Feet Below Land Surface | Lithology of Supplying Aquifer/ Waterbearing Zone | Known Uses of Well/Spring (if spring give discharge rate) |
|---|---|---|---|---|---|---|
| WL-168 | A. FUNKHOUSER | 1112 | 62' | 37' | C | DOMESTIC |
| DW-169 | A. FUNKHOUSER | 1100 | 25' | 19' | A | DOMESTIC |
| W-172 | A. MAY | 1106 | 116' | 20' | D | NOT IN USE |
| DW-173 | S. RICE | 1166 | 25' | 16' | A | OCCASIONAL DOMESTIC |
| W-294 | J. WILSON | 1125 | 57' | 45' | C | DOMESTIC |
| W-323 | F. FUNKHOUSER | 1138 | 120' | 61' | D | DOMESTIC |
| W-396 | C. WORKMAN | 1305 | 70' | 37' | B | DOMESTIC |
| W-405 | F. SIMPSON | 1322 | 103' | 77' | B | NOT IN USE |
| DW-406 | F. SIMPSON | 1322 | 24' | 22' | A | NOT IN USE |
| W-407 | F. SIMPSON | 1306 | 63' | 57' | B | NOT IN USE |
| DW-408 | F. SIMPSON | 1305 | 33' | 26' | A | DOMESTIC |
| DS-223 | S. RICE | 1130 | N/A | N/A | B | AGRICULTURAL 1.11 GPM |
| DS-242 | R. SAFFELL | 1090 | N/A | N/A | C | AGRICULTURAL 3.1 GPM |
| DS-282 | F. SIMPSON | 1268 | N/A | N/A | B | NONE 4.35 GPM |
| DS-286 | F. SIMPSON | 1220 | N/A | N/A | B | UNUSED/1.4 GPM |
| DS-287 | F. SIMPSON | 1220 | N/A | N/A | B | UNUSED/.89 GPM |

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES AND RECLAMATION**

**ATTACHMENT 14D**
**SURFACE BODIES/PUBLIC WATER SUPPLIES**

**APPLICANT'S NAME** THE OHIO VALLEY COAL COMPANY

| Surface Water/ Public Supply Identification # | Type of Surface Water/Public Supply | Name of Owner of Surface Water/ Public Supply | Known Uses of Surface Water/ Public Supply |
|---|---|---|---|
| Williams Creek | Perenial Stream | See Application Map | As Noted: |
| U34-166 | Stream (Perennial) | SAFFELL | LIVESTOCK |
| | | | |
| Williams Creek Tributaries | Intermittent Streams | See Application Map | As Noted: |
| U34-007, U34-008 | Stream | FUNKHOUSER | UNUSED |
| U34-143 | Stream | STUDENC | UNUSED |
| U34-164 | Stream | SAFFELL | UNUSED |
| U34-001 | Pond P-16 | FUNKHOUSER | UNUSED |
| | | | |
| Joy Fork Tributaries | Intermittent Streams | See Application Map | As Noted: |
| These points are outside the hydrologic boundary but they define the stream through the application area. | | | |
| U37-000 | Stream | KEMP | UNUSED |
| U37-001 | Pond P-7 | HENNEBERT | RECREATIONAL |
| D37-000 | Stream | HENNEBERT | LIVESTOCK |
| | | | |
| PUBLIC WATER | | | |
| P-3 | PUBLIC WATER | M.D. & K. MAY | DOMESTIC |
| P-4 | PUBLIC WATER | A.A. MAY | DOMESTIC |
| P-5 | PUBLIC WATER | RHODES ET AL. | DOMESTIC |
| P-6 | PUBLIC WATER | STUDENC | DOMESTIC |
| P-8 | PUBLIC WATER | RICE | DOMESTIC |



TOVCC 11866

PRECIPITATION RECORD FOR USE WITH YOUR
Taylor 11" CLEAR-VU RAIN GAGE

LOCATION TraDet, Inc.

COUNTY Ohio STATE West Virginia

TIME OF OBSERVATION 8:30 AM YEAR 1990

ADDENDUM TO PAGE 19, PART 2, D(3)

| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.01 | 0.16 | 0.00 | 0.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 | 0.00 | s - melted snow |
| 2 | Trace | 0.10 | 0.00 | 0.10 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 | |
| 3 | 0.10 | 0.70 | 0.00 | 0.07 | 0.12 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | |
| 4 | 0.16 | 0.35 | 0.00 | 0.05 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 | 0.00 | Trace | |
| 5 | 0.00 | 0.00 | 0.00 | 0.12 | 0.30 | 0.00 | 0.19 | 0.05 | 0.20 | 0.00 | 0.53 | 0.00 | |
| 6 | 0.00 | Trace | 0.00 | 0.25 | 0.00 | 0.43 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 | |
| 7 | 0.00 | 0.10 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 1.25 | 0.00 | Trace | 0.00 | |
| 8 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.28 | 0.15 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | |
| 9 | Trace | 0.60 | 0.08 | Trace | 0.04 | 0.38 | 0.47 | 0.70 | 0.91 | 0.05 | 0.28 | 0.00 | |
| 10 | 0.00 | 0.00 | 0.00 | 0.90 | 0.22 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 11 | 0.04 | 0.15 | 0.07 | 0.16 | 0.00 | 0.00 | 2.33 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | |
| 12 | Trace | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 13 | 0.00 | 0.04 | 0.00 | 0.17 | 0.21 | 0.00 | 0.77 | 0.20 | 0.00 | 0.01 | 0.00 | 0.00 | |
| 14 | 0.00 | 0.54 | 0.00 | 0.30 | 0.00 | 0.95 | 0.17 | 0.00 | 0.71 | 0.00 | 0.00 | 0.10 | |
| 15 | 0.09 | 0.41 | 0.00 | 0.00 | 0.05 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.67 | |
| 16 | 0.00 | 0.06 | 0.80 | 0.00 | 1.12 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.40 | 0.00 | |
| 17 | 0.12 | 0.00 | 0.00 | 0.09 | 0.00 | 0.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 | |
| 18 | 0.00 | 0.00 | Trace | 0.00 | 0.00 | 0.00 | 0.00 | Trace | 0.02 | 0.00 | 0.00 | 0.73 | |
| 19 | 0.08 | 0.00 | 0.25 | Trace | 0.15 | 0.00 | 0.00 | 1.45 | 0.40 | 0.50 | 0.00 | 0.00 | |
| 20 | 0.93 | 0.00 | 0.00 | 0.30 | 0.15 | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 21 | 0.03 | 0.00 | 0.00 | 0.04 | 0.00 | 0.02 | 0.27 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | |
| 22 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.18 | 0.74 | 0.20 | 0.00 | 0.00 | 0.53 | 0.15 | |
| 23 | 0.08 | 0.14s | 0.20 | 0.00 | 0.06 | 0.06 | 0.02 | 0.40 | 0.27 | 0.40 | 0.00 | 0.47s | |
| 24 | 0.01s | 0.06s | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.02 | |
| 25 | 0.09 | 0.00 | 0.00 | 0.16 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 26 | 0.07 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | |
| 27 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.13s | |
| 28 | 0.40 | 0.00 | 0.00 | 0.00 | 1.08 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 29 | 0.74 | — | 0.02 | 0.00 | 0.39 | 0.00 | 0.00 | 0.18 | 0.53 | 0.00 | 0.00 | 0.07 | |
| 30 | 0.00 | — | 0.08 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.12 | 0.00 | 0.00 | 1.40 | |
| 31 | 0.00 | — | 0.21 | — | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | |
| Total | 2.87 | 3.63 | 1.78 | 3.46 | 5.84 | 3.94 | 6.29 | 3.18 | 6.03 | 1.84 | 2.45 | 5.41 | |

SYBRON Taylor

Total Annual 46.72

**PRECIPITATION RECORD FOR USE WITH YOUR**
**Taylor 11" CLEAR-VU RAIN GAGE**

**LOCATION** TraDet, Inc.

**COUNTY** Ohio **STATE** West Virginia

**TIME OF OBSERVATION** **YEAR** 1991

ADDENDUM TO PAGE 19, PART 2, D(3)

| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.05[s] | 0.00 | 0.11 | 0.00 | 0.40 | | | | | | s - melted snow |
| 2 | 0.00 | 0.00 | 0.02[s] | 0.00 | 0.00 | 0.00 | 0.20 | | | | | | |
| 3 | 0.00 | 0.00 | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | |
| 4 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.84 | | | | | | |
| 5 | 0.15 | 0.31 | 0.00 | 0.13 | 0.93 | 0.00 | 0.00 | | | | | | |
| 6 | 0.00 | 0.30 | 0.65 | 0.00 | 0.08 | 0.00 | 0.00 | | | | | | |
| 7 | 0.18 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 1.18 | | | | | | |
| 8 | 0.18 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.19 | | | | | | |
| 9 | 0.02 | 0.00 | 0.01 | 0.55 | 0.00 | 0.00 | 0.00 | | | | | | |
| 10 | 0.49 | 0.21 | Trace[s] | 0.00 | 0.00 | 0.00 | | | | | | | |
| 11 | Trace | 0.00 | 0.00 | 0.00 | 0.00 | 1.63 | | | | | | | |
| 12 | 0.00 | 0.00 | 0.12 | Trace | 0.00 | 0.00 | | | | | | | |
| 13 | Trace | 0.22 | 0.25 | 0.86 | 0.00 | 0.00 | | | | | | | |
| 14 | Trace | 0.29 | 0.00 | 0.24 | 0.00 | 0.00 | | | | | | | |
| 15 | 0.36 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 16 | 0.19 | 0.06[s] | 0.00 | 0.00 | 0.00 | 0.25 | | | | | | | |
| 17 | 0.01 | 0.05 | 0.09 | 0.10 | 0.02 | 0.00 | | | | | | | |
| 18 | 0.00 | 0.00 | 0.19 | 0.00 | 0.10 | 0.00 | | | | | | | |
| 19 | Trace | 0.20 | 0.00 | 0.05 | 0.00 | 0.00 | | | | | | | |
| 20 | 0.28[s] | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 21 | 0.02[s] | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 22 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 23 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 24 | 0.01[s] | 0.00 | 0.11 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 25 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 26 | 0.01[s] | 0.31[s] | 0.14 | 0.00 | Trace | 0.00 | | | | | | | |
| 27 | 0.30[s] | Trace[s] | 0.02 | 0.00 | 0.07 | 0.00 | | | | | | | |
| 28 | 0.00 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | | | | | | | |
| 29 | 0.40 | - | 0.00 | 0.13 | 0.00 | 0.00 | | | | | | | |
| 30 | 0.17 | - | 0.05[s] | 0.00 | 0.65 | 0.25 | | | | | | | |
| 31 | 0.01[s] | - | 0.04 | - | 0.04 | - | | | | | | | |
| Total | 2.74 | 1.51 | 2.63 | 2.18 | 1.97 | 2.13 | | | | | | | |

SYBRON Taylor

Total Annual

# ANNUAL RAINFALL REPORT

Location No. 6 Mine Year 1991

| DATE | JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | SEPT. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | 0 | 0.20 | 0 | 0.15 | 0 | 0 | 0 |
| 2 | | | | | | 0 | 0.50 | 0 | 0 | 0 | 0 | 0.40 |
| 3 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 1.90 |
| 4 | | | | | | 0 | 0 | 0.30 | 0 | TRACE | 0 | TRACE ms |
| 5 | | | | | | 0 | 0.25 | 0 | 0.50 | 0 | 0 | TRACE ms |
| 6 | | | | | | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 |
| 7 | | | | | | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 |
| 8 | | | | | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | | | | | W | 0 | 0 | 0.38 | 0 | 0 | 0 | 0.10 |
| 10 | | | | | A | 0 | 0 | 0.10 | 0.95 | 0 | 0 | 0.25 |
| 11 | A | A | A | A | R | 0 | 0 | 0 | 0.20 | .20 | .40 | 0 |
| 12 | W | W | W | W | D | 0.30 | 0 | 0 | 0 | .25 | 0 | 0 |
| 13 | A | A | A | A | E | 0 | 0.10 | 0 | 0 | .05 | .40 ms | 0 |
| 14 | R | R | R | R | W | 0 | 0 | 0 | 0 | 0 | TRACE | 0 |
| 15 | D | D | D | D | R | 0 | 0 | 0 | 0 | .25 | 0 | 1.00 |
| 16 | E | E | E | E | | 0 | 0 | 0 | 0 | 0 | 0.05 | 0.30 ms |
| 17 | W | W | W | W | T | 1.00 | 0 | 0.50 | 0 | 0 | 0 | 0 |
| 18 | R | R | R | R | O | 0 | 0 | 0 | 0 | 0 | 0 | TRACE ms |
| 19 | | | | | N | 0.10 | 0 | 0 | 0.20 | 0 | 0 | 0 |
| 20 | T | T | T | T | | 0 | 0 | 1.80 | 0 | 0 | 0.22 | 0 |
| 21 | O | O | O | O | | 0 | 0 | 0.10 | 0 | 0 | 0.10 | 0 |
| 22 | N | N | N | N | | 0 | 0 | 0 | 0 | 0 | 0.40 | 0 |
| 23 | | | | | | 0 | 0 | 0.30 | 0 | 0.23 | 0 | 1.00 | 0.40 |
| 24 | | | | | | 0 | 0 | 0.40 | 0 | TRACE | 0 | 0 | 0 |
| 25 | | | | | | 0 | 0 | TRACE | 0 | 1.40 | 0 | 0 | 0 |
| 26 | | | | | | 0 | 0 | 0 | 0 | 0.10 | TRACE | 0 | 0 |
| 27 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | TRACE |
| 28 | | | | | | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | | | | | | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | | | | | | 0 | 0 | 1.50 | 0 | 0 | 0 | 0 | 0.50 |
| 31 | | | | | | 0.16 | X | 0.15 | 0 | X | 0 | X | 0 |
| Total | | | | | | 1.40 | 3.90 | 3.18 | 3.73 | 0.75 | 2.57 | 4.85 |

TOTAL FOR YEAR

TOVCC 11869

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
RAINFALL RECORD – 1993

MONTH

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.01 | T | 0.00 | 0.20 | 0.00 | 0.00 | 1.00 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0.56 | 0.00 | 0.00 | 0.03 | T | 0.29 | 0.10 | 1.03 | 0.00 | 0.47 | T | 0.13 |
| 3 | 0.02 | 0.00 | 0.40 | 0.00 | 0.00 | 0.17 | 0.47 | 0.00 | 1.99 | 0.00 | 0.10 | 0.00 |
| 4 | 0.63 | 0.00 | 1.45 | 0.00 | 0.16 | 0.50 | 0.46 | 0.01 | 0.00 | 0.00 | 0.05 | 0.79 |
| 5 | 0.01 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.01 |
| 7 | T | 0.00 | 0.04 | 0.00 | 0.00 | 0.86 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 |
| 8 | T | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 0.02 | 0.00 | 0.08 | 0.05 | 0.00 | 0.12 | 0.00 | 0.00 | 0.85 | 0.30 | 0.00 | 0.10 |
| 10 | 0.15 | 0.00 | 0.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| 11 | 0.19 | 0.39 | 0.00 | 0.06 | 0.00 | 0.00 | 0.31 | 0.00 | 0.00 | T | 0.00 | T |
| 12 | 0.00 | 0.00 | 0.00 | 0.06 | 0.49 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 0.39 | 0.20 | 0.40 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.90 | 0.00 |
| 14 | T | 0.01 | 0.00 | 0.07 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 |
| 15 | 0.00 | 0.40 | 0.00 | 0.30 | 0.04 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | T | 0.01 |
| 16 | 0.00 | 0.50 | 0.20 | 0.00 | 0.06 | 0.00 | 0.00 | 1.61 | 0.00 | 0.90 | T | 0.00 |
| 17 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.01 | 0.80 | 0.00 |
| 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.30 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 |
| 19 | 0.00 | 0.00 | 0.01 | 0.01 | T | 0.00 | 0.66 | 0.00 | 0.00 | 0.55 | 0.00 | 0.00 |
| 20 | T | 0.00 | 0.38 | 0.01 | T | 0.14 | 0.00 | 0.00 | T | 0.39 | 0.00 | 0.41 |
| 21 | 0.70 | 0.73 | 0.00 | 0.03 | T | 0.78 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.03 |
| 22 | 0.05 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.10 |
| 23 | 0.00 | 0.02 | 0.49 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 |
| 24 | 0.50 | 0.00 | 0.02 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |
| 25 | 0.00 | 0.15 | 0.00 | 2.20 | 0.00 | 0.72 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.10 |
| 26 | 0.00 | T | 0.00 | 0.10 | 0.00 | 0.10 | 0.31 | 0.00 | 0.75 | 0.00 | 0.16 | 0.00 |
| 27 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.62 | 0.00 |
| 28 | 0.00 | 0.00 | T | 0.00 | 0.13 | 0.39 | 0.35 | 0.00 | 0.10 | 0.00 | T | 0.00 |
| 29 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | T | 0.00 | 0.00 |
| 30 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.04 |
| 31 | 0.00 | | 0.38 | | 0.65 | | 0.00 | T | | 1.50 | | 0.06 |
| TOT. | 3.23 | 2.46 | 4.96 | 3.12 | 1.85 | 4.37 | 4.00 | 3.07 | 4.83 | 4.21 | 3.03 | 2.19 |

T = TRACE

ANNUAL TOTAL: 41.32

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
RAINFALL RECORD – 1994

MONTH

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.10 | 0.00 |
| 2 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | T | T | 0.10 | 0.05 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.46 | 0.00 | 0.00 | 0.00 | 0.90 |
| 5 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.06 |
| 6 | 0.28 | 0.00 | 0.00 | 0.70 | 0.20 | 0.00 | 0.83 | 0.00 | 0.00 | 0.00 | T | 0.01 |
| 7 | 0.14 | 0.00 | 0.19 | 0.00 | 0.83 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 8 | 0.00 | 0.81 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.59 | 0.00 |
| 9 | 0.00 | T | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 |
| 10 | 0.00 | 0.00 | T | 1.38 | 0.00 | 0.00 | T | 0.00 | T | 0.00 | 0.00 | 0.61 |
| 11 | 0.30 | T | 0.00 | 0.11 | 0.30 | 0.90 | 0.00 | T | 0.00 | 0.00 | 0.00 | T |
| 12 | 0.01 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | T | 0.01 | 0.20 | T | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| 14 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.36 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | T | 0.00 | 0.10 | 0.95 | 0.60 | 0.00 | 0.30 | 0.00 | T | 0.00 | 0.60 | 0.00 |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 |
| 17 | 0.86 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 | 2.30 | 0.00 | 0.00 | 0.00 |
| 18 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.03 |
| 19 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 |
| 20 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 |
| 21 | 0.00 | 0.39 | 0.68 | 0.00 | 0.00 | 0.62 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22 | 0.00 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 2.69 | 0.00 | 0.00 | 0.00 | 0.00 |
| 23 | 0.01 | 0.65 | 0.19 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 |
| 24 | 0.01 | 0.02 | 0.00 | 0.00 | T | 0.50 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 25 | 0.46 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.40 | 0.00 | 0.82 | 0.00 | 0.00 | 0.00 |
| 26 | 0.00 | 0.00 | 0.05 | 0.00 | T | 1.19 | 0.00 | 0.02 | T | 0.00 | 0.00 | 0.00 |
| 27 | 1.89 | 0.00 | 0.90 | 0.00 | 0.00 | T | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | 0.08 | T | 0.18 | T | 0.00 | 0.29 | 0.00 | 0.41 | 0.00 | 0.00 | 0.95 | 0.00 |
| 29 | 0.00 | | 0.00 | 0.04 | 0.00 | 0.25 | 0.36 | T | 0.00 | 0.00 | 0.00 | 0.00 |
| 30 | T | | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 |
| 31 | 0.01 | | 0.00 | | T | | 0.00 | 0.46 | | 0.71 | | 0.00 |
| TOT. | 5.39 | 2.51 | 5.31 | 4.08 | 2.34 | 4.17 | 3.68 | 6.28 | 3.12 | 1.16 | 2.73 | 2.09 |

T = TRACE

ANNUAL TOTAL: 42.86

**THE OHIO VALLEY COAL COMPANY**
**POWHATAN NO. 6 MINE**
**RAINFALL - 1997**

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 1.10 | 0.00 | 0.00 | 0.32 | 0.29 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | |
| 2 | 0.01 | T | 1.20 | 0.00 | 0.00 | 0.90 | T | T | 0.04 | 0.00 | 0.07 | 0.00 | |
| 3 | 0.03 | 0.14 | 0.30 | 0.00 | 0.64 | 0.03 | 0.00 | 0.40 | 0.00 | 0.00 | T | 0.21 | |
| 4 | 0.60 | 0.35 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | |
| 5 | 0.00 | 0.01 | 0.35 | 0.00 | 0.12 | 0.00 | T | 0.00 | T | 0.00 | 0.00 | 0.06 | |
| 6 | 0.00 | 0.00 | T | 0.00 | 0.01 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.09 | 0.04 | |
| 7 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.39 | 0.04 | |
| 8 | 0.00 | T | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | |
| 9 | 0.29 | 0.00 | 0.71 | 0.00 | 0.90 | 0.00 | 0.20 | 0.00 | 0.45 | 0.05 | 0.00 | 0.23 | |
| 10 | T | T | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.01 | 0.31 | |
| 11 | 0.00 | T | 0.00 | 0.21 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.01 | |
| 12 | T | 0.00 | 0.00 | 0.48 | 0.00 | 0.18 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 | T | |
| 13 | 0.00 | 0.52 | 0.29 | 0.00 | T | 0.01 | 0.00 | 0.10 | 0.00 | 0.02 | 1.30 | 0.00 | |
| 14 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 15 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 16 | 0.28 | 0.05 | 0.00 | T | 0.10 | 0.49 | 0.00 | 0.07 | 0.00 | 0.00 | 0.30 | 0.00 | |
| 17 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 2.53 | 0.09 | 0.00 | 0.00 | 0.00 | |
| 18 | 0.00 | 0.00 | 0.20 | 0.00 | 0.05 | 0.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 19 | 0.00 | 0.10 | 0.00 | 0.00 | 0.65 | 0.00 | 0.00 | 0.49 | 1.26 | 0.00 | 0.00 | 0.00 | |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 21 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.39 | 0.15 | |
| 22 | 0.27 | 0.00 | 0.00 | 0.01 | 0.00 | T | 0.50 | 0.00 | 0.00 | 0.00 | 0.01 | 0.18 | |
| 23 | 0.00 | 0.00 | 0.02 | 0.04 | 0.00 | 0.00 | 0.06 | 0.00 | T | 0.00 | 0.00 | T | |
| 24 | 0.23 | 0.00 | T | 0.79 | 0.90 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 25 | 0.01 | 0.00 | 1.04 | 0.60 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | |
| 26 | 0.00 | 0.17 | T | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 1.72 | 0.20 | 0.00 | |
| 27 | 0.79 | 0.00 | 0.00 | 0.39 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 28 | 0.08 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 1.20 | 0.00 | 0.20 | 0.10 | |
| 29 | 0.00 | | 0.00 | 0.00 | 0.20 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.30 | |
| 30 | 0.00 | | 0.18 | 0.03 | T | 0.33 | 0.00 | 0.00 | 0.18 | 0.00 | 0.12 | 0.00 | |
| 31 | 0.00 | | T | | 0.25 | | 0.00 | 0.00 | | 0.00 | | 0.00 | |
| TOTAL | 2.59 | 1.46 | 5.46 | 2.56 | 4.92 | 2.77 | 1.16 | 5.35 | 3.22 | 1.99 | 3.67 | 1.63 | 36.78 |
| H/L | L | L | H | L | H | L | L | H | L | L | H | L | |

TOVCC 11872

ALLEDONIA STATION

**THE OHIO VALLEY COAL COMPANY**
**POWHATAN NO. 6 MINE**
**RAINFALL - 2001**

RAINFALL AS OF: 11/06/2001

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.01 | 0.00 | 0.11 | 0.00 | 1.50 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 2 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 | | |
| 3 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 4 | 0.04 | T | 0.75 | 0.00 | 0.00 | 0.00 | 0.28 | T | 0.00 | 0.00 | 0.00 | | |
| 5 | 0.01 | 0.01 | 0.07 | 0.33 | 0.00 | 0.43 | 0.16 | 0.00 | 0.00 | 0.28 | 0.00 | | |
| 6 | 0.01 | 0.05 | 0.01 | 0.75 | 0.00 | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 7 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | | | |
| 8 | 0.01 | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| 9 | 0.00 | 0.20 | T | 0.06 | 0.00 | 0.00 | 0.00 | 1.23 | 0.00 | 0.00 | | | |
| 10 | 0.00 | 0.00 | 0.00 | 0.88 | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | | | |
| 11 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.02 | | | |
| 12 | 0.00 | 0.00 | 0.35 | 0.00 | 0.86 | 0.00 | 0.00 | 2.28 | 0.00 | 0.50 | | | |
| 13 | 0.00 | 0.02 | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | | | |
| 14 | 0.04 | 0.70 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.37 | | | |
| 15 | T | 0.15 | 0.15 | 0.59 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | | | |
| 16 | T | 0.31 | 0.50 | 0.03 | 0.13 | 0.72 | 0.00 | 0.00 | 0.00 | 0.44 | | | |
| 17 | T | 0.00 | 0.05 | 0.00 | 0.14 | 0.00 | 0.57 | 0.00 | 0.00 | 0.00 | | | |
| 18 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.02 | 0.00 | 0.00 | | | |
| 19 | 0.00 | T | 0.00 | 0.00 | 0.44 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | | | |
| 20 | 0.41 | T | 0.41 | 0.78 | 0.00 | 0.53 | 0.00 | 0.00 | 0.46 | 0.00 | | | |
| 21 | 0.00 | 0.00 | 0.94 | 0.14 | 0.74 | 0.20 | 0.00 | 0.00 | 0.02 | 0.00 | | | |
| 22 | 0.00 | 0.08 | 0.00 | 0.00 | 0.55 | 1.05 | 0.00 | 0.16 | 0.00 | 0.00 | | | |
| 23 | 0.00 | 0.00 | 0.19 | 0.01 | 0.13 | 0.00 | 0.00 | 0.05 | T | 0.65 | | | |
| 24 | 0.01 | 0.00 | 0.04 | T | 0.40 | 0.07 | 0.02 | 0.00 | 0.57 | 0.37 | | | |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | | | |
| 26 | 0.34 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.13 | 0.57 | 0.00 | T | | | |
| 27 | T | 0.00 | 0.00 | 0.03 | 0.05 | 0.00 | 0.00 | 0.00 | T | 0.00 | | | |
| 28 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.60 | 0.07 | 0.04 | 0.00 | | | |
| 29 | 0.51 | | 0.06 | 0.00 | 0.07 | 0.31 | 0.06 | 0.00 | 0.00 | 0.00 | | | |
| 30 | T | | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| 31 | 0.01 | | 0.00 | | 0.00 | | 0.00 | 1.71 | | 0.00 | | | |
| TOTAL | 1.60 | 1.59 | 3.81 | 3.96 | 4.37 | 5.97 | 3.85 | 6.51 | 1.51 | 2.64 | 0.44 | 0.00 | 36.25 |
| H/L | L | L | H | H | H | H | L | H | L | H | L | | |

**Rain gauge is read at 7:00 am for the prior day. H/L compares the monthly rainfall with the 50 year average for this area**

TOVCC 11873

# ADDENDUM TO ATTACHMENTS 14A, 14C, 14D, THE OHIO VALLEY COAL COMPANY

| | | | State Plane Coordinates | | | | |
|---|---|---|---|---|---|---|---|
| Source I.D. | Elevation | Owner | X | Y | Township | Section | Quarter Section |
| U34-001 | 1100 | FUNKHOUSER | 2,427,965.79 | 730,795.90 | SMITH | 28 | NE |
| U34-002 | 1072 | FUNKHOUSER | 2,428,090.85 | 730,009.04 | SMITH | 28 | SE |
| U34-003 | 1070 | FUNKHOUSER | 2,428,528.74 | 729,846.94 | SMITH | 28 | SE |
| U34-004 | 1069 | FUNKHOUSER | 2,428,793.47 | 729,808.34 | SMITH | 22 | SW |
| U34-007 | 1085 | FUNKHOUSER | 2,429,469.95 | 731,348.05 | SMITH | 22 | NW |
| U34-008 | 1055 | FUNKHOUSER | 2,429,708.07 | 729,865.78 | SMITH | 22 | SW |
| U34-009 | 1055 | EARLIWINE | 2,430,118.24 | 729,647.48 | SMITH | 22 | SW |
| U34-010 | 1072 | EARLIWINE | 2,430,533.47 | 729,651.89 | SMITH | 22 | SW |
| U34-021 | 1075 | RICE | 2,431,962.76 | 730,889.89 | SMITH | 22 | NE |
| U34-022 | 1120 | RICE | 2,432,250.29 | 730,752.94 | SMITH | 22 | NE |
| U34-023 | 1090 | RICE | 2,432,254.04 | 730,312.19 | SMITH | 22 | NE |
| U34-024 | 1060 | MAY | 2,431,865.16 | 730,214.01 | SMITH | 22 | NE |
| U34-025 | 1055 | GROVES | 2,431,820.13 | 729,956.45 | SMITH | 22 | SE |
| U34-143 | 1105 | STUDENC | 2,431,596.58 | 730,843.11 | SMITH | 22 | NE |
| U34-145 | 1182 | RUBEL | 2,423,428.13 | 729,626.52 | SMITH | 28 | SW |
| U34-146 | 1138 | RUBEL | 2,424,657.56 | 729,506.94 | SMITH | 28 | SW |
| U34-150 | 1152 | SIMPSON | 2,423,349.97 | 731,276.08 | SMITH | 34 | NE |
| U34-163 | 1115 | SAFFELL | 2,427,000.25 | 731,603.88 | SMITH | 28 | NE |
| U34-164 | 1110 | SAFFELL | 2,425,474.91 | 730,245.34 | SMITH | 28 | NW |
| U34-165 | 1112 | PRICE | 2,426,699.62 | 729,628.65 | SMITH | 28 | SE |
| U34-166 | 1075 | SAFFELL | 2,427,103.28 | 730,188.86 | SMITH | 28 | NE |
| U34-167 | 1220 | HART | 2,423,075.73 | 729,546.24 | SMITH | 34 | SE |
| U-34H | 1100 | GROVES | 2,431,974.26 | 729,901.84 | SMITH | 22 | SE |
| U37-000 | 1130 | KEMP | 2,418,250.51 | 731,418.17 | GOSHEN | 4 | NE |
| U37-001 | 1135 | HENNEBERT | 2,419,391.38 | 730,093.80 | SMITH | 34 | SW |
| D34-001 | 1075 | FUNKHOUSER | 2,427,257.74 | 730,058.70 | SMITH | 28 | SE |
| D37-000 | 1195 | DUNFEE | 2,418,607.23 | 729,769.99 | SMITH | 34 | SW |
| DS-111 | 1121 | RAUCHENBERG | 2,428,264.52 | 729,659.85 | SMITH | 28 | SE |
| DS-223 | 1122 | RICE | 2,429,803.85 | 730,620.59 | SMITH | 22 | NW |
| DS-226A | 1173 | RICE | 2,431,057.10 | 730,960.62 | SMITH | 22 | NW |
| DS-226B | 1155 | RICE | 2,430,121.67 | 731,294.25 | SMITH | 22 | NW |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DS-228 | 1290 | RUBEL | 2,423,364.96 | 729,086.53 | SMITH | 28 | SW |
| DS-230 | 1170 | RUBEL | 2,424,279.06 | 729,586.43 | SMITH | 28 | SW |
| DS-231 | 1230 | RUBEL | 2,424,454.63 | 730,001.59 | SMITH | 28 | SW |
| DS-232 | 1237 | RUBEL | 2,424,170.77 | 728,330.02 | SMITH | 28 | SW |
| DS-240 | 1170 | HART | 2,423,989.47 | 731,178.95 | SMITH | 28 | NW |
| DS-241 | 1200 | SAFFELL | 2,425,632.32 | 731,029.92 | SMITH | 28 | NW |
| DS-242 | 1090 | SAFFELL | 2,426,442.03 | 730,724.03 | SMITH | 28 | NE |
| DS-244 | 1290 | MAYO | 2,422,373.81 | 729,824.17 | SMITH | 34 | SE |
| DS-277 | 1264 | MAYO | 2,422,063.00 | 730,173.29 | SMITH | 34 | SE |
| DS-278 | 1230 | WORKMAN | 2,421,109.95 | 729,887.37 | SMITH | 34 | SW |
| DS-282 | 1268 | SIMPSON | 2,421,896.69 | 730,510.13 | SMITH | 34 | NE |
| DS-283 | 1270 | SIMPSON | 2,421,609.00 | 731,576.91 | SMITH | 34 | NE |
| DS-285 | 1190 | BIANCO | 2,417,862.26 | 730,040.49 | GOSHEN | 4 | SE |
| DS-286 | 1220 | SIMPSON | 2,422,911.94 | 730,739.12 | SMITH | 34 | NE |
| DS-287 | 1220 | SIMPSON | 2,422,677.72 | 730,710.51 | SMITH | 34 | NE |
| DS-289 | 1190 | BIANCO | 2,417,916.88 | 730,862.33 | GOSHEN | 4 | SE |
| W-166 | 1106 | EARLIWINE | 2,431,127.17 | 729,567.51 | SMITH | 22 | SW |
| W-167 | 1105 | HEBRY | 2,430,792.79 | 729,777.10 | SMITH | 22 | SW |
| WL-168 | 1112 | FUNKHOUSER | 2,427,817.97 | 730,322.37 | SMITH | 28 | NE |
| DW-169 | 1100 | FUNKHOUSER | 2,427,881.52 | 730,325.78 | SMITH | 28 | NE |
| W-170 | 1105 | MAY | 2,431,577.81 | 730,086.96 | SMITH | 22 | NE |
| W-172 | 1106 | MAY | 2,431,637.18 | 730,305.13 | SMITH | 22 | NE |
| DW-173 | 1166 | RICE | 2,431,114.67 | 730,826.06 | SMITH | 22 | NW |
| W-174 | 1117 | GRANT | 2,431,688.01 | 731,164.71 | SMITH | 22 | NE |
| WL-294 | 1125 | WILSON | 2,427,681.68 | 730,415.71 | SMITH | 28 | NE |
| W-315 | 1280 | HART | 2,422,711.41 | 729,637.06 | SMITH | 34 | SE |
| W-316 | 1203 | SAFFELL | 2,425,776.05 | 730,991.09 | SMITH | 28 | NW |
| WL-317 | 1303 | HART | 2,424,662.36 | 731,095.86 | SMITH | 28 | NW |
| DW-318 | 1294 | MAYO | 2,422,408.37 | 729,922.45 | SMITH | 34 | SE |
| W-323 | 1138 | FUNKHOUSER | 2,428,971.06 | 730,339.40 | SMITH | 22 | NW |
| W-374 | 1285 | COLE | 2,417,475.69 | 730,748.27 | GOSHEN | 4 | SE |
| W-396 | 1305 | WORKMAN | 2,420,621.76 | 730,247.04 | SMITH | 34 | SW |
| WL-397 | 1310 | CRAMER | 2,420,447.23 | 729,993.06 | SMITH | 34 | SW |
| WL-398 | 1303 | HABIG | 2,420,424.21 | 729,595.73 | SMITH | 34 | SW |
| W-405 | 1322 | SIMPSON | 2,421,717.69 | 730,927.08 | SMITH | 34 | NE |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DW-406 | 1322 | SIMPSON | 2,421,675.78 | 730,928.49 | SMITH | 34 | NE |
| W-407 | 1306 | SIMPSON | 2,422,089.97 | 730,858.42 | SMITH | 34 | NE |
| DW-408 | 1305 | SIMPSON | 2,421,986.22 | 730,832.36 | SMITH | 34 | NE |
| W-409 | 1318 | SIMPSON | 2,420,712.16 | 731,237.35 | SMITH | 34 | NW |
| W-458 | 1175 | RAUSHENBERG | 2,428,459.00 | 729,987.00 | SMITH | 28 | SE |
| P-7 | 1140 | HENNEBERT | 2,419,491.00 | 730,096.00 | SMITH | 34 | SW |
| P-8 | 1240 | HART | 2,423,076.00 | 729,546.00 | SMITH | 34 | SE |
| P-16 | 1100 | FUNKHOUSER | 2,427,965.79 | 730,795.90 | SMITH | 28 | NE |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |



TOVCC 11876

ADDDENDUM TO ATTACHMENT 14A
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## DISTURBANCES TO WATERSHED

The D-0360-13 application area was sampled originally in 1990 and then subsequently after that time. The application was submitted in December, 2001. In the interim period, longwall mining has been conducted to the north of the application area within the Captina Creek and McMahon Creek watersheds. However, the mining to date has been over 6000 ft away from this application area and is not expected to have impacted water supplies at that distance. Wells are only impacted up about 700 ft from the mining, springs only 300 to 500 ft from the mining. There have been no other impacts to the watershed with the exception of localized construction for dwellings or other buildings.

D. (3) Based on the data listed on Attachment 14A, and other information submitted with this application, identify the seasonal variations in water quality and quantity for the streams identified in Part 2, D(2).

See Attachment 14A, Addenda, PHC

E. HYDROLOGIC DETERMINATION-Permit, Shadow Area, and Adjacent Area

Based on the information submitted in response to items B, C, and D in this part of the permit application, submit an addendum describing the probable hydrologic consequences of this proposed underground mining operation on the hydrologic regime of the proposed permit area, shadow area, and adjacent area. The description shall include findings on each of the following items:

(1) The consequences of the proposed operation on the contents of total suspended and dissolved solids, total iron, total manganese, acidity, and pH;

See Addendum to Page 18, Part 2, E

(2) Whether adverse impacts may occur to the hydrologic balance; and

See Addendum to Page 18, Part 2, E

(3) The impact the proposed operation will have on:

(a) sediment yield from the disturbed area,

(b) flooding and stream flow alteration or diminution,

(c) ground water and surface water availability.

See Addendum to Page 18, Part 2, E

F. ALTERNATIVE WATER SUPPLY INFORMATION-Permit, Shadow Area, and Adjacent Area

(1) Based on the response in Part 2, item E, submit an addendum identifying the extent to which the proposed coal mining activities may proximately result in contamination, diminution, or interruption of an underground or surface source of water within the proposed permit area, shadow area, and adjacent area that is used for domestic, agricultural, industrial, or other legitimate use. See Addendum to Page 18, Page 2, F

(2) If contamination, diminution, or interruption may result, submit an addendum identifying the alternative sources of water supply that could be developed to replace the existing sources including information on water availability and suitability of alternative sources for existing pre-mining uses and postmining land use. See Addendum to Page 18, Part 2, F

ADDENDUM TO PAGE 18, PART 2, E
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## HYDROLOGIC DETERMINATION

Based on the information submitted in this application, the enclosed probable hydrologic consequences may be expected. With partial extraction mining, no impacts are expected to occur to ground water or surface water. The quality of the surface and ground water in the application area is not expected to be changed as a result of the proposed mining activities. Specifically, the levels of pH, iron, manganese, total suspended solids, and total dissolved solids are not expected to vary from their original levels.

ADDENDUM TO PAGE 18, PART 2, E
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## PROBABLE HYDROGEOLOGIC CONSEQUENCES OF GATE ENTRY DEVELOPMENT AT POWHATAN NO. 6 MINE

### Topographic Setting

The Powhatan No. 6 Mine is located in Belmont County, Ohio which is within the Appalachian Plateau physiographic province. The topography of the county is typically hilly with broad rounded ridges and deep v-shaped valleys dissecting the terrain. Total topographic relief within the county is approximately 800 ft. However, within the application area, maximum relief is approximately 215 ft. The elevation varies between 1305 ft. (maximum) above sea level and 1080 ft. (minimum). Figure #1 is a portion of the Hunter and Armstrong Mills, Ohio U.S.G.S. 7½ Minute Topographic maps showing the location of the area of interest.

Drainage within the western portion of the application area occurs to the south through several streams that are tributaries to Millers Run, a tributary of Captina Creek. Captina Creek is the main drainage system for the southern portion of Belmont County. Captina Creek flows eastward to the Ohio River with the confluence of the two located at Powhatan Point, Ohio.

Drainage within the western portion (north of State Route 147) of the application area occurs to the south through several streams that are tributaries to Williams Creek, a tributary of McMahon Creek. McMahon Creek is the main drainage system for the central portion of Belmont County. McMahon Creek flows eastward to the Ohio River with the confluence of the two located at Bellaire, Ohio.

### Geologic Setting

The bedrock units that underlie the study area consist of Permian through Pennsylvanian in Age. The Permian Age rocks consist of Dunkard Group. This sequence covers much of the study area at the surface. Below the Dunkard Group lies the Monongahela and Conemaugh Formations of the Pennsylvania system. The Monongahela Formation is exposed only in the stream valleys with the underlying Conemaugh Formation not exposed at all. Figure #2 is a generalized stratigraphic column showing the relationship of these bedrock units.

The Monongahela Formation consists of the Pittsburgh #8 coal seam at the base through the Waynesburg #11 coal seam. Other coal seams consist of the Redstone (No. 8A), Fishpot, Sewickley (No. 9) and Uniontown (No. 10) coal seams. Other important members of the formation are the Redstone Limestone, the Fishpot Limestone and the Benwood Limestone, all of which are found

above the Pittsburgh (No. 8) coal seam. The remaining portion of the Monongahela Formation consists of clay, sandstone and shale.

Above the Waynesburg #11 coal seam, the Dunkard Group consists of coal (Washington #12 seam), limestone, sandstone, shale and clay. The Dunkard Group is found at the cap of the hilltops at elevations above sea level of approximately 950 ft. and above.

Below the Pittsburgh #8 coal seam lies the Conemaugh Formation. The Conemaugh consists of sandstone, siltstone, mudstone, shale, clay and limestone. Much of the formation consists of undifferentiated strata, however, several important members lie relatively close to the Pittsburgh #8 coal seam. These members are the underclay to the Pittsburgh #8 coal seam, the Upper Pittsburgh Limestone, the Bellaire Sandstone and the Lower Pittsburgh Limestone. These units are not tapped as aquifers within the study area at present because adequate aquifers can be found at shallower depths.

Hydrology

Bedrock units within the study area are generally tight and have limited ground water development potential. Domestic well yields are generally less than 5 gallons per minute (g.p.m.) with transmissivities usually less than 1,000 gallons per day per foot. Ground water within the study area occurs under water table, semi-confined and confined conditions. Storage coefficients should range from $10^{-2}$ to $10^{-6}$.

Most valuable ground water supplies developed in rock units are dependent on natural fracturing or secondary porosity and permeability. Primary porosity and permeability is relatively low in the bedrock as is noted by the relatively low yield of domestic wells and the reliance on springs for domestic water supplies. Approximately 50% of the domestic water supplies within the study area rely on springs as the source. Most of these springs are contact springs located along the valley walls where bedrock units of lower permeability and porosity impede downward infiltration of ground water and force water to discharge as springs.

The aquifers within the study area that are tapped for domestic water supplies are local in extent. The relatively flat-lying orientation of the bedrock and the high topographic relief (i.e., deep v-shaped valleys) of the area, tends to isolate many of the aquifers to small upland areas. Therefore, the aerial extent of the unit is limited and so would be the recharge potential.

Downward migration of ground water is also controlled by naturally occurring fractures. These earth fractures, while not ubiquitous, do occur sporadically, over most of the mine plan area and have an effective depth of less than 200 ft. Below 200 ft., the fractures may still be present, but are either filled with silts and clays, or have healed due to lithostatic pressures. Therefore, the enhanced permeability of these fractures is regulated and the relatively low primary permeability of

the units controls ground water flow at depth. This premise is based on the general limited hydraulic communication with the No. 6 Mine.

It is a generally accepted principal of hydrogeology that joints, cleavage, and other fractures tend to be tighter and have lower permeability with increasing depth. This premise is substantiated at the local level by the water conditions exhibited in the No. 6 Mine. To date, observations indicate that the No. 6 Mine made very little water and that water flow through fractures into the mine is rare. Most areas of the mine are essentially dry with no or very little water accumulation. What water does accumulate is generally man-made, being used for dust suppression and motor cooling. This general condition (no water inflow into the mine) was reported to be true with as little as 200 feet of cover. These site specific observations coupled with the general premise of closed fractures with depth lead to the statements made in the PHC.

In a study conducted by Moody and Associates in 1980, the water make of the mine (total water inflow), was calculated to be approximately 42 gallons per day (g.p.d.) per acre mined or 26,880 g.p.d. per square mile. Most sections of the mine were essentially dry and water inflow was generally limited to areas of low cover and stream valleys or fractured zones. In the 14 years since that time, the mine has progressed to the north, away from the Captina Creek valley.

In contrast to the mine water make, the ground water recharge potential of the area has been estimated between 100,000 and 250,000 g.p.d. per square mile or 155 to 400 g.p.d. per acre. It thus appears less than 10 to 27 percent of the ground water recharge potential is intercepted by the mine. This data clearly indicates that the majority of the subsurface flow system within the mine plan area is shallow and is unaffected by deep mining.

A number of years ago, when the Powhatan No. 6 Mine was owned and operated by The NACCO Mining Company, photo lineaments were traced over the mine area. The report from the project no longer exists, but talking to Mr. William Siplivy, who was associated with the project was beneficial. Mr. Siplivy indicated that the photo lineaments were not associated with poor conditions in the mine, except that the lineaments defined stream channels.

# Probable Hydrologic Consequences

Ohio Valley Coal Company
Powhatan No. 6 Mine
Application Area D-0360-13

December 10, 2001
May 14, 2002 (Revised)

*Prepared For:*

**The Ohio Valley Coal Company**
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

*Prepared By:*

David M. Anderson, P.G.
Moody and Associates, Inc.
11548 Cotton Road
Meadville, PA, 16335

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TABLE 1 - Groundwater Quality Summary

## INTRODUCTION

Since 1987, three partial recovery and seven full recovery application areas of the Powhatan No. 6 Mine have been evaluated relative to the Probable Hydrologic Consequences (PHC) of mining activities. One combination area has been evaluated relative to the PHC. They are:

| Application Area | Year Prepared | Prepared By |
|---|---|---|
| R-0360-1 | 1989 | William Siplivy P.E. & C.P.G. (partial recovery) |
| R-0360-2 | 1989 | Moody and Associates, Inc. (full recovery) |
| D-0360-1 | 1990 | Moody and Associates, Inc. (partial recovery) |
| D-0360-2 | 1991 | Moody and Associates, Inc. (full recovery) |
| D-0360-3 | 1992 | William Siplivy P.E. & C.P.G. (Two additional applications were prepared by OVCC using this PHC for two small areas within the D-0360-3 area. They were identified as D-0360-4 and D-0360-5). (full recovery) |
| D-0360-6 | 1996 | Moody and Associates, Inc. (full recovery) (One additional application was prepared by OVCC using this PHC for one small area within the D-0360-6 area. It was identified as D-0360-10) (full recovery). |
| D-0360-7 | 1998 | Moody and Associates, Inc. (full recovery) |
| D-0360-9 | 1998 | Moody and Associates, Inc. (partial recovery) |
| D-0360-11 | 1999 | Moody and Associates, Inc. (full recovery) |
| D-0360-12 | 2001 | Moody and Associates, Inc. (full and partial recovery |

This PHC for the longwall Application Area D-0360-13 has been prepared on behalf of the Ohio Valley Coal Company by Moody and Associates, Incorporated. The information developed during the preparation of the previous PHC's has been used in the preparation of this PHC.



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## TOPOGRAPHIC SETTING

The Powhatan No. 6 Mine is located in Belmont County in southeastern Ohio. The topography of the entire application area is typical of the Appalachian Plateau Province and is characterized by narrow rounded ridges and deep V-shaped valleys dissecting the terrain, which is underlain by essentially horizontal sedimentary rocks. Topographic relief within the D-0360-13 application area is approximately 240 feet. The lowest elevation is approximately 1070 feet in a tributary to Williams Creek in the mid-east portion of the application area. The highest elevation is 1310 feet on a hilltop in the center of the application area.

The surface drainage within the application area is to the south and east. The drainage in the western portion of the application area is through unnamed tributaries to Miller's Run and Joy Fork, which are part of the Captina Creek drainage area. The eastern drainage is through Williams Creek. Williams Creek is a tributary of McMahon Creek.

Most of the developed water supplies (wells and springs) are located along the roads in the application area. There is a concentration of supplies along State Route 147, Hart Road, and Dunfee Road. There is a large group of water supplies along State Route 9 just east of the application area. There are large areas of the Joy Fork and Miller's Run drainage area, which have no identified water supplies. All of the identified water supplies are listed on the ATTACHMENT 14C.

## GEOLOGIC SETTING

A detailed discussion of the stratigraphic and structural setting of the Application Area is provided in the Geologic Section of this application. However, those properties of the geologic setting pertinent to ground water occurrence and movement are described here.

The bedrock units that outcrop in the Application Area belong to the Dunkard Group that is Upper Pennsylvanian to Permian in age. The rocks consist of interbedded sandstone, siltstone, shale, mudstone, clay, fresh to brackish water limestone and coal. The Monongahela Formation (Pennsylvanian) underlies the Dunkard Group and consists of similar rock types. The Pittsburgh (No. 8) Coal seam, which is the seam to be mined, marks the bottom of the Monongahela



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Formation. According to Mr. James M. Raab, a hydrogeologist with the Ohio Department of Natural Resources, in correspondence to Dave Bartsch of the Ohio Valley Coal Company dated January 30, 1989, water below 250 feet beneath the stream bottoms is brackish.

In addition, there is considerable horizontal and vertical variability of the rock units. Rapid facies and hydrologic property changes tend to limit the horizontal continuity of the individual rock units. With the exception of major coal seams, very few lithologic units are continuous across the proposed application area. Horizontal facies changes and corresponding changes in hydrologic properties of the rocks tend to enhance the importance of localized flow systems. In addition, most available ground water in this region is limited to the first 100 feet of the surface where enhanced secondary permeability associated with rock fracturing is present. This information is supported by the OVCC drilling records and from locally developed wells and springs. Ground water recharge in the upland or ridge top areas results in downward migration primarily within this shallow saturated zone. Because the topographic relief between ridge tops often exceeds 100 feet, there are localized flow systems under the hilltops that are not in hydrologic communication with adjacent hilltops. While the ground water under any given ridge top can be viewed as being continuous, the continuity generally does not extend to adjacent hilltops.

The geologic structures in the Application Area consist of gently folded rocks that dip to the southeast at approximately 30 feet per mile. Overburden thickness above the Pittsburgh coal seam ranges from a low of approximately 300 feet along the Williams Creek valley to a high of approximately 535 feet along the hilltops in the center of the area. Geologic structure can influence regional ground water flow patterns but local variations in hydraulic properties of the rocks tend to accentuate localized flow systems.

## GENERAL HYDROLOGIC SETTING

The source of all ground and surface water in the mine plan area is precipitation. Upon reaching the land surface, water that is not part of direct surface runoff or evapotranspiration infiltrates into the subsurface and contributes to soil moisture and ground water.

Within the bedrock aquifer system, ground water occurs in primary and secondary openings. Primary openings are pore spaces between sand, silt and clay grains formed at the time of sediment



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depositions. Primary permeability is the ability of water to move between pore spaces. In this area, primary permeability is very low and limited ground water movement occurs in hard or soft rocks as a result of primary openings (Stoner 1983, Siplivy 1992).

Secondary porosity and permeability is formed by fractures or partings in the rock mass. Most available ground water in the application area occurs within the first 100 feet below the surface within these secondary openings and the success of a water well in terms of yield potential is dependent upon the well encountering water filled fracture zone(s) that transmit enough water to the well bore to meet the well's intended use (Schmitt et al, 1983; Waite, 1987).

Fractures are not ubiquitous in the area, however, and are not interconnected over large areas. For these reasons, it is very difficult to identify aquifers over large areas and the ground water flow system tends to be made up of small, localized fracture controlled systems. While fractures in hard rocks tend to stay open better than fractures in soft rock, the horizontal and vertical variability of even the hard rock units tend to produce hydraulically isolated areas.

In addition, fractures tend to close at increasing depths due to overlying lithostatic pressures, thereby limiting the effective depth of the ground water flow system (Stoner, 1983). This condition is evident throughout the Powhatan No. 6 Mine. The mine, in general, is very dry with very minor amounts of water inflow limited to the low cover areas (generally less than 200 feet). The overburden thickness in the application area ranges from 300 feet to 535 feet. No water inflow into the mine is expected in this application area.

Based on an evaluation of the geologic units presently supplying water to wells or springs in the Application Area, four aquifer units have been identified within the D-0360-13 hydrologic boundary. These units, which are also outlined on Form 14B of this application, are summarized below:

**Aquifer A: Unconsolidated Material**

Includes the layer of weathered bedrock above solid bedrock and unconsolidated deposits along stream valleys.



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**Aquifer B: Washington No. 12 Cyclothem**

Includes the rock sequence from the Washington Coal Bed to the surface of the consolidated bedrock. Occurs from approximately 350 feet to 500 feet above the No. 8 Pittsburgh Coal Bed.

**Aquifer C: Waynesburg No. 11 Cyclothem**

Includes the rock sequence from the Waynesburg No. 11 Coal Bed to the Washington No. 12 Coal Bed. Occurs from approximately 250 feet to 350 feet above the No. 8 Pittsburgh Coal Bed.

**Aquifer D: Sewickley No. 9 Cyclothem**

Includes the rock sequence from the Sewickley No. 9 Coal Bed to the Waynesburg No. 11 Coal Bed. Occurs from approximately 90 feet to 250 feet above the No. 8 Pittsburgh Coal Bed.

These units are only recognized as aquifers where they occur within 100 feet of the surface where secondary porosity and permeability is greatest.

## WATER SUPPLIES

The water supplies that serve domestic and agricultural needs have been inventoried within the hydrologic boundary of the Application Area. The Application Map illustrates the location of these supplies. ATTACHMENT 14C lists both the used and unused supplies identified in the Application area. Only the used supplies are discussed in the PHC.

There are no impacts to any of the used or unused supplies that serve domestic and agricultural areas as a result of the mining within this application area.

In addition, used ponds are shown on Attachment 14D.



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## EVALUATION OF HYDROLOGIC IMPACT IN PREVIOUSLY MINED AREAS

### Literature Review

Since 1972, when the Powhatan No. 6 Mine was opened, considerable research has been conducted relative to the impacts on the ground water flow system by longwall mining in the western Pennsylvania, northern West Virginia and southeastern Ohio areas. This literature database was reviewed as a guide to selecting those variables pertinent to predicting the hydrologic consequences of mining in the application area. An annotated bibliography of this literature is provided as the end of this report.

Stoner (1983); Rauch (1984); Cifelli (1986); and Dixon et al. (1988 & 1990) explored the relationship between overburden thickness and effects on ground water levels. In general, a conclusion was drawn that there is an inverse relation between overburden thickness and detrimental impacts to water levels. Aquifers less than 200 feet above longwall mines are more likely to be partially dewatered than aquifers greater than 200 feet above the mine.

The importance of rock fracturing was investigated by Dixon et al. (1990), Parizek (1971), Schubert (1980), and Stoner (1983). The studies concluded that secondary rock fractures have a major influence on ground water occurrence and movement. In addition, Rauch (1984), determined that rock lithology of the overburden material was important in evaluating hydrologic impacts of mining. In general, the presence of a high percentage of soft rocks such as shale, clay, and mudstones minimizes negative impacts.

Walker (1988) and Leavitt et al. (1992) indicated the position of the water supply over the longwall panel affected the degree of hydrologic impact. In general, the greatest water level declines occurred directly over the panels and decreased away from the panels. Water wells outside the angle of draw were generally unaffected.

Leavitt et al. (1992) found a strong correlation between topographic position and water level declines over longwall mines. In general, where overburden thickness exceeded 300 feet, the greatest impacts occurred in hilltop wells and springs, a lesser impact was noted in hillside wells and springs and the least impacts were noted in valley bottom wells and springs.



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Leavitt et al. (1992) and Tieman et al. (1986) made a correlation between hydrologic base level and water level declines. In general, the closer the bottom of the well (or spring) is to the local hydrologic base level, the less severe and less permanent is the impacts. However, Leavitt noted that base level and topographic position are similar variables and topographic position proved to be a more reliable variable in predicting hydrologic impacts.

These variables, which include overburden thickness, local rock lithology, position over the longwall mining panel, topographic position and local hydrologic base level, are used here to evaluate the potential hydrologic impacts in the application area.

**Quantity Impacts In Previously Mined Areas**

The monitoring data from wells and springs in the previously mined areas at the Powhatan No. 6 mine indicate that there will be no impacts to wells or springs from gate entry development. Earlier water losses in room-and-pillar areas were due to unplanned subsidence where the safety factor for the pillars was not high enough. Safety factors for the gate entry pillars are well above 2:1, and no subsidence or water loss is anticipated from this operation.
A similar evaluation was performed for the developed springs that were undermined in the previously mined areas of the Powhatan No. 6 Mine. No impacts were observed from gate entry development.

Hydrographs are presented for one developed spring and four wells undermined or adjacent to main or gate development entries. In each case, there was no impact from being mined under by the development entries. No impacts to water quantity in the D-0360-13 application area are anticipated.

**Quality Impacts In Previously Mined Areas**

The water quality effects of gate entry development areas do not vary from pre-mining levels due to the mining of development (mains and gate) entries. Table 1 shows water quality before and after being mined by development entries. No impacts to water quality in the D-0360-13 application area are anticipated.



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**TABLE 1 - D-0360-13 PHC**
**THE OHIO VALLEY COAL COMPANY**
**POWHATAN NO. 6 MINE**
**PERMIT D-0360**
**SOURCES UNDERMINDED BY DEVELOPMENT ENTRIES**

| | Site ID | Field pH SU | Lab pH SU | Tot. Acidity mg/l | Tot. Alk. mg/l | Tot. Iron mg/l | Tot. Mn mg/l | Tot. TSS mg/l | Hardness mg/l | Tot. Sulfate mg/l | Spec. Cond. µmho/cm | Tot. Nitrates mg/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PRE-MINING AVG. | W-345 | 7.2-7.6 | 7.22-7.65 | 18.16 | 194.00 | 0.17 | 0.02 | 0.26 | 240.00 | 47.60 | 500.00 | 1.22 |
| POST-MINING AVG. | W-345 | 7.2-7.5 | 7.58-7.74 | 14.98 | 190.00 | 0.14 | 0.00 | 1.13 | 245.00 | 48.00 | 572.50 | 1.41 |
| | | | | | | | | | | | | |
| PRE-MINING AVG. | W-343 | 7.5-8.4 | 7.13-8.16 | 17.17 | 265.00 | 3.09 | 0.30 | 113.67 | 346.67 | 40.00 | 1043.33 | 0.47 |
| POST-MINING AVG. | W-343 | 7.1-7.5 | 7.16-7.82 | 16.37 | 220.00 | 6.30 | 0.58 | 296.43 | 560.00 | 49.33 | 1333.33 | 0.43 |
| | | | | | | | | | | | | |
| PRE-MINING AVG. | W-344 | 6.9-7.4 | 7.08-7.6 | 11.04 | 152.00 | 0.51 | 0.01 | 0.66 | 152.00 | 30.60 | 340.00 | 0.29 |
| POST-MINING AVG. | W-344 | 7.1-7.3 | 7.32-7.77 | 12.33 | 216.67 | 0.47 | 0.06 | 18.33 | 293.33 | 40.67 | 800.00 | 0.16 |
| | | | | | | | | | | | | |
| PRE-MINING AVG. | DS-107 | 7.2-7.3 | 7.36-7.56 | 13.00 | 225.00 | 0.04 | 0.00 | 0.00 | 265.00 | 51.50 | 485.00 | 2.80 |
| POST-MINING AVG. | DS-107 | 7.1-7.4 | 7.12-7.39 | 22.00 | 217.50 | 0.42 | 0.03 | 9.50 | 262.50 | 49.75 | 460.00 | 2.23 |
| | | | | | | | | | | | | |
| PRE-MINING AVG. | DW-227 | 7.2-7.3 | 7.27-7.58 | 16.00 | 215.00 | 0.36 | 0.05 | 2.31 | 345.00 | 107.00 | 715.00 | 2.35 |
| POST-MINING AVG. | DW-227 | 6.7-7.3 | 6.87-7.48 | 25.48 | 220.00 | 0.62 | 0.22 | 44.90 | 325.00 | 139.80 | 693.00 | 2.43 |

## PROBABLE HYDROLOGIC CONSEQUENCES SUMMARY

### Surface Water

Based on a review of past data collected at the Powhatan No. 6 Mine, no surface water impacts are anticipated since there will be no subsidence associated with main or gate entry development mining.

### Ground Water

The data from earlier mined areas shows that there are no impacts from main or gate entry development mining. Water impacts are only evident when an area is subsided, and no subsidence from mining is anticipated in this application area.

### Post Mining Water Breakouts

The area with the lowest cover is located in the middle-east portion of Application Area D-0360-13, in the Williams Creek valley. The lowest surface elevation in the Application Area is approximately 1070 feet msl. The maximum coal elevation in the Application Area is approximately 800 feet msl. or 270 feet below the lowest surface elevation. The lowest surface opening elevation for the entire Powhatan No. 6 Mine is 847 feet msl. The maximum coal elevation in Application Area D-0360-13 is approximately 800 feet msl. or 47 feet below the lowest surface opening. The highest coal elevation in the Powhatan No. 6 Mine is approximately 845 msl. or 2 feet below the lowest surface opening in the Powhatan No. 6 Mine. The 845 foot coal elevation is located in the D-0360-7 Application Area to the north of the D-0360-13 area. No post mining water breakouts are predicted to occur due to mining in the D-0360-13 area.

### Water Supplies

The potential impacts on the used water supplies by mining have been evaluated based on monitoring of springs and wells located over the D-0360 approved mining areas and a review of pertinent literature.



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Since there will be no subsidence associated with gate entry development mining, there are no impacts anticipated from mining within the D-0360-13 application area. The data clearly shows that impacts only occur when subsidence occurs.

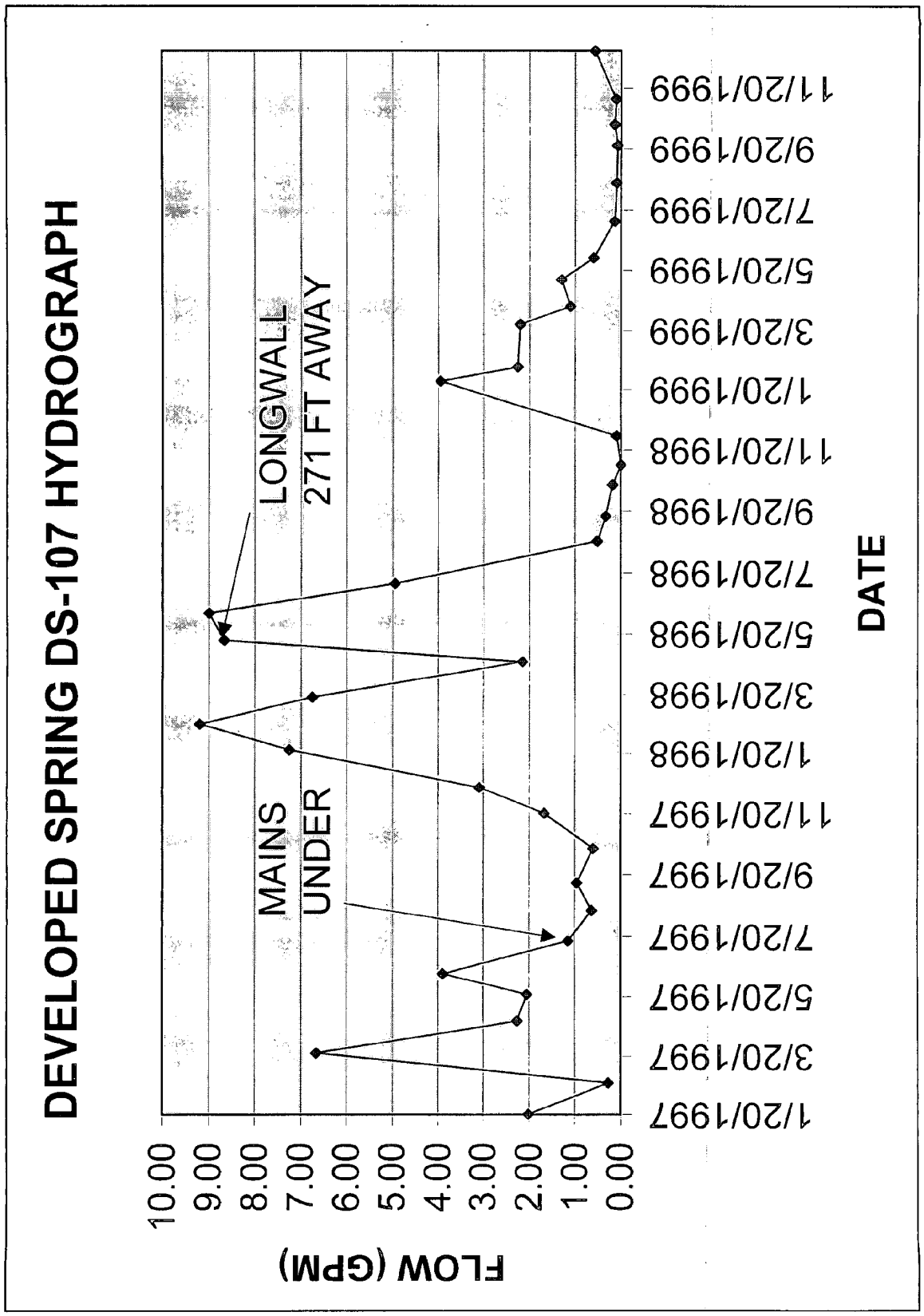


TOVCC 11894

**APPENDIX A**

Powhatan No. 6 Mine

Well and Spring Hydrographs


DEVELOPED SPRING DS-107 HYDROGRAPH
FLOW (GPM)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
MAINS UNDER
LONGWALL 271 FT AWAY
1/20/1997
3/20/1997
5/20/1997
7/20/1997
9/20/1997
11/20/1997
1/20/1998
3/20/1998
5/20/1998
7/20/1998
9/20/1998
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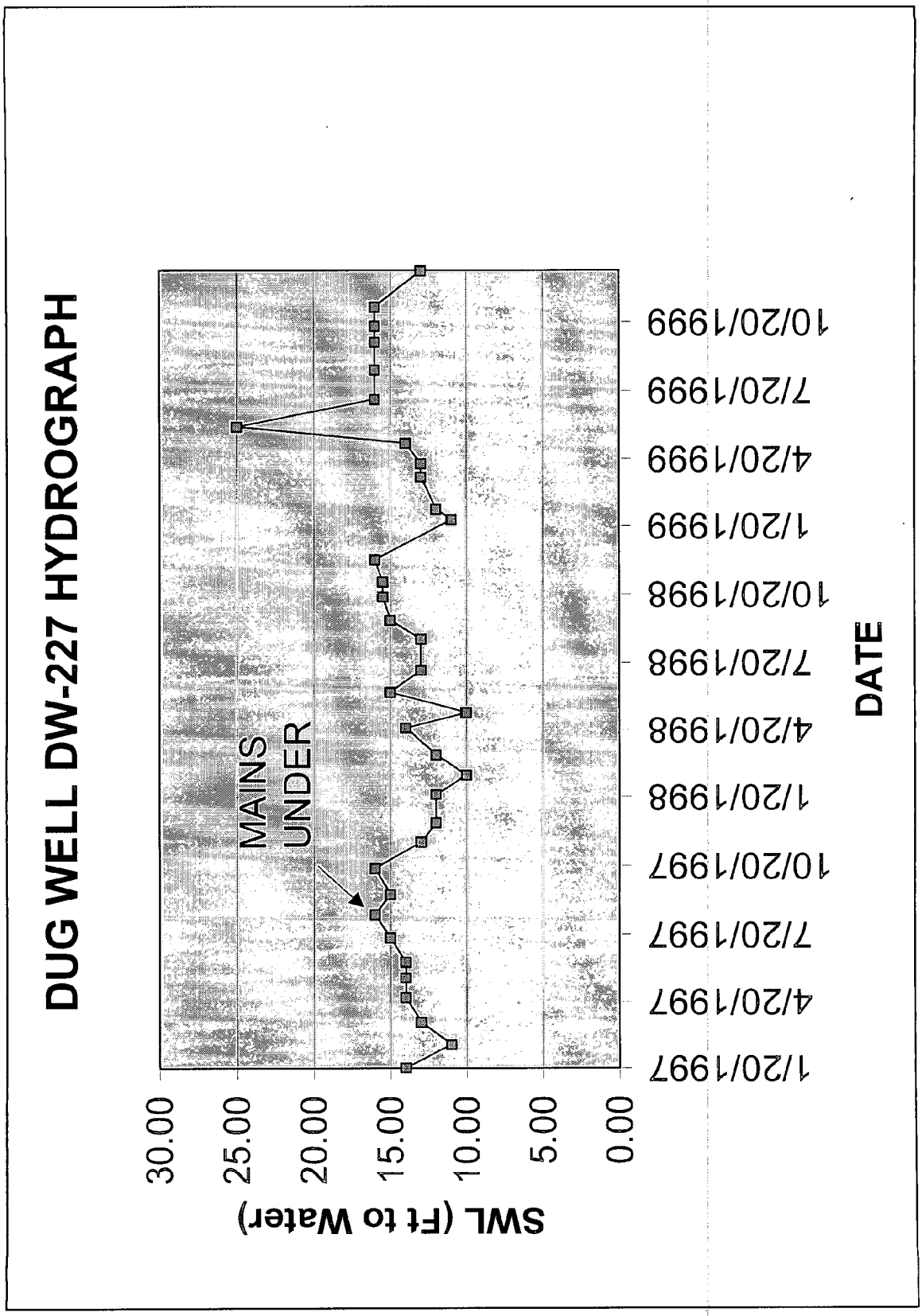
7/20/1999
9/20/1999
11/20/1999
DATE


DUG WELL DW-227 HYDROGRAPH
MAINS UNDER
SWL (Ft to Water)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1/20/1997
4/20/1997
7/20/1997
10/20/1997
1/20/1998
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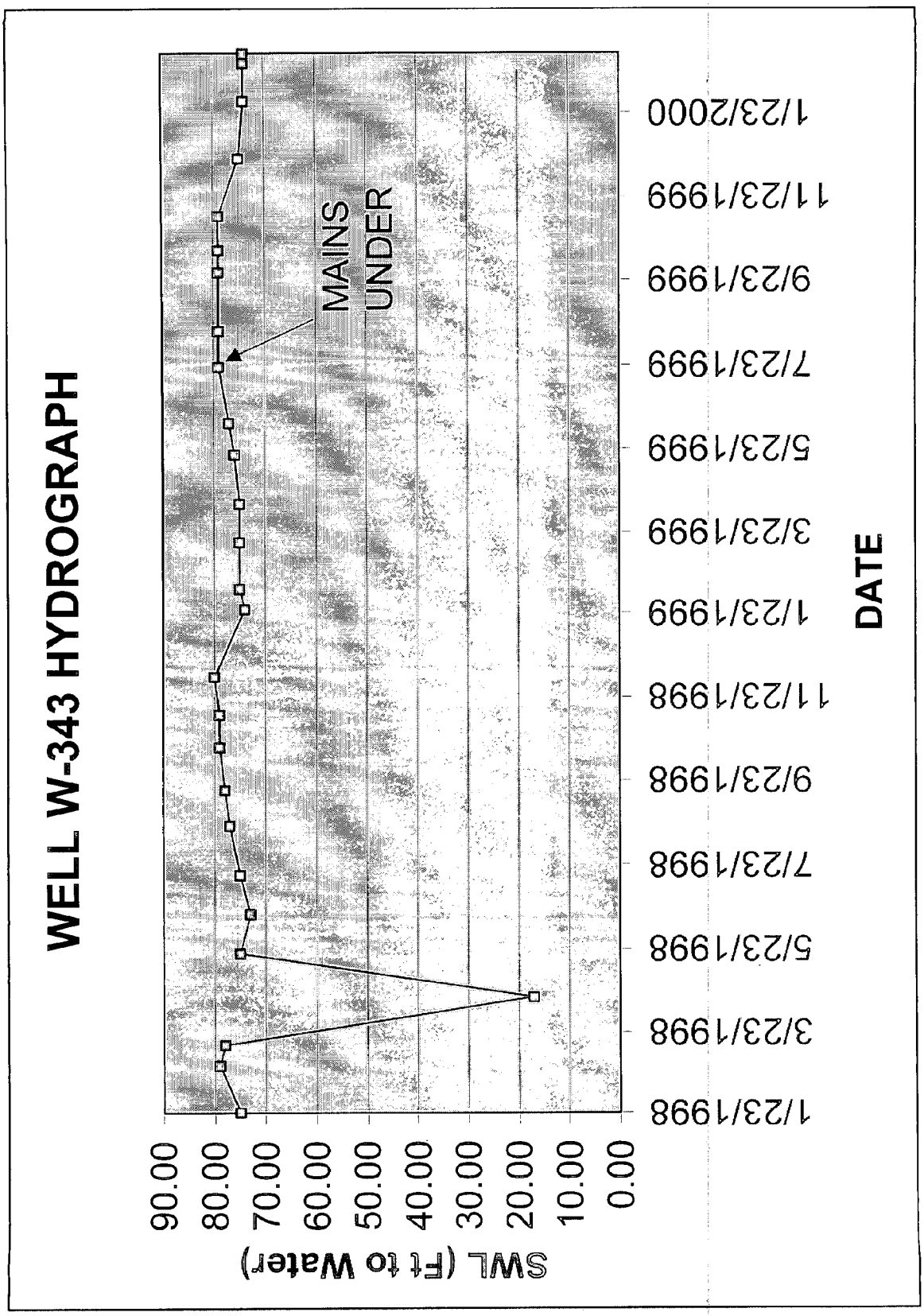
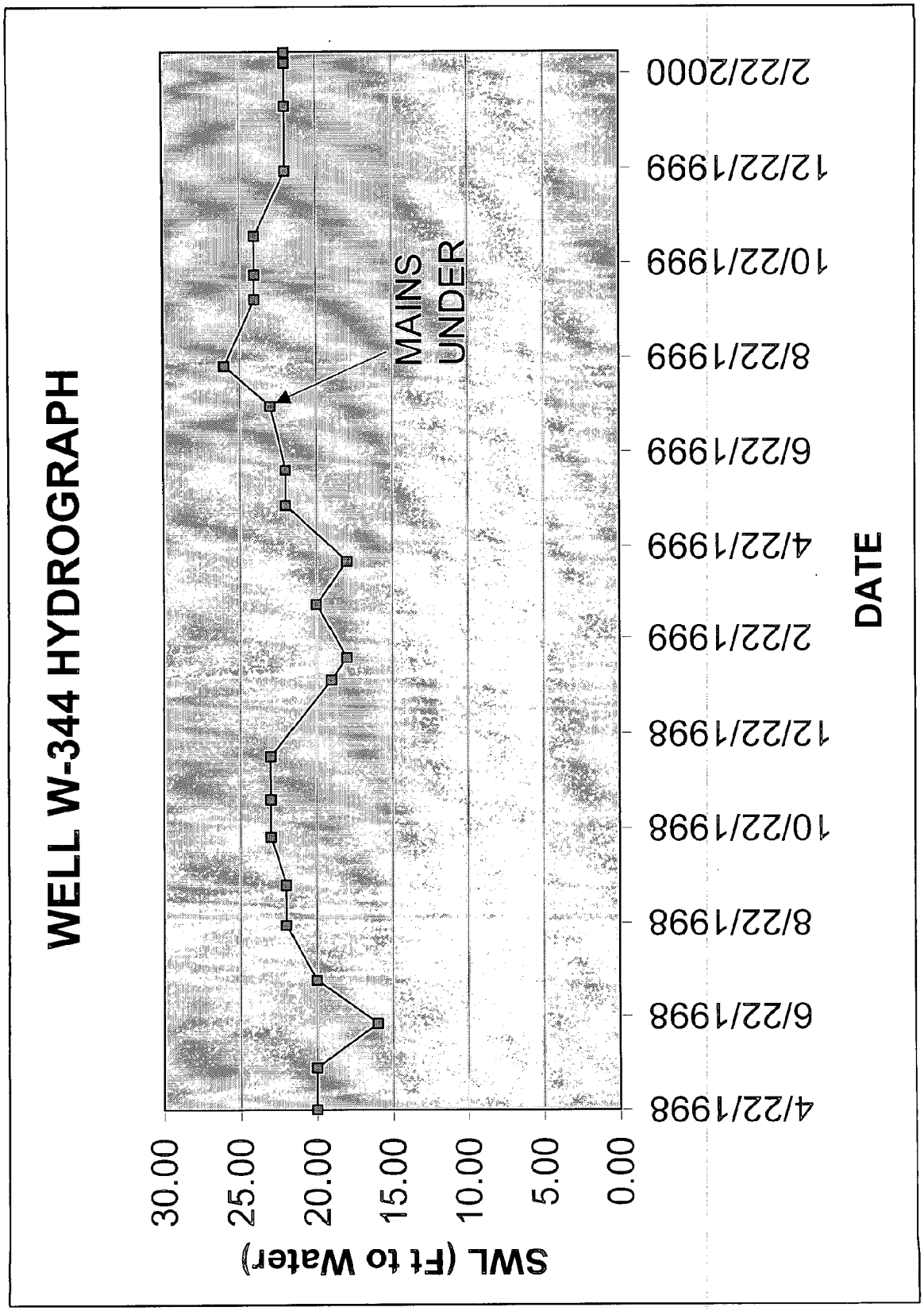
7/20/1999
10/20/1999
DATE


WELL W-343 HYDROGRAPH
SWL (Ft to Water)
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
1/23/1998
3/23/1998
5/23/1998
7/23/1998
9/23/1998
11/23/1998
1/23/1999
3/23/1999
5/23/1999
7/23/1999
9/23/1999
11/23/1999
1/23/2000
DATE
MAINS UNDER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25.00
20.00
15.00
10.00
5.00
0.00
4/22/1998
6/22/1998
8/22/1998
10/22/1998
12/22/1998
2/22/1999
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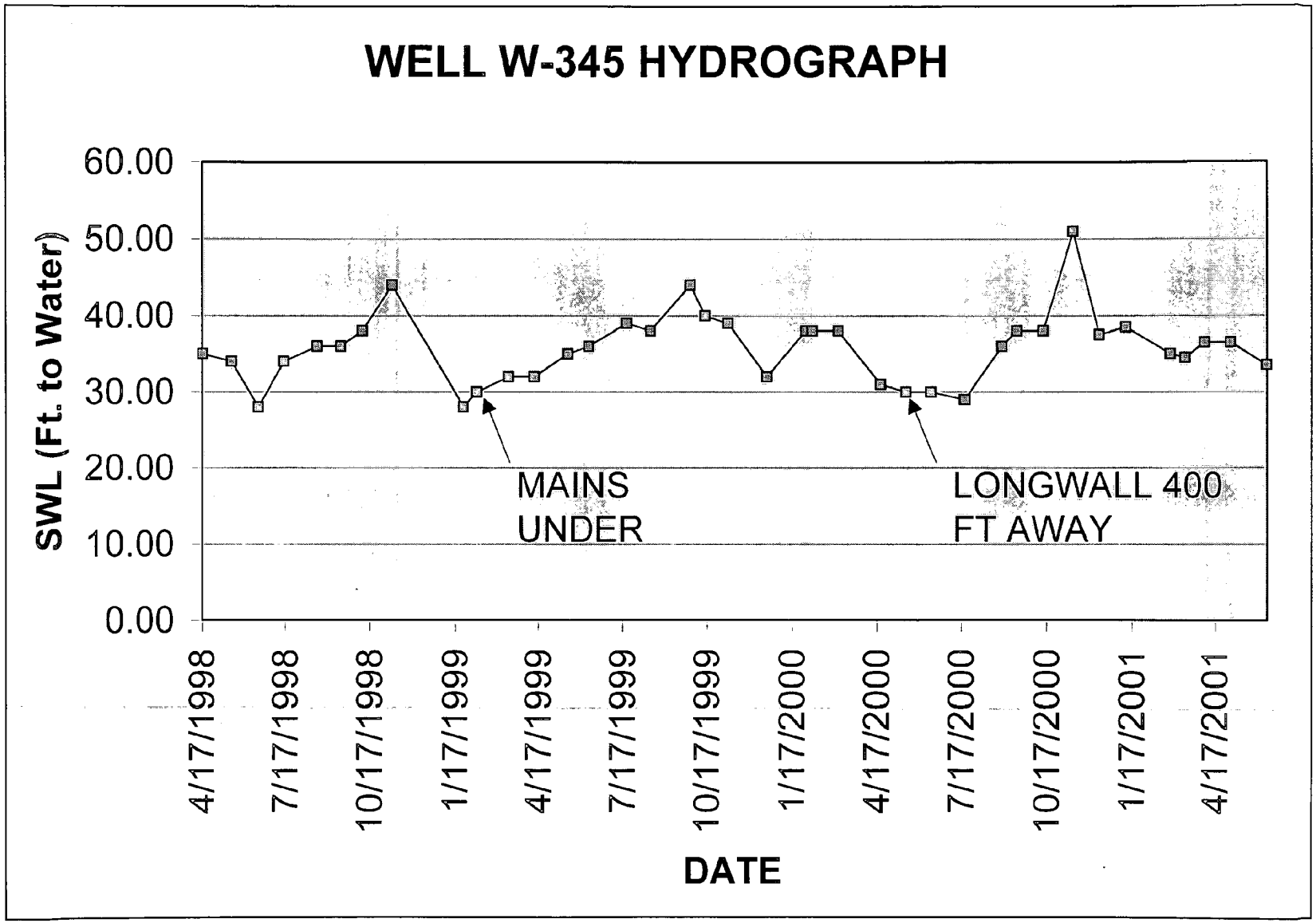
8/22/1999
10/22/1999
12/22/1999
2/22/2000
MAINS UNDER
DATE


WELL W-345 HYDROGRAPH
SWL (Ft. to Water)
60.00
50.00
40.00
30.00
20.00
10.00
0.00
MAINS
UNDER
LONGWALL 400
FT AWAY
4/17/1998
7/17/1998
10/17/1998
1/17/1999
4/17/1999
7/17/1999
10/17/1999
1/17/2000
4/17/2000
7/17/2000
10/17/2000
1/17/2001
4/17/2001
DATE

ADDENDUM TO PAGE 18, PART 2, F(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## DEVELOPED SUPPLIES OF GROUND AND SURFACE WATER THAT MAY BE IMPACTED AS A RESULT OF THE PROPOSED OPERATION

Of the supplies listed in Attachment 14C and 14D, no impacts to any water supply are expected as a result of the proposed operation. According to the PHC, these sources will not be impacted.

# TABLE A

*Addendum to Page 18, Part 2, F(1)*

Ohio Valley Coal Company
Application Area D-0360-13

Well Data Predicted Hydrologic Impacts Summary

| Source | Surface Elevation | Well Depth | Bottom Elevation | Coal Elevation | Overburden Depth surface | Overburden Depth well bottom | Percent soft rock | Topo Position | Panel Position | Distance to Nearest Panel Edge | Use |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W 167 | 1105 | 96 | 1009 | 765 | 340 | 244 | 70.7 | Hillside | Quarter Panel | 200 | Domestic |
| W 168 | 1112 | 62 | 1050 | 775 | 337 | 275 | 52 | Valley Bottom | Quarter Panel | 160 | Domestic |
| DW 169 | 1100 | 25 | 1075 | 775 | 325 | 300 | 52.5 | Valley Bottom | Quarter Panel | 160 | Domestic |
| DW 173 | 1166 | 25 | 1141 | 770 | 396 | 371 | 51.1 | Hilltop | Outside | 210 | Occasional Domestic |
| W 174 | 1117 | 101 | 1016 | 770 | 347 | 246 | 51 | Hilltop | Outside | 560 | Domestic |
| W 294 | 1125 | 57 | 1068 | 775 | 350 | 293 | 52.5 | Valley Bottom | Quarter Panel | 80 | Domestic |
| W 315 | 1280 | 88 | 1192 | 775 | 505 | 417 | 74.2 | Hilltop | Gate | 40 | Domestic |
| DW 318 | 1294 | 18 | 1276 | 775 | 519 | 501 | 74.2 | Hilltop | Mid Panel | 240 | Domestic |
| W 323 | 1138 | 120 | 1018 | 775 | 363 | 243 | 52.5 | Hillside | Quarter Panel | 120 | Domestic |
| W 374 | 1285 | 51 | 1234 | 810 | 475 | 424 | 81 | Hilltop | Outside | 1340 | Domestic |
| W 396 | 1305 | 70 | 1235 | 785 | 520 | 450 | 81 | Hilltop | Mid Panel | 340 | Domestic |
| WL 397 | 1310 | 51 | 1259 | 780 | 530 | 479 | 81 | Hilltop | Mid Panel | 290 | Domestic |
| WL 398 | 1303 | 60 | 1243 | 780 | 523 | 463 | 81 | Hilltop | Gate | 40 | Domestic |
| DW 408 | 1305 | 33 | 1272 | 780 | 525 | 492 | 81 | Hilltop | Outside | 100 | Domestic |

## TABLE B

*Addendum to Page 18, Part 2, F(1)*

Ohio Valley Coal Company
Application Area D-0360-13

Spring Data Predicted Hydrologic Impacts Summary

| Source | Surface Elevation (feet) | Coal Elevation (feet) | Overburden Depth (feet) | Percent soft rocks | Topo Position | Panel Position | Distance to Nearest Panel Edge (feet) | Use |
|---|---|---|---|---|---|---|---|---|
| DS 278 | 1230 | 780 | 450 | 81 | Hillside | Quarter Panel | 180 | Livestock |
| DS 285 | 1190 | 800 | 390 | 81 | Hillside | Outside | 940 | Domestic |
| DS 289 | 1190 | 810 | 380 | 81 | Hillside | Outside | 940 | Livestock |
| DS 226A | 1173 | 770 | 403 | 51.1 | Hilltop | Outside | 500 | Livestock |
| DS 226B | 1173 | 770 | 403 | 51.1 | Hillside | Outside | 830 | Livestock |

TOVCC 11903

ADDENDUM TO PAGE 18, PART 2, F(2)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## ALTERNATIVE WATER SUPPLY INFORMATION

### Adjacent Areas Above Partial Recovery Mining

The PHC contained in this application indicate a low potential for diminution and/or interruption of ground water supplies in areas above and contiguous to full recovery mining operations. No contamination of such water supplies is expected. In the highly unlikely event that a utilized source is disrupted or contaminated, the following plan will be utilized.

Notwithstanding its mining rights and without waiving any of its mining rights, where water diminution, contamination, or interruption results from its mining, The Ohio Valley Coal Company will repair or install a replacement source in the adjacent area at its own expense in a manner mutually satisfactory to OVCC, the water user, and the Division of Mineral Resources Management, and to a level sufficient to meet the water user's pre-mining quantity and quality levels which will be determined by monitoring information gathered in accordance with the Monitoring Plan. While it will be the policy of OVCC to replace a water source, payment of water bills will be the responsibility of the water user, unless otherwise agreed upon by OVCC and the water user.

The steps which OVCC would take to repair or replace affected water sources in the adjacent area include:

1. Repair damaged cisterns after OVCC has determined that damage is complete;

2. On a site specific basis, re-drill existing wells, drill new wells, or connect the water user to public water supplies (if no public water supply exists, OVCC may install a line of sufficient size to service those affected by OVCC's mining operation);

3. On a site specific basis, developed springs will be replaced by a farm pond built according to accepted engineering practices, drilling of a new well, development of another spring in close proximity to the original spring, or connect the water user to public water supplies (if no public water supply exists, OVCC may install a line of sufficient size to service those affected by OVCC's mining operation);

4. Repair damaged farm ponds so as to be comparable to their pre-mining conditions;

5. Install an interim water supply until affected water supplies are replaced. Interim supplies may include hauled water or a tap to public water. OVCC will only install temporary, replacement water using a public water supply if it can be connected within 48 hours. OVCC routinely uses the local fire department to haul county water for temporary replacement supplies. This practice is expected to continue. The local fire department can haul water within a matter of hours after receiving a request. Temporary tanks and water troughs for livestock are kept in stock to facilitate quick installations. Payment of interim water bills shall be the responsibility of the OVCC.

6. Such other proven, cost effective, and reasonable techniques as OVCC may now, or in the future, deem appropriate.

It is OVCC's intention to bear the cost of the installation only of both interim and permanent replacement of developed water sources being used at the time of undermining. If contamination, diminution, or interruption of a water user's ground or surface water supply used for domestic use occurs as a proximate result of the mine's operation, OVCC will repair such water supply or install a replacement supply at OVCC's expense. OVCC will not be responsible for non-developed sources or developed sources not being used at the time of undermining. A source is considered to be developed if it has been fully developed (i.e., water delivery system and drinking facilities) and is well maintained such that it is usable at the time of undermining.

OVCC will install, at OVCC's expense, an alternate water supply system (within 48 hours) to be used until repair or replacement is completed or will reimburse the water user for the reasonable cost of obtaining a water supply from the date of any such contamination, diminution, or interruption until the supply is repaired or replaced. In cases where temporary water cannot be provided within 48 hours, OVCC will immediately notify the Chief of the Division of Mines and Reclamation who will determine if the circumstances warrant an extension of the 48 hours.

OVCC will provide the affected water user with no less of an available water supply than the water user had before mining, based on the pre-mining measurements. If required, OVCC will notify the Division of Mineral Resources Management immediately after it has been informed of the loss of developed water (ground or surface water) due to its mining activities.

As previously stated, the elevation of alternative water sources is unpredictable until the water system in the area again attains equilibrium after mining. Therefore, the alternative water supplies to be developed will be identified when the need arises.

4. Repair damaged farm ponds so as to be comparable to their pre-mining conditions;

5. Install an interim water supply until affected water supplies are replaced. Interim supplies may include hauled water or a tap to public water. OVCC will only install temporary, replacement water using a public water supply if it can be connected within 48 hours. OVCC routinely uses the local fire department to haul county water for temporary replacement supplies. This practice is expected to continue. The local fire department can haul water within a matter of hours after receiving a request. Temporary tanks and water troughs for livestock are kept in stock to facilitate quick installations. Payment of interim water bills shall be the responsibility of the OVCC.

6. Such other proven, cost effective, and reasonable techniques as OVCC may now, or in the future, deem appropriate.

It is OVCC's intention to bear the cost of the installation only of both interim and permanent replacement of developed water sources. If contamination, diminution, or interruption of a water user's ground or surface water supply used for domestic use occurs as a proximate result of the mine's operation, OVCC will repair such water supply or install a replacement supply at OVCC's expense. OVCC will not be responsible for non-developed. A source is considered to be developed if it has been fully developed (i.e., water delivery system and drinking facilities) and is well maintained such that it is usable at the time of undermining.

OVCC will install, at OVCC's expense, an alternate water supply system (within 48 hours) to be used until repair or replacement is completed or will reimburse the water user for the reasonable cost of obtaining a water supply from the date of any such contamination, diminution, or interruption until the supply is repaired or replaced. In cases where temporary water cannot be provided within 48 hours, OVCC will immediately notify the Chief of the Division of Mines and Reclamation who will determine if the circumstances warrant an extension of the 48 hours.

OVCC will provide the affected water user with no less of an available water supply than the water user had before mining, based on the pre-mining measurements. If required, OVCC will notify the Division of Mineral Resources Management immediately after it has been informed of the loss of developed water (ground or surface water) due to its mining activities.

As previously stated, the elevation of alternative water sources is unpredictable until the water system in the area again attains equilibrium after mining. Therefore, the alternative water supplies to be developed will be identified when the need arises.

Those supplies may include but not be limited to re-development of an existing well, spring, or pond, or replacement of the source with the County Water System. The County Water System has been contacted by OVCC and has assured us that there is capacity to replace each developed source with county water. A letter to that effect is enclosed.

If a water user believes that his or her underground or surface water source which is used for domestic use has been contaminated, diminished, or interrupted as a proximate result of the mine's operation, he or she should notify OVCC by calling (614) 926-1351. (After normal business hours, dial extension 221) OVCC will make a determination of liability no later than sixty (60) days after notification of the contamination, diminution, or interruption of a water supply as a proximate result of the mine's operation.

Work on installing a temporary alternate water supply will be complete within 48 hours (unless an extension of the 48 hour time frame is granted by the Chief) after OVCC learns of the contamination, diminution, or interruption to a domestic-use water supply proximately caused by the mining operation. OVCC will pay for installation costs only for a temporary, alternate water supply. Permanent repair or the installation of a replacement water supply for an affected water supply shall be completed no later than eighteen (18) months after it has been determined that the supply has been contaminated, diminished, or interrupted as a proximate result of the mine's operation. The costs of repair of the original water supply and/or the installation of a replacement supply system to provide the affected water user with no less of an available water supply than was being used before mining, based on the pre-mining measurements, shall be paid for by OVCC. If the water user opts to do so, he may install his own temporary water supply system. OVCC will reimburse the water user for the costs of installing a temporary water supply system. Payment for domestic water will be the responsibility of the water user unless otherwise agreed upon by OVCC and the water user.

In repairing or replacing a water user's ground or surface water supply system used for domestic use which is damaged as a proximate result of the mine's operation, OVCC's first preference is to repair the affected supply system. If that is neither effective nor feasible, OVCC's second preference is to replace the affected supply system with a like supply system. For example, a damaged pond, if not repairable, would be replaced with a new pond. If that is not feasible, OVCC will replace the affected supply system with a similar supply system. For example, a damaged dug well, if not repairable or replaceable with another dug well, would be replaced by a potable-type cistern, a drilled well or a similar supply system.

It should be recognized that property sites differ in such elements as geologic and hydrologic composition. Thus, the determination of whether repair of an affected water supply system is feasible or whether replacement by a specific type of water supply system is feasible must be made on a case-by-case, site-specific basis by OVCC. OVCC, in the past, has always attempted to consult and negotiate with the affected water user concerning the selection of the type of water replacement system and its site. This is done at the request of water users who prefer this procedure to that of

OVCC making unilateral decisions about replacement supplies and sites. However, OVCC, if required by the Division of Mineral Resources Management, will make these decisions unilaterally.

In some cases, OVCC reaches pre-subsidence agreements with water users, who are normally represented by counsel and in all cases, have full opportunity to consult with counsel or anyone else of their choosing. These agreements, which are typically negotiated by OVCC employees, normally cover all potential damage claims. In situations where such an agreement is reached, OVCC will comply with the water replacement terms contained in the agreement. Such an agreement will satisfy, at a minimum, this permit and ORC 1513.162.

In any situation where OVCC determines that the contamination, diminution, or interruption of a water supply was not proximately caused by the mining operation, based on evidence such as the proximity of the supply to the mining operation, site specific geologic and surface conditions, or climatological conditions, OVCC will provide the Division of Mineral Resources Management with notice of its determination and the proof in support of that determination to allow the Division of Mineral Resources Management to issue a Chief's Order deciding the issue. This Chief's Order is then appealable in accordance with O.R.C. §1513.13. The water user's water supply system will continue in operation during the time OVCC seeks review of this matter pursuant to O.R.C. §1513.13. If it is determined that contamination, diminution, or interruption of a supply is the proximate result of the mine's operation, OVCC shall bear the costs of installing temporary water system. OVCC reserves the right to proceed against the water user to recover costs incurred if it is determined that OVCC is not liable for the contamination, diminution, or interruption of the affected water supply.

ADDENDUM TO PAGE 17, C
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

GROUNDWATER INFORMATION

See Addendum to Page 17, C(1) in Application D-0360-7.

ADDENDUM TO PAGE 18, PART 2, F(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## DEVELOPED SUPPLIES OF GROUND AND SURFACE WATER THAT MAY BE IMPACTED AS A RESULT OF THE PROPOSED OPERATION

Of the supplies listed in Attachment 14C and 14D, no impacts to any water supply are expected as a result of the proposed operation. According to the PHC, and since there will be no subsidence associated with this application area, these sources will not be impacted.

G. **LAND USE INFORMATION-Permit Area**

(1) Describe the uses of the land within the proposed permit area existing at the time of the filing of this permit application and provide a map which delineates the area of each land use.

N/A - No Permit Area

(2) Was the land use described in item G(1) above changed within five years before the anticipated date of beginning this proposed mining operation? _____ Yes, _____ No. If "yes," submit an addendum describing the historic use of the land.

N/A - No Permit Area

(3) Analyze the capability of the land within the proposed permit area before any mining to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover, and hydrology of the proposed permit area.

N/A - No Permit Area

(4) Analyze the productivity of the land within the proposed permit area before any mining to include average yields obtained under high level of management.

N/A - No Permit Area

(5) Is any land within the proposed permit area classified as prime farmland? _____ Yes, _____ No.

N/A - No Permit Area

(6) Submit an addendum describing the use of the land within the permit area, including the creation of permanent water impoundments, that is proposed to be made of the land following reclamation, including information regarding the utility and capacity of the reclaimed land to support a variety of alternative uses. N/A - No Permit Area

(7) Are there existing land use classifications under local law of the proposed permit area? _____ Yes, _____ No. If "yes," describe the land use classification and submit as an addendum to the permit application, the comments of the governmental agency which would have to initiate, implement, approve or authorize the proposed use of the land following reclamation. If "no," describe the sources of information on which the determination was made.

N/A - No Permit Area

G. (8) Submit as an addendum a copy of the comments from the legal or equitable owner of record of the surface of the proposed permit area concerning the proposed land use.

N/A - No Permit Area

(9) Describe the consideration which has been given to making all of the proposed coal mining activities consistent with surface owner plans and applicable state and local land use plans and programs.

N/A - No Permit Area

(10) Describe how the proposed land use is to be achieved and the necessary support activities that may be needed to achieve the proposed land use.

N/A - No Permit Area

(11) Is the postmining land use to be different from the premining land use? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, the plans and findings required by paragraph (D) of rule 1501:13-9-17 of the Administrative Code.

N/A - No Permit Area

(12) Has the proposed permit area been previously mined? _____ Yes, _____ No. If "yes," provide the following information, if available. N/A No Permit Area

(a) Type of mining method _____

(b) Coal seam mined _____

(c) Non coal mineral mined _____

(d) Extent of mining (acres) _____

(e) Approximate dates _____

(f) Land use preceding mining _____

H. <u>PRIME FARMLAND INVESTIGATION-Permit Area</u>

(1) Does the proposed permit area include any land that is prime farmland, taking into consideration the negative determinations listed in paragraph (L)(2) of rule 1501:13-4-13 of the Administrative Code?
_____ Yes, _____ No. N/A No Permit Area

(2) If the response to item H.(1) is "yes," submit Attachment 15.

(3) If the response to item H.(1) is "no," submit Attachment 16.

PART 3 RECLAMATION AND OPERATIONS PLAN

A. GENERAL REQUIREMENTS-**Permit Area** (Items A.(1) and A.(2)-**Permit and Underground Workings)**

(1) Submit an addendum describing the type and method of coal mining procedures for this application. Explain how these procedures will maximize the use and conservation of the coal resources. Room and Pillar areas will mine the maximum amount of coal and still provide for no subsidence.

(2) Indicate the anticipated annual and total production of coal from this proposed operation.

Annual 5.0 million Total 25 million

(3) Will this operation be combined with surface coal mining activities to the extent that contemporaneous reclamation of areas disturbed by surface mining will be delayed or such that the underground workings will be within 500 feet of the surface mining activities? _____ Yes, _____ No. If "yes," submit Attachment 30.

N/A - No Permit Area

(4) Are experimental mining practices to be employed in the proposed mining operations? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, the description, maps, and plans required by paragraph (B) of rule 1501:13-4-12 of the Administrative Code.

N/A - No Permit Area

(5) Are mountaintop removal mining practices to be employed in the proposed mining operations? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application the information required by paragraph (C) of rule 1501:13-4-12 of the Administrative Code.

N/A - No Permit Area

(6) Are the natural pre-mining slopes within the permit area in excess of twenty (20) degrees? _____ Yes, _____ No. If "yes," submit an addendum demonstrating compliance with the steep slope mining provisions of paragraph (D) of rule 1501:13-4-12 and 1501:13-13-05 of the Administrative Code.

N/A - No Permit Area

(7) Is augering proposed within the permit area? _____ Yes, _____ No. If "yes," submit Attachment 18.

N/A - No Permit Area

(8) Are variances from approximate original contour to be employed for the proposed underground mining surface operations? _____ Yes, _____ No. If "yes," submit an addendum to the permit application demonstrating compliance with paragraph (E) and/or (K) of rule 1501:13-4-12 of the Administrative Code.

N/A - No Permit Area

ADDENDUM TO PAGE 21, PART 3, A(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

MINING METHODS

This application area will be mined by partial recovery methods. Pillars will be sized sufficiently to maintain a high factor of safety for long-term standup of the pillars (see the Addendum to Page 29, K(4).

A. (9) Will access to the underground workings be gained through a drift entry? _____ Yes, _____ No. If "yes," provide as an addendum sufficient information to determine the location of the entry relative to the highest elevation of the coal reserve. Is the drift entry located so as to eliminate the potential for a gravity discharge? _____ Yes, _____ No. If "no," the applicant must demonstrate that the coal seam is not acid or iron producing. Provide an analysis of the strata immediately above and below the coal, and the coal seam itself, sufficient to demonstrate that the water quality from the entry will meet effluent limitations without treatment.

N/A - No Permit Area

(10) For entries to underground workings other than drift entries, provide as an addendum sufficient information to determine the location of the entry relative to the coal reserve. Are the entries located so as to eliminate the potential for a gravity discharge? _____ Yes, _____ No. If "no," provide the following demonstration: N/A - No Permit Area

(a) the gravity discharge will meet effluent limitations without treatment, or

(b) the water will be treated to meet effluent limitations and provisions will be made for consistent maintenance of the treatment facility throughout the anticipated period of gravity discharge.

(11) Will the permanent entry seals be designed to withstand the maximum anticipated hydraulic head when the operations are abandoned? _____ Yes, _____ No. If "yes," submit the appropriate information demonstrating that this will be accomplished. If "no," provide a typical plan for the seals to be used to close the mine entries pursuant to applicable state and federal regulations. N/A - No Permit Area

(12) Submit an addendum describing the construction, modification, maintenance, and removal (unless to be retained for postmining land use), including the proposed engineering techniques and major equipment to be used, of the following facilities:

(a) dams, embankments, and other impoundments. Do any of the plans for water, sediment or slurry impoundments meet the requirements of 30 CFR 77.216? _____ Yes, _____ No. If "yes," submit as an addendum a plan that addresses each of the requirements in 30 CFR 77.216-2.

(b) overburden and topsoil handling and storage areas and structures.

N/A - No Permit Area

A. (12) (c) coal removal, handling, storage, cleaning, and transportation areas and structures; including, but not limited to, preparation plants, beltlines, tipples, rail sidings, and primary roads. For roads, conveyors and rail systems, submit an addendum describing the information required pursuant to paragraph (L) of rule 1501:13-4-14 and 1501:13-10-01 of the Administrative Code.

N/A - No Permit Area

(d) spoil removal, handling, storage, transportation, and disposal areas and structures, including underground development waste or excess spoil disposal sites. If underground development waste or excess spoil is to be generated, submit an addendum describing the information required by paragraphs (O) and (P) of rule 1501:13-4-14 and 1501:13-9-07 of the Administrative Code.

N/A - No Permit Area

(e) mine facilities such as portal/shaft development, boreholes, de-gas holes, vents, office or shop buildings and maintenance facilities.

N/A - No Permit Area

(f) water and air pollution control facilities.

N/A - No Permit Area

(13) Provide an estimate of the cost per acre to reclaim the permit area. _____ N/A - No Permit Area

(14) Will the proposed operation include any of the following: N/A - No Permit Area

(a) disposal of coal mine waste from a wash plant, tipple, or other source? _____ Yes, _____ No. If "yes," submit Attachment 28 and, if applicable, the information required by paragraph (H) of rule 1501:13-4-14 of the Administrative Code.

(b) disposal of fly ash or other noncoal wastes? _____ Yes, _____ No. If "yes," submit an addendum which addresses the disposal material and a detailed disposal plan, pursuant to paragraph (E) of rule 1501:13-9-09 of the Administrative Code.

(c) return of slurry or other mine waste or material into the abandoned underground workings? _____ Yes, _____ No. If "yes," comply with provisions contained in paragraph (N) of rule 1501:13-4-14 and paragraph (Q) of 1501:13-9-04 of the Administrative Code, and submit copies of the required MSHA approvals as an addendum.

B. <u>EXISTING STRUCTURES-Permit Area</u>

(1) Are any existing structures proposed to be used in connection with or to facilitate the coal mining and reclamation operation? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application a description of each structure. The description shall include the information required by paragraph (B)(1) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

B. (2) Are any existing structures proposed to be modified or reconstructed for use in connection with or to facilitate the coal mining and reclamation operation? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, a compliance plan for each structure. The plan shall include the information required by paragraph (B)(2) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

C. BLASTING-Permit Area

Will blasting occur within 25 feet of the surface during shaft and portal development or other on-site development? _____ Yes, _____ No. If "yes," submit Attachment 29.

N/A - No Permit Area

D. RECLAMATION PLAN - GENERAL REQUIREMENTS-Permit Area (Item D.(12)-Permit, Shadow, and Adjacent Area)

(1) Provide a detailed timetable for the completion of backfilling and grading for each mining year.

N/A

(2) Provide a detailed timetable for the completion of resoiling for each mining year.

N/A

(3) Provide a detailed timetable for the completion of planting for each mining year.

N/A

(4) Describe the plan for backfilling, compacting and grading of the disturbed permit area, including the disposal of all mine generated debris.

N/A

(5) Submit an addendum describing the plan for the removal, storage, redistribution and stabilization of topsoil, subsoil, or approved alternative resoiling material to meet the requirements of rule 1501:13-9-03 of the Administrative Code. If an alternative resoiling material is to be used, submit Attachment 19.

N/A

(6) Provide the following information for the revegetation plan:

(a) Schedule for revegetation to include planting of temporary vegetation.

N/A

D. (6) (b) List the species and amounts per acre of seeds and seedlings to be used.

N/A

(c) Describe the methods to be used in planting and seeding.

N/A

(d) Describe the mulching techniques.

N/A

(7) Describe the soil testing plan for evaluation of the results of topsoil handling and reclamation procedures related to revegetation.

N/A

(8) Submit an addendum describing the measures to be employed to handle and place acid or toxic-forming materials in accordance with paragraph (J) of rule 1501:13-9-04 and paragraph (J) of rule 1501:13-9-14 of the Administrative Code. N/A

(9) Describe the measures, including appropriate cross-sections and maps, to be used to plug, case or manage mine openings or bore holes other than those entries utilized to gain access to the underground workings, pursuant to rule 1501:13-9-02 of the Administrative Code.

N/A

(10) Is the reclamation plan consistent with local physical, environmental, and climatological conditions?
_____ Yes, _____ No. N/A

(11) Identify any other applicable air and water quality laws and regulations and health and safety standards and describe the steps to be taken to comply with each.

N/A

(12) Submit an addendum describing the plan for minimizing to the extent possible and using the best technology currently available disturbances and adverse impacts of the operation on fish and wildlife and related environmental values and achieving enhancement of such resources where practical for the permit, shadow, and adjacent areas. See Addendum to Page 25, Part 3, D(12)

ADDENDUM TO PART 3, PAGE 25, D(12)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

RECLAMATION PLAN - FISH, WILDLIFE, ENVIRONMENTAL VALUES

The proposed mining operation is not expected to impact fish, wildlife, and other related environmental values. The mining will not proceed beneath any streams where fish live. Minnows have been found in some of the larger stream segments within the application area. However, the normal annual cycle shows that during the summer and fall months, when the stream flow is minimal, the minnows swim downstream, only to return again. There are several ponds overlying the application area, and larger fish live in them. Our experience at the Powhatan No. 6 Mine is that ponds are not influenced by partial recovery mining. Wildlife has never been shown to be affected by partial recovery mining. Undeveloped springs are not impacted by partial recovery mining. If undeveveloped springs located above the application area are inadvertently dewatered they usually reposition themselves downstream. Ohio Valley will replace undeveloped springs if they are disrupted by our mining activities and are legitimately used according to our water replacement plan.

E. **RECLAMATION PLAN-PROTECTION OF HYDROLOGIC BALANCE-Permit and Adjacent Area**

Submit an addendum describing the measures to be taken during and after the proposed mining operations to:

See Addendum to Page 26, Part 3E (1-3)

(1) minimize disturbance to the hydrologic balance, including quality and quantity, within the permit and adjacent areas and to prevent material damage outside the permit area;

(2) protect the rights of present users of surface and ground water;

(3) avoid acid or toxic drainage.

F. **GROUND WATER AND SURFACE WATER MONITORING PLAN-Permit and Shadow Area**

Based upon the probable hydrologic consequences determination and analysis of all baseline hydrologic, geologic, and other information submitted in this application, address the following items in accordance with paragraph (F) of rule 1501:13-4-14 and paragraph (N) of rule 1501:13-9-04 of the Administrative Code.

See Addendum to Page 29, Part 3, F

(1) In addition to the quality and quantity parameters required for quarterly monitoring and NPDES monitoring, will any other parameters be monitored?
_____ Yes, __X__ No. If "yes," indicate the parameter(s) and the site(s) where such monitoring will occur.

(2) Do you propose or anticipate the need for a variation in the required monitoring frequency for ground and surface water sites and monthly monitoring for NPDES?
_____ Yes, __X__ No. If "yes," describe the variation in frequency and the monitoring sites to be affected.

(3) Describe the plan for collection, recording, and reporting of all surface and ground water quality and quantity monitoring data, including data collected for the NPDES program.

ADDENDUM TO PAGE 25, PART 3, D(12)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## PLAN FOR MINIMIZING TO THE EXTENT POSSIBLE AND USING THE BEST TECHNOLOGY CURRENTLY AVAILABLE DISTURBANCES AND ADVERSE IMPACTS OF THE CURRENT OPERATION ON FISH, WILDLIFE AND RELATED ENVIRONMENTAL VALUES AND ACHIEVING ENHANCEMENT OF SUCH RESOURCES WHERE PRACTICAL

The proposed operation, partial recovery mining, results in no subsidence, and minimizes to the extent possible (and is the best technology currently available) impacts on fish, wildlife, and environmental values because it occurs in a planned, predictable and controlled manner. There are no impacts anticipated to fish, wildlife, and environmental values. Areas where partial recovery mining has occurred do not show any impacts on such resources. Therefore, no impacts are anticipated to fish, wildlife, and such resources.

### Wetlands

Wetlands have been undermined by the partial recovery operations at the Powhatan No. 6 Mine without impacts.

ADDENDUM TO PAGE 26, F(3)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT 0360

## GROUND AND SURFACE WATER MONITORING

Although the D-0360-13 application is for underground works only and not surface operations, ground water and surface water monitoring as previously approved for Powhatan No. 6 Mine (Permit D-0360) will continue with respect to the surface operations. Ground water and surface water monitoring over underground areas of the mine is proposed to determine the impacts of underground mining on these areas. The proposed plan presented below is to be used in lieu of all previously proposed and existing plans for such areas.

### Surface Water

For mining areas, intermittent and perennial streams and that originate within the mining area will be monitored where the stream leaves the area; and utilized streams crossing through the mining area will be monitored for flow monthly both upstream and downstream of the property where they are being used, for a year prior to and after the area has been undermined. Monitored streams will be sampled quarterly and the water analyzed for quarterly parameters. Utilized streams will be monitored once a week for 3 weeks prior to the mining proceeding past a source and once a week for 3 weeks after the mining has past a source.

### Ground Water

For all coal mining areas, ground water monitoring will consist of monitoring and sampling all developed water sources, with the permission of the landowner, in the following manner:

> Monthly monitoring will be done for quantity (static water level/flow) for a one-year period before and after mining for developed springs and wells. This information will be reported quarterly but is available at the OVCC office.
>
> For all mining areas, quarterly monitoring will be conducted for quality for a one-year period before and after mining for developed springs, wells, and stream monitoring points. This information will be reported quarterly.
>
> Daily precipitation data from the mining area will be submitted to evaluate its impact on spring and stream flow. This information will be submitted quarterly but will be available at the OVCC office.

An attempt will be made to sample as outlined above, however, some sources may not be accessible should a landowner deny permission to sample, a well may be buried, etc. These locations, if encountered, will be documented in the quarterly reports.

All samples will be taken as outlined to the extent that existing well construction allows. Any samples that are unobtainable will be documented as such in the quarterly report.

OVCC will monitor all developed supplies in accordance with the monitoring plan outlined above regardless of the aquifers and/or saturated zones that they access. All developed supplies have been identified and have been indicated on the Application Map. All wells, both drilled and dug have been identified. Developed springs, consisting of a french drain and catchment basin, have been shown. A map will be included in the quarterly monitoring report showing the location of the wells, streams, and springs monitored and their position relative to the active mining areas of OVCC's Powhatan No. 6 Mine. OVCC will submit a request to cease monitoring following 12 months of monitoring after undermining a location.

ADDENDUM TO PAGE 26, PART 3, E(1-3)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## RECLAMATION PLAN - PROTECTION OF HYDROLOGIC BALANCE

Since this area will be mined using partial recovery mining methods, no changes to the hydrologic balance are anticipated. Experience with partial recovery operations that do not result in subsidence shows that the hydrologic balance will not be disturbed. Subsequent longwall mining adjacent to this area may occur sometime in the future, but the impacts of longwall mining are not the subject of this application.

G. DIVERSIONS AND DRAINAGE CONTROLS-Permit Area

(1) Will the proposed coal mining activities result in diversions of overland flow away from the disturbed areas? _____ Yes, _____ No. If "yes," describe, including maps and cross sections, the diversion to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

(2) Will the proposed coal mining activities result in the diversion of intermittent or perennial streams within the proposed permit area? _____ Yes, _____ No. If "yes," describe, including maps and cross sections, the diversions to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

(3) Will the proposed coal mining activities result in construction of diversions to direct runoff through a sediment pond or a series of sediment ponds? _____ Yes, _____ No. If "yes," submit an addendum to describe, including maps and cross sections, the diversions to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

(4) Indicate which of the following are proposed to be constructed within the proposed permit area and submit as an addendum the detailed design plans for each structure in accordance with paragraph (H) of rule 1501:13-4-14 and 1501:13-9-04 of the Administrative Code.

_____ sedimentation pond(s) (submit Attachment 20)

_____ water impoundment(s) (submit Attachment 20)

_____ other (specify) _____

N/A - No Permit Area

(5) Submit an addendum describing the plan for the control of water drainage into, through, and out of the proposed permit area. If applicable, submit as an addendum any request for variances pursuant to paragraphs (B) and (E) of rule 1501:13-9-04 of the Administrative Code.

N/A - No Permit Area

(6) Describe the treatment, when required, of ground and surface water drainage from the area to be disturbed by the proposed coal mining activities

N/A - No Permit Area

ADDENDUM TO PAGE 25, PART 2, A(14)(a) AND PAGE 27, PART 2, D(8)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

Refuse from Area to be Mined

The refuse from the area to be mined will be disposed of according to the plans previously submitted and approved in the original submittal of Permit D-0360 (on file at the Division of Mines and Reclamation Office). In particular, see Addendum 20 and Appendix IV-9. See also approved application D-0360-8.

H. PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES-**Permit and Planned Subsidence Area**

Will the proposed coal mining activities adversely affect any public parks and places listed on the National Register of Historic Places? _____ Yes, __X__ No. If "yes," submit an addendum describing the measures to minimize or prevent these impacts. No subsidence areas.

I. MINING NEAR OR THROUGH A PUBLIC ROAD-**Permit Area**

If the response to Part 1, item D(6) of the permit application is "yes," submit an addendum describing the measures to be used to ensure that the interests of the public and landowners are protected.

N/A - No Permit Area

J. SUBSIDENCE CONTROL SURVEY-**Shadow Area**

No subsidence areas.

(1) Is this a full coal recovery operation?
_____ Yes, __X__ No. If "yes," complete Attachment 31, Subsidence Control Survey, and following items J(2) and (3).

(2) Does the shadow area contain any of the structures or facilities listed in 1501:13-12-03(J)(1-3)?
_____ Yes, __X__ No. If "yes," complete Attachment 32, Protection of Specific Structures, and specifically identify the structures or facilities on the application map.

(3) Are any aquifers or bodies of water that serve as a significant water source for any public water supply system present in the shadow area?
_____ Yes, __X__ No. If "yes," complete Attachment 32, Protection of Specific Structures, and specifically identify the areas on the application map.

K. SUBSIDENCE CONTROL PLAN-**Shadow Area**

(1) Submit an addendum which describes the method of coal removal, and indicates the size, sequence, and timing of the development of the underground workings.
See Addendum to Page 28, Part 3, K(1)/Timing, Struc. Cont., and Parcel.

(2) Utilizing the application map, specifically indicate areas where planned subsidence mining methods (i.e. longwall or pillar extraction) will be used.
See Application Map and Timing, Struc. Cont., and Parcel Map.

(3) Utilizing the application map, specifically indicate room-and-pillar mining areas where subsidence will be prevented or minimized.
See Application Map and Timing, Struc. Cont., and Parcel Map.

ADDENDUM TO PART 3, PAGE 28, (K)(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

ANNUAL MAP

In accordance with PPD Underground 91-1, a mine map will be submitted to coincide with the permit anniversary date. For ground water monitoring, the face location of the active panel will be provided quarterly with the monitoring data. The maps will contain the following:

1. Scale the same as the Division of Mines submittal, or 1 in. = 500 ft.
2. All base map requirements pursuant to ORC 4153.03.
3. Surface owner names and property lines.
4. Streams and other bodies of water.
5. Section lines and numbers.
6. Buildings and other surface structures.
7. Public roads and railroad tracks.
8. Mine openings and surveyed workings, showing pillar and entry size, configuration and location.
9. Survey extension dates for all workings, including longwall face or pillar recovery lines.
10. Areas of full extraction.
11. Coal elevations and extraction height.
12. Completion dates for individual sections (if sealed, date and location of seal).
13. Maximum extraction ratios for completed sections.
14. Ground water and subsidence monitoring stations.
15. The boundaries of the authorized mining area.
16. The location and extent of any other mine excavation (surface or underground) within the same seam being mined.
17. A map title block and notarized map certification.

**Method of coal removal, size, sequence, timing of development of underground works:**

The method of coal removal from this application area is development mining, where three entries are to be driven on centers of 68 ft, with cross cut centers of 120 ft. Entries are to be driven a maximum of 20 ft wide, with a mining height of 78 inches. The Timing, Deed Parcel, and Structure Contour Map shows the timing of the mining in this area. The mining will progress (sequence) from the mains (on the east side of the section) toward the west as shown on the Map. In this application area, mining is only projected to occur over a period of approximately six months, so no other mining sequence is shown

K. (4) Submit as an addendum, for those areas mapped as room-and-pillar mining, the following information:

See Addendum to Page 29, Part 3, K(4)(a-j).

(a) the maximum and average overburden thickness.

(b) the projected maximum extraction ratios for mains, submains, and butt sections, as well as the existing ranges of values for the same areas.

(c) projected maximum width of entries and cross cuts throughout the mine, as well as the existing ranges of values for the same areas.

(d) the center spacing for entries and cross cuts.

(e) minimum pillar dimensions for mains, submains, and butt sections, as well as the existing ranges of values for these areas.

(f) the barrier pillar width between butt sections, as well as the existing ranges of values for the same areas.

(g) the engineering properties of the clay/shale, or other soft rock material in the roof and floor of the mine.

(h) measures to be taken on the surface to prevent damage or lessening of the value or reasonably foreseeable use of the surface, if any.

(i) the minimum pillar safety factor, for protected structures, based upon coal strength and load.

(j) methods and calculations used to determine the safety factor.

(5) Submit as an addendum for those areas mapped as full coal recovery mining, the following information:

No full recovery areas.

(a) for each method to be employed (i.e. longwall or pillar extraction), provide the following:

i) rate and direction of dip for the coal seam.

ii) dimensions of panels or butt sections.

iii) thickness of coal to be extracted (mining height).

iv) maximum angle of draw.

v) maximum anticipated subsidence.

vi) width of barrier pillars or chain pillars between sections or panels.

vii) the maximum extraction ratio within a pillaring section.

ADDENDUM TO PAGE 29, PART 3, K(4)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

(a) For those areas mapped as no longwall mining areas, room-and-pillar mining is anticipated, consisting mainly of main entries and gate entries. The maximum overburden thickness in these areas is 530 ft. The average overburden thickness is 410 ft.

(b) For gate entries, with pillars on 120 ft x 68 ft centers, the projected maximum extraction ratio is 48.7 percent. These dimensions are currently used at the No. 6 Mine.

(c) The projected maximum width of entries and crosscuts currently is 20 ft, and is expected to remain the same for the application area.

(d) The center spacing is discussed in part (b) above.

(e) For gate entries, the minimum pillar dimensions are 100 ft x 48 ft. These values are in use today at the Powhatan No. 6 Mine.

(f) There are no barrier pillars planned for this area.

(g) Typical floor at the Powhatan No. 6 Mine is comprised of shale, calcareous shale, or claystone. Table 13 shows the engineering properties of the floor material. Compressive strength varies from 3,930 psi to 12, 590 psi. Unit weights of floor samples varies from 158.3 lb/cu. ft to 183.2 lb/cu. ft.

(h) There are no measures planned to be taken on the surface to prevent damage or lessening of the value or reasonably foreseeable use of the surface, as these areas will not be subsided.

(i) The minimum pillar safety factor for gate entries in this area is 2.6.

(j) The method used to calculate the safety factors is the highly conservative Holland Formulae, shown on the enclosed calculation sheets.

ADDENDUM TO PAGE 29, PART 3, K(4)
PILLAR SAFETY FACTOR AND EXTRACTION RATIO
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## PILLAR SAFETY FACTOR

The critical factor to show pillar resistance to failure, from an engineering standpoint, is the pillar safety factor. OVCC uses the Holland Method, perhaps the most conservative of the many design formulae. This formula uses the strength of a pillar scaled from a 3 in. cube, the depth (average depth plus maximum depth)/2, the pillar width and length in inches, the entry width and height in inches, plus the overburden load (1.1 psi/ft of depth). Based on these parameters, the pillar safety factor for the 22 West gate section is a modest 2.6, or more than 2.5 to 1. See enclosed safety factor calculation sheet.

## EXTRATION RATIO

Another measure of the long-term standup potential of pillars, although only rough estimate, is the extraction ratio. The rule of thumb says that if the extraction ratio is less than 50 percent of the total coal in place, there is little likelihood of pillar failure. This rule may not be true, if the safety factor is less than a minimum of 1.0. In this case, the safety factor is greater than 2.5, so it tends to reinforce the stability of the pillar.

In this instance, the extraction ratio is calculated as follows:

Extraction ratio = 100 x [(480 x 156) – (8 x 4800)]/(480 x 156) = 100 x [(74880-38400)/74880]

= 100(36480/74880) = 48.7 percent of coal extracted

Less than 49 percent of the coal will be extracted in the 22 West gate section.

## PARAMETERS

Average depth = 410 ft, Maximum depth = 530 ft
Pillar dimensions = 100 ft x 48 ft (120 ft x 68 ft, center-to-center)
Entry dimensions = 20 ft x 6.5 ft
Total coal in block of coal examined = 480 ft x 156 ft
Total coal in pillar = 100 ft x 48 ft
Total pillars in block of coal examined = 8

The Ohio Valley Coal Company
Powhatan No. 6 Mine
Pillar Safety Factor - 22 West Gate Section
HOLLAND METHOD

| | | | |
|---|---|---|---|
| PILLAR STRENGTH | 850 | PSI | Strength of a pillar scaled down from a 3 in. cube (HOLLAND) |
| DEPTH | 470 | FT | (Avg depth + Max. depth)/2 (PENG) |
| PILLAR W | 576 | IN | Pillar width in inches |
| PILLAR L | 1200 | IN | Pillar length in inches |
| ENTRY W | 240 | IN | Entry width in inches |
| ENTRY H | 78 | IN | Entry height in inches |
| OVERBURDEN LOAD | 1.1 | PSI | Per ft. of depth (PENG) |

HOLLAND FORMULAE:

| | | | |
|---|---|---|---|
| AVG STRESS | 878.9 | psi | VERT. STRESS x {[(PILLAR W + ENTRY W)x(PILLAR L + ENTRY W)]/(PILLAR W x PILLAR L)} |
| S1 | 850 | psi | (HOLLAND) |
| S2 | 2309.8 | psi | S1 x SQUARE ROOT OF (PILLAR W/ENTRY H) |
| SF | 2.6 | | S2/AVG STRESS |

From Peng , S. S. and Dutta, D., "Evaluation of Various Pillar Design Methods: A Case Study," Proceedings of the Workshop of Coal Pillar Mechanics and Design, compiled by A.T. Iannacchione, C. Mark, R. C. Repsher, R. J. Tuchman, and C.C. Jones, USBM, IC 9315, 1992, pp. 269-276.

STATE OF OHIO
DAVID L. BARTSCH
E - 50396
REGISTERED
PROFESSIONAL ENGINEER

TOVCC 11932

ADDENDUM TO PAGE 29, K4(g)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

Strength Of Floor Rock Under Saturated Conditions

The strength of the floor rock beneath the pillars is a concern in the long-term stability of areas of the mine where pillars are to remain. The floor at the Powhatan No. 6 Mine is comprised of about a foot of interbedded shale, clay stone, limestone, and limey shales in layers of a few hundredths to a few tenths of a foot in thickness. As such, there it is not possible to test the strength of the interbedded material, and given its thickness (about a foot), even if it became saturated, it is unlikely to cause surface subsidence.

Underlying that layer of interbedded rock, is a layer of limey shale or sandy shale with a thickness of about three (3) ft. This member comprises the main floor of the mine. Previous applications have presented test results of the compressive strength of this floor rock (see Addendum to Page 29, Park 3, K(4). The strength varied from just under 4,000 psi to just over 12,500 psi. There have been questions about the strength of this rock under saturated conditions and its ability to support the surface.

Ohio Valley collected available core samples of floor rock from test holes in the vicinity of Dysart Woods (located just to the west of the Ohio University Property). One sample was saturated for 24 hours and another sample from the same core was left in its original dry condition. One sample was large enough to extract a third sample, which was saturated for 28 days. All samples were then tested to determine their compressive strength according to ASTM D-2938 (Unconfined Compressive Strength Of Intact Raw Core). The results are shown in Table A.

TABLE A
Compressive strength of floor rock – Powhatan No. 6 Mine*

| Boring | Condition @ test | Unit Weight (pcf) | Compressive Strength (psi) |
|---|---|---|---|
| S-1A | Dry | 166.32 | 4,877 |
| S-1B | Saturated 24 hr | 165.33 | 5,614 |
| S-1C | Saturated 28 days | 167.40 | 6,566 |
| S-2A | Dry | 164.56 | 5,460 |
| S-2B | Saturated 24 hr | 165.05 | 14,665 |
| S-3A | Dry | 167.72 | 9,997 |
| S-3B | Saturated 24 hr | 163.68 | 7,879 |
| S-4A | Dry | 163.52 | 4,863 |
| S-4B | Saturated 24 hr | 166.94 | 4,500 |
| Average Dry | | | 6,299 |
| Average Sat. | | | 7,845 |

- Samples tested by DLZ Corporation of Columbus, Ohio.

The results indicate that there is no decrease in strength due to the presence of water (inundation or saturation). The rock appears to be a competent in all conditions and there is not expected to be any subsidence as a result of saturation of this rock member. Results are similar for one sample saturated for 28 days.

# Unconfined Compression of Rock Core Specimens

(ASTM D-2938)

DLZ Project No.: 0221-3003.01

Project Name: Ohio Valley Coal

Client: Ohio Valley Coal Company

Date: 7/30/02

| Boring | Time in water | Condition @ test | $D_1$ | $D_2$ | $D_3$ | $D_{(ave)}$ | $L_1$ | $L_2$ | $L_3$ | $L_{(ave)}$ | L/D | Volume ($ft^3$) | Mass (Gram) | Unit Wt. (pcf) | Load (lbs) | Strength (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-1A | 0 | dry | 1.989 | 1.986 | 1.990 | 1.990 | 4.329 | 4.330 | 4.324 | 4.328 | 2.175 | 0.007782 | 587.06 | 166.32 | 15,160 | 4,877 |
| | | | 1.986 | 1.994 | 1.992 | | | | | | | | | | | |
| S-1B | 24h | wet | 1.987 | 1.991 | 1.991 | 1.989 | 4.268 | 4.289 | 4.272 | 4.276 | 2.150 | 0.007684 | 576.26 | 165.33 | 17,440 | 5,614 |
| | | | 1.983 | 1.990 | 1.991 | | | | | | | | | | | |
| S-1C | 28d | wet | 1.991 | 1.993 | 1.991 | 1.991 | 4.127 | 4.127 | 4.123 | 4.126 | 2.072 | 0.007432 | 564.35 | 167.40 | 20,450 | 6,566 |
| | | | 1.992 | 1.991 | 1.990 | | | | | | | | | | | |
| S-2A | 0 | dry | 1.993 | 1.992 | 1.987 | 1.991 | 4.836 | 4.840 | 4.840 | 4.839 | 2.431 | 0.008709 | 650.10 | 164.56 | 16,990 | 5,460 |
| | | | 1.986 | 1.993 | 1.992 | | | | | | | | | | | |
| S-2B | 24h | wet | 1.990 | 1.997 | 1.990 | 1.992 | 4.912 | 4.926 | 4.922 | 4.920 | 2.469 | 0.008872 | 664.20 | 165.05 | 45,720 | 14,665 |
| | | | 1.993 | 1.994 | 1.990 | | | | | | | | | | | |
| S-3A | 0 | dry | 1.990 | 1.989 | 1.991 | 1.990 | 4.982 | 4.990 | 4.988 | 4.987 | 2.506 | 0.008971 | 682.50 | 167.72 | 31,030 | 9,977 |
| | | | 1.988 | 1.990 | 1.992 | | | | | | | | | | | |
| S-3B | 24h | wet | 1.993 | 1.989 | 1.993 | 1.991 | 4.473 | 4.478 | 4.470 | 4.474 | 2.247 | 0.008059 | 598.36 | 163.68 | 24,540 | 7,879 |
| | | | 1.993 | 1.988 | 1.992 | | | | | | | | | | | |

DLZ

Engineers * Architects * Scientists

6121 Huntley Road * Columbus, Ohio * 43229-1003 * Phone: (614) 888-0576 * Fax (614) 888-6415

# Unconfined Compression of Rock Core Specimens
(ASTM D-2938)

DLZ Project No.: 0221-3001.00

Client: Ohio Valley Coal Company

Project Name: Ohio Valley Coal

Date: 7/30/02

| Boring | Time in water | Condition @ test | $D_1$ | $D_2$ | $D_3$ | $D_{(ave)}$ | $L_1$ | $L_2$ | $L_3$ | $L_{(ave)}$ | L/D | Volume ($ft^3$) | Mass (Gram) | Unit Wt.(pcf) | Load (lbs) | Strength (psi) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-4A | 0 | dry | 1.993 | 1.997 | 1.993 | 1.992 | 4.473 | 4.478 | 4.470 | 4.474 | 2.245 | 0.008067 | 598.36 | 163.52 | 15,160 | **4,863** |
| | | | 1.991 | 1.988 | 1.992 | | | | | | | | | | | |
| S-4B | 24h | wet | 1.989 | 1.993 | 1.992 | 1.990 | 3.998 | 3.992 | 3.995 | 3.995 | 2.007 | 0.00719 | 544.41 | 166.94 | 14,000 | **4,500** |
| | | | 1.987 | 1.991 | 1.99 | | | | | | | | | | | |

DLZ

Engineers * Architects * Scientists

6121 Huntley Road * Columbus, Ohio * 43229-1003 * Phone: (614) 888-0576 * Fax (614) 888-6415

K. (5) (b) the anticipated effects of planned subsidence upon the land and water resources identified in the subsidence control survey and survey of ground and surface water resources.

(c) the measures to be taken to mitigate the anticipated effects of planned subsidence to the land and water resources.

(d) the anticipated effects of planned subsidence upon the structures identified in the subsidence control survey.

(e) the proposed measures to be taken to mitigate anticipated effects to structures.

(f) the proposed measures to determine the extent of mining related damages including a presubsidence survey with an indication of the timing of the survey.

(g) the provisions for repair and/or compensation for damages to structures.

(h) describe the monitoring, if any, needed to determine the commencement and degree of subsidence so that, when approriate, other measures can be taken to prevent, reduce, or correct material damage in accordance with rule 1501:13-12-03 of the Administrative Code.

(6) Will planned subsidence operations be conducted within the angle of draw of urbanized areas, cities, towns, communities, industrial or commercial buildings, major impoundments, or perennial streams?
No subsidence operations.
_____ Yes, __X__ No. If "yes," describe any measures or activities that will prevent a condition or practice that could result in an imminent danger to the health or safety of the public.

(7) Will planned subsidence operations be conducted within the angle of draw of transmission pipelines?
_____ Yes, __X__ No. If "yes," describe the procedural plan to avoid the creation of a situation of imminent danger to the health and safety of the public.
No subsidence operations.

## PART 4 FORMAT AND CONTENT

### A. FILING OF ADDENDA

If an addendum is needed to present the information required by the items in the permit application, the addendum is to be submitted with the permit application and each page, map, plan or other document in the addendum should include the applicant's name and indicate to what item the addendum applies. For example, "Addendum to Part 3, item K(2) Zebco Coal Company."

B. Provide the information requested below for all technical data submitted in the application.

| Identification of Technical Data (1) | Person/Organization that Collected Data and Date | Methodology for Collecting Data | Person/Organization that Collected Data and Date | Methodology Used to Analyze Data |
|---|---|---|---|---|
| Attachments, Addenda | D. Bartsch (OVCC) | N/A | Quality Environmental Services, Tra-Det, Inc. | Water Sampling<br>Lab Analysis<br>Field Analysis |
| | | | | |

(1) The technical data is to be identified by referencing the particular item in the application for which the data was used in preparing the response (e.g. Part 2, B(1) Attachment 14; Part 4, A).

C. Provide the name, address, and position of officials of each private or academic research organization or governmental agency contacted in the preparation of the application for information on land uses, soils, geology, vegetation, fish and wildlife, water quantity and quality, air quality, and archeological, cultural, and historic features.

| Name and Address of Official | Position of Official | Name of Agency/ Organization | Type of information (e.g.Geology) |
|---|---|---|---|
| Bill Haiker | Hydrologist | ODNR, Division of Water | Ground Water Inventory Report |
| No contact person - Public Document | | USGS | Water Resources Data |

D. APPLICATION FOR ABANDONED MINED LAND DIRECT NEGOTIATED CONTRACT (IF APPLICABLE)

In accordance with Section 1513.27 of the Ohio Revised Code, the chief of the Division of Reclamation has been granted the authority to enter into contracts with licensed operators for reclamation of abandoned mined lands affected by coal mining prior to April 10, 1972 and located adjacent to a permit area. To be eligible for reclamation funding, the abandoned mined land must be causing offsite environmental problems, will not be affected b the operator during the normal course of mining, and is not likely to be mined in the foreseeable future. If such lands exist adjacent to your perm area and you are interested in contracting for reclamation of the lands, complete this application, detach and send directly to:

Robert S. Baker, Manager
Mined Land Reclamation
Division of Reclamation
Fountain Square, H-2
Columbus, Ohio 43224

Upon receipt, a representative from the Mined Land Reclamation section wil contact you.

Applicant: _____

Address: _____

City: _____ State: _____ Zip: _____

Business Telephone: _____

Contact Person: _____

Description of Abandoned Mined Land:

County: _____
Township: _____
Section/Lot: _____
Approximate Acreage _____

Environmental Problems Associated with Site:

_____

_____

_____

_____

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

Floyd Simpson
44680 Bel-Cent Road
Belmont, OH 43718

Dear Mr. Simpson:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

The Division of Mineral Resources Management conducted an informal conference for application #D-360-13 on May 15, 2002, at the Belmont Technical College. As a participant in that conference, you are being provided with this notification and a copy of the attached written findings pursuant to Ohio Revised Code Section 1513.02(I)(1). This conference was a bit unusual in that few speakers expressed or identified specific questions or concerns. Instead, they expressed either their opposition or support for the permit. As a result, we were required to interpret comments to isolate questions and/or concerns to address in these findings. The attached written findings address each of the concerns we were able to identify in detail. The taped proceedings of the conference will remain on file with the Division of Mineral Resources until such time that all bond is released or the permit expires or otherwise is terminated.

If you are a person having an interest that is or may be adversely affected by the Chief's decision of approval, and should you wish to appeal the Chief's decision, you may do so by filing a notice of appeal with the Reclamation Commission, Ohio Department of Natural Resources, 1855 Fountain Square Court, Suite 124, Columbus, Ohio 43224, (614) 262-1269 within thirty days after the applicant is notified of this decision. It is also necessary to file a copy of any notice of appeal with the Chief of the Division of Mineral Resources Management, Ohio Department of Natural Resources, 1855 Fountain Square Court, Columbus, Ohio 43224, within three days after filing the notice of appeal with the Board. Further essential provisions governing appeals to the Board, including request for temporary relief, are found in Section 1513.07(I)(3) and 1513.13 of the Ohio Revised Code.

Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5518

cc: District Office
Ohio Valley Coal Company

DNR 0001

TOVCC 11940

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

Zachariah Gibbons-Ballew
12667 North Peach Ridge Road
Athens, OH 45701

Dear Mr. Gibbons-Ballew:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5501

cc: District Office
Ohio Valley Coal Company

DNR 0001

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

Peter Gibbons-Ballew
19 Hudson – Apt #4
Athens, OH 45701

Dear Mr. Gibbons-Ballew:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5495

cc: District Office
Ohio Valley Coal Company

DNR 0001

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

David Bartsch
56854 Pleasant Ridge Road
Alledonia, OH 43902

Dear Mr. Bartsch:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5488

cc: District Office
Ohio Valley Coal Company

DNR 0001

TOVCC 11943

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

Stephen Rouhthwaite
1422 Carriage Hill
Athens, OH 45701

Dear Mr. Routhwaite:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

The Division of Mineral Resources Management conducted an informal conference for application #D-360-13 on May 15, 2002, at the Belmont Technical College. As a participant in that conference, you are being provided with this notification and a copy of the attached written findings pursuant to Ohio Revised Code Section 1513.02(I)(1). This conference was a bit unusual in that few speakers expressed or identified specific questions or concerns. Instead, they expressed either their opposition or support for the permit. As a result, we were required to interpret comments to isolate questions and/or concerns to address in these findings. The attached written findings address each of the concerns we were able to identify in detail. The taped proceedings of the conference will remain on file with the Division of Mineral Resources until such time that all bond is released or the permit expires or otherwise is terminated.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5464

cc: District Office
Ohio Valley Coal Company

DNR 0001

TOVCC 11944

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

Bob Groves
43141 National Road
Belmont, OH 43718

Dear Mr. Groves:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5471

cc: District Office
Ohio Valley Coal Company

DNR 0001

TOVCC 11945

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

Bian Lin
1127 Carriage Hill
Athens, OH 45701

Dear Ms. Lin:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

The Division of Mineral Resources Management conducted an informal conference for application #D-360-13 on May 15, 2002, at the Belmont Technical College. As a participant in that conference, you are being provided with this notification and a copy of the attached written findings pursuant to Ohio Revised Code Section 1513.02(I)(1). This conference was a bit unusual in that few speakers expressed or identified specific questions or concerns. Instead, they expressed either their opposition or support for the permit. As a result, we were required to interpret comments to isolate questions and/or concerns to address in these findings. The attached written findings address each of the concerns we were able to identify in detail. The taped proceedings of the conference will remain on file with the Division of Mineral Resources until such time that all bond is released or the permit expires or otherwise is terminated.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5457

cc: District Office
Ohio Valley Coal Company

DNR 0001

TOVCC 11946

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ∘ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

John Pollock
46085 Liddle Road
Jacobsburg, OH 43933

Dear Mr. Pollock:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5440

cc: District Office
Ohio Valley Coal Company

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

Chad Kister
PO Box 31
Athens, OH 45701

Dear Mr. Kister:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5426

cc: District Office
Ohio Valley Coal Company

DNR 000

TOVCC 11948

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

Tony Ripa
1127 Carriage Hill
Athens, OH 45701

Dear Mr. Ripa:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

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Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5433

cc: District Office
Ohio Valley Coal Company

DNR 0001

TOVCC 11949

June 22, 2002

Ms. Deborah S. Bates
Environmental Specialist
Division of Mineral Resources Management
Ohio Department of Natural Resources
1855 Fountain Square Court
Columbus OH 43224

Dear Debbie:

Enclosed are three copies of the revisions to application D-0360-13 per your letter of June 19, 2002. The items in your letter are addressed below in the same order as your letter.

A. Application Review

a. Page2, F has been provided acknowledging these revisions.

b. Page 4, A(10) – The revised Attachment 5 for American Energy Corporation is enclosed.

B. Engineering Review

Ohio Valley will attempt to obtain the requested information and will submit it as soon as it becomes available.

C. Hydrology Review

1. Attachment 14A for D37-000 collected on 9/12/01 has been revised.

2. Attachment 14C

a. The supplying aquifer for W-172 was changed inadvertently. Attachment 14C has been revised to refer to Zone D in agreement with Attachment 14 A for this location.

b. DW-173 is shown on the S. Rice property as requested.

56854 PLEASANT RIDGE ROAD ◦ ALLEDONIA OHIO 43902
(740) 926-1351 ◦ FAX (740) 926-1615

c. As requested, log 221729 has been revised to show WL-168 and a copy is enclosed.

3. The addendum to Page 14, E(1-3) has been revised as requested.

4. The addendum to Page 18, F(2) has been revised as requested.

5. Page 26, F(3)

a. The addendum has been revised as requested.

b. The addendum has been revised as requested.

c. The addendum has been revised as requested.

D. Application/Hydrology Map Review

1. A revision date is shown on the map as requested.

2. The referenced undeveloped spring is S-41, and is located north of U34-004, not U34-001. Its symbol has been enlarged to show the location better.

3. The property hook across Smith Township Road 211 has been darkened to show it better.

If you have any questions, please contact me.

Sincerely,
THE OHIO VALLEY COAL COMPANY

David L. Bartsch

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: File

RECEIPT

118353

OFFICE OF

COUNTY RECORDER

BELMONT CO.

ST. CLAIRSVILLE, OHIO

Instrument No. _____ Amount _____

Date 5-15 2002

Received Of Ohio Valley Coal Co.

FOR RECORDING THE FOLLOWING INSTRUMENTS:

FILED
MAY 15 2002
MARY CATHERINE NIXON
RECORDER
BELMONT CO
OHIO

| | | |
|---|---|---|
| DEED | $ | |
| CERT. FOR TRANS. | $ | |
| P. OF ATT'Y. | $ | |
| RELEASE | $ | |
| ASSIGNMENTS | $ | |
| LIEN | $ | |
| MORTGAGE | $ | |
| XEROX COPY | $ | |
| LEASE | $ | |
| FINANCING STATEMENT | $ | |
| | $ | |
| | $ | |

D-0360-13

Revisions

OTHER

MARY CATHERINE NIXON, RECORDER

BY 27 DEPUTY

McGHEE & CO., WHEELING, W. VA.

TOVCC 11952

February 1, 2002

Ms. Deborah S. Bates
Environmental Specialist
Division of Mineral Resources Management
Ohio Department of Natural Resources
1855 Fountain Square Court
Columbus OH 43224

Dear Debbie,

We are in receipt of your letter of January 22, 2002, requesting revisions of the D-0360-13 application for underground acreage. Each item is addressed below, with numbering that corresponds to your letter.

A. Application Review
   1. An Attachment 1 for Ohio Valley Resources is enclosed.
   2. Attachement 5's for The Ohio Valley Coal Company and all affiliated companies are enclosed.
   3. Attachment 23's for The Ohio Valley Coal Company and all affiliated companies are enclosed.
   4. Page 7, C(1)(b)
      a. The reference to deed parcel 1-24-2 has been deleted from F. & S. Simpson
      b. Deed parcel 105 has been added to the J.W. & J.E. Carson listing, and the name has been changed from J.D. to J. E.
      c. Deed parcel 1-24-2 has been added to the F. Simpson property.
   5. The reference to an addendum on Page 8, C(2) has been removed.
   6. The reference to a "futures" map on Page 8, C(6) has been removed. This application and the pending D-0360-12 application will complete permitting of the property controlled by The Ohio Valley Coal Company at this time.
   7. Deed parcel 104 includes parcels 104-1 and 104-2, and the reference to parcel 104 has been changed to 104-1 as it is the parcel within the application area. Corresponding changes to the addendum have been made and are enclosed.
   8. F.P. & I. Funkhouser has been changed to F.P. & A. Funkhouser as requested.
   9. The Attachment 14A's have been revised as requested. A new addendum has been submitted addressing all land disturbances in the

56854 PLEASANT RIDGE ROAD • ALLEDONIA OHIO 43902
(740) 926-1351 • FAX (740) 926-1615

watershed. The Attachment 14 C has been revised also. The Attachment 14D has been revised as requested.

B. Structure Contour, Deed Parcel, and Timing Map
   1. Captina Creek has been added as requested.
   2. The coal ownership property lines have been designated with the correct symbol from the legend.

C. Application & Hydrology Map
   1. The hook across Smith Township Road 231 actually joins a small triangular-shaped parcel of land belonging to F. T. Hart and the hook is needed.
   2. The property hook has been deleted as requested.
   3. The property is owned by F. T. Hart. The map has been revised to show this ownership.

Three copies of these revisions have been submitted. Please contact me when the application has been deemed complete. You may correspond with me via email at dbartsch@coalsource.com. The number of the fax machine that I use is (740)926-9112, not the number shown on this letterhead. If you have any questions, or have any further revisions, please contact me.

Sincerely,
THE OHIO VALLEY COAL COMPANY

David L. Bartsch, P.E.
Environmental Coordinator and
Permit Administrator

cc: File

**The Ohio Valley Coal Company** **78575**

| INVOICE NUMBER | INVOICE DATE | INVOICE AMOUNT | AMOUNT PAID | DISCOUNT | NET AMOUNT |
|---|---|---|---|---|---|
| 03/15/02 PERMIT | 03/13/02 | 200.20 | 200.20 | .00 | 200.20 |
| | | | | Check Total | 200.20 |

FOR SECURITY PURPOSES THE FACE OF THIS DOCUMENT CONTAINS A COLORED BACKGROUND AND MICROPRINTING IN THE BORDER.

*The Ohio Valley Coal Company*
*153 Highway 7 South*
*Powhatan Point Ohio 43942*

Fifth Third Bank of Southern Ohio
Hillsboro, Ohio

56-733
422

| DATE | CHECK NO. | VENDOR NO. |
|---|---|---|
| 03/15/02 | 78575 | 000000084611 |

TWO HUNDRED AND 20/100 DOLLARS

AMOUNT
$200.20

VOID VOID VOID

PAY TO THE ORDER OF
THE TIMES LEADER
200 SOUTH FOURTH STREET
MARTINS FERRY OH 43935

VOID AFTER 6 MONTHS

Robert E. Murray
Robert E. Murray, Director

⑈0078575⑈ ⑆042207735⑆ 733⑈517170⑈

THE REVERSE SIDE OF THIS DOCUMENT INCLUDES AN ARTIFICIAL WATERMARK - HOLD AT ANGLE TO VIEW

THE OHIO VALLEY COAL COMPANY
FAX TRANSMISSION
February 11, 2002

1 page

TO: The Times Leader, Legal Notices

FROM: David L. Bartsch, P.E.

SUBJECT: Public Notice, Mining operation

Attn: Audrey

Please publish the following notice once per week for 4 consecutive weeks beginning as soon as possible. Please let me know the dates of publication and send me a notarized copy of proof of publication. Thank you. Dave Bartsch

**Public Notice**

The Ohio Valley Coal Company, Powhatan No. 6 Mine, 56854 Pleasant Ridge Road, Alledonia, Ohio 43902, has submitted an underground coal mining application for Permit D-0360, designated as D-0360-13 to the Ohio Department of Natural Resources, Division of Mineral Resources Management. The proposed additional underground acreage for Permit D-0360 is located in Belmont County, Smith Township, Sections 22, 28, and 34. The area is located on the Armstrong Mills and Hunter 7 ½ minute USGS quadrangle maps, approximately 1.2 miles north of Centerville, Ohio. The proposed underground workings encompass 38.6 acres. This area will be mined using partial-recovery methods from which there will be no surface subsidence.

This application is on file at the Belmont County Recorder's Office, located at the County Court House on Main Street in St. Clairsville for public viewing. Written comments or requests for an informal conference may be sent to the Division of Mineral Resources Management, 1855 Fountain Square Court, Columbus, Ohio 43224 within thirty days of the last date of publication of this notice.

THE OHIO VALLEY COAL COMPANY
FAX TRANSMISSION
February 11, 2002

1 page

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TL-AOV - Feb. 15 - 4 FRI.
Feb. 22
March 1
March 8

OVCC

NAME OF COMPANY

MEMORANDUM FOR VOUCHER No. _____

MONTH OF MAR 02

FAVOR The Times Leader AMOUNT $ 200.20

ADDRESS 200 Fourth St., Martins Ferry, OH 43935

FOR Public Notice - D-0340-13

REMARKS: Send check to Dave Bartsch Please. Thanks.

CHARGE _____

CREDIT _____

APPROVED _____ DATE _____

LSP.

TOVCC 11958

COMMENTS OF THE OHIO VALLEY COAL COMPANY
by
David L. Bartsch, P.E.
Environmental Coordinator and Permit Administrator

INFORMAL HEARING
APPLICATION D-0360-13

The Ohio Valley Coal Company welcomes the opportunity to comment on its current application under review by the Ohio Division of Mineral Resources Management, D-0360-13. Ohio Valley also welcomes public participation in the mining application review process because we believe that public involvement helps make an overall better product when an application is approved. Our comments will review the facts surrounding the application.

- The D-0360-13 application is for less than 40 acres of mining of the Pittsburgh (No. 8) Seam of coal in Smith Township, Ohio.
- The D-0360-13 application is an application for full-surface protection mining and will not involve subsidence of the surface at all.
- No surface impacts from mining in the D-0360-13 application will result.
- The purpose of the mining in the D-0360-13 application area is to allow completion of the already-approved D-0360-7 area, located just to the north.
- The D-0360-13 application area is located 2000 ft north of the Ohio University property line, and a full 3000 ft north of the old-growth forest known as Dysart Woods.
- The D-0360-13 application will not impact the surface watershed of Dysart Woods.
- Last November, Mr. Robert E. Murray committed that Ohio Valley would not longwall mine beneath Dysart Woods. Mr. Murray made this commitment to provide a further measure of safety to the woods, even though all of the research

done to date on surface areas overlying mining shows that there is no impact to vegetation, soil moisture, and especially trees.

- The facts on the D-0360-13 are clear, Dysart Woods is not an issue in this application.
- It is important that the D-0360-13 application be approved in a timely manner to allow the operation of the Powhatan No. 6 Mine to proceed without interruption. Ohio Valley has the largest private payroll in Belmont County, and there are a number of other jobs that depend on the No. 6 Mine for their survival.

We strongly urge the Division of Mineral Resources Management to approve the D-0360-13 application without delay. Thank you for this public forum.

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

22 January, 2002

The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Gentlemen:

The Division has completed a pre-initial completeness review of the coal mining and reclamation permit application #D-0360-13 and revisions are required before processing can continue. Please comply with the following application requirements.

A. Application Review

1. Page 3, A(4): Submit an Attachment 1 for Ohio Valley Resources.

2. Page 4, A(10): Submit an Attachment 5 for The Ohio Valley Coal Company and all affiliated companies.

3. Page 4, A(11): Submit an Attachment 23 for The Ohio Valley Coal Company and all affiliated companies.

4. Page 7, C(1)(b):

   a. F. & S. Simpson- delete deed parcel 1-24-2

   b. J.W. & J.D. Carson

      - add deed parcel 105
      - according to the map, the surface owner is J.W. & J.E. Carson- revise for consistency

   c. F. Simpson- add deed parcel 1-24-2

5. Page 8, C(2): Submit the referenced addendum.

6. Page 8, C(6): No futures map submitted. Submit as necessary.

7. Page 10, C(8)(b):

   a. Deed parcel 104-1 has not been submitted. Revise to submit as necessary. Note: deed parcel 104 has been submitted but is not within the proposed application area. Revise to delete this affidavit as necessary.

   b. Addendum to Page 10, C(8)(b): Revise to delete parcel 104. Add deed parcel 104-1.

8. Page 12, C(9)(b): F.P. & I. Funkhouser are listed as surface owners. According to page 7, C(1)(b) and the map, the owner is F.P. & A. Funkhouser. Revise for consistency.

9. Page 17, C:

- Attachment 14A: Revise to properly designate the sampled sites as high, low, or intermediate per Permitting & Hydrology PPD 2000-2. Comply with all provisions of the PPD, including the requirement to describe all land disturbances in the watershed for samples that pre-date the application submittal by 36 months.

- Attachment 14D: Indicate stream designation (perennial or intermittent).

B. Structure Contour, Deed Parcel and Timing Map

1. Revise to indicate Captina Creek under watershed.

2. Label the coal ownership property lines with the correct symbol.

C. Application & Hydrology Map

1. Delete the property hook across TR-231 between T.N. & E.N. Rubel and F.T. Hart property. This area is located in section 28.

2. Delete the property hook north of test hole N98-26. It appears that this is on a panel line and not on a property line.

3. Who owns the property north of TR-231 west of the R.A. Sr. & J.L Saffell property and east of the F.T. Hart property?

When submitting the above revisions, please submit three copies of the requested revisions. If you have any questions, feel free to e-mail me at deborah.bates@dnr.state.oh.us or call me at (614) 265-6654.

Sincerely,

Deborah S. Bates

Deborah S. Bates
Environmental Specialist
Division of Mineral Resources Management

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ▫ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

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The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

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   c. F. Simpson- add deed parcel 1-24-2

5. Page 8, C(2): Submit the referenced addendum. Rem

6. Page 8, C(6): No futures map submitted. Submit as necessary. Rem

7. Page 10, C(8)(b):

   a. Deed parcel 104-1 has not been submitted. Revise to submit as necessary. Note: deed parcel 104 has been submitted but is not within the proposed application area. Revise to delete this affidavit as necessary.

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Sincerely,

Deborah S. Bates

Deborah S. Bates
Environmental Specialist
Division of Mineral Resources Management

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ◦ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

April 18, 2002

The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Gentlemen:

This is to inform you that an informal conference for The Ohio Valley Coal Company Application **#D-0360-13** has been scheduled at the following location and time:

**Belmont Technical College**
**Red Room**
**120 Fox-Shannon Place**
**St. Clairsville, Ohio 43950**

**Wednesday, May 15, 2002, 2:00 PM**

Persons who are or may be adversely affected or any officer or head of any federal, state, or local governmental agency or authority may attend to present their views. The purpose of an informal conference is to provide persons with an interest an opportunity to comment on the permit application. The Chief of the Division of Mineral Resources Management will consider those comments in making a decision on the application. No decision will be made at the informal conference.

All proceedings at the informal conference will be taped. Comments may be submitted in either written or verbal form. It is suggested that all commenters prepare a summary of their view on the permit application prior to presenting them at the informal conference.

If you have any questions prior to the informal conference, please feel free to contact me at (614) 265-6663.

Sincerely,

Russell W. Gibson, Manager
Permitting, Hydrology & Bonding
Division of Mineral Resources Management

DNR 0001

TOVCC 11965

April 30, 2002

The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Gentlemen:

The Division has reviewed coal mining and reclamation permit application # D-0360-13 and revisions are required before processing can continue. Please comply with the following application requirements.

A. Application Review

ok 1. Page 2, F: Provide the printed name, date, signature, title and notarization acknowledging these revisions.

? 2. Page 3: Provide a complete copy of this page that includes all items in their entirety.

3. Page 4, A(10): Provide an Attachment 5 for American Energy Corporation.

4. Page 10, C(8)(b): Right of entry affidavits:

a. Per the deed parcel map, deed parcel 104-1 is in section 28 only; therefore, delete section 22 from the affidavit.

no - this AP stands alone

5. Page 16, A: Since full recovery is planned north and south of the proposed area, it is inaccurate to indicate this area will not subside; therefore, revise to address all items as necessary.

6. Page 21, A(1): Even though partial recovery is planned for the proposed area, full coal recovery on either side will cause surface subsidence; therefore, the assertion that the area will not subside is incorrect. Revise and address accordingly.

7. Page 25, D(12): As mentioned above, if full coal recovery is anticipated on either side of the proposed area, one could reasonably assume that surface areas within the angle of draw would be impacted by subsidence; therefore, revise the

addendum to address the effects of surface subsidence on fish and wildlife resources within the proposed area.

8. Page 28, J: Presumably future full coal recovery operations conducted on D-0360-7 will extend the shadow area (or zero subsidence line) and planned subsidence onto the proposed area; therefore, revise to indicate that although partial coal recovery operations proposed for this application will not cause subsidence, future full coal recovery operations on D-0360-7 and D-0360-12 will cause the proposed area to subside. Also, reference the applicable subsidence control survey provided in D-0360-7.

9. Page 28, K(1): The referenced addendum does not address the method of coal removal, nor does it indicate the size, sequence, and timing of the development of the underground works as required. Provide an addendum that addresses requirements specified in item K(1).

don't have

B. Engineering Review

1. Please provide the strength of the clay stone floor under **saturated conditions** simulating a flooded mine. Include actual material test results from tested samples.

don't anticipate will be used in new plan

pumping during mining

C. Hydrology Review

1. Page 16, B(1):

Greg/Sip

a. Delete the 2nd page 2 from this addendum, as it starts in the middle of a sentence and has no continuity to page 1. re-arranged

b. Submit a clearer copy of Figure 2, or delete it and reference to it in the addendum, as the submitted copy is illegible. delete

2. Attachment 13:

a. The first submitted drill log is illegible; submit a clearer copy. delete

Greg

b. Submit a complete log for test hole N98-26, as only the last sheet was submitted. elim complete shallow to show area normally cased

?

3. Cross-Section B-B': The #8 Coal is at 785 ft. msl at test hole B&O-13, however the cross-section shows the #8 Coal to be below 770 ft. msl at this test hole. Revise. elim

4. Page 17, C(1): Delete the Ground Water Information addendum, as there are numerous errors within it, and the correct version of this addendum was submitted numerous times previously for the D-0360 permit.

Dele

5. Attachment 14A:

a. Fill out the appropriate information for the sample of W-316: surface elevation, depth, and depth to static water level.

b. Why was only the pH value reported for the DS-111 sample collected on 12/10/90? Who knows? Lost canal

6. Attachment 14B: According to the two submitted cross-sections, zone B, which is associated with the #12 Coal seam and its overburden, is as much as 140 feet thick. Revise.

7. Attachment 14C:

Pub wat

? a. Include the water supply for the Rhodes residence in central Section 22 immediately to the east of the proposed shadow area.

? b. Include DW-399, located on the Hennebert property in the SW ¼ of Section 34, in the inventory. If DW-399 is not the domestic supply for this residence, then what is? Also see comment **10b** below.

? c. If W-172, W-170, and W-166, which are located in the SW ¼ of Section 22, are not in use, then what are the water supplies for the A. May, M. May, and H. Earliwine residences, respectively? Also see comment **10b** below.

d. According to the map, DS-244, DS-277, and DW-318 are located on the *F.* Mayo, not the C. Mayo, property. Similarly, DW-173 is shown to be located on the *S.* Rice property, not the R. Rice property. Revise for consistency.

? e. Revise to indicate that the 90-foot depth of WL-317 was taken from the log, not reported. If the static water level cannot be measured because this well is buried, then indicate the log value of 39 feet in the inventory.

f. Submit logs for WL-168, WL-397, and WL-398. If there are no logs for these wells, then delete the "WL" prefix. Conversely delete logs that represent wells beyond the hydrology review limits, unless these logs have particular relevance that is addressed in the addendum. Based on its location at elevation, DS-242 is located only 315 feet (1090-775=315) above the #8 Coal seam, which means that this developed spring is recharged by zone C, not zone B. Revise the supplying aquifer entry for DS-242 accordingly. ?

g. Several sites, such as DS-241, show different surface elevations on the Attachment 14A's and 14C's. Revise for consistency.

h. ? DW-173 is shown to be an occasional domestic supply. What is the regular supply for the residence when DW-173 is not used? Clarify or revise.

Country

8. Attachment 14D: Revise to indicate that U34-161, U34-166, D34-1, U34-004, and U-34-009 are all located on perennial Williams Creek. Separate entries should not be made for each sampling station; instead each stream should be listed as a single entry. For example, U34-007 and U-34-008 should be listed as a single entry, and the same pertains to U34-146 and U34-164.

OK

9. Page 14, E(1-3):

a. The lowest surface elevation within the proposed application area is *1070* ft. msl on U-34-007/U34-008, not 1005 ft. msl. Accordingly, the maximum topographic relief within the application area is 240 feet. Revise the Topographic Setting on page 2.

b. Revise the Post-Mining Breakouts narrative on page 8, as the minimum overburden within the application area is *325* feet, according to the narrative in the 3rd paragraph on page 2, and not 400 feet. Also revise to indicate that the lowest surface elevation within the application area is *1070* ft. msl, per previous comment, and that the highest elevation of the #8 Coal seam is *800* ft. msl, not 765 ft. msl.

c. Replace the data on Table 1 with more current data, as the submitted data has been submitted several times previously.

d. Delete the submitted hydrographs, as they have been previously submitted numerous times with the D-0360 permit. Furthermore, since subsidence is not proposed, the subsidence monitoring data is not relevant. You may wish to submit monitoring data from room and pillar areas to substantiate the claim that no hydrologic impact is anticipated as a result of the proposed operation.

10. Page 18, F(1):

a. Make sure that revisions to surface elevations, per comment **7g** above, are carried over to Table A.

b. Per comments **7a** through **7c**, include the additional water supplies in the tables.

c. Include W-458, a domestic supply, in Table A.

d. Include the following used developed springs in the Table B inventory: DS-111, DS-223, DS-230, DS-231, DS-240, DS-241, DS-242, and DS-244.

e. According to the Attachment 14C, DS-226B is located at 1155 ft. msl. Revise Table B accordingly, as it incorrectly indicates a surface elevation of 1173 ft. msl.

11. Page 18, F(2): Revise the sentence in item 5 on page 2 which incorrectly states that the payment of interim water bills shall be the responsibility of the water user. Note that interim water bills are to be paid by the operator, per page 4 of Technical PPD 93-1.

12. Page 26, F(3):

a. Revise the 1st sentence, as it incorrectly refers to surface operations, which are not proposed.

b. Delete reference to longwall mining throughout the narrative, as longwall mining is not proposed. Revise the narrative so that it addresses the proposed room and pillar operation. For the sake of simplicity, if the monitoring plan to be implemented is identical to that which has been previously proposed for longwall mining operations at the D-0360 permit, then merely indicate this and identify the appropriate adjacent area application; in this event the remainder of the narrative can be omitted.

D. Application/ Hydrology Map Review

1. Provide a revised map date.

2. Identify sections 22, 28 & 34 and section lines.

3. Show water supply to the dwelling owned by Rhodes. Pub wat.

where? Fred

4. Show two undeveloped springs on the property owned by Funkhouser.

5. Show Williams Creek as a perennial stream.

6. Add a property hook to clearly show that F. Simpson owns the property north and northwest of Township Road 211.

done

7. Identify the water supply for the residence to the southwest of P-16 and the landowner name. Also include this supply in the Attachment 14C inventory and in Table A or B of the response to Page 18, F(1).

8. Note that since this is a room and pillar mining operation, the hydrology review boundary should only extend 300 feet from the limits of the proposed shadow area. Keep this in mind for future applications.

E. Structure Contour, Deed Parcel, and Timing Map Review

1. Indicate the total proposed acreage is for partial coal recovery.

2. Identify sections 22, 28 &34 and section lines.

3. Lines of cross-section obliterate the test hole labels. Clarify.

When submitting the above revisions, please submit three copies of the requested revisions. Two copies will be sent to the field for review. Three additional copies of the application will be requested at a later date. If you have any questions, feel free to e-mail me at deborah.bates@dnr.state.oh.us or call me at (614) 265-6654.

Sincerely,

Deborah S. Bates
Environmental Specialist
Division of Mineral Resources Management

cc: Kevin Ricks
George Mychkovsky
Joe Noonan

PW
1 Earlewine
2 Helmy
3 MD+K May
4 AA May
5 Rhodes
6 Studenc
7 Grant
8 Rice

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR | SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler • Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999

September 23, 2002

David Bartsch
56854 Pleasant Ridge Road
Alledonia, OH 43902

Dear Mr. Bartsch:

I am writing to inform you that Ohio Valley Coal Company's coal mining permit application D-360-13 has been approved. The Division completed a thorough review of the permit application and has determined the revised application is in full compliance with the requirements of Ohio's coal mining laws and rules, which are contained in Section 1513 of the Ohio Revised Code and Chapter 1501:13 of the Ohio Administrative Code.

The Division of Mineral Resources Management conducted an informal conference for application #D-360-13 on May 15, 2002, at the Belmont Technical College. As a participant in that conference, you are being provided with this notification and a copy of the attached written findings pursuant to Ohio Revised Code Section 1513.02(I)(1). This conference was a bit unusual in that few speakers expressed or identified specific questions or concerns. Instead, they expressed either their opposition or support for the permit. As a result, we were required to interpret comments to isolate questions and/or concerns to address in these findings. The attached written findings address each of the concerns we were able to identify in detail. The taped proceedings of the conference will remain on file with the Division of Mineral Resources until such time that all bond is released or the permit expires or otherwise is terminated.

If you are a person having an interest that is or may be adversely affected by the Chief's decision of approval, and should you wish to appeal the Chief's decision, you may do so by filing a notice of appeal with the Reclamation Commission, Ohio Department of Natural Resources, 1855 Fountain Square Court, Suite 124, Columbus, Ohio 43224, (614) 262-1269 within thirty days after the applicant is notified of this decision. It is also necessary to file a copy of any notice of appeal with the Chief of the Division of Mineral Resources Management, Ohio Department of Natural Resources, 1855 Fountain Square Court, Columbus, Ohio 43224, within three days after filing the notice of appeal with the Board. Further essential provisions governing appeals to the Board, including request for temporary relief, are found in Section 1513.07(I)(3) and 1513.13 of the Ohio Revised Code.

Sincerely,

Michael L. Sponsler, Chief

Certified Mail # 7000 0600 0027 4779 5488

cc: District Office
Ohio Valley Coal Company

DNR 0001

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINERAL RESOURCES MANAGEMENT

# WRITTEN FINDINGS-INFORMAL CONFERENCE

Ohio Valley Coal Company – Application #D-360-13
May 15, 2002

1. **CONCERN**: The application map for this permit application fails to show the proximity of Dysart Woods Land Laboratory to the permit application area. The application area is well within the watershed buffer zone established by Ohio University that has been requested to be off limits to mining since 1970.

   ***RESPONSE:*** *A review of the Application/Hydrology map for D-0360-13 shows that the hydrology review area of the proposed application area is not located within any of the following areas of Dysart Woods: the Old Growth Forest Area(s), or the area determined to be unsuitable for surface coal mining. It should be noted that insofar as only partial extraction of the #8 Pittsburgh Coal seam for gate entry development mining is proposed, with no full coal recovery planned and no subsidence anticipated, the hydrology review for D-0360-13 consists of the application area and the surrounding area defined by a perimeter extending 300-feet from the application area. Since none of the applicable areas of Dysart Woods are located within the hydrology review area, they are not required to be shown on the map.*

2. **CONCERN:** The Belmont County Farm Bureau has had a policy the last two or three years to allow no mining within a half mile of Dysart Woods.

   ***RESPONSE:*** *Chapter 1513 of the Ohio Revised Code and related rules within Ohio Administrative Code 1501:13 regulates Coal mining within Ohio. While the Belmont County Farm Bureau may have adopted a policy that expresses their desire to not allow mining within a half-mile of Dysart Woods, the binding rule of law and authority of the Division is limited to (and by) the above referenced statutes and administrative rules.*

3. **CONCERN:** Dysart Woods is among the most endangered ecosystems on earth and this permit if approved would be destructive to Dysart Woods. The large trees within the old growth forest areas are dependent upon perched aquifers, which are clay-like bowls within the earth, about 30, 40, or 50 feet down that hold water and feed it into the forest ecosystem. Longwall mining with planned subsidence and subsequent rock fracturing will dewater the perched aquifers that are used by the trees, thereby preventing access to the water they need and jeopardizing the health of the trees. Mining impacts to Dysart Woods should not be allowed. How will the proposed mining impact the hydrology of the Dysart Woods area and watershed?

   ***RESPONSE:*** *The mining area approved in application D-360-13 is located approximately 2600 feet north of the old growth forest areas within Dysart Woods.*



TOVCC 11973

*The old-growth forest areas and the Dysart Woods Land Laboratory are not within the hydrologic boundary for this application. The type of mining that is proposed calls for gate entry development in which only 48.7% of the available coal is to be removed. As a general rule, underground extraction of less than 50% is a professionally accepted engineering standard in which no subsidence can be expected from the mining activities. Therefore, there is no subsurface or surface water loss that is to be expected as a result of this activity.*

*The distance to Dysart Woods from the permit application area, as well as the fact that no subsidence will occur and therefore no subsurface water loss is anticipated, assures that no damage or impacts to Dysart Woods or on the immediate overlying areas of the D-360-13 permit area should occur.*

4. **CONCERN:** Claims that room and pillar mining don't cause subsidence are a fallacy and wrong. If you dig a gap under the ground, particularly as big as a mine, it is going to cave in at some point. Subsidence of any kind damages the hydrology, which in turn may reroute surface and/or groundwater flow in, around and through Dysart Woods.

***RESPONSE:*** *Contemporary room and pillar mining practices, in which less than 50% of available coal is extracted, have been demonstrated to prevent subsidence events from occurring. The concern cited by the speaker is most likely referencing subsidence events that occurred as a result of historical room and pillar operations. Previous room and pillar operations extracted more than 50% of available coal reserves, skimming additional coal from the pillars as they moved out of the mine, thereby dramatically weakening the supporting pillars. Such practice is not proposed for the D-0360-13 application area. Gate entry development is an extremely stable method of underground mining, since the gate entries are designed first and foremost to house conveyors and other equipment to move coal and miners through the mine over a long period of time.*

*The applicant further claims that partial coal extraction for the proposed gate entry development mining does not result in water loss due to subsidence, since subsidence is prevented. In order to substantiate this claim, the applicant submitted hydrographs in Appendix A of the Probable Hydrologic Consequences addendum to Page 18, E (1-3) from ground water sites previously undermined by development entries for mains, where partial extraction in very similar ratios occurred at other sections of the D-0360 permit area. The hydrograghs derived from monitoring data of developed spring DS-107, dug well DW-227, and drilled wells W-343, W344, and W-345 show no loss of spring discharge or decrease in static water level in the wells. The applicant's claim that partial coal extraction for gate entry development mining does not result in water loss or alteration of surface water flows due to subsidence is adequately documented.*



TOVCC 11974

5. **CONCERN:** The many little pieces of forests that are being destroyed by industry every day are adding up to a complete destruction of all the forests. We should not limit our thinking just about the impact of this one permit, we should be thinking about the impact of our lifestyle, of the large number of small requests from the industry that when added all together represent one very large impact upon forests. We must end this lifestyle today by saying "No" to this request; otherwise tomorrow we will have no forest left because we've asked for infinite number of small requests.

***RESPONSE:*** *The Division of Mineral Resources Management has jurisdiction only over the submittals presented before us, and is limited to reviewing such proposals to insure that they meet all provisions of Chapter 1513 of the Ohio Revised Code and related rules in 1501:13 of the Ohio Administrative Code. When reviewing permit applications, we evaluate the individual conditions and circumstances of each application area. As a result, there is no generic template for these permits; each permit has its own unique conditions and circumstances. However, when processing and reviewing permit applications, the Division requires applicants to submit a Probable Hydrologic Consequences narrative to predict the anticipated impacts of mining on the surface and ground water hydrology systems with respect to water quality and water quantity. Such predictions are largely based upon the impacts that occurred to-date under similar circumstances and conditions based on available monitoring data. The D-0360 permit (in total) is a large and active mine and has been operational for a number of years. As a result, there is a sizeable collection of monitoring data available to make such predictions with high reliability. While the Division reviews each permit application on its own merits and unique circumstances, the impacts from other similar operations are considered and factored in the permitting process. In this manner, the fragmented and/or disjointed approach alluded to in the comments is avoided in the permitting process.*

*References to altering lifestyles and other broadly sweeping statements may only be addressed through legislation and social change. Such concerns are clearly outside of the Division's jurisdiction and authority expressed in the Revised Code. The Division is a regulatory agency, with authority and jurisdiction to implement and enforce existing laws and rules governing coal mining in Ohio. We have no authority to influence or engage in practices designed to encourage lifestyle changes or other alterations of existing public policy.*

6. **CONCERN:** You may not have heard of the PM245 air pollution in southeastern Ohio; it is a small problem in the area. You might like to ignore it, but it exists all the time around us. Among the whole population, there are some groups who are susceptible to air pollution; old people, children and patients with respiratory and cardio-vascular disease. Approving this permit application will increase pollution caused by P245.

***RESPONSE:*** *The applicant has indicated within the permit application that Ohio Valley Coal Company will be in compliance with the federal Clean Air Act. The Division of Mineral Resources Management has no authority to enforce provisions of*



TOVCC 11975

*the Clean Air Act or other air quality regulations. Such jurisdiction is housed within the Ohio Environmental Protection Agency and/or the US Environmental Protection Agency.*

7. **CONCERNS:** How close will longwall panels go off of this particular room and pillar operation and where will they go?

   ***RESPONSE:*** *Plans for future longwall panel development were not submitted as part of the D-0360-13 adjacent area application. When such long-range, future plans are submitted, they are rather speculative and subject to considerable changes. As a result, the precise distances and locations of future longwall panel development have not been fully identified during the course of the review of D-0360-13. However, the D-0360-13 permit application is to develop gate entries that will allow the applicant to continue mining on the D-0360-7 shadow area which is to the north of the D-0360-13 application area.*

   *The applicant has also recently submitted an adjacent area permit application identified as D-0360-12, which is south of the proposed D-0360-13 application area and is currently under review by the Division. It is our understanding from this application, that longwall panels are expected to eventually exist on both sides of the gate entries developed as a result of the D-0360-13 adjacent area application.*

8. **CONCERN:** Does this room and pillar operation (D-360-13) mean an entry way into Goshen Township in the future?

   ***RESPONSE:*** *The applicant makes no reference to future mining in Goshen Township in either the D-0360-13 permit application or the D-0360-12 permit application.*

9. **CONCERN:** Is there any truth to the rumor, and I would state that it is strictly a rumor at this point, that as soon as they finish with this area of Smith Township, Ohio Valley Coal will be retired in favor of other coal companies that are non-union?

   ***RESPONSE:*** *This information is not available to the Division and would in no way influence the regulatory review and processing of this application. The Division's review of the permit application of D-360-13 concluded that the application was fully compliant with rules and laws governing coal mining in the state of Ohio.*



TOVCC 11976

10. **CONCERN:** OVCC says that the trees surround all the rainwater but does not mining underneath the trees affect the rainwater as well, which will still kill the trees?

***RESPONSE:*** *Longwall mining may accelerate the infiltration of rainwater into the groundwater system by the creation of subsidence fractures that carry a certain percentage of water to greater depths, thereby making this portion of water unavailable to the tree roots for growth and sustenance. The issues to be addressed are the extent of water diversion into the subsurface, and whether such water diversion is sufficient to harm trees, specifically those found within the old growth areas of Dysart Woods.*

*The activities associated with D-0360-13 will not result in any rainwater diversion since no surface affectment will occur on the overlying areas of this permit application. As a result, activities conducted as part of the D-0360-13 permit will have no impact on the trees within the old growth areas of Dysart Woods, since the application area is more than 2600 feet north of these areas and no surface affectment will occur.*

11. **CONCERN:** What happens with longwall mining, this is a room and pillar mining. It is to support longwall mining, which is extremely destructive and both longwall and room and pillar mining do have effects on the hydrology. What they do is they suck the water down to the level of mining, which in this case is a bout 400 feet down and that makes it totally unusable for the trees because trees don't have roots that can penetrate 400 feet beneath the ground and so then the water gets sucked out at that level, the trees can die and that is one of our big concerns.

***RESPONSE:*** *There are no longwall mining activities associated with the proposed D-360-13 permit application area. All mining to be conducted is associated with gate entry development and will result in no surface subsidence. There is no evidence to suggest that any impacts to surface vegetation (including trees) will occur since gate entry development does not result in impacts to the hydrologic balance in the area.*

12. **CONCERN:** The application does not contain waivers to mine under or within 300-feet of occupied dwellings on Hart Road and Dunfee Road.

***RESPONSE:*** *The prohibition against mining within 300 feet of an occupied dwelling applies only to 300-feet as measured horizontally. There is no prohibition in the Ohio Revised Code that is based upon vertical measurement when dealing with an underground mining activity. Since no surface disturbance is expected within 300 feet of an occupied dwelling as a result of activities associated with the D-360-13 permit, no waivers are required for this permit application.*



TOVCC 11977

13. **CONCERN:** The application would permit underground operations under State Route 147, and two Smith Township roads. The location of the operations under State Highway 147 would be extremely dangerous to traffic when subsidence occurs.

***RESPONSE**: There are no longwall mining activities associated with the proposed D-360-13 permit application area. All mining that is to be conducted is associated with gate entry development and will result in no subsidence or other surface affectment. There is no evidence to suggest that mining related impacts to public roads will occur as a result of this permit.*

14. **CONCERN:** The proposed underground operation is within the angle of draw from any future subsidence to a livestock spring (DS-282) used in the farming operations of Country Mile Farm.

***RESPONSE:** The angle of draw is an issue related only to longwall mining and the predicted subsidence that occurs in conjunction with longwall mining. The mining activities identified in the D-360-13 permit application are strictly limited to gate entry development, which is completed using a modified room and pillar method of mining. In the instance of gate entry development and with respect to the D-360-13 permit, only 48.7% of available coal is to be removed. The remaining pillars will insure that surface affectment resulting from subsidence will be prevented, since no subsidence is expected to result from activities approved in this permit. As a result, there are no impacts expected to occur to the above spring.*

15. **CONCERN:** The proposed mine operation would go under a 4+ acre stand of Old Growth Forest (determined to be a virgin forest by ODNR May, 1986) which is also within the 57 acre boundary of the National Register property listed above.

***RESPONSE:** The old growth forest area that you identify in your letter does not meet the requirements for any of the specific prohibited areas identified in Section 1501:13-3-04 of the Ohio Administrative Code or any other provisions of the Ohio Revised Code. The inclusion of this area on state or federal registries is insufficient to include it as an area where mining is prohibited. Additionally, the activity that is proposed in this permit application will not result in any surface affectment or dewatering of any groundwater or surface water sources. No impacts to overlying trees will occur as a result of this permit.*

16. **CONCERN:** The Lucas Cemetery along Hart Road is very closed to the proposed permit area. On March 23, 2002, United State District Judge James Robertson, ruled on Civil Action No 00-0274 which overturns the Secretary of the Interior's decision that (Section) §1272 does not prohibit underground activities that may cause subsidence and activities that may cause subsidence to ... the National Park System, National Wildlife Refuge Systems, National System of Trails, National Wilderness Preservation System, Wild and Scenic Rivers System, National Recreation Areas ... Federal land with the boundaries of any nation for ... public parks, National Register of Historic Sites.



TOVCC 11978

...within 100-feet of the outside right-of-way of any public road, or within 300-feet from any occupied dwelling, unless waived by the owner thereof nor within 300-feet of any public building, school, church, community or institutional building, public park, or within 100-feet of a cemetery.

***RESPONSE:*** *Judge Robertson has stayed his ruling on these matters. Additionally, there have been no changes to either the federal Surface Mining Control & Reclamation Act (SMCRA) or to Chapter 1513 of the Ohio Revised Code. The ruling deals specifically with subsidence related events associated with longwall mining. As has been previously identified in these findings, there is no subsidence expected to result from the activities permitted under D-360-13.*

*The cemetery prohibition contained in OAC 1501:13-3-03 applies only to 100-feet when measured horizontally. Under existing state and federal laws governing underground coal mining, there is no prohibition based upon vertical measurement. No surface affectment within 100-feet of a cemetery will occur as a result of activities proposed in this permit application. Therefore, the applicant has properly and appropriately responded to the question within the permit application.*

17. **CONCERN:** Previous Ohio Valley Coal permit applications state that all room and pillar operations will subside at some future time. Any declaration of D-360-13 that it will not subside would be incorrect.

***RESPONSE:*** *As mentioned previously, contemporary room and pillar mining practices, in which less that 50% of available coal is extracted, have been demonstrated to prevent subsidence events from occurring. Gate entry development is an extremely stable method of underground mining, since the removal of coal is actually secondary to developing the infrastructure of the mine. In this permit, the percentage of available coal to be removed is 48.7%. Extraction of less than 50% is a professionally accepted engineering standard in which no subsidence can be expected. The DMRM engineer has reviewed the permit application for the potential for subsidence and determined that it is not expected to occur. Previous room and pillar mining techniques involved mining an area and then scaling back the pillars as the mining moves out of an area, dramatically weakening pillar strength. This activity is neither proposed nor likely to be proposed in this permit application.*

Michael L. Sponsler by RW Carlson

*Michael L. Sponsler, Chief*
*Division of Mineral Resources Management*

9/23/02
*Date*



TOVCC 11979

11/92

RECEIVED
SEP 9 2002
DIVISION OF MINERAL RESOURCES MANAGEMENT

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF RECLAMATION**

**UNDERGROUND COAL MINING AND RECLAMATION**
**PERMIT APPLICATION**

Applicant The Ohio Valley Coal Company

A. Type of Operation (check appropriate space(s)):

_____ Shaft, _____ Slope, _____ Drift,
_X_ Room and Pillar, _____ Pillar Extraction,
_____ Longwall, _____ Combined Surface and Underground

B. Type of Application (check appropriate space(s)):

(1) _____ New
(2) _____ Initial Underground Workings to Existing Permit
(3) _X_ Additional Underground Workings

C. Address the following if applicable:

(1) Permit Number D-0360
(2) Date Issued 6/20/84

D. Did a person other than an employee of the applicant prepare this application? _____ Yes, _X_ No. If "yes," provide:

Preparer's Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____-_____-_____

E. I, the undersigned, a responsible official of the applicant, do hereby verify the information in the complete permit application as true and correct to the best of my information and belief.

Printed Name John R. Forrelli; Title President & General Manager

Signature _____; Date December 10, 2001

Sworn before me and subscribed in my presence this 10th day of Dec, 2001.

Notary Public

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

OPERATOR

00360

TOVCC 11980

F. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature David L. Bartsch ; Date 1-30-02

Sworn before me and subscribed in my presence this

30th day of JAN., 2002.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

Employer Identification No. (EIN) 34-1041310, or

Social Security No. (SSN), _____

(2) Indicate business structure of applicant and additional information:

____ Single proprietorship,
____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
____ Association, ____ Other, specify _____

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

Beginning date of ownership _____

OPERATOR

D036013

TOVCC 11981

F. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature David L. Bartsch ; Date 6-22-02

Sworn before me and subscribed in my presence this 22nd day of June, 2002.

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

Denise R. Jackson
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

Employer Identification No. (EIN) 34-1041310, or

Social Security No. (SSN), _____

(2) Indicate business structure of applicant and additional information:

_____ Single proprietorship,
_____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
_____ Association, _____ Other, specify _____

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

Beginning date of ownership _____

OPERATOR

F. For Revision Review Only. This item is to be completed after revisions, if any, have been made to the permit application.

I, the undersigned, a responsible official of the applicant, do hereby verify and acknowledge the revisions made during the permit review process as true and correct to the best of my information and belief.

Printed Name David L. Bartsch ; Title Permit Administrator

Signature David L. Bartsch ; Date 8-5-02

Sworn before me and subscribed in my presence this 5th day of Aug., 2002.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

## PART 1. LEGAL, FINANCIAL, COMPLIANCE, AND RELATED INFORMATION

### A. IDENTIFICATION OF INTERESTS

(1) Applicant's Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Telephone 740 - 926 - 1351

Employer Identification No. (EIN) 34-1041310, or

Social Security No. (SSN), _____

(2) Indicate business structure of applicant and additional information:

____ Single proprietorship,
____ Partnership (registration no. and date obtained) _____,
X Corporation (charter no. and date incorporated) 5/25/88 384971,
____ Association, ____ Other, specify _____,

(3) If the applicant is a single proprietorship, provide the following:

Owner's Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

Beginning date of ownership _____

OPERATOR

D036013

TOVCC 11983

John R. Forrelli
President & General Manager

November 5. 2001

Mr. Michael S. Sponsler. Chief
Division of Mineral Resources Management
Ohio Department of Natural Resources
1855 Fountain Square Court
Columbus, OH 43224

Dear Mr. Sponsler:

This letter is to certify that

David L. Bartsch, P.E.

Is authorized to sign application revisions for The Ohio Valley Coal Company. Permit D-0360 will be the subject of applications to add underground mining areas. In his job as the Environmental Coordinator and Permit Administrator, Mr. Bartsch acts as a responsible official of this company. If you have any questions, please contact me.

Sincerely,
THE OHIO VALLEY COAL COMPANY

John R. Forrelli
President and General Manager

OPERATOR

56854 PLEASANT RIDGE ROAD • ALLEDONIA OHIO 43902
(740) 926-1351 • FAX (740) 926-1615

5036013

TOVCC 11984

(4) If the applicant is a business entity other than a single proprietorship, provide the following for the applicant's statutory agent and submit Attachment 1.

Agent's Name A&H Statutory

Address 1100 Huntington Building

City Cleveland State OH Zip 44115

Telephone 216 - 969 - 1100

EIN 34-104130, or SSN (optional) _____

(5) Is the operator of the mine to be a person different from the applicant? ____ Yes, X No. If "yes," provide the operator's name and submit Attachment 17. (Note: if more than one operator, indicate operator's name and submit a separate attachment for each.)

Operator's Name _____

(6) Provide the following for the person who will pay the abandoned mine land reclamation fee for the applicant.

Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State OH Zip 43902

Telephone 740 - 926 - 1351

EIN 34-1041310, or SSN (optional) _____

(7) Provide the following for all persons having the authority or ability to commit the financial, real property assets, or working resources of the applicant who are not otherwise identified as officers, directors, or owners of the applicant. If none, check box: [ ]. If any person listed is a business entity and not an individual, also complete Attachment 1 for that person.

Name Robert E. Murray

Address 29325 Chagrin Boulevard, Suite 300

City Pepper Pike State OH Zip 44122

Telephone 216 - 765 - 1240

EIN _____, or SSN 295-36-8852

Date O & C relationship began/ended (if applicable)

5/25/88 / _____

Submit and identify additional pages necessary to complete response. See Attachment 1's

OPERATOR

(8) Provide the following for all persons owning or controlling the coal to be mined by another person under a lease, sublease, or other contract and (a) having the right to receive the coal after mining, or (b) having the authority to determine the manner in which another person conducts coal mining operations. If none, check box: [ x ]. If any person listed is a business entity and not an individual, also complete Attachment 1 for that person.

Name _____

Address _____

City _____ State _____ Zip _____

Telephone ____-____-____

EIN _____, or SSN _____

O & C relationship to entity _____

Date O & C relationship began/ended (if applicable)

_____ / _____

Submit and identify additional pages necessary to complete response.

(9) List below the person or persons primarily responsible for ensuring that the applicant will comply with Chapter 1513. of the Revised Code and the rules adopted pursuant thereto while mining and reclaiming the area for which this permit is requested.

Robert E. Murray

(10) Has the applicant, any person listed under items A(3), (7), and (8), or any person listed on Attachment 1 who "owned or controlled" or "owns or controls" as defined in 1501:13-4-03(A), held a coal mining permit in the United States within the five years preceding the date of the application? X Yes, ____ No. If "yes," submit Attachment 5. See Attachment 5's

(11) Does the applicant, any person listed under items A(3), (7), and (8), or any person listed on Attachment 1 have a pending coal mining application in any state of the United States? X Yes, ____ No. If "yes," submit Attachment 23. See Attachment 23's

(12) Indicate name of mine Powhatan No. 6 Mine

(13) List below the MSHA identification numbers for the mine and for all mine-associated structures requiring MSHA approval on the proposed permit area.

33-01159
1210-OH8-0025-003
1210-OH8-0025-004
1210-OH8-0025-005

(14) Submit Attachment 22, Certificate of Liability Insurance. See Attachment 22

OPERATOR

11/92

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF MINES AND RECLAMATION
## ATTACHMENT 1
## (OWNERS AND CONTROLLERS)

Applicant's Name THE OHIO VALLEY COAL COMPANY

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that entity.

Name of business entity THE OHIO VALLEY COAL COMPANY

Name STEPHEN C. ELLIS
Street address 1100 HUNTNGTON BLDG
City CLEVELAND State OH Zip 44115
EIN SSN (Optional) 279-42-7396
Title of position within entity SECRETARY
Date position assumed/ended (if appropriate) 05/25/88 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name OHIO VALLEY RESOURCES INC.
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional)
Title of position within entity SHAREHOLDER
Date position assumed/ended (if appropriate) 05/25/88 /
Percent of ownership 100 Date of ownership 05/28/88
Location in organizational structure SHAREHOLDER

Name MICHAEL D. LOIACONO
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 206-36-6784
Title of position within entity ASST SECY & CORP. COMPT.. TREASURER
Date position assumed/ended (if appropriate) 03/10/95 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name ROBERT E. MURRAY
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 295-36-8852
Title of position within entity PRESIDENT. CEO
Date position assumed/ended (if appropriate) 05/25/88 / 10/31/99
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Submit and identify additional pages necessary to complete response.

OPERATOR

TOVCC 11987

11/92

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF MINES AND RECLAMATION
## ATTACHMENT 1
## (OWNERS AND CONTROLLERS)

Applicant's Name THE OHIO VALLEY COAL COMPANY

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that entity.

Name of business entity THE OHIO VALLEY COAL COMPANY

Name ROBERT E. MURRAY
Street address 53854 PLEASANT RIDGE ROAD
City ALLEDONIA State OH Zip 43902
EIN SSN (Optional) 232-86-2688
Title of position within entity DIRECTOR
Date position assumed/ended (if appropriate) 03/10/95
Percent of ownership 0 Date of ownership
Location in organizational structure DIRECTOR

Name JOHN R. FORRELLI
Street address 53854 PLEASANT RIDGE ROAD
City ALLEDONIA State OH Zip 43902
EIN SSN (Optional) 232-90-2378
Title of position within entity PRESIDENT AND GENERAL MANAGER
Date position assumed/ended (if appropriate) 11/01/99 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name ROBERTA K. HEIL
Street address 56854 PLEASANT RIDGE ROAD
City ALLEDONIA State OH Zip 43902
EIN SSN (Optional) 004-72-8632
Title of position within entity ASSISTANT SECRETARY
Date position assumed/ended (if appropriate) 11/01/99 /
Percent of ownership 0 Date of ownership
Location in organizational structure ASSISTANT SECRETARY

Name BONNIE M FROEHLICH
Street address 56854 PLEASANT RIDGE ROAD
City ALLEDONIA State OH Zip 43902
EIN SSN (Optional) 004-72-8632
Title of position within entity ASSISTANT SECRETARY AND ASSISTANT TREASURER
Date position assumed/ended (if appropriate) 06/25/2001 /
Percent of ownership 0 Date of ownership
Location in organizational structure ASSISTANT SECRETARY AND ASSISTANT TREASURER

Submit and identify additional pages necessary to complete response.

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 1
(OWNERS AND CONTROLLERS)

Applicant's Name THE OHIO VALLEY COAL COMPANY

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that entity.

Name of business entity OHIO VALLEY RESOURCES INC.

Name MICHAEL D. LOIACONO
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 206-36-6784
Title of position within entity TREASURER
Date position assumed/ended (if appropriate) 11/01/99 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name MICHAEL D. LOIACONO
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 206-36-6784
Title of position within entity ASSISTANT SECRETARY
Date position assumed/ended (if appropriate) 10/30/89 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name MICHAEL D. LOIACONO
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 206-36-6784
Title of position within entity CORPORATE COMPTROLLER
Date position assumed/ended (if appropriate) 04/02/91 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name ROBERT E. MURRAY
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 295-36-8852
Title of position within entity PRESIDENT, CEO, TREASURER
Date position assumed/ended (if appropriate) 03/29/88 / 10/31/99
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Submit and identify additional pages necessary to complete response.

11/92

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION
ATTACHMENT 1
(OWNERS AND CONTROLLERS)

Applicant's Name THE OHIO VALLEY COAL COMPANY

This attachment is to be completed and submitted with the permit application if the applicant is other than a single proprietorship. Provide the following for all partners, officers, directors, stockholders owning ten percent or more of any class of voting stock or other instruments of ownership, and any other person performing a function similar to a director. If any person listed is a business entity and not an individual, also complete an Attachment 1 for that entity.

Name of business entity OHIO VALLEY RESOURCES INC.

Name STEPHEN C. ELLIS
Street address 1100 HUNTINGTON BLDG
City CLEVELAND State OH Zip 44115
EIN SSN (Optional) 279-42-7396
Title of position within entity SECRETARY
Date position assumed/ended (if appropriate) 12/20/90 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name JOHN R. FORRELLI
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 232-86-2688
Title of position within entity PRESIDENT
Date position assumed/ended (if appropriate) 11/01/99 /
Percent of ownership 0 Date of ownership
Location in organizational structure OFFICER

Name ROBERT E. MURRAY
Street address SUITE 300 29325 CHAGRIN BOULEVARD
City PEPPER PIKE State OH Zip 44122
EIN SSN (Optional) 295-36-8852
Title of position within entity DIRECTOR/SHAREHOLDER
Date position assumed/ended (if appropriate) 03/10/95 /
Percent of ownership 100 Date of ownership
Location in organizational structure DIRECTOR/SHAREHOLDER

Name
Street address
City State Zip
EIN SSN (Optional)
Title of position within entity
Date position assumed/ended (if appropriate) /
Percent of ownership Date of ownership
Location in organizational structure

Submit and identify additional pages necessary to complete response.

12/95

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DIVISION OF MINERAL RESOURCES MANAGEMENT

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 5
## (PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: The American Coal Company
Address: 29325 Chagrin Blvd Suite 300
City: Pepper Pike State: OH Zip: 43122
Telephone: 216 - 765 - 1240
EIN: 73-1546124 or SSN: _____

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| 02 | IL | Office of Mines And Minerals | 11-02752 10/14/98 |
| 255 | IL | Office of Mines And Minerals | 11-02752 10/14/98 |
| 257 | IL | Office of Mines and Minerals | 11-02752 10/14/98 |
| 306 | IL | Office of Mines and Minerals | 11-02752 10/14/98 |
| 344 | IL | Office of Mines and Minerals | 11-02752 10/14/98 |
| 352 | IL | Office of Mines and Minerals | 11-02752 10/14/98 (to replace #344 soon) |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray President

12/95

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 5
## (PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: The Oklahoma Coal Company
Address: 29325 Chagrin Blvd, Suite 300
City: Pepper Pike State: OH Zip: 44122
Telephone: 216 - 765 - 1240
EIN: 34-1673480 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-0230 | OH | DMRM | |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray, Director

12/95

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 5
## (PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: The Ohio Valley Coal Company
Address: 56854 Pleasant Ridge Road
City: Alledonia State: OH Zip: 43902
Telephone: 740 - 926 - 1351
EIN: 34-104130 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-0360 | OH | DMRM | 33-01159 5/25/88 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

12/95

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 5
## (PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: UtahAmerican Energy, Inc.
Address: P. O. Box 187
City: St. Clairsville State: OH Zip: 43950
Telephone: 435 - 613 - 0393
EIN: 34-1874726 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| ACT/007/013 | UT | DOGM | Horse Canyon Mine 42-00100 12/24/78<br>Lila Canyon Mine 42-02241 4/15/99 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray, Director

12/95

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 5
## (PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: Belmont Coal Company
Address: P. O. Box 146
City: Powhatan Point State: OH Zip: 43942
Telephone: 714 - 795 - 5200
EIN: 31-1536602 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-1020 | OH | DMRM | 33-04397 7/31/97 |
| D-0241 | OH | DMRM | 33-03048 7/2/93 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray, Shareholder, 100%

12/95

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 5
## (PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: MonValley Transportation Center, Inc.
Address: P.O. Box 135 – 1060 Ohio Ave.
City: Glassport State: PA Zip: 15045
Telephone: 412 - 673 - 1500
EIN: 15-1490495 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| 02851602 | PA | DEP | 36-08678 06/08/95 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray - Director

12/95

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 5
## (PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: Maple Creek Mining Company
Address: 981 Route 917
City: Bentleyville State: PA Zip: 15314
Telephone: 724 - 258 - 2056
EIN: 25-1755305 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| 63841302 | PA | DEP | 36-00970 – June 30, 1995 |
| 63733706 | PA | DEP | 36-00970 – June 30, 1995 |
| 63723707 | PA | DEP | 36-00970 – June 30, 1995 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray – Director

12/95

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 5
## (PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: UMCO Energy, Inc.
Address: 981 Route 917
City: Bentleyville State: PA Zip: 15314
Telephone: 724 - 258 - 2056
EIN: 52-1615668 or SSN:

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| 63921301 | PA | DEP | 36-08375 June 08, 1994 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

Robert E. Murray – Director

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

ATTACHMENT 5
(PERMIT LISTING)

Applicant's Name: The Ohio Valley Coal Company

Submit the following information for each coal mining operation owned or controlled by either the applicant or by any person who owns or controls the applicant.

Name of Business Entity: American Energy Corporation
Address: 43521 Mayhugh Hill Road, TWP Highway 88
City: Beallsville State: OH Zip: 43716
Telephone: 740 - 926 - 9152
EIN: 31-1550443 or SSN: _____

| Permit No. | State | Regulatory Authority | MSHA No. and Date Issued |
|---|---|---|---|
| D-0425 | OH | DMRM | 33-01070 11/6/00 |
| D-1159 | OH | DMRM | 33-01070 11/6/00 |
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If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including the percent ownership and location in organizational structure:

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**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES AND RECLAMATION**

**ATTACHMENT 5**
**PERMIT LISTING**

APPLICANT'S NAME THE OHIO VALLEY COAL COMPANY

SUBMIT THE FOLLOWING INFORMATION FOR EACH COAL MINING OPERATION OWNED OR CONTR EITHER THE APPLICANT OR BY ANY PERSON WHO OWNS OR CONTROLS THE APPLICANT

Name of business entity Energy Resources Incorporated
Address PO Box 259
City Brockway State PA Zip 15824
Telephone 814-265-8021
EIN 31-1044044 SSN

| PERMIT NO. | STATE | NAME OF REGULATORY AGENCY | MSHA NO. AND DATE ISSUED | |
|---|---|---|---|---|
| 33840123 | PA | DEP | 36-02695 | 05/25/88 |
| 33860102 | PA | DEP | 36-02695 | 05/25/88 |
| 17880102 | PA | DEP | 36-02695 | 05/25/88 |
| 33870113 | PA | DEP | 36-02695 | 05/25/88 |
| 33830115 | PA | DEP | 36-02695 | 05/25/88 |
| 24880101 | PA | DEP | 36-02695 | 05/25/88 |
| 24880103 | PA | DEP | 36-02695 | 05/25/88 |
| 24890101 | PA | DEP | 36-02695 | 05/25/88 |
| 24890102 | PA | DEP | 36-02695 | 05/25/88 |
| 24890108 | PA | DEP | 36-02695 | 05/25/88 |
| 24900102 | PA | DEP | 36-02695 | 05/25/88 |
| 24900104 | PA | DEP | 36-02695 | 05/25/88 |
| 24900103 | PA | DEP | 36-02695 | 05/25/88 |
| 24960101 | PA | DEP | 36-02695 | 05/25/88 |
| 24970102 | PA | DEP | 36-02695 | 05/25/88 |
| 24970103 | PA | DEP | 36-02695 | 05/25/88 |
| 24980101 | PA | DEP | 36-02695 | 05/25/88 |
| 24970101 | PA | DEP | 36-02695 | 05/25/88 |
| 24305006 | PA | DEP | 36-02695 | 05/25/88 |

If not previously provided, indicate the ownership or control relationship of the business entity with the applicant, including percent of ownership and location in organization structure:

Owned by Parent Entity

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 23**
**(PENDING PERMIT APPLICATIONS)**

Applicant's Name THE OHIO VALLEY COAL COMPANY

Provide the following information for each pending coal mining application for either the applicant or any person who owns or controls the applicant.

Indicate the business entity for which this listing has been completed BELMONT COAL COMPANY INC.

| Application No. | Name of Regulatory Authority | State |
|---|---|---|
| 10168 | DMRM | OH |
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**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 23**
**(PENDING PERMIT APPLICATIONS)**

Applicant's Name THE OHIO VALLEY COAL COMPANY

Provide the following information for each pending coal mining application for either the applicant or any person who owns or controls the applicant.

Indicate the business entity for which this listing has been completed UTAHAMERICAN ENERGY INC.

| Application No. | Name of Regulatory Authority | State |
|---|---|---|
| ACT/007/013 | DOGM | UT |
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**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 23**
**(PENDING PERMIT APPLICATIONS)**

Applicant's Name THE OHIO VALLEY COAL COMPANY

Provide the following information for each pending coal mining application for either the applicant or any person who owns or controls the applicant.

Indicate the business entity for which this listing has been completed The Ohio Valley Coal Company

| Application No. | Name of Regulatory Authority | State |
|---|---|---|
| D-0360-12 | DMRM | OH |
| D-0360-13 | DMRM | OH |
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**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 23**
**(PENDING PERMIT APPLICATIONS)**

Applicant's Name The Ohio Valley Coal Company

Provide the following information for each pending coal mining application for either the applicant or any person who owns or controls the applicant.

Indicate the business entity for which this listing has been completed The Ohio Valley Coal Company

| Application No. | Name of Regulatory Authority | State |
|---|---|---|
| D-0360-9 | DMR | OHIO |
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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 22
## (CERTIFICATE OF LIABILITY INSURANCE)

Name of Insured The Ohio Valley Coal Company

This is to certify that the policy of insurance listed below has been issued to the above named insured and is in force at this time. The policy provides bodily injury and property damage insurance for all coal mining and reclamation operations of the insured in the State of Ohio as required by paragraph (B) of rule 1501:13-7-07 of the Administrative Code stated below.

Name of Insurer Federal Insurance Company
Policy Number 3710 4410
Policy Period 6/1/02-6/1/03
Name of Underwriting Agent Reschini Agency, Inc.
Address of Underwriting Agent 922 Philadelphia St., Indiana, PA 15701
Telephone Number of Underwriting Agent ( 800) 828 - 5040

In the event of cancellation or non-renewal of this policy, including non-payment of policy premiums, the insurer agrees to promptly notify:

The Division of Reclamation
Foundation Square
Columbus, OH 43224

Karen L Williams
Signature of Underwriting Agent

Date

This certificate is issued as a matter of information only and confers no rights upon the Division of Reclamation. This certificate does not amend, extend, or alter the coverage afforded by the policy listed above.

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1501:13-7-07(B) The Public Liability Insurance Policy shall:

1.) Be in effect during the term of the permit or any renewal, including the length of all reclamation operations;

2.) Provide for personal injury and property damage protection in amounts adequate to compensate any persons injured or property damaged as a result of coal mining and reclamation operations, including the use of explosives. The minimum insurance coverage for bodily injury and property damage shall be three hundred thousand dollars for each occurrence and five hundred thousand dollars in the aggregate; and

3.) Include a rider requiring that the insurer notify the Chief whenever substantive changes are made in the policy, including any termination or failure to renew.

B. COMPLIANCE INFORMATION

(1) Has the applicant, any subsidiary, affiliate, or persons controlled by or under common control with the applicant:

(a) Had a federal or state coal mining permit suspended or revoked in the five years preceding the data of submission of this application? _____ Yes, __X__ No. If "yes," submit Attachment 6.

(b) Forfeited a mining bond or similar security deposited in lieu of bond? _____ Yes, __X__ No. If "yes," submit Attachment 6.

(2) Has the applicant been issued a notice of violation (NOV) in connection with any coal mining and reclamation operation during the three years preceding the date of submission of this application for violations of Chapter 1513. of the Revised Code or these rules, or of any federal or state law, rule, or regulation pertaining to air or water environmental protection? __X__ Yes, _____ No. If "yes," submit Attachment 7A.

(3) Have any unabated federal or state cessation orders (COs) and unabated air and water quality notices of violations (NOVs) been received prior to the submission date of this application by any coal mining and reclamation operation owned or controlled by either the applicant or by any person who owns or controls the applicant? _____ Yes, __X__ No. If "yes," submit Attachment 7B.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES & RECLAMATION

ATTACHMENT 7A
(NOTICES OF VIOLATION)

Applicant's Name The Ohio Valley Coal Company

| Permit No. | Violation Number | Date of Issuance | Issuing Agency | State | Brief Description of N.O.V. | Action Taken to Abate N.O.V. | Current Status of N.O.V. (*) |
|---|---|---|---|---|---|---|---|
| D-0360 | 25510 | 5/5/99 | DMRM | OH | Fail to follow approved mining plan - installed underdrains and culvert | Submitted D-0360-8 | Terminated |
| D-0360 | 21173 | 4/23/99 | DMRM | OH | Fail to follow approved mining plan - installed culvert under refuse pile | Designed adjacent fill to fill valley to convert culvert to underdrain and submitted IBR | Terminated |
| D-0360 | 25444 | 4/25/00 | DMRM | OH | Failure to maintain a sediment control measure using BTA to prevent additional accumulation of sediment | Stopped flow immediately | Terminated |

(*) If administrative or judicial proceedings have been initiated concerning any of the violations, identify the violation and provide an addendum indicating the date, location, type of proceeding, and current status.

C. RIGHT OF ENTRY INFORMATION

(1)(a) Provide the following information for every legal or equitable owner of record, surface and mineral, of the property to be mined on the permit area (i.e. areas affected by surface operations and facilities), indicating whether the ownership is of surface, coal, or noncoal mineral. N/A - No Permit Area

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Deed Parcel No. _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Deed Parcel No. _____

C.(1)(b) Provide the following information for every legal or equitable owner of the property to be mined covered by the underground workings indicating whether ownership is for the surface or coal.

Name The Ohio Valley Coal Company
Address 56854 Pleasant Ridge Road
City Alledonia State OH Zip 43902
Surface _____, Coal X (No. 8 Seam)
Deed Parcel No. 76, 77-1, 104-1, 105, 106, 109, 103, 1-24-1, 1-24-2, 1-22-52

Name F. & S. Simpson
Address 44680 Belmont-Centerville Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 1-22-52

Name F. T. Hart
Address 45239 Hart Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 109

Name L. L. Griffith
Address 57079 Steele Road
City Alledonia State OH Zip 43902
Surface X, Coal _____
Deed Parcel No. 106

Name J.W. & J.E. Carson
Address 45745 Belmont-Centerville Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 105, 106

Name J.L. & E. Wilson
Address 45837 Hart Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 105, 104-1

Name A. Funkhouser
Address 45839 Hart Road
City Belmont State OH Zip 43718
Surface X, Coal _____
Deed Parcel No. 104-1


Surface owners also own the No. 9, 10, 11, and 12 if present

C.(1)(b) Provide the following information for every legal or equitable owner of the property to be mined covered by the underground workings indicating whether ownership is for the surface or coal.

Name C.E. Jr. & C.A. Funkhouser
Address 45843 Hart Road
City Belmont State OH Zip 43718
Surface X , Coal
Deed Parcel No. 104-1

Name E.P. & A. Funkhouser
Address 45839 Hart Road
City Belmont State OH Zip 43718
Surface X , Coal
Deed Parcel No. 77-1

Name C.E. Sr. & I. Funkhouser
Address 45837 Hart Road
City Belmont State OH Zip 43718
Surface X , Coal
Deed Parcel No. 104-1

Name S.L. Rice
Address 62800 Centerville-Warnock Road
City Belmont State OH Zip 43718
Surface X , Coal
Deed Parcel No. 76

Name T.N. & E.M. Rubel
Address 45021 Belmont-Centerville Road
City Belmont State OH Zip 43718
Surface X , Coal
Deed Parcel No. 103

Name F. Simpson
Address 44680 Belmont-Centerville Road
City Belmont State OH Zip 43718
Surface X , Coal
Deed Parcel No. 1-24-1, 1-24-2

Name
Address
City State Zip
Surface , Coal
Deed Parcel No.


Surface owners also own the No. 9, 10, 11, and 12 if present

ADDENDUM TO PAGE 7, C(1)(b)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

The Ohio Valley Coal Company owns or leases the Pittsburgh (No. 8) coal seam in this application area. The surface owners generally own the other mineral rights, unless otherwise indicated.

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 3**
**(IDENTIFICATION OF OTHER BUSINESS ENTITIES)**

Applicant's Name The Ohio Valley Coal Company

This attachment is to be completed and submitted with the permit application if the response to item C.(4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity The Ohio Valley Coal Company

Statutory agent A&H Statutory

Street Address 1100 Huntington Bldg

City Cleveland State OH Zip 44115

Person's name Robert E. Murray Position Director

Street Address Suite 111, 29525 Chagrin Blvd

City Pepper Pike State OH Zip 44122

Person's name Stephen C. Ellis Position Secretary

Street Address 1100 Huntington Bldg

City Cleveland State OH Zip 44115

Person's name Michael D. Loiacono Position Treas., Asst. Sec'y and Corp. Comptroller

Street Address Suite 111, 29525 Chagrin Blvd

City Pepper Pike State OH Zip 44122

Person's name Ohio Valley Resources, Inc. Position Shareholder

Street Address Suite 111, 29525 Chagrin Blvd

City Pepper Pike State OH Zip 44122

Person's name John R. Forrelli Position President/Gen. Manager

Street Address 56854 Pleasant Ridge Road

City Alledonia State OH Zip 43902

12/95

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES & RECLAMATION**

**ATTACHMENT 3**
**(IDENTIFICATION OF OTHER BUSINESS ENTITIES)**

Applicant's Name The Ohio Valley Coal Company

This attachment is to be completed and submitted with the permit application if the response to item C.(4) in Part 1 of the permit application is "yes." A separate attachment is to be submitted for each business entity.

Name of business entity The Ohio Valley Coal Company

Person's name Bonnie M. Froelich Position Asst. Sec'y and Asst. Treasurer

Street Address 56854 Pleasant Ridge Road

City Alledonia State OH Zip 43902

Person's name Roberta K. Heil Position Secretary

Street Address 56854 Pleasant Ridge Road

City Alledonia State OH Zip 43902

Person's name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

Person's name _____ Position _____

Street Address _____

City _____ State _____ Zip _____

C. (2) Provide the following information for the holders of record of any leasehold interest in the coal to be mined or property to be affected by surface operations or facilities, indicating whether the held interest is of surface, coal, or noncoal rights.

Name The Ohio Valley Coal Company

Address 56854 Pleasant Ridge Road

City Alledonia State Ohio Zip 43902

Surface X, Coal X, Noncoal _____

Name _____

Address _____

City _____ State _____ Zip _____

Surface _____, Coal _____, Noncoal _____

Submit and identify additional pages necessary to complete response.

(3) Are there purchasers of record under a real estate contract of the coal to be mined or property to be affected by surface operations and facilities?
_____ Yes, X No. If "yes," submit Attachment 2.

(4) Is any owner, holder, or purchaser listed in items C(1) (a and b), (2), or (3) respectively, a business entity other than a single proprietorship?
X Yes, _____ No. If "yes," submit Attachment 3.
See Attachment 3

(5) Is any part of the proposed permit area adjacent to any lands which are not owned by those persons identified in item C(1)(a)? _____ Yes, _____ No. If "yes," submit Attachment 4. N/A No Permit Area

(6) Does the applicant hold lands, interests in lands, options, or pending bids on interests for lands which are contiguous to the property to be mined?
_____ Yes, X No. If "yes," provide a description of the lands.

(7) Is it anticipated that individual mining permits will be sought for any of those lands described in item C(6) above? _____ Yes, X No. If "yes," submit as an addendum and identify those lands to include the size, sequence, and timing of future mining permits, utilizing a map pursuant to 1501:13-4-13(J)(29), Ohio Administrative Code.

It is anticipated that all mining in lands adjacent to the D-0360 Permit will be mined from the D-0360 permit. I.e. no new permits.

c. (8)(a) Provide either of the following to allow for coal mining operations on the **permit area**:

N/A - No Permit Area

(i) A copy of the documents, or

(ii) An affidavit wherein the documents are described.

AFFIDAVIT

State of Ohio, _____ County, ss. _____ being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of document _____

Execution Date _____

Expiration Date _____

Parties: From _____ To _____

Description of land: No. Acres _____

County _____ Township _____

Sections _____ Lots _____

Parcel # _____

Explanation of legal rights claimed _____

_____

_____

Pending litigation _____ Yes, _____ No.

_____ _____

Signature of Affiant Date

_____

Position

Sworn before me and subscribed in my presence this

_____ day of _____, 19_____.

_____

Notary Public

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 22 Lots: _____

Parcel#: 76

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 1

Pending Litigation: ___Yes X No

David L. Bartsch
Signature of Affiant

12-7-01
Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 22 Lots: _____

Parcel#: 77-1

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 2

Pending Litigation: ___ Yes X No

David L Bartsch
Signature of Affiant

12-7-01
Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 2001.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

RIGHT OF ENTRY INFORMATION

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corporation To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 103

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 3

Pending Litigation: ___Yes X No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 104-1

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 4

Pending Litigation: ___Yes X No

David L. Bartsch 1-30-02
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 30th day of January 20 02.

Denise R. Jackson
Notary Public

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

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 105

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 5

Pending Litigation: __ Yes X No

David L. Bartsch
Signature of Affiant

12-7-01
Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 106

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 6

Pending Litigation: ___ Yes X No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: The North American Coal Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 28 Lots: _____

Parcel#: 109

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 7

Pending Litigation: ___Yes X No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: Consolidated Land Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 34 Lots: _____

Parcel#: 1-22-52

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 8

Pending Litigation: ___Yes X No

David L Bartsch
Signature of Affiant

12-7-01
Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 2001.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L Luke
Notary Public

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: Consolidated Land Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 34 Lots: _____

Parcel#: 1-24-1

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 9

Pending Litigation: ___Yes X No

David L. Bartsch
Signature of Affiant

12-7-01
Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2006

Claude L. Luke
Notary Public

**RIGHT OF ENTRY INFORMATION**

C.(8)(B) Provide either of the following to allow for coal mining operations on the **underground workings**.

(i) A copy of the documents, or
(ii) An affidavit wherein the documents are described. For all documents or affidavits provided for the shadow area, the specific parcels are to be identified on the application map.

AFFIDAVIT

State of Ohio, Belmont County, ss. David L. Bartsch being first duly sworn, says that the following described documents convey to the applicant the legal right explained below and is a subject of litigation as shown below.

Type of Document: Warranty Deed

Execution Date: 12/29/70

Expiration Date: None

Parties: From: Consolidated Land Corp. To: The Ohio Valley Coal Company

Description of land: No. Acres _____

County: Belmont Township: Smith

Sections: 34 Lots: _____

Parcel#: 1-24-2

Explanation of legal rights claimed: See Addendum to Page 10, Part 1, C(8)(B), Item 10

Pending Litigation: ___Yes X No

David L. Bartsch 12-7-01
Signature of Affiant Date

Environmental Coordinator and Permit Administrator
Position

Sworn before me and subscribed in my presence this 7th day of Dec. 20 01.

STATE OF OHIO
NOTARY PUBLIC
CLAUDE L. LUKE
My Commission Expires Aug. 21, 2008

Notary Public

RECEIVED
9 2002
DIVISION OF MINERAL
RESOURCES MANAGEMENT

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360
ADDENDUM TO PAGE 10, PART 1, C(8)(b)

## MINING RIGHTS

Item 1 - Mining Rights to Tract No. 76 - Together with the free and uninterrupted right of way into, on and under said land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating by air shafts and otherwise and of carrying away the coal, together with the privilege of mining and removing through said described premises, other coal belonging to said grantee, its successors or assigns, or which may hereafter be acquired, together with any other mining rights, options and privileges now owned by the grantors in connection with the above described coal.

Item 2 - Mining Rights to Tract No. 77-1 and -2 - Party of the Second part to have the free and uninterrupted right of way into, upon, and under said land at such points, and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal, (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 3 - Mining Rights to Tract No. 103 - Party of Second part to have the free and uninterrupted right of way into and under said land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 4 - Mining Rights to Tract No. 104-1 - Party of Second part to have the free and uninterrupted right of way - and under said land, at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 5 - Mining Rights to Tract No. 105 - Party of Second part to have the free and uninterrupted right of way into, upon, and under said land at such points, and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of

mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 6 - Mining Rights to Tract No. 106 - Party of Second part to have the free and uninterrupted right of way into and under said land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 7 - Mining Rights to Tract No. 109 - Party of Second part to have the free and uninterrupted right of way into and under said land at such points and in such manner as may be proper and necessary for the purpose of digging, mining, draining, and ventilating, and carrying away said coal (hereby waiving all surface damages, or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises, other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 8 - Mining Rights to Tract No. 1-22-52 - Party of Second part to have the free and uninterrupted right of way into, upon, and under said land at such points, and in such manner as may be proper and necessary for the purpose of digging, mining, draining, and ventilating and carrying away said coal (hereby waiving all surface damages or damages of any sort, arising there from, or from the removal of all of said coal), together with the privilege of mining and removing through said described premises other coal belonging to said party of the Second part, its successors and assigns, or which may hereafter be acquired.

Item 9 - Mining Rights to Tract No. 1-24-1 - Together with the right in perpetuity of mining, taking out and removing such coal; also the further right in perpetuity to remove coal to and from any other land or lands through entries, shafts, air-ways and mine openings of any and every kind whatever, with the same rights, in removing coal to or from such other lands, to use the surface, entries, shafts, air-ways, mine openings and other appliances for mining upon, in, through, or under the lands herein described, as are herein granted for the mining and removal of the coal hereby conveyed; mining of said coal by the stripping method is prohibited.

Provided, further, that said Grantee, its successors and assigns, shall have the right to purchase from time to time so much of, and such parts of the surface over the aforesaid described coal rights, except that situated within 500 feet from the brick residence located on the west side of State Route 147 and the adjacent barn, and the frame house located on the east side of State Route 147, presently on said surface, as said Grantee, its successors and assigns may desire and as may be necessary for shafts, slopes, buildings, structures and appurtenances thereunto, drill holes for power or water, drains, reservoirs, roads, industrial tracks, storage yards, and machinery, to facilitate the taking out, mining and removing of such coal, paying therefor at

the rate of One Hundred Dollars ($100.00) per acre; it is, however, understood and agreed by Grantors and Grantee herein, that the total acreage of surface that may be purchased in accordance with the above rights shall not exceed 40.0 acres; Grantee, its successors and assigns, shall separate any surface so purchased from the remaining surface by a legal fence.

And the said Grantors, for themselves and their heirs, executors, administrators and assigns covenant and agree with the said Grantee, its successors and assigns, that the said Grantors, their heirs, executors, administrators and assigns, will from time to time, upon demand and payment aforesaid, for the amount and part and parts of said surface demanded, execute and deliver unto the said Grantee herein, its successors and assigns, a good and sufficient deed of GENERAL WARRANTY, conveying, in fee simple, free and clear of liens and encumbrance, such amount and such part and parts of the surface of the above described lands, except that which is above reserved, or is in excess of 40.0 acres as above provided, as Grantee, its successors and assigns, may from time to time demand; together with the further right to enter upon said land at any time for the purpose of testing for said coal.

The said Grantors, for themselves and for their heirs, executors, administrators and assigns, hereby waive and release any and all claims and demands which we may now or hereafter have, or claim to have, against said Grantee, its successors and assigns, by reason of or in any way resulting from the removal of coal from, under, and over said premises, or any part thereof.

Item 10 – Mining Rights to Tract No. 1-24-2 – Together with the right in perpetuity of mining, taking out and removing such coal; also the further right in perpetuity to remove coal to and from any other land or lands through entries, shafts, air-ways and mine openings of any and every kind whatever, with the same rights, in removing coal to or from such other lands, to use the surface, entries, shafts, air-ways, mine openings and other appliances for mining upon, in, through, or under the lands herein described, as are herein granted for the mining and removal of the coal hereby conveyed; mining of said coal by the stripping method is prohibited.

Provided, further, that said Grantee, its successors and assigns, shall have the right to purchase from time to time so much of, and such parts of the surface over the aforesaid described coal rights, except that situated within 500 feet from the brick residence located on the west side of State Route 147 and the adjacent barn, and the frame house located on the east side of State Route 147, presently on said surface, as said Grantee, its successors and assigns may desire and as may be necessary for shafts, slopes, buildings, structures and appurtenances thereunto, drill holes for power or water, drains, reservoirs, roads, industrial tracks, storage yards, and machinery, to facilitate the taking out, mining and removing of such coal, paying therefor at the rate of One Hundred Dollars ($100.00) per acre; it is, however, understood and agreed by Grantors and Grantee herein, that the total acreage of surface that may be purchased in accordance with the above rights shall not exceed 40.0 acres; Grantee, its successors and assigns, shall separate any surface so purchased from the remaining surface by a legal fence.

And the said Grantors, for themselves and their heirs, executors, administrators and assigns covenant and agree with the said Grantee, its successors and assigns, that the said Grantors, their heirs, executors, administrators and assigns, will from time to time, upon demand and payment aforesaid, for the amount and part and parts of said surface demanded, execute and deliver unto the said Grantee herein, its successors and assigns, a good and sufficient deed of GENERAL WARRANTY, conveying, in fee simple, free and clear of liens and encumbrance, such amount and such part and parts of the surface of the above described lands, except that which is above reserved, or is in excess of 40.0 acres as above provided, as Grantee, its successors and assigns, may from time to time demand; together with the further right to enter upon said land at any time for the purpose of testing for said coal.

The said Grantors, for themselves and for their heirs, executors, administrators and assigns, hereby waive and release any and all claims and demands which we may now or hereafter have, or claim to have, against said Grantee, its successors and assigns, by reason of or in any way resulting from the removal of coal from, under, and over said premises, or any part thereof.

c. (9)(a) List below the following information for each surface owner of land within the proposed permit area.

N/A No Permit Area

| OWNER NAME | COUNTY | TOWNSHIP | SEC./LOT | T- ,R- |
|---|---|---|---|---|
| | | | | |

C. (9)(b) List the following information for each surface owner of land within the proposed underground workings.

| OWNER NAME | COUNTY | TOWNSHIP | SEC./LOT | T- R- |
|---|---|---|---|---|
| Floyd & Shirley Simpson | Belmont | Smith | 34 | 6N/4W |
| F. T. Hart | Belmont | Smith | 28 | 6N/4W |
| L. L. Griffith | Belmont | Smith | 28 | 6N/4W |
| J.W. & J.D. Carson | Belmont | Smith | 28 | 6N/4W |
| J.L. & E. Wilson | Belmont | Smith | 28 | 6N/4W |
| A. Funkhouser | Belmont | Smith | 28 | 6N/4W |
| C.E. Jr. & C.A. Funkhouser | Belmont | Smith | 28 | 6N/4W |
| T.N. & E.M. Rubel | Belmont | Smith | 28 | 6N/4W |
| C.E. Sr. & I. Funkhouser | Belmont | Smith | 28 | 6N/4W |
| F.P. & A. Funkhouser | Belmont | Smith | 22 | 6N/4W |
| S.L. Rice | Belmont | Smith | 22 | 6N/4W |
| F. Simpson | Belmont | Smith | 34 | 6N/4W |

D. AREAS WHERE MINING IS PROHIBITED OR LIMITED-Permit Area

(1) Does the permit area included in this permit application include any area dedicated as a nature preserve pursuant to Chapter 1517., Ohio Revised Code? _____ Yes, _____ No. If "yes," submit proof of valid existing right. N/A No Permit Area

(2) Does the permit area included in this permit application include any area within one thousand feet of the waterlines of any wild, scenic, or recreational river dedicated pursuant to Chapter 1501., Ohio Revised Code? _____ Yes, _____ No. If "yes," submit proof of valid existing right. N/A No Permit Area

(3) Does the permit area included in this permit application include any area within the boundaries of the following systems: national park, national wildlife refuge, national trails, national wilderness preservation, national recreational areas, or wild and scenic rivers or river corridors, including those rivers under study? _____ Yes, _____ No. If "yes," submit proof of valid existing right.

N/A No Permit Area

(4) Does the permit area included in this permit application include any federal lands within the boundaries of any national forest? _____ Yes, _____ No. If "yes," submit approval of the U.S. Secretary of Interior of proof of valid existing right.

N/A No Permit Area

(5) Will operations in the permit area conducted under this permit adversely affect any publicly owned park or places included on the National Register of Historic Places? _____ Yes, _____ No. If "yes," submit joint approval from the chief and the federal, state, or local agency with jurisdiction over the park or places or proof of valid existing right.

N/A No Permit Area

(6) Will operations in the permit area conducted under this permit affect land within one hundred feet of the outside right-of-way of a public highway? _____ Yes, _____ No. If "yes," list the highway(s) in the space below and submit Attachment 9 or proof of valid existing right.

N/A No Permit Area

D. (7) Will operations in the permit area conducted under this permit affect land within three hundred feet of any occupied dwelling? _____ Yes, _____ No. If "yes," list the name of the owner(s) in the space below and submit Attachment 10 or proof of valid existing right.

N/A No Permit Area

(8) Will operations in the permit area conducted under this permit affect land within three hundred feet of any public building, school, church, community or institutional building, or public park?
_____ Yes, _____ No. If "yes," submit proof of valid existing right. N/A No Permit Area

(9) Will operations in the permit area conducted under this permit affect land within one hundred feet of a cemetery? _____ Yes, _____ No. If "yes," submit proof of valid existing right or appropriate authorization to relocate the cemetery. N/A No Permit Area

(10) Will operations conducted during this permit result in the extension of any part of the pit within fifty feet of horizontal distance to any adjacent land or water in which the applicant does not own either the surface or mineral rights? _____ Yes, _____ No. If "yes," list below the name(s) of the adjacent owner(s) and submit Attachment 11. N/A No Permit Area

E. <u>AREAS WHERE MINING IS PROHIBITED OR LIMITED-Permit and Shadow Area</u>

Are there areas within the proposed permit area, shadow area, or adjacent areas designated unsuitable for coal mining operations under rule 1501:13-3-07 of the Administrative Code or under study for designation in an administrative proceeding under this rule?
_____ Yes, __X__ No.

(1) If "yes" to the item above, did the applicant make substantial legal and financial commitments in the proposed areas prior to January 4, 1977?
_____ Yes, _____ No. N/A

(2) If "yes" to item (1) above, submit as an addendum to the permit application information supporting the assertions that the commitments were made prior to January 4, 1977.

N/A

F. PERMIT TERM AND EXTENT-**Permit and Underground Workings**

(1) Anticipated/actual date for:

(a) Starting mining operations 8/1/2002

(b) Terminating mining operations N/A

(2) Does the applicant propose a permit term in excess of five (5) years? _____ Yes, X No. If "yes," submit an addendum with the information required by 1501:13-4-03(E)(3), Ohio Administrative Code.

(3) Indicate the following acreage figures:

(a) Total Acres 0 (Permit area)

(b) Total Acres 38.6 (Underground Workings)

(4) Horizontal extent of underground workings over life of permit in acres:

(a) Full Coal Recovery _____

(b) Room and Pillar 38.6

G. PUBLIC NOTICE-**Permit and Shadow Area**

(1) In the space below, provide the name and address of the public office where a complete copy of this permit application is to be filed.

Recorder's Office
Belmont County Court House
Main Street
St. Clairsville, OH 43950

(2) In the space below, list the name and address of the newspaper and submit an addendum providing the text of the advertisement that is to be published in a newspaper of general circulation in the locality of the proposed operation. Note: The advertisement is to provide the information required by paragraph (A) of rule 1501:13-5-01 of the Administrative Code.

The Times Leader
200 South Fourth Street
Martins Ferry, OH 43935

ADDENDUM TO PAGE 15, PART 1, G(2)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

**Public Notice**

The Ohio Valley Coal Company, Powhatan No. 6 Mine, 56854 Pleasant Ridge Road, Alledonia, Ohio 43902, has submitted an underground coal mining application for Permit D-0360, designated as D-0360-13 to the Ohio Department of Natural Resources, Division of Mineral Resources Management. The proposed additional underground acreage for Permit D-0360 is located in Belmont County, Smith Township, Sections 22, 28, and 34. The area is located on the Armstrong Mills and Hunter 7 ½ minute USGS quadrangle maps, approximately 1.2 miles north of Centerville, Ohio. The proposed underground workings encompass 38.6 acres. This area will be mined using partial-recovery methods from which there will be no surface subsidence.

This application is on file at the Belmont County Recorder's Office, located at the County Court House on Main Street in St. Clairsville for public viewing. Written comments or requests for an informal conference may be sent to the Division of Mineral Resources Management, 1855 Fountain Square Court, Columbus, Ohio 43224 within thirty days of the last date of publication of this notice.

*PROOF OF PUBLICATION*

The State of Ohio
County of Belmont, ss:

The undersigned, being sworn, says that he or she is an employee of Eastern Ohio Newspapers, Inc., A Corporation, publisher of the Times Leader a newspaper published in Martins Ferry, Belmont County, Ohio, each day of the week except Saturday and of general circulation in said city and county; that it is a newspaper meeting the requirements of sections 7.12 and 5721.01 Ohio Revised Code as amended effective September 24, 1957; that affiant has custody of the records and files of said newspaper; and that the advertisement of which the annexed is a true copy, was published in said newspaper on each of the days in the month and year stated, as follows:

Feb. 15, 22,
Mar 1, 8 2002

Audrey Blanco

Subscribed by Affiant and sworn to before me, this 8th day of Mar, A.D. 2002.

Rebecca L Anderson
Notary Public

REBECCA L. ANDERSON
Notary Public, State of Ohio
My Commission Expires Nov. 25, 2006

Printer's Fee $ 200.20

Notary's Fee $_____

The Times Leader
Martins Ferry, Ohio

Public Notice

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This application is on file at the Belmont County Recorder's Office, located at the County Court House on Main Street in St. Clairsville for public viewing. Written comments or requests for an informal conference may be sent to the Division of Mineral Resources Management, 1855 Fountain Square Court, Columbus, Ohio 43224 within thirty days of the last date of publication of this notice.

TL - ADV. - 4 FRI. - FEB. 15, 22, MARCH 1, 8.

PART 2 ENVIRONMENTAL RESOURCES INFORMATION

A. CULTURAL, HISTORIC, AND ARCHEOLOGICAL INFORMATION-**Permit and Planned Subsidence Area**

(1) Are there any cultural or historic resources or structures listed or eligible for listing on the National Register of Historic Places within the proposed permit or planned subsidence area? _X_ Yes, ____ No. If "yes," submit an addendum describing the resources and structures including the location and submit Attachment 27 or 27A as appropriate. No subsidence areas.

(2) Are there any known archeological sites within the proposed permit or planned subsidence area? ____ Yes, _X_ No. If "yes," submit an addendum describing the site including the location and submit Attachment 27 or 27A as appropriate.

(3) If applicable, based upon the review of the proposed planned subsidence areas and the completed Attachment 27A for the initial six months of projected mining, have any properties listed or eligible for listing on the National Register of Historic Places been identified? ____ Yes, _X_ No. If "yes," submit an addendum listing each property identified.

(4) Submit an addendum indicating the method to be used to identify historic properties on planned subsidence areas as mining progresses. No subsidence areas.

B. GEOLOGY DESCRIPTION-**Permit and Shadow Area**

(1) Submit an addendum describing the geology within the proposed permit area and shadow area down to and including the first stratum below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely affected by mining. The description shall also include information on the areal and structural geology of the permit and shadow area and any other geologic parameters which may influence the probable hydrologic consequences and protection of the hydrologic balance from material damage outside of the permit area.
See Addendum to Page 16, Part 2, B.(1)

(2) Submit an addendum describing how the areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially affected surface and ground waters per paragraph (C) of rule 1501:13-4-13 of the Administrative Code.
See Addendum to Page 16, Part 2, B.(2)

ADDENDUM TO PART 2, PAGE 16, B(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## GEOLOGY DESCRIPTION

Stratigraphy of the proposed permit area is formed by the Monongahela formation of the Pennsylvania period, and the Dunkard group of Permian time. The primary strata of both sections consists of an alternating sequence of limestone, sandstone, siltstone, shale, claystone, and coal.

The Monongahela formation is approximately 245 feet thick. In ascending order, it occupies the interval from the Pittsburgh No. 8 to the Waynesburg No. 11 coal bed. The primary rock units are limestone, shale, and claystone. Limestone forms 44 to 68 percent of this stratigraphic interval.

The Dunkard group is 250 to 300 feet thick, occupying the interval from the Waynesburg No. 11 coal bed to the ground surface. The primary rock units here are shale and claystone. These soft units form about 85 percent of this stratigraphic interval. This strata is primarily located within the constrained zone of disturbance resulting from longwall mining.

The rock strata of Belmont County typically form a gentle monocline that dips southeasterly at grades less than one percent and in the application area is southward to southeasterly. The base elevation of the No. 8 seam ranges from approximately 765 ft. in the southeast corner of the application area to approximately 800 ft. in the northwest corner.

The orientation of the major joints in rock and face cleat in coal is approximately N 75° W. The minor joints and butt cleats are generally perpendicular to these ( N 15° E).

Geology and Coal Resources of Belmont County, Ohio, Geological Survey Professional Paper 380, reports that a small dome-shaped anticline lies in eastern Belmont County, primarily in Mead Township. This structure is located over three miles east of the Powhatan No. 6 Mine application area and, therefore, is not expected to have an impact on ground water flow in the application area.

In addition, there is a graben structure that passes through the Powhatan No. 6 Mine Reserve. This graben has been tracked through the adjacent Powhatan No. 3 Mine and enters the No. 6 reserve on the eastern boundary. It proceeds in a southwesterly direction, turns approximately 90 degrees, proceeds in a northwesterly direction, then turns again and proceeds in a general westerly direction off the mine property. The graben is located to the south of the application area and is not expected to have an impact on the ground water flow in the area.

ADDENDUM TO PART 2, PAGE 16, B(1)
PAGE TWO

The structural contours of the No. 8 Seam indicate that the graben is made up of a series of slumps in the deposit, indicated by a thickening of the seam at the bottom of the structure. This structure apparently affected the structural contours to the north of the graben, but these effects do not extend into the application area. Locally, these effects may be seen as areas where incidental water pools in the mine. This water is generally only a nuisance and does not require pumping. Most of the water found underground at the No. 6 mine is man-made during the mining cycle from water sprays (used for dust suppression) and cooling water for motors.

ADDENDUM TO PAGE 16, B(2)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## Geological Impact of Coal Removal Upon Ground Water

The geological impact of coal removal, according to the PHC, is expected to vary from short term to long term. The Pittsburgh (No. 8) coal seam will be mined, and in this area has dip of approximately 40 ft per mile to the southeast, with the strike to the northeast. Ground water occurs in this area in several disconnected saturated zones associated with the occurrence of the coal seams and underlying clay stone units that prevent downward migration of the ground water. Ground water is generally limited to within the first 100 ft of the surface. Since primary porosity in the rock units is poor, nearly all of the ground water in this area of Ohio occurs as secondary porosity in the joints, cleats, fractures, and bedding planes of the rocks.

This area will be mined using partial-recovery mining techniques from which there will be no subsidence or disruption of ground water. There will be no impact of coal removal upon ground water anticipated. Safety factors are sufficiently high and extraction ratio sufficiently low to assure no subsidence during mining of the gate section. Impacts to individual water supplies are addressed in the Addendum to Page 18 F(1). The PHC addresses impacts to aquifers.

# LJ HUGHES & SONS, INC.

DIAMOND CORE DRILLING
Pressure Grouting, Foundation & Soil Borings
320 Turnpike Road, Summersville, West Virginia 26651 (304) 872-1111


DRILL HOLE NO. N-86-19 DRILLER: DANIEL HAMRICK

DRILLING FOR: THE NACCO MINING COMPANY, POWHATAN POINT, OHIO

SURFACE ELEVATION: STARTED: NOVEMBER 25, 1986
COMPLETED: DECEMBER 1, 1986

LOCATION: OHIO, BELMONT COUNTY
SMITH TOWNSHIP
SECTION 22
SOUTHWEST 1/4.

| FORMATION | STRATA THICKNESS | | DEPTH FROM SURFACE |
|---|---|---|---|
| CASING | 23.00 | | 23.00 CA |
| CHIPPED | 7.00 | | ~~30.00~~ |
| GRAY CLAYSTONE | 13.50 | | 43.50 CY |
| COAL . . . . . | 2.10 | WAYNESBURG (No.11) | 45.60 CO WY 11 |
| GRAY CLAYSTONE | 9.40 | | 55.00 CY |
| GREEN SANDY SHALE WITH LIME | 15.00 | | 70.00 SY |
| GRAY SANDSTONE | 15.00 | | 85.00 SS |
| GRAY SHALE | 1.80 | | 86.80 SH |
| COAL . . . . . | 1.50 | UNIONTOWN (No.10) | 88.30 CO UNTN |
| GREEN CLAYSTONE | 7.00 | | ~~95.30~~ |
| GRAY LIMY CLAYSTONE | 7.10 | | ~~102.40~~ |
| GREEN CLAYSTONE | 3.00 | | 105.40 CY |
| GRAY SANDSTONE | 5.80 | | 111.20 SS |
| GREEN CLAYSTONE | 1.20 | | 112.40 CY |
| LIMESTONE | 1.60 | | 114.00 LS |
| GREEN CLAYSTONE | 1.00 | | 115.00 CY |
| LIMESTONE WITH SHALE | 15.00 | | 130.00 LS |
| GREEN LIMY SHALE | 6.00 | | 136.00 SL |
| LIMESTONE WITH SHALE | 4.00 | | 140.00 LS |
| GREEN CLAYSTONE WITH LIME | 5.00 | | 145.00 CY |
| LIMESTONE WITH SHALE | 50.00 | | 195.00 LS |
| GRAY CLAYSTONE | 5.00 | | 200.00 CY |
| COAL . . . . . | 2.75 | BEWICKLEY (No.8) | 202.75 CO SWKY |
| GRAY LIMY SHALE | 9.25 | | 212.00 SL |
| GRAY SHALE | 10.00 | | 222.00 SH |
| LIMESTONE WITH SHALE | 34.80 | | 256.80 LS |
| GREEN CLAYSTONE | 6.50 | | ~~263.30~~ |
| LIMESTONE | 1.70 | | ~~265.00~~ TD LOG |



TOVCC 12041

# LJ HUGHES & SONS, INC.

THE NACCO MINING COMPANY

CONTINUATION OF DRILL HOLE NO. N-86-19

| FORMATION | STRATA THICKNESS | | DEPTH FROM SURFACE |
|---|---|---|---|
| | | | 265.00 |
| LIMESTONE WITH SHALE | 16.00 | | 281.00 |
| GRAY CLAYSTONE | 3.30 | | 284.30 |
| BONY COAL | 0.33 | | 284.63 |
| GRAY SHALE | 0.23 | | 284.86 |
| COAL . . . . . | 0.85 | ROOF COAL | 285.71 |
| GRAY SHALE | 0.86 | | 286.57 |
| COAL . . . . . | 5.10 | PITTSBURGH (No.8) | 291.67 |
| GRAY LIMY SHALE | 13.33 | | 305.00 |

TOTAL DEPTH: 305 FEET

12 BAGS CEMENT PLACED IN HOLE



TOVCC 12042

**THE OHIO VALLEY COAL COMPANY**
**POWHATAN NO. 6 MINE**
**PERMIT D-0360**
**ATTACHMENT 13 FOR TEST HOLE N86-19**

**STATE PLANE COORDS.**
**X -2,431,056.72**
**Y - 729,033.72**
**SURF. ELEV = 1055.45**

| FORMATION | THICKNESS | DEPTH | COMMENT | STRATA ELEV. |
|---|---|---|---|---|
| CASING | 23.00 | 23.00 | CASING | 1032.45 |
| CHIPPED | 7.00 | 30.00 | S, C, E | 1025.45 |
| GRAY CLAYSTONE | 13.50 | 43.50 | S, C, E | 1011.95 |
| **COAL - NO. 11** | **2.70** | **45.60** | **S, C, E, AC** | **1009.85** |
| GRAY CLAYSTONE | 9.40 | 55.00 | S, C, E | 1000.45 |
| GREEN SANDY SHALE W/LIMESTONE | 15.00 | 70.00 | S, C, E, ALK | 985.45 |
| GRAY SANDSTONE | 15.00 | 85.00 | H, NC, NE | 970.45 |
| GREEN SHALE | 1.80 | 86.80 | S, C, E | 968.65 |
| **COAL - NO. 10** | **1.50** | **88.30** | **S, C, E, AC** | **967.15** |
| GREEN CLAYSTONE | 7.00 | 95.30 | S, C, E | 960.15 |
| GRAY LIMY CLAYSTONE | 7.10 | 102.40 | S, C, E, ALK | 953.05 |
| GREEN CLAYSTONE | 3.00 | 105.40 | S, C, E | 950.05 |
| GRAY SANDSTONE | 5.80 | 111.20 | H, NC, NE | 944.25 |
| GREEN CLAYSTONE | 1.20 | 112.40 | S, C, E | 943.05 |
| LIMESTONE | 1.60 | 114.00 | H, NC, NE | 941.45 |
| GREEN CLAYSTONE | 1.00 | 115.00 | S, C, E | 940.45 |
| LIMESTONE W/ SHALE | 15.00 | 130.00 | H, NC, E, ALK | 925.45 |
| GREEN LIMY SHALE | 6.00 | 136.00 | S, C, E, ALK | 919.45 |
| LIMESTONE W/SHALE | 4.00 | 140.00 | H, NC, E, ALK | 915.45 |
| GREEN CLAYSTONE W/ LIME | 5.00 | 145.00 | S, C, E, ALK | 910.45 |
| LIMESTONE W/SHALE | 50.00 | 195.00 | H, NC, E, ALK | 860.45 |
| GRAY CLAYSTONE | 5.00 | 200.00 | S, C, E | 855.45 |
| **COAL - NO. 9** | **2.75** | **202.75** | **S, C, E, AC** | **852.70** |
| GRAY LIMY SHALE | 9.25 | 212.00 | S, C, E, ALK | 843.45 |
| GRAY SHALE | 10.00 | 222.00 | S. C. E | 833.45 |
| LIMESTONE W/SHALE | 34.80 | 256.80 | H, NC, E, ALK | 798.65 |
| GREEN CLAYSTONE | 6.50 | 263.30 | S. C. E | 792.15 |
| LIMESTONE | 1.70 | 265.00 | H, NC, NE, ALK | 790.45 |
| LIMESTONE W/SHALE | 16.00 | 281.00 | H, NC, E, ALK | 774.45 |
| GRAY CLAYSTONE | 3.30 | 284.30 | S, C, E | 771.15 |
| BONE COAL | 0.33 | 284.63 | S, C, E, AC | 770.82 |
| GRAY SHALE | 0.23 | 284.86 | S, C, E | 770.59 |
| COAL | 0.85 | 285.71 | S, C, E, AC | 769.74 |
| GRAY SHALE | 0.86 | 286.57 | S, C, E | 768.88 |
| **COAL - NO. 8** | **5.10** | **291.67** | **S, C, E, AC** | **763.78** |
| GRAY LIMY SHALE | 13.30 | 305.00 | S, C, E, ALK | 750.45 |

PERCENT SOFT ROCK 50.90 PERCENT
PERCENT HARD ROCK 49.10 PERCENT

S = SOFT ROCK
H = HARD ROCK
C = COMPACTIBLE
NC = NON-COMPACTIBLE
E = ERODIBLE
NE = NON=ERODIBLE
AC = ACIDIC
ALK = ALKALINE

| | TOT. S % | PYRITE S % | POT ACIDITY MG/L AS CACO3 | NEUT. POT (/1000 TONS) | CACO3 DEF (1000 TONS |
|---|---|---|---|---|---|
| ROOF | | | | | |
| COAL | | | | | |
| BOTTOM | | | | | |



TOVCC 12043

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1198.84 ~~1195~~

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| CASING | | 20.00 | |
| SILTSTONE | | 5.35 | ALK, COMP, EROD |
| SHALE | | 4.65 | ALK, COMP, EROD |
| LIMESTONE | * | 4.75 | ALK |
| LIMESTONE | | 5.25 | ALK |
| SHALE | | 5.40 | COMP, EROD |
| SHALE | * | 2.64 | COMP, EROD |
| SHALE | | 1.50 | COMP |
| SHALE | | 1.30 | COMP |
| SHALE | * | 1.25 | COMP, EROD |
| SHALE | | 2.30 | COMP |
| LIMESTONE | | 1.65 | ALK |
| SHALE | | 1.52 | COMP, EROD |
| LIMESTONE | | 0.32 | ALK |
| SHALE | | 1.42 | COMP |
| SHALE | | 0.70 | COMP |
| LIMESTONE | | 2.10 | ALK |
| SHALE | | 8.20 | COMP |
| SHALE | | 1.10 | COMP |
| COAL (NO. 12) | | 3.40 | AC, EROD |
| SHALE | | 5.20 | COMP, EROD |
| SHALE | | 2.85 | COMP, EROD |
| COAL | | 0.82 | COMP, EROD |
| SHALE | | 0.25 | COMP, EROD |
| SHALE | | 6.85 | ALK, COMP |
| SANDSTONE | | 5.30 | ALK |
| SANDSTONE | | 3.93 | HARD |
| SANDSTONE | | 14.42 | ALK |
| LIMESTONE | | 2.85 | ALK |
| LIMESTONE | | 0.46 | ALK |
| CLAYSTONE | | 2.01 | ALK, COMP, EROD |
| CLAYSTONE | | 5.19 | COMP, EROD |
| SHALE | | 2.38 | ALK, COMP, EROD |
| LIMESTONE | | 3.90 | ALK |
| SHALE | | 4.29 | ALK, COMP |
| SANDSTONE | | 0.90 | HARD |
| SHALE | | 1.16 | COMP |
| SANDSTONE | | 2.70 | ALK |
| SANDSTONE | | 5.44 | HARD |
| SHALE | | 0.92 | COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1195

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| SHALE | | 0.59 | COMP, EROD |
| SHALE | | 0.50 | COMP, EROD |
| SHALE | | 0.20 | COMP, EROD |
| LIMESTONE | | 4.26 | ALK |
| SANDSTONE | | 3.62 | ALK, EROD |
| SHALE | | 1.71 | COMP, EROD |
| CLAYSTONE | | 0.14 | COMP, EROD |
| LIMESTONE | | 0.32 | ALK |
| CLAYSTONE | | 3.45 | ALK, COMP, EROD |
| SHALE | | 0.58 | ALK, COMP |
| SANDSTONE | | 6.28 | ALK |
| CLAYSTONE | | 0.75 | ALK, COMP, EROD |
| SHALE | | 10.98 | COMP, EROD |
| COAL (NO. 11) | | 3.41 | AC, EROD |
| CLAYSTONE | | 11.69 | ALK, COMP, EROD |
| LIMESTONE | | 4.10 | ALK |
| SHALE | | 7.10 | ALK, COMP, EROD |
| SANDSTONE | | 4.37 | HARD |
| SHALE | | 0.98 | COMP, EROD |
| SANDSTONE | | 1.57 | HARD |
| SHALE | | 5.81 | COMP, EROD |
| SHALE | | 2.59 | COMP, EROD |
| COAL (NO. 10) | | 2.86 | AC, EROD |
| CLAYSTONE | | 2.26 | ALK, COMP, EROD |
| SANDSTONE | | 0.32 | ALK |
| CLAYSTONE | | 3.28 | COMP, EROD |
| CLAYSTONE | | 8.26 | ALK, COMP, EROD |
| SHALE | | 0.34 | COMP |
| SHALE | | 2.55 | ALK, COMP |
| SANDSTONE | | 1.48 | ALK |
| SHALE | | 2.33 | ALK, COMP, EROD |
| CLAYSTONE | | 0.62 | ALK, COMP, EROD |
| SHALE | | 5.40 | ALK, COMP |
| LIMESTONE | | 6.20 | ALK |
| CLAYSTONE | | 0.64 | ALK, COMP, EROD |
| SHALE | | 0.33 | ALK, COMP, ALK |
| SHALE | | 0.74 | ALK, COMP, EROD |
| LIMESTONE | | 0.60 | ALK |
| SHALE | | 1.98 | ALK, COMP, EROD |
| LIMESTONE | | 1.83 | ALK |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1195

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| CLAYSTONE | | 2.35 | ALK, COMP, EROD |
| LIMESTONE | | 0.36 | ALK |
| CLAYSTONE | | 3.08 | ALK, COMP, EROD |
| SHALE | | 1.62 | ALK, COMP |
| LIMESTONE | | 3.11 | ALK |
| CLAYSTONE | | 0.33 | COMP, EROD |
| LIMESTONE | | 1.57 | ALK |
| CLAYSTONE | | 0.44 | COMP, EROD |
| LIMESTONE | | 0.90 | ALK |
| SILTSTONE | | 1.32 | COMP, EROD |
| SILTSTONE | | 0.78 | COMP, EROD |
| LIMESTONE | | 4.81 | ALK |
| SILTSTONE | | 1.24 | COMP, EROD |
| LIMESTONE | | 13.09 | ALK |
| LIMESTONE | | 2.99 | ALK |
| CLAYSTONE | | 0.72 | ALK, COMP, EROD |
| LIMESTONE | | 1.17 | ALK |
| CLAYSTONE | | 0.58 | COMP, EROD |
| SHALE | | 1.39 | ALK, COMP, EROD |
| LIMESTONE | | 6.20 | ALK |
| SHALE | | 0.98 | ALK, COMP, EROD |
| LIMESTONE | | 4.05 | ALK |
| SHALE | | 0.92 | ALK, COMP |
| SHALE | | 0.19 | ALK |
| LIMESTONE | | 14.10 | ALK |
| CLAYSTONE | | 2.69 | COMP, EROD |
| SHALE | | 0.24 | COMP, EROD |
| COAL (NO. 9) | | 3.85 | AC, EROD |
| CLAYSTONE | | 0.10 | COMP, EROD |
| SHALE | | 1.05 | COMP, EROD |
| LIMESTONE | | 4.63 | ALK |
| LIMESTONE | | 1.75 | ALK |
| LIMESTONE | | 3.84 | ALK |
| SHALE | | 1.50 | COMP, EROD |
| SHALE | | 2.96 | ALK, COMP, EROD |
| CLAYSTONE | | 0.13 | ALK, COMP, EROD |
| SILTSTONE | | 1.94 | ALK, COMP, EROD |
| SHALE | | 0.90 | COMP, EROD |
| LIMESTONE | | 0.38 | ALK |
| CLAYSTONE | | 0.80 | ALK, COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94–1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1195

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| LIMESTONE | | 0.81 | ALK, COMP |
| CLAYSTONE | | 0.95 | COMP, EROD |
| COAL | | 0.23 | AC, EROD |
| SHALE | | 0.63 | ALK, COMP, EROD |
| LIMESTONE | | 3.02 | ALK |
| SHALE | | 0.40 | COMP, EROD |
| LIMESTONE | | 0.75 | ALK |
| SHALE | | 0.05 | COMP, EROD |
| LIMESTONE | | 7.45 | ALK |
| SHALE | | 0.54 | ALK, COMP |
| CLAYSTONE | | 0.70 | COMP, EROD |
| LIMESTONE | | 2.70 | ALK |
| SHALE | | 1.03 | COMP, EROD |
| LIMESTONE | | 1.42 | ALK |
| LIMESTONE | | 0.50 | ALK |
| LIMESTONE | | 1.87 | ALK |
| CLAYSTONE | | 0.65 | COMP, EROD |
| LIMESTONE | | 4.39 | ALK |
| CLAYSTONE | | 1.87 | ALK, COMP, EROD |
| SHALE | | 0.76 | ALK, COMP |
| LIMESTONE | | 2.98 | ALK |
| CLAYSTONE | | 2.46 | ALK, COMP, EROD |
| SHALE | | 1.17 | ALK, COMP, EROD |
| CLAYSTONE | | 0.51 | COMP, EROD |
| SHALE | | 1.32 | COMP, EROD |
| SHALE | | 0.49 | AC, COMP, EROD |
| LIMESTONE | | 11.78 | ALK |
| CLAYSTONE | | 0.72 | ALK, COMP, EROD |
| LIMESTONE | | 1.16 | ALK |
| CLAYSTONE | | 1.30 | COMP, EROD |
| LIMESTONE | | 0.42 | ALK |
| CLAYSTONE | | 0.55 | COMP, EROD |
| LIMESTONE | | 0.35 | ALK |
| CLAYSTONE | | 0.05 | COMP, EROD |
| LIMESTONE | | 0.35 | ALK |
| CLAYSTONE | | 4.33 | COMP, EROD |
| SHALE | | 0.55 | COMP, EROD |
| COAL (NO. 8) | | 7.53 | AC, EROD |
| SHALE | | 0.38 | ALK, COMP, EROD |
| SHALE | | 1.39 | ALK, COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-1

State Plane Coords: X2426439.59 Y730558.99 Surface Elevation 1195

| LITHOLOGY | H2O* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| LIMESTONE | | 0.50 | ALK |
| SHALE | | 0.66 | COMP, EROD |
| CLAYSTONE | | 0.16 | COMP, EROD |
| LIMESTONE | | 0.74 | ALK |
| SHALE | | 0.64 | COMP, EROD |
| LIMESTONE | | 1.60 | ALK |
| SHALE | | 1.70 | ALK, COMP |
| LIMESTONE | | 3.10 | ALK |
| LIMESTONE | | 1.07 | ALK |

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam

| Stratum | Total Sulfur % | Pyrite Sulfur % | Potential Acidity Mg/l as CaCO3 | Neutralization Potential (/1000 Tons) | CaCO3 Deficiency (/1000 Tons) |
|---|---|---|---|---|---|
| Roof | 1.55 | 1.08 | 48.4 | 318 | −270 |
| Coal | 5.44 | 2.64 | 170 | 10.43 | 159 |
| Bottom | 1.44 | 0.99 | 45.0 | 647 | −602 |

**Legend:**
AC = ACID PRODUCING
ALK = ALKALINE PRODUCING
COMP = COMPACTIBLE
EROD = ERODIBLE

* – Indicates water bearing stratum under column labelled H2O

Stratum thickness is measured in feet.

# DIAMOND DRILL HOLE N94-1

GEOLOGIST: HOMER McEVERS

ELEVATION: ~~1195.00~~ 1198.34 (ALTIMETER)

COORDINATES: N ~~-9450.67~~ -9424.68, E ~~-62828.48~~ -62483.61 (~~NOT SURVEYED~~)

TOWNSHIP: SMITH

SECTION: 22, NW 1/4

COUNTY: BELMONT

SURF. OWNER: R. RICE

DATE STARTED: 6/21/94

DATE FINISHED: 6/23/94

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 20.00 | CASING | 20.00 | 1175.00 |
| 5.35 | SILTSTONE, LT. BROWN, CALC, SOFT, WEATHERED | 25.35 | 1169.65 |
| 4.65 | SHALE, GRAY, CALCAREOUS, SOFT | 30.00 | 1165.00 |
| 4.75 | LIMESTONE, WITH IRON STAINS, GRAY, MEDIUM | 34.75 | 1160.25 |
| 5.25 | LIMESTONE, GRAY, MEDIUM | 40.00 | 1155.00 |
| 5.40 | SHALE, GRAY, MEDIUM | 45.40 | 1149.60 |
| 2.64 | SHALE, W/IRON STAINS, MEDIUM | 48.04 | 1146.96 |
| 1.50 | SHALE, GRAY, MEDIUM | 49.54 | 1145.46 |
| 1.30 | SHALE, GRAY, MEDIUM/HARD | 50.84 | 1144.16 |
| 1.25 | SHALE, GRAY, BROKEN W/IRON STAINS, MEDIUM | 52.09 | 1142.91 |
| 2.30 | SHALE, GRAY, MEDIUM | 54.39 | 1140.61 |
| 1.65 | LIMESTONE, GRAY, HARD | 56.04 | 1138.96 |
| 1.52 | SHALE, GRAY, MEDIUM | 57.56 | 1137.44 |
| 0.32 | LIMESTONE, GRAY, HARD | 57.88 | 1137.12 |
| 1.42 | SHALE, GRAY, LAMINATED, MEDIUM | 59.30 | 1135.70 |
| 0.70 | SHALE, GRAY, MEDIUM | 60.00 | 1135.00 |
| 2.10 | LIMESTONE, GRAY, HARD | 62.10 | 1132.90 |
| 8.20 | SHALE, GRAY, MEDIUM | 70.30 | 1124.70 |
| 1.10 | SHALE, GRAY, BROKEN, MEDIUM | 71.40 | 1123.60 |
| 3.40 | 0.50 BONE COAL (NO. 12) | 74.80 | 1120.20 |
| | 2.80 COAL | | |
| | 0.10 BONE COAL | | |
| 5.20 | SHALE, GRAY. LAMINATED, SOFT | 80.00 | 1115.00 |
| 2.85 | SHALE, LAMINATED, SOFT | 82.85 | 1112.15 |
| 0.82 | COAL | 83.67 | 1111.33 |
| 0.25 | SHALE, BLACK, LAMINATED, SOFT | 83.92 | 1111.08 |
| 6.85 | SHALE, CALCAREOUS, MEDIUM, GRAY | 90.77 | 1104.23 |
| 5.30 | SANDSTONE, GRAY W/LS NODULES, HARD | 96.07 | 1098.93 |
| 3.93 | SANDSTONE, GRAY, HARD | 100.00 | 1095.00 |
| 14.42 | SANDSTONE, GRAY, MEDIUM, CALCAREOUS, LAMINATED | 114.42 | 1080.58 |
| 2.85 | LIMESTONE, GRAY, HARD | 117.27 | 1077.73 |
| 0.46 | LIMESTONE, LIGHT BROWN, HARD | 117.73 | 1077.27 |
| 2.01 | CLAYSTONE, CALCAREOUS, GRAY, BROKEN, SOFT | 119.74 | 1075.26 |
| 5.19 | CLAYSTONE, GRAY, SOFT | 124.93 | 1070.07 |
| 2.38 | SHALE, CALCAREOUS, MEDIUM, GRAY | 127.31 | 1067.69 |
| 3.90 | LIMESTONE, GRAY, MEDIUM | 131.21 | 1063.79 |
| 4.29 | SHALE, GRAY, MEDIUM, W/LIMESTONE NODULES | 135.50 | 1059.50 |
| 0.90 | SANDSTONE, GRAY, HARD, LAMINATED | 136.40 | 1058.60 |
| 1.16 | SHALE, SANDY, GRAY, LAMINATED, MEDIUM | 137.56 | 1057.44 |
| 2.70 | SANDSTONE, CALCAREOUS, HARD, GRAY | 140.26 | 1054.74 |
| 5.44 | SANDSTONE, HARD, GRAY, LAMINATED | 145.70 | 1049.30 |

(Continued)

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 0.92 | SHALE, GRAY, SOFT | 146.62 | 1048.38 |
| 0.77 | CLAYSTONE, GRAY, LAMINATED, SOFT | 147.39 | 1047.61 |
| 0.59 | SHALE, GRAY, LAMINATED, SOFT | 147.98 | 1047.02 |
| 0.50 | SHALE, BLACK, SOFT | 148.48 | 1046.52 |
| 0.20 | SHALE, GRAY, MEDIUM | 148.68 | 1046.32 |
| 4.26 | LIMESTONE, GRAY, W/SANDSTONE STREAKS, HARD | 152.94 | 1042.06 |
| 3.62 | SANDSTONE, LS NODULES, LAM. W/SHALE, GRAY, HARD | 156.56 | 1038.44 |
| 1.71 | SHALE, GRAY, LAMINATED, SOFT | 158.27 | 1036.73 |
| 0.14 | CLAYSTONE, DARK GRAY, SOFT | 158.41 | 1036.59 |
| 0.32 | LIMESTONE, LIGHT GRAY, HARD | 158.73 | 1036.27 |
| 3.45 | CLAYSTONE, GRAY, SOFT, CALCAREOUS | 162.18 | 1032.82 |
| 0.58 | SHALE, W/SANDSTONE STREAKS, CALCAREOUS, GRAY, MEDIUM | 162.76 | 1032.24 |
| 6.28 | SANDSTONE, GRAY, LAMINATED, CALCAREOUS | 169.04 | 1025.96 |
| 0.75 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 169.79 | 1025.21 |
| 10.98 | SHALE, GRAY, SOFT | 180.77 | 1014.23 |
| 3.41 | **0.18 BONE COAL (NO. 11)** | **184.18** | **1010.82** |
| | **3.23 COAL, W/PYRITE STREAKS** | | |
| 11.69 | CLYSTN, GRAY, SOFT, W/COAL STREAKS, CALC, BROKEN | 195.87 | 999.13 |
| 4.10 | LIMESTONE, GREEN, HARD | 199.97 | 995.03 |
| 7.10 | SHALE, GREEN, SANDY, W/LIMESTONE NODULES, SOFT | 207.07 | 987.93 |
| 4.37 | SANDSTONE, GRAY, LAMINATED, HARD | 211.44 | 983.56 |
| 0.98 | SHALE, GRAY, LAMINATED, SOFT | 212.42 | 982.58 |
| 1.57 | SANDSTONE, GRAY, LAMINATED, HARD | 213.99 | 981.01 |
| 5.81 | SHALE, SANDY, LAMINATED | 219.80 | 975.20 |
| 2.59 | SHALE, GRAY | 222.39 | 972.61 |
| 2.86 | **2.00 COAL (NO. 10)** | **225.25** | **969.75** |
| | **0.15 CLAYSTONE, GRAY** | | |
| | **0.71 COAL** | | |
| 2.26 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 227.51 | 967.49 |
| 0.32 | SANDSTONE, GRAY, CALCAREOUS, HARD | 227.83 | 967.17 |
| 3.28 | CLAYSTONE, GRAY, BROKEN, SOFT | 231.11 | 963.89 |
| 8.26 | CLAYSTONE, CALCAREOUS, GRAY, SOFT | 239.37 | 955.63 |
| 0.34 | SHALE, GRAY, MEDIUM | 239.71 | 955.29 |
| 2.55 | SHALE, GREEN, MEDIUM, CALCAREOUS, LAMINATED | 242.26 | 952.74 |
| 1.48 | SAND STONE, GRAY, HARD, CALCAREOUS, LAMINATED | 243.74 | 951.26 |
| 2.33 | SHALE, GRAY, SOFT, CALCAREOUS | 246.07 | 948.93 |
| 0.62 | CLAYSTONE, GRAY, SOFT, CALCAREOUS | 246.69 | 948.31 |
| 5.40 | SHALE, GRAY, MEDIUM, CALCAREOUS | 252.09 | 942.91 |
| 6.20 | LIMESTONE, GRAY, HARD | 258.29 | 936.71 |
| 0.64 | CLAYSTONE, GRAY, SOFT, CALCAREOUS | 258.93 | 936.07 |
| 0.33 | SHALE, GRAY, LAMINATED, CALCAREOUS, SOFT | 259.26 | 935.74 |
| 0.74 | SHALE, GRAY, LAMINATED, CALCAREOUS, SOFT | 260.00 | 935.00 |
| 0.60 | LIMESTONE, GRAY, HARD | 260.60 | 934.40 |
| 1.98 | SHALE, GRAY, SOFT, LAMINATED, CALCAREOUS | 262.58 | 932.42 |
| 1.83 | LIMESTONE, GRAY, HARD | 264.41 | 930.59 |
| 2.35 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 266.76 | 928.24 |

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 0.36 | LIMESTONE, GRAY, HARD | 267.12 | 927.88 |
| 3.08 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 270.20 | 924.80 |
| 1.62 | SHALE, CALCAREOUS, GRAY, MEDIUM | 271.82 | 923.18 |
| 3.11 | LIMESTONE, GRAY, JOINTED, HARD | 274.93 | 920.07 |
| 0.33 | CLAYSTONE, GRAY, SOFT | 275.26 | 919.74 |
| 1.57 | LIMESTONE, GRAY, HARD | 276.83 | 918.17 |
| 0.44 | CLAYSTONE, GREEN, SOFT | 277.27 | 917.73 |
| 0.90 | LIMESTONE, GRAY, HARD | 278.17 | 916.83 |
| 1.32 | SILTSTONE, MEDIUM, GREEN, LAMINATED | 279.49 | 915.51 |
| 0.78 | SILTSTONE, GREEN, LAMINATED, SOFT | 280.27 | 914.73 |
| 4.81 | LIMESTONE, GRAY, HARD | 285.08 | 909.92 |
| 1.24 | SILTSTONE, SOFT, GREEN | 286.32 | 908.68 |
| 13.09 | LIMESTONE, GRAY, HARD | 299.41 | 895.59 |
| 2.99 | LIMESTONE, GRAY, MEDIUM | 302.40 | 892.60 |
| 0.72 | GREEN, CLAYSTONE, SOFT, CALCAREOUS | 303.12 | 891.88 |
| 1.17 | LIMESTONE, GRAY, MEDIUM | 304.29 | 890.71 |
| 0.58 | GREEN CLAYSTONE, SOFT | 304.87 | 890.13 |
| 1.39 | SHALE, CALCAREOUS, SOFT, GRAY | 306.26 | 888.74 |
| 6.20 | LIMESTONE, GRAY, LAMINATED | 312.46 | 882.54 |
| 0.98 | SHALE, GRAY, W/ LIMESTONE NODULES | 313.44 | 881.56 |
| 4.05 | LIMESTONE, MEDIUM, GRAY, LAMINATED | 317.49 | 877.51 |
| 0.92 | GREEN SHALE, CALCAREOUS, MEDIUM | 318.41 | 876.59 |
| 0.19 | GRAY SHALE, LAMINATED, CALCAREOUS, HARD | 318.60 | 876.40 |
| 14.10 | GRAY LIMESTONE, HARD | 332.70 | 862.30 |
| 2.69 | GRAY CLAYSTONE, SOFT | 335.39 | 859.61 |
| 0.24 | GRAY SHALE, SOFT | 335.63 | 859.37 |
| 3.85 | COAL (NO. 9), SS PARTINGS W/PYRITE | 339.48 | 855.52 |
| 0.10 | GRAY CLAYSTONE, SOFT | 339.58 | 855.42 |
| 1.05 | SHALE, BLACK, SOFT | 340.63 | 854.37 |
| 4.63 | LIMESTONE, GRAY, MEDIUM, LAMINATED | 345.26 | 849.74 |
| 1.75 | LIMESTONE, WHITE, HARD | 347.01 | 847.99 |
| 3.84 | LIMESTONE, GRAY, MEDIUM, LAMINATED | 350.85 | 844.15 |
| 1.50 | SHALE, GRAY SOFT | 352.35 | 842.65 |
| 2.96 | SHALE, GRAY, SOFT, LAMINATED, CALCAREOUS | 355.31 | 839.69 |
| 0.13 | CLAYSTONE, GRAY, SOFT, CALCAREOUS | 355.44 | 839.56 |
| 1.94 | SILTSTONE, GRAY, SOFT, LAMINATED, CALCAREOUS | 357.38 | 837.62 |
| 0.90 | GRAY, SHALE, SOFT | 358.28 | 836.72 |
| 0.38 | WHITE LIMESTONE, HARD | 358.66 | 836.34 |
| 0.80 | GRAY CLAYSTONE, SOFT, CALCAREOUS, | 359.46 | 835.54 |
| 0.81 | LIMESTONE, GRAY, MEDIUM | 360.27 | 834.73 |
| 0.95 | GRAY CLAYSTONE, SOFT | 361.22 | 833.78 |
| 0.23 | COAL | 361.45 | 833.55 |
| 0.63 | SHALE, GRAY, LAMINATED, CALCAREOUS, SOFT | 362.08 | 832.92 |
| 3.02 | LIMESTONE, GRAY, HARD | 365.10 | 829.90 |
| 0.40 | SHALE, BLACK, SOFT | 365.50 | 829.50 |
| 0.75 | LIMESTONE, GRAY, HARD | 366.25 | 828.75 |

(Continued)

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 0.05 | SHALE, BLACK, SOFT | 366.30 | 828.70 |
| 7.45 | LIMESTONE, GRAY, HARD | 373.75 | 821.25 |
| 0.54 | SHALE, CALCAREOUS, HARD, GRAY, LAMINATED | 374.29 | 820.71 |
| 0.70 | CLAYSTONE, GRAY, SOFT | 374.99 | 820.01 |
| 2.70 | LIMESTONE, LIGHT GRAY, HARD | 377.69 | 817.31 |
| 1.03 | SHALE, GREY, LAMINATED, SOFT | 378.72 | 816.28 |
| 1.42 | LIMESTONE, LIGHT GRAY, HARD | 380.14 | 814.86 |
| 0.50 | LIMESTONE, GRAY, HARD, LAMINATED | 380.64 | 814.36 |
| 1.87 | LIMESTONE, LIGHT GRAY | 382.51 | 812.49 |
| 0.65 | CLAYSTONE, GREEN, SOFT | 383.16 | 811.84 |
| 4.39 | LIMESTONE, GRAY, HARD | 387.55 | 807.45 |
| 1.87 | CLAYSTONE, GREEN, SOFT, CALCAREOUS | 389.42 | 805.58 |
| 0.76 | SHALE, CALCAREOUS, GRAY, MEDIUM | 390.18 | 804.82 |
| 2.98 | LIMESTONE, LIGHT GRAY, HARD | 393.16 | 801.84 |
| 2.46 | CLAYSTONE, GREEN, SOFT, CALCAREOUS | 395.62 | 799.38 |
| 1.17 | SHALE, BLACK, SOFT, CARBONACEOUS | 396.79 | 798.21 |
| 0.51 | CLAYSTONE, GREY, SOFT | 397.30 | 797.70 |
| 1.32 | SHALE, DARK GREY, SOFT | 398.62 | 796.38 |
| 0.49 | SHALE, CARBONACEOUS, SOFT | 399.11 | 795.89 |
| 11.78 | LIMESTONE, LIGHT GRAY, HARD | 410.89 | 784.11 |
| 0.72 | GREEN CLAYSTONE, SOFT, CALCAREOUS | 411.61 | 783.39 |
| 1.16 | LIMESTONE, LIGHT GRAY, LAMINATED | 412.77 | 782.23 |
| 1.30 | CLAYSTONE, GREEN, SOFT | 414.07 | 780.93 |
| 0.42 | LIGHT GRAY LIMESTONE, HARD | 414.49 | 780.51 |
| 0.55 | GREEN CLAYSTONE, SOFT | 415.04 | 779.96 |
| 0.35 | LIMESTONE, LIGHT GRAY, HARD | 415.39 | 779.61 |
| 0.05 | GREEN CLAYSTONE, SOFT | 415.44 | 779.56 |
| 0.35 | LIMESTONE, LIGHT GRAY, HARD | 415.79 | 779.21 |
| 4.33 | CLAYSTONE, GREEN, LAMINATED, SOFT W/SLICKENSIDES | 420.12 | 774.88 |
| 0.55 | SHALE, DARK GREY, LAMINATED, SOFT | 420.67 | 774.33 |
| 7.53 | 0.99 ROOF COAL (NO. 8) W/SULFUR STREAKS | 428.20 | 766.80 |
| | 0.90 CLAYSTONE, GRAY | | |
| | 5.64 COAL W/SULFUR STREAKS | | |
| 0.38 | SHALE, CALCAREOUS, LAMINATED, GRAY, SOFT | 428.58 | 766.42 |
| 1.39 | SHALE, CALCAREOUS, DARK GRAY, SOFT | 429.97 | 765.03 |
| 0.50 | LIMESTONE, LIGHT GRAY, HARD | 430.47 | 764.53 |
| 0.66 | SHALE, DARK GRAY, SOFT | 431.13 | 763.87 |
| 0.16 | CLAYSTONE, GRAY, SOFT | 431.29 | 763.71 |
| 0.74 | LIMESTONE, GRAY, HARD | 432.03 | 762.97 |
| 0.64 | SHALE, GRAY, SOFT | 432.67 | 762.33 |
| 1.60 | LIMESTONE, GRAY, HARD | 434.27 | 760.73 |
| 1.70 | SHALE, W/LIMESTONE NODULES, GRAY, MEDIUM | 435.97 | 759.03 |
| 3.10 | LIMESTONE, GRAY, LAMINATED, HARD | 439.07 | 755.93 |
| 1.07 | LIMESTONE, GREEN, HARD | 440.14 | 754.86 |

AMOUNT OF HARD ROCK ABOVE NO. 8 SEAM

HARD ROCK: 205.71 FT (48.9%) OF CORE

SOFT ROCK: 214.96 FT. (51.1%) OF CORE

PROJECTED AQUIFERS:

1. 30.00 TO 34.75 (MINOR)
2. 45.40 TO 52.09 (MINOR)

DIVISION OF RECLAMATION

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-2

State Plane Coords: X2430539.19 Y731089.68 Surface Elevation 1079.26 ~~1085~~

| LITHOLOGY | H20* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| CASING | | 20.00 | |
| SHALE | | 0.95 | COMP |
| SANDSTONE | | 0.80 | ALK, HARD |
| SHALE | | 1.80 | COMP |
| LIMESTONE | | 1.75 | ALK |
| SHALE | | 3.92 | COMP |
| SHALE | | 0.31 | COMP, EROD |
| SHALE | | 1.92 | ALK, COMP, EROD |
| SHALE | | 1.78 | COMP, EROD |
| (CORE LOST) | | 3.30 | |
| SILTSTONE | | 0.65 | COMP, EROD |
| SHALE | | 1.35 | COMP, EROD |
| SANDSTONE | | 1.12 | HARD |
| SHALE | | 0.35 | COMP, EROD |
| SHALE | | 1.45 | COMP |
| SANDSTONE | | 0.20 | HARD |
| SHALE | | 1.88 | COMP, HARD |
| SANDSTONE | | 1.20 | HARD |
| SHALE | | 2.20 | COMP, HARD |
| SANDSTONE | | 1.20 | HARD |
| SHALE | | 2.89 | COMP, HARD |
| SANDSTONE | | 0.12 | HARD |
| SHALE | | 0.88 | COMP, HARD |
| SHALE | | 1.10 | COMP |
| SHALE | | 0.82 | COMP, HARD |
| SHALE | | 0.30 | COMP |
| **COAL (NO. 11)** | | **3.04** | AC, EROD |
| SANDSTONE | | 0.05 | HARD |
| SHALE | | 0.30 | COMP, EROD |
| SHALE | | 2.37 | COMP, EROD |
| SHALE | | 6.39 | ALK, COMP |
| SANDSTONE | | 2.40 | ALK, HARD |
| LIMESTONE | | 11.41 | ALK |
| SHALE | | 15.07 | COMP |
| **COAL (NO. 10)** | | **2.76** | AC, EROD |
| SHALE | | 0.17 | COMP |
| LIMESTONE | | 1.80 | ALK |
| SHALE | | 1.70 | COMP |
| CLAYSTONE | * | 2.65 | COMP, EROD |
| SHALE | | 4.62 | ALK, COMP |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-2

State Plane Coords: X2430539.19 Y731089.68 Surface Elevation 1085

| LITHOLOGY | H20* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| CLAYSTONE | * | 1.50 | COMP, EROD |
| SILTSTONE | | 1.30 | COMP, EROD |
| SHALE | | 0.60 | COMP |
| SANDSTONE | | 1.20 | HARD |
| SHALE | | 6.43 | COMP |
| CLAYSTONE | | 1.35 | ALK, COMP, EROD |
| LIMESTONE | | 10.12 | ALK |
| CLAYSTONE | * | 0.25 | ALK, COMP, EROD |
| LIMESTONE | | 6.75 | ALK |
| CLAYSTONE | | 7.23 | ALK, COMP, EROD |
| LIMESTONE | | 4.00 | ALK |
| CLAYTONE | * | 0.55 | ALK, COMP, EROD |
| CLAYSTONE | | 3.70 | ALK, COMP, EROD |
| LIMESTONE | | 4.85 | ALK |
| CLAYSTONE | | 1.20 | COMP, EROD |
| LIMESTONE | | 20.40 | ALK |
| LIMESTONE | | 6.20 | ALK |
| LIMESTONE | | 3.60 | ALK |
| CLAYSTONE | | 1.05 | ALK, COMP, EROD |
| LIMESTONE | | 8.75 | ALK |
| LIMESTONE | | 3.35 | ALK |
| LIMESTONE | | 0.95 | ALK, COMP |
| LIMESTONE | | 0.17 | ALK |
| SHALE | | 4.52 | COMP, EROD |
| COAL (N0. 9) | | 3.90 | AC, EROD |
| SHALE | | 1.44 | COMP, EROD |
| LIMESTONE | | 1.80 | ALK, COMP |
| LIMESTONE | | 3.87 | ALK |
| LIMESTONE | | 1.90 | ALK |
| SHALE | | 10.60 | ALK, COMP, EROD |
| LIMESTONE | | 0.30 | ALK |
| SHALE | | 0.67 | COMP, EROD |
| LIMESTONE | | 0.95 | ALK |
| SHALE | | 0.45 | COMP, EROD |
| SHALE | | 0.80 | AC, COMP, EROD |
| SHALE | | 0.70 | ALK, COMP, EROD |
| LIMESTONE | | 14.73 | ALK |
| CLAYSTONE | | 1.25 | ALK, COMP, EROD |
| LIMESTONE | | 4.38 | ALK |
| CLAYSTONE | | 0.62 | ALK, COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94–2

State Plane Coords: X2430539.19 Y731089.68 Surface Elevation 1085

| LITHOLOGY | H20* | THICKNESS | PHYSICAL PROPERTIES |
|---|---|---|---|
| LIMESTONE | | 2.65 | ALK |
| LIMESTONE | | 2.95 | ALK |
| CLAYSTONE | | 2.35 | ALK, COMP, EROD |
| LIMESTONE | | 1.70 | ALK |
| CLAYSTONE | | 1.10 | ALK, COMP, EROD |
| CLAYSTONE | | 1.50 | ALK, COMP, EROD |
| SHALE | | 2.40 | COMP, EROD |
| LIMESTONE | | 8.00 | ALK |
| LIMESTONE | | 3.15 | ALK |
| SHALE | | 0.63 | ALK, COMP, EROD |
| LIMESTONE | | 1.40 | ALK |
| SHALE | | 0.75 | ALK, COMP, EROD |
| LIMESTONE | | 0.17 | ALK |
| CLAYSTONE | | 2.10 | ALK, COMP, EROD |
| SHALE | | 1.80 | ALK, COMP, EROD |
| CLAYSTONE | | 3.10 | COMP, EROD |
| CLAYSTONE | | 0.80 | COMP, EROD |
| COAL (NO. 8) | | 7.12 | AC, EROD |
| CLAYSTONE | | 4.78 | ALK, COMP, EROD |
| SHALE | | 2.20 | ALK, COMP, EROD |
| CLAYSTONE | | 2.00 | COMP, EROD |

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam

| Stratum | Total Sulfur % | Pyrite Sulfur % | Potential Acidity Mg/l as CaCO3 | Neutralization Potential (/1000 Tons) | CaCO3 Deficiency (/1000 Tons) |
|---|---|---|---|---|---|
| Roof | 1.26 | 0.87 | 39.4 | 351 | -312 |
| Coal | 4.73 | 2.30 | 148 | 10.78 | 71.8 |
| Bottom | 1.86 | 1.56 | 58.1 | 451 | -393 |

**Legend:**
AC = ACID PRODUCING
ALK = ALKALINE PRODUCING
COMP = COMPACTIBLE
EROD = ERODIBLE

* – Indicates water bearing stratum under column labelled H2O

Stratum thickness is measured in feet.

# DIAMOND DRILL HOLE N94-2

GEOLOGIST: HOMER McEVERS

ELEVATION: ~~1085.0~~ 1079.26 (ALTIMETER)

COORDINATES: N ~~9906.55~~ -4888.61, E ~~66930.08~~ -66914.94 (NOT SURVEYED) EXCHANGE

DRILLER: L. J. HUGHES & SONS, INC., FUZZY SALISBURY

TOWNSHIP: SMITH

SECTION: 28, NE 1/4

COUNTY: BELMONT

SURF. OWNER: R. SAFFLE

DATE STARTED: 6/23/94

DATE FINISHED: 6/28/94

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 20.00 | CASINGS | 20.00 | 1065.00 |
| 0.95 | SHALE, GRAY, MEDIUM | 20.95 | 1064.05 |
| 0.80 | SANDSTONE, GRAY, CALCAREOUS, HARD | 21.75 | 1063.25 |
| 1.80 | SHALE, GRAY, LAMINATED, MEDIUM | 23.55 | 1061.45 |
| 1.75 | LIMESTONE, GRAY, HARD | 25.30 | 1059.70 |
| 3.92 | SHALE, GRAY, MEDIUM | 29.22 | 1055.78 |
| 0.31 | SHALE, GRAY, LAMINATED, SOFT | 29.53 | 1055.47 |
| 1.92 | SHALE, GRAY, CALCAREOUS, SOFT | 31.45 | 1053.55 |
| 1.78 | SHALE, GRAY, LAMINATED, SOFT | 33.23 | 1051.77 |
| 3.30 | (CORE LOST) | 36.53 | 1048.47 |
| 0.65 | SILTSTONE, LIGHT BROWN, SOFT | 37.18 | 1047.82 |
| 1.35 | SHALE, GRAY, SOFT | 38.53 | 1046.47 |
| 1.12 | SANDSTONE, GRAY, HARD | 39.65 | 1045.35 |
| 0.35 | SHALE, GRAY, SOFT | 40.00 | 1045.00 |
| 1.45 | SHALE, GRAY, MEDIUM | 41.45 | 1043.55 |
| 0.20 | SANDSTONE, GRAY, HARD | 41.65 | 1043.35 |
| 1.88 | SHALE, SANDY, GRAY, HARD | 43.53 | 1041.47 |
| 1.20 | SANDSTONE, GRAY, HARD | 44.73 | 1040.27 |
| 2.20 | SHALE, SANDY, GRAY, HARD | 46.93 | 1038.07 |
| 1.20 | SANDSTONE, GRAY, HARD | 48.13 | 1036.87 |
| 2.89 | SHALE, SANDY, GRAY, HARD | 51.02 | 1033.98 |
| 0.12 | SANDSTONE, GRAY, HARD | 51.14 | 1033.86 |
| 0.88 | SHALE, SANDY, GRAY, HARD | 52.02 | 1032.98 |
| 1.10 | SHALE, BLACK, MEDIUM | 53.12 | 1031.88 |
| 0.82 | SHALE, SANDY, GRAY, HARD | 53.94 | 1031.06 |
| 0.30 | SHALE, BLACK, MEDIUM | 54.24 | 1030.76 |
| 3.04 | COAL W/PARTINGS (NO. 11) | 57.28 | 1027.72 |
| 0.05 | SANDSTONE, GRAY, HARD | 57.33 | 1027.67 |
| 0.30 | SHALE, BLACK | 57.63 | 1027.37 |
| 2.37 | SHALE, GRAY, SOFT | 60.00 | 1025.00 |
| 6.39 | SHALE, SANDY, W/LIMESTONE NODULES, GRAY, MEDIUM | 66.39 | 1018.61 |
| 2.40 | SANDSTONE, CALCAREOUS, GRAY, HARD | 68.79 | 1016.21 |
| 11.41 | LIMESTONE, GRAY GREEN, HARD | 80.20 | 1004.80 |
| 15.07 | SHALE, GRAY, MEDIUM | 95.27 | 989.73 |
| 2.76 | 1.65 COAL (NO. 10) | 98.03 | 986.97 |
| | 0.02 SANDSTONE, GRAY | | |
| | 0.10 COAL | | |
| | 0.06 BONE COAL | | |
| | 0.11 COAL | | |

(Continued)

| THICK. (FT) | DESCRIPTION | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| | 0.15 SHALE, BLACK (NO. 10 COAL CONTINUED) | | |
| | 0.67 COAL | | |
| 0.17 | SHALE, BLACK, MEDIUM | 98.20 | 986.80 |
| 1.80 | LIMESTONE, GRAY, HARD | 100.00 | 985.00 |
| 1.70 | SHALE, SANDY, GRAY, MEDIUM | 101.70 | 983.30 |
| 2.65 | CLAYSTONE, W/IRON STAINS, GRAY SOFT | 104.35 | 980.65 |
| 4.62 | SHALE, GRAY, W/LIMESTONE NODULES, MEDIUM | 108.97 | 976.03 |
| 1.50 | CLAYSTONE, W/IRON STAINS, GRAY, SOFT | 110.47 | 974.53 |
| 1.30 | SILTSTONE, GRAY, SOFT | 111.77 | 973.23 |
| 0.60 | SHALE, SANDSTONE, GRAY, MEDIUM | 112.37 | 972.63 |
| 1.20 | SANDSTONE, GRAY, HARD | 113.57 | 971.43 |
| 6.43 | SHALE, GRAY, MEDIUM | 120.00 | 965.00 |
| 1.35 | CLAYSTONE, CALAREOUS, GRAY, SOFT | 121.35 | 963.65 |
| 10.12 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 131.47 | 953.53 |
| 0.25 | CLAYSTONE, CALCAREOUS, W/IRON STAINS, GRAY, SOFT | 131.72 | 953.28 |
| 6.75 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 138.47 | 946.53 |
| 7.23 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 145.70 | 939.30 |
| 4.00 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 149.70 | 935.30 |
| 0.55 | CLAYTONE, GREEN, CALCAREOUS, W/IRON STAINS, SOFT | 150.25 | 934.75 |
| 3.70 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 153.95 | 931.05 |
| 4.85 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 158.80 | 926.20 |
| 1.20 | CLAYSTONE, GREEN, SOFT | 160.00 | 925.00 |
| 20.40 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 180.40 | 904.60 |
| 6.20 | LIMESTONE, SANDY, GRAY, HARD | 186.60 | 898.40 |
| 3.60 | LIMESTONE, SANDY, GRAY GREEN, HARD | 190.20 | 894.80 |
| 1.05 | CLAYSTONE, GREEN, CALCAREOUS, MEDIUM | 191.25 | 893.75 |
| 8.75 | LIMESTONE, LIGHT BROWN, HARD | 200.00 | 885.00 |
| 3.35 | LIMESTONE, LIGHT BROWN, HARD | 203.35 | 881.65 |
| 0.95 | LIMESTONE, SHALEY, GRAY, MEDIUM | 204.30 | 880.70 |
| 0.17 | LIMESTONE, LIGHT BROWN, MEDIUM | 204.47 | 880.53 |
| 4.52 | SHALE, BLACK, BROKEN, SOFT | 208.99 | 876.01 |
| 3.90 | COAL (N0. 9) W/PARTINGS | 212.89 | 872.11 |
| 1.44 | SHALE, BLACK, SOFT | 214.33 | 870.67 |
| 1.80 | LIMESTONE, SHALEY, GRAY, MEDIUM | 216.13 | 868.87 |
| 3.87 | LIMESTONE, LIGHT BROWN, HARD | 220.00 | 865.00 |
| 1.90 | LIMESTONE, LIGHT BROWN, HARD | 221.90 | 863.10 |
| 10.60 | SHALE, BLACK, CALCAREOUS, SOFT | 232.50 | 852.50 |
| 0.30 | LIMESTONE, LIGHT BROWN, HARD | 232.80 | 852.20 |
| 0.67 | SHALE, GRAY, SOFT | 233.47 | 851.53 |
| 0.95 | LIMESTONE, LIGHT BROWN, HARD | 234.42 | 850.58 |
| 0.45 | SHALE, GRAY, SOFT | 234.87 | 850.13 |
| 0.80 | SHALE, BLACK W/COAL STREAKS,SOFT | 235.67 | 849.33 |
| 0.70 | SHALE, BLACK, CALCAREOUS, SOFT | 236.37 | 848.63 |
| 14.73 | LIMESTONE, LIGHT BROWN , HARD | 251.10 | 833.90 |
| 1.25 | CLAYSTONE, GREEN, CALCAREOUS, SOFT, | 252.35 | 832.65 |
| 4.38 | LIMESTONE, LIGHT BROWN, HARD | 256.73 | 828.27 |

(Continued)

| THICK. (FT) | DESCRIPTION. | DEPTH (FT) | ELEV. (FT) |
|---|---|---|---|
| 0.62 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 257.35 | 827.65 |
| 2.65 | LIMESTONE, LIGHT BROWN, HARD | 260.00 | 825.00 |
| 2.95 | LIMESTONE, LIGHT BROWN, HARD | 262.95 | 822.05 |
| 2.35 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 265.30 | 819.70 |
| 1.70 | LIMESTONE, LIGHT BROWN, HARD | 267.00 | 818.00 |
| 1.10 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 268.10 | 816.90 |
| 1.50 | CLAYSTONE, GRAY, CALCAREOUS, SOFT | 269.60 | 815.40 |
| 2.40 | SHALE, BLACK, SOFT | 272.00 | 813.00 |
| 8.00 | LIMESTONE, LIGHT BROWN/GRAY, HARD | 280.00 | 805.00 |
| 3.15 | LIMESTONE, LIGHT BROWN, HARD | 283.15 | 801.85 |
| 0.63 | SHALE, BLACK, CALCAREOUS, SOFT | 283.78 | 801.22 |
| 1.40 | LIMESTONE, LIGHT BROWN, HARD | 285.18 | 799.82 |
| 0.75 | SHALE, GRAY/GREEN, CALCAREOUS, SOFT | 285.93 | 799.07 |
| 0.17 | LIMESTONE, LIGHT BROWN, HARD | 286.10 | 798.90 |
| 2.10 | CLAYSTONE, GREEN, CALCAREOUS, SOFT | 288.20 | 796.80 |
| 1.80 | SHALE, GRAY/GREEN, CALCAREOUS, SOFT | 290.00 | 795.00 |
| 3.10 | CLAYSTONE, GREEN, SOFT | 293.10 | 791.90 |
| 0.80 | CLAYSTONE, GRAY/BLACK, SOFT | 293.90 | 791.10 |
| 7.12 | **0.95 COAL (NO. 8)** | 301.02 | 783.98 |
| | **0.81 SHALE, GRAY** | | |
| | **0.20 COAL** | | |
| | **0.03 SHALE, W/PYRITE** | | |
| | **5.13 COAL** | | |
| 4.78 | CLAYSTONE, GREEN/GRAY, CALCAREOUS, SOFT | 305.80 | 779.20 |
| 2.20 | SHALE, GRAY, CALCAREOUS, SOFT | 308.00 | 777.00 |
| 2.00 | CLAYSTONE, GREEN, SOFT | 310.00 | 775.00 |

AMOUNT OF HARD ROCK ABOVE NO. 8 SEAM

HARD ROCK: 139.60 FT. (47.5%) OF CORE

SOFT ROCK: 154.30 FT. (52.5%) OF CORE

PROJECTED AQUIFERS

1. 104.35 TO 110.47 (MINOR)
2. 131.47 TO 150.25

DIVISION OF RECLAMATION

ATTACHMENT 13

(GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation ~~1303~~ 1,299.87

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| CASING | | 29.00 | |
| SANDSTONE | ° | 4.40 | HARD |
| SHALE | ° | 1.00 | COMP, EROD |
| SHALE | ° | 0.65 | COMP, EROD |
| SHALE | | 1.22 | COMP, EROD |
| SHALE | | 0.47 | COMP, EROD, ALK |
| SHALE | ° | 2.26 | COMP, EROD |
| SHALE | | 3.10 | COMP, EROD |
| SHALE | | 1.55 | COMP, EROD, ALK |
| CLAYSTONE | | 2.20 | COMP, EROD |
| SHALE | ° | 1.15 | COMP, EROD |
| SHALE | | 3.90 | COMP, EROD, ALK |
| SHALE | | 4.10 | COMP, EROD, ALK |
| SHALE | | 3.60 | COMP, EROD |
| CLAYSTONE | | 1.00 | COMP, EROD |
| SHALE | | 2.10 | COMP, EROD |
| CLAYSTONE | | 1.15 | COMP, EROD |
| SHALE | | 1.50 | COMP, EROD |
| SHALE | ° | 0.50 | COMP, EROD |
| SHALE | | 1.85 | COMP, EROD |
| CLAYSTONE | | 1.01 | COMP, EROD |
| SHALE | | 1.20 | COMP, EROD |
| SHALE | | 1.40 | COMP, EROD |
| SHALE | | 1.69 | COMP, EROD |
| SHALE | | 0.95 | COMP, EROD |
| SHALE | | 1.91 | COMP, EROD |
| SHALE | | 0.65 | COMP, EROD, ALK |
| CLAYSTONE | | 0.60 | COMP, EROD |
| SHALE | | 4.20 | COMP, EROD, ALK |
| SHALE | | 0.95 | COMP, EROD |
| SHALE | | 2.00 | COMP, EROD, ALK |
| SANDSTONE | | 1.74 | HARD |
| SHALE | | 4.25 | COMP, EROD |
| SHALE | | 0.61 | COMP, EROD |
| LIMESTONE | | 3.00 | HARD, ALK |
| SHALE | | 4.15 | COMP, EROD, ALK |
| SHALE | | 0.95 | COMP, EROD |
| LIMESTONE | | 0.90 | HARD, ALK |
| SHALE | | 6.14 | COMP, EROD, ALK |
| SHALE | | 7.30 | COMP, EROD, ALK |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94–6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation 1303

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| SHALE | | 1.10 | COMP, EROD |
| SHALE | | 5.40 | COMP, EROD, ALK |
| SHALE | | 5.00 | COMP, EROD |
| SHALE | | 1.20 | COMP, EROD, ALK |
| SHALE | | 0.90 | COMP, EROD, ALK |
| SHALE | | 1.00 | COMP, EROD, ALK |
| SHALE | | 1.25 | COMP, EROD |
| SHALE | | 3.60 | COMP, EROD, ALK |
| LIMESTONE | | 2.20 | HARD, ALK |
| SHALE | | 4.50 | COMP, EROD, ALK |
| SHALE | | 6.75 | COMP, EROD, ALK |
| SHALE | | 3.10 | COMP, EROD |
| SHALE | | 6.70 | COMP, EROD, ALK |
| CLAYSTONE | | 3.53 | COMP, EROD, ALK |
| SHALE | | 0.63 | COMP, EROD, AC |
| SHALE | | 0.56 | COMP, EROD |
| SHALE | | 0.33 | COMP, EROD, AC |
| LIMESTONE | | 5.00 | HARD, ALK |
| CLAYSTONE | | 5.05 | COMP, EROD |
| COAL (NO. 12) | | 4.90 | EROD, AC |
| SHALE | | 2.60 | COMP, EROD |
| SANDSTONE | | 2.30 | HARD |
| SHALE | | 3.80 | COMP, EROD |
| BONE COAL | | 0.35 | AC, EROD |
| SHALE | | 1.30 | COMP, EROD |
| COAL | | 0.20 | ALK, COMP, EROD |
| SHALE | | 0.68 | COMP, EROD |
| SHALE | | 5.37 | COMP, EROD, ALK |
| SHALE | | 3.40 | COMP, EROD, ALK |
| SHALE | | 6.05 | COMP, EROD, ALK |
| SHALE | | 10.45 | COMP, EROD |
| SHALE | | 0.57 | COMP, EROD |
| SHALE | | 0.22 | COMP, EROD |
| SHALE | | 0.32 | COMP, EROD |
| SHALE | | 0.45 | COMP, EROD |
| SHALE | | 1.94 | COMP, EROD |
| SHALE | | 0.20 | COMP, EROD |
| SHALE | | 1.40 | COMP, EROD |
| SHALE | | 0.50 | COMP, EROD |
| SHALE | | 5.55 | COMP, EROD |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation 1303

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| CLAYSTONE | | 3.00 | COMP, EROD |
| SHALE | | 0.80 | COMP, EROD, AC |
| SHALE | | 3.12 | COMP, EROD, ALK |
| SHALE | | 1.70 | COMP, EROD, ALK |
| SHALE | | 2.45 | COMP, EROD, ALK |
| SHALE | | 1.28 | COMP, EROD |
| SHALE | | 7.85 | COMP, EROD |
| SHALE | | 1.00 | COMP, EROD, ALK |
| SHALE | | 5.65 | COMP, EROD |
| SHALE | | 1.35 | COMP, EROD |
| SHALE | | 4.15 | COMP, EROD, ALK |
| SHALE | | 0.40 | COMP, EROD |
| SHALE | | 0.82 | COMP, EROD, ALK |
| SHALE | | 0.73 | COMP, EROD |
| SHALE | | 2.23 | COMP, EROD |
| SHALE | | 3.50 | COMP, EROD |
| SANDSTONE | | 1.62 | HARD |
| SHALE | | 10.70 | COMP, EROD |
| SHALE | | 2.13 | COMP, EROD |
| SHALE | | 0.53 | COMP, EROD |
| COAL (NO. 11) | | 2.85 | COMP, EROD, AC |
| SHALE | | 1.35 | COMP, EROD |
| SHALE | | 13.14 | COMP, EROD, ALK |
| SHALE | | 10.50 | COMP, EROD, ALK |
| SANDSTONE | | 1.70 | HARD |
| SHALE | | 8.50 | COMP, EROD |
| SHALE | | 5.70 | COMP, EROD |
| SHALE | | 0.10 | COMP, EROD, AC |
| SHALE | | 0.10 | COMP, EROD |
| COAL (NO. 10) | | 1.85 | COMP, EROD, AC |
| SHALE | | 6.40 | COMP, EROD, ALK |
| CLAYSTONE | | 1.25 | COMP, EROD |
| SHALE | | 3.90 | COMP, EROD, ALK |
| SHALE | | 1.40 | COMP, EROD, ALK |
| CLAYSTONE | | 0.65 | COMP, EROD |
| SHALE | | 9.55 | COMP, EROD |
| SANDSTONE | | 1.90 | HARD |
| SHALE | | 1.13 | COMP, EROD, ALK |
| LIMESTONE | | 2.07 | HARD, ALK |
| SHALE | | 3.30 | COMP, EROD, ALK |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant: Ohio Valley Coal Company  Drill Hole #: N94-6

State Plane Coords: X2423328.60 Y730536.33  Surface Elevation: 1303

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| LIMESTONE | | 4.30 | HARD, ALK |
| CLAYSTONE | | 0.31 | COMP, EROD |
| SHALE | | 1.60 | COMP, EROD, ALK |
| CLAYSTONE | | 0.22 | COMP, EROD |
| LIMESTONE | | 0.70 | HARD, ALK |
| SHALE | | 12.05 | COMP, EROD, ALK |
| SHALE | | 0.82 | COMP, EROD, ALK |
| SHALE | | 1.25 | COMP, EROD, ALK |
| LIMESTONE | | 0.22 | HARD, ALK |
| SHALE | | 0.60 | COMP, EROD, ALK |
| LIMESTONE | | 1.78 | HARD, ALK |
| SHALE | | 3.25 | COMP, EROD |
| LIMESTONE | | 11.40 | HARD, ALK |
| LIMESTONE | | 1.50 | HARD, ALK |
| LIMESTONE | | 11.30 | HARD, ALK |
| SHALE | | 1.30 | COMP, EROD, ALK |
| LIMESTONE | | 7.73 | HARD, ALK |
| SHALE | | 3.20 | COMP, EROD, ALK |
| SHALE | | 1.25 | COMP, EROD, ALK |
| SHALE | | 5.22 | COMP, EROD, ALK |
| SHALE | | 1.30 | COMP, EROD, ALK |
| LIMESTONE | | 2.10 | HARD, ALK |
| SHALE | | 4.75 | COMP, EROD, ALK |
| CLAYSTONE | | 2.40 | COMP, EROD |
| SHALE | | 0.22 | COMP, EROD |
| COAL (NO. 9) | | 4.24 | COMP, EROD, AC |
| SHALE | | 0.25 | COMP, EROD |
| SHALE | | 1.40 | COMP, EROD |
| SHALE | | 3.34 | COMP, EROD, ALK |
| SHALE | | 1.50 | COMP, EROD, ALK |
| LIMESTONE | | 2.60 | HARD, ALK |
| SHALE | | 6.90 | COMP, EROD, ALK |
| SHALE | | 1.90 | COMP, EROD |
| SHALE | | 3.00 | COMP, EROD, ALK |
| SHALE | | 1.50 | COMP, EROD |
| SHALE | | 2.60 | COMP, EROD, ALK |
| LIMESTONE | | 11.95 | HARD, ALK |
| SHALE | | 1.20 | COMP, EROD, ALK |
| LIMESTONE | | 3.62 | HARD, ALK |
| SHALE | | 0.30 | COMP, EROD, ALK |

## ATTACHMENT 13
## (GEOLOGY REPORT – Underground Workings)

Applicant Ohio Valley Coal Company Drill Hole # N94-6

State Plane Coords: X2423328.60 Y730536.33 Surface Elevation 1303

| Lithology | H20* | Thickness | Physical Properties |
|---|---|---|---|
| LIMESTONE | | 2.93 | HARD, ALK |
| LIMESTONE | | 0.85 | HARD, ALK |
| SHALE | | 0.30 | COMP, EROD, ALK |
| LIMESTONE | | 1.35 | HARD, ALK |
| SHALE | | 0.50 | COMP, EROD |
| CLAYSTONE | | 1.20 | COMP, EROD |
| SHALE | | 1.35 | COMP, EROD, ALK |
| LIMESTONE | | 2.52 | HARD, ALK |
| CLAYSTONE | | 2.15 | COMP, EROD |
| SHALE | | 2.43 | COMP, EROD |
| LIMESTONE | | 12.65 | HARD, ALK |
| CLAYSTONE | | 1.83 | COMP, EROD, ALK |
| SHALE | | 0.82 | COMP, EROD, ALK |
| CLAYSTONE | | 2.05 | COMP, EROD, ALK |
| CLAYSTONE | | 1.46 | COMP, EROD |
| SHALE | | 1.50 | COMP, EROD |
| BONE COAL | | 0.23 | COMP, EROD, AC |
| SHALE | | 0.38 | COMP, EROD |
| COAL (NO. 8) | | 7.08 | COMP, EROD, AC |
| SHALE | | 1.67 | COMP, EROD |
| LIMESTONE | | 0.54 | HARD, ALK |
| CLAYSTONE | | 1.00 | COMP, EROD |
| SHALE | | 1.70 | COMP, EROD, ALK |
| CLAYSTONE | | 0.80 | COMP, EROD |
| LIMESTONE | | 0.70 | HARD, ALK |

Submit the following information for the stratum above the coal seam, the coal seam, and the stratum below the coal seam

| Stratum | Total Sulfur % | Pyrite Sulfur % | Potential Acidity Mg/l as CaCO3 | Neutralization Potential (/1000 Tons) | CaCO3 Deficiency (/1000 Tons) |
|---|---|---|---|---|---|
| Roof | 3.44 | 2.64 | 107 | 7.71 | 99.3 |
| Coal | 6.41 | 3.27 | 200 | 7.83 | 192 |
| Bottom | 2.44 | 1.09 | 76.2 | 254 | -178 |

**Legend:**
AC = ACID PRODUCING
ALK = ALKALINE PRODUCING
COMP = COMPACTIBLE
EROD = ERODIBLE

° – Indicates water bearing stratum under column labelled H2O

Stratum thickness is measured in feet.

# DIAMOND DRILL HOLE N94-6

GEOLOGIST: HOMER McEVERS

ELEVATION: ~~1305 FT. (ALTIMETER)~~ 1299.87

COORDINATES: ~~-9872.33 S, -70847.97 E (NOT SURVEYED)~~ -9854.16; -70,166.02

TOWNSHIP: SMITH

SECTION: 28, W 1/4

COUNTY: BELMONT

SURF. OWNER: HART

DATE STARTED: 9/1/94

DATE FINISHED: 9/8/94

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 29.00 | CASING | 29.00 | 1274.00 |
| 4.40 | SANDSTONE, GRAY, BROKEN, IRON STAINS | 33.40 | 1269.60 |
| 1.00 | SHALE, BROKEN, IRON STAINS | 34.40 | 1268.60 |
| 0.65 | SHALE, BROKEN, IRON STAINS | 35.05 | 1267.95 |
| 1.22 | SHALE, GRAY, SANDY | 36.27 | 1266.73 |
| 0.47 | SHALE, GRAY, CALCAREOUS, SANDY | 36.74 | 1266.26 |
| 2.26 | SHALE, SANDY, BROKEN, IRON STAINS | 39.00 | 1264.00 |
| 3.10 | SHALE, GRAY | 42.10 | 1260.90 |
| 1.55 | SHALE, GRAY, CALCAREOUS | 43.65 | 1259.35 |
| 2.20 | CLAY STONE, GRAY | 45.85 | 1257.15 |
| 1.15 | SHALE, GRAY, BROKEN, IRON STAINS | 47.00 | 1256.00 |
| 3.90 | SHALE, GRAY, CALCAREOUS | 50.90 | 1252.10 |
| 4.10 | SHALE, RED/BROWN, CALCAREOUS | 55.00 | 1248.00 |
| 3.60 | SHALE, RED/GRAY | 58.60 | 1244.40 |
| 1.00 | CLAYSTONE, GRAY | 59.60 | 1243.40 |
| 2.10 | SHALE, RED | 61.70 | 1241.30 |
| 1.15 | CLAYSTONE, GRAY | 62.85 | 1240.15 |
| 1.50 | SHALE, SANDY, GRAY | 64.35 | 1238.65 |
| 0.50 | SHALE, RED, IRON STAINS | 64.85 | 1238.15 |
| 1.85 | SHALE, GRAY | 66.70 | 1236.30 |
| 1.01 | CLAYSTONE, RED/GRAY | 67.71 | 1235.29 |
| 1.20 | SHALE, GRAY | 68.91 | 1234.09 |
| 1.40 | SHALE, RED/GRAY | 70.31 | 1232.69 |
| 1.69 | SHALE, RED/BROWN, SOFT | 72.00 | 1231.00 |
| 0.95 | SHALE, RED | 72.95 | 1230.05 |
| 1.91 | SHALE, GRAY | 74.86 | 1228.14 |
| 0.65 | SHALE, CALCAREOUS, GRAY | 75.51 | 1227.49 |
| 0.60 | CLAYSTONE, GRAY | 76.11 | 1226.89 |
| 4.20 | SHALE, SANDY, CALCAREOUS, GRAY | 80.31 | 1222.69 |
| 0.95 | SHALE, SANDY, GRAY | 81.26 | 1221.74 |
| 2.00 | SHALE, SANDY, CALCAREOUS, GRAY | 83.26 | 1219.74 |
| 1.74 | SANDSTONE, SHALEY, GRAY | 85.00 | 1218.00 |
| 4.25 | SHALE, GRAY, SOFT | 89.25 | 1213.75 |
| 0.61 | SHALE, GRAY/RED | 89.86 | 1213.14 |
| 3.00 | LIMESTONE, GRAY | 92.86 | 1210.14 |
| 4.15 | SHALE, CALCAREOUS, GRAY | 97.01 | 1205.99 |
| 0.95 | SHALE, IRON STAINS, BROKEN | 97.96 | 1205.04 |
| 0.90 | LIMESTONE, GRAY | 98.86 | 1204.14 |
| 6.14 | SHALE, SANDY, CALCAREOUS, GRAY | 105.00 | 1198.00 |
| 7.30 | SHALE, W/LIMESTONE STREAKS, GRAY | 112.30 | 1190.70 |
| 1.10 | SHALE, GRAY | 113.40 | 1189.60 |

(Continued)

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 5.40 | SHALE, W/LIMESTONE STREAKS, GRAY | 118.80 | 1184.20 |
| 5.00 | SHALE, RED/GRAY/RED | 123.80 | 1179.20 |
| 1.20 | SHALE, CALCAREOUS, GRAY | 125.00 | 1178.00 |
| 0.90 | SHALE, CALCAREOUS, BLACK/GRAY | 125.90 | 1177.10 |
| 1.00 | SHALE, W/LIMESTONE STREAKS, GRAY | 126.90 | 1176.10 |
| 1.25 | SHALE, GRAY | 128.15 | 1174.85 |
| 3.60 | SHALE, W/LIMESTONE STREAKS, GRAY | 131.75 | 1171.25 |
| 2.20 | LIMESTONE, W/SHALE STREAKS, GRAY | 133.95 | 1169.05 |
| 4.50 | SHALE, W/LIMESTONE STREAKS, GRAY | 138.45 | 1164.55 |
| 6.75 | SHALE, W/LIMESTONE NODULES, GRAY | 145.20 | 1157.80 |
| 3.10 | SHALE, SANDY, GRAY | 148.30 | 1154.70 |
| 6.70 | SHALE, W/LIMESTONE NODULES, GRAY | 155.00 | 1148.00 |
| 3.53 | CLAYSTONE, GRAY | 158.53 | 1144.47 |
| 0.63 | SHALE, CARBONACEOUS, BLACK | 159.16 | 1143.84 |
| 0.56 | SHALE, GRAY | 159.72 | 1143.28 |
| 0.33 | SHALE, CARBONACEOUS, BLACK | 160.05 | 1142.95 |
| 5.00 | LIMESTONE, GRAY | 165.05 | 1137.95 |
| 5.05 | CLAYSTONE, GRAY | 170.10 | 1132.90 |
| 4.90 | **SHALE, BLACK W/COAL STREAKS – NO. 12 COAL** | 175.00 | 1128.00 |
| | **1.10 BONE COAL** | | |
| | **1.85 SHALE, BLACK** | | |
| | **0.35 COAL** | | |
| | **1.17 SHALE, BLACK** | | |
| | **0.37 BONE COAL** | | |
| | **0.06 SHALE, BLACK** | | |
| 2.60 | SHALE, GRAY | 177.60 | 1125.40 |
| 2.30 | SANDSTONE, W/SHALE STREAKS, GRAY | 179.90 | 1123.10 |
| 3.80 | SHALE, GRAY | 183.70 | 1119.30 |
| 0.35 | BONE COAL W/PYRITE | 184.05 | 1118.95 |
| 1.30 | SHALE GRAY | 185.35 | 1117.65 |
| 0.20 | COAL | 185.55 | 1117.45 |
| 0.68 | SHALE, GRAY | 186.23 | 1116.77 |
| 5.37 | SHALE, CALCAREOUS, GRAY | 191.60 | 1111.40 |
| 3.40 | SHALE, SANDY, CALCAREOUS, GRAY | 195.00 | 1108.00 |
| 6.05 | SHALE, W/LIMESTONE NODULES, GRAY, W/SS STREAKS | 201.05 | 1101.95 |
| 10.45 | SHALE, GRAY | 211.50 | 1091.50 |
| 0.57 | SHALE, RED | 212.07 | 1090.93 |
| 0.22 | SHALE, GRAY | 212.29 | 1090.71 |
| 0.32 | SHALE, RED | 212.61 | 1090.39 |
| 0.45 | SHALE, GRAY | 213.06 | 1089.94 |
| 1.94 | SHALE, RED | 215.00 | 1088.00 |
| 0.20 | SHALE, RED, SOFT | 215.20 | 1087.80 |
| 1.40 | SHALE, GRAY | 216.60 | 1086.40 |
| 0.50 | SHALE, RED | 217.10 | 1085.90 |
| 5.55 | SHALE, GRAY | 222.65 | 1080.35 |
| 3.00 | CLAYSTONE, GRAY, SOFT | 225.65 | 1077.35 |

(Continued)

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 0.80 | SHALE, CARBONACEOUS, BLACK | 226.45 | 1076.55 |
| 3.12 | SHALE, CALCAREOUS, GRAY | 229.57 | 1073.43 |
| 1.70 | SHALE, RED, CALCAREOUS | 231.27 | 1071.73 |
| 2.45 | SHALE, GREEN W/RED STREAKS, CALCAREOUS | 233.72 | 1069.28 |
| 1.28 | SHALE, GRAY/GREEN | 235.00 | 1068.00 |
| 7.85 | SHALE, SANDY, GRAY | 242.85 | 1060.15 |
| 1.00 | SHALE, SANDY, CALCAREOUS, GRAY | 243.85 | 1059.15 |
| 5.65 | SHALE, SANDY, GRAY | 249.50 | 1053.50 |
| 1.35 | SHALE, GRAY, BROKEN, SOFT | 250.85 | 1052.15 |
| 4.15 | SHALE, SANDY, CALCAREOUS, GRAY | 255.00 | 1048.00 |
| 0.40 | SHALE, SANDY, GRAY | 255.40 | 1047.60 |
| 0.82 | SHALE, W/LIMESTONE NODULES, GRAY | 256.22 | 1046.78 |
| 0.73 | SHALE, RED | 256.95 | 1046.05 |
| 2.23 | SHALE, GRAY/BLACK/GRAY | 259.18 | 1043.82 |
| 3.50 | SHALE, SANDY, GRAY | 262.68 | 1040.32 |
| 1.62 | SANDSTONE, W/SHALE STREAKS, GRAY | 264.30 | 1038.70 |
| 10.70 | SHALE, SANDY, GRAY | 275.00 | 1028.00 |
| 2.13 | SHALE, GRAY | 277.13 | 1025.87 |
| 0.53 | SHALE, BLACK | 277.66 | 1025.34 |
| **2.85** | **COAL (NO. 11)** | **280.51** | **1022.49** |
| 1.35 | SHALE, GRAY | 281.86 | 1021.14 |
| 13.14 | SHALE, CALCAREOUS, GRAY | 295.00 | 1008.00 |
| 10.50 | SHALE, SANDY, W/LIMESTONE NODULES, GRAY | 305.50 | 997.50 |
| 1.70 | SANDSTONE, W/SHALE, GRAY | 307.20 | 995.80 |
| 8.50 | SHALE, GRAY | 315.70 | 987.30 |
| 5.70 | SHALE, DARK GRAY | 321.40 | 981.60 |
| 0.10 | SHALE, CARBONACEOUS, BLACK | 321.50 | 981.50 |
| 0.10 | SHALE, GRAY | 321.60 | 981.40 |
| **1.85** | **COAL (NO. 10)** | **323.45** | **979.55** |
| | **1.15 COAL** | | |
| | **0.20 SHALE, GRAY** | | |
| | **0.50 COAL** | | |
| 6.40 | SHALE, CALCAREOUS, GRAY | 329.85 | 973.15 |
| 1.25 | CLAYSTONE, GRAY | 331.10 | 971.90 |
| 3.90 | SHALE, SANDY, CALCAREOUS, GRAY | 335.00 | 968.00 |
| 1.40 | SHALE, CALCAREOUS, GRAY | 336.40 | 966.60 |
| 0.65 | CLAYSTONE, GRAY | 337.05 | 965.95 |
| 9.55 | SHALE, SANDY, GRAY | 346.60 | 956.40 |
| 1.90 | SANDSTONE, GRAY | 348.50 | 954.50 |
| 1.13 | SHALE, SANDY, CALCAREOUS, GRAY | 349.63 | 953.37 |
| 2.07 | LIMESTONE, GRAY | 351.70 | 951.30 |
| 3.30 | SHALE, SANDY, CALCAREOUS, GRAY | 355.00 | 948.00 |
| 4.30 | LIMESTONE, GRAY | 359.30 | 943.70 |
| 0.31 | CLAYSTONE, GREEN | 359.61 | 943.39 |
| 1.60 | SHALE, CALCAREOUS, GRAY | 361.21 | 941.79 |
| 0.22 | CLAYSTONE, GREEN | 361.43 | 941.57 |

(Continued)

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 0.70 | LIMESTONE, GRAY | 362.13 | 940.87 |
| 12.05 | SHALE, CALCAREOUS, W/LIMESTONE NODULES, GRAY | 374.18 | 928.82 |
| 0.82 | SHALE, CALCAREOUS, GRAY | 375.00 | 928.00 |
| 1.25 | SHALE, CALCAREOUS, GRAY | 376.25 | 926.75 |
| 0.22 | LIMESTONE, GRAY | 376.47 | 926.53 |
| 0.60 | SHALE, CALCAREOUS, GRAY | 377.07 | 925.93 |
| 1.78 | LIMESTONE, GRAY | 378.85 | 924.15 |
| 3.25 | SHALE, GREEN/GRAY | 382.10 | 920.90 |
| 11.40 | LIMESTONE, SHALEY, GRAY | 393.50 | 909.50 |
| 1.50 | LIMESTONE, GRAY | 395.00 | 908.00 |
| 11.30 | LIMESTONE, GRAY, HARD | 406.30 | 896.70 |
| 1.30 | SHALE, CALCAREOUS, GRAY | 407.60 | 895.40 |
| 7.73 | LIMESTONE, GRAY | 415.33 | 887.67 |
| 3.20 | SHALE, CALCAREOUS, SANDY, GRAY | 418.53 | 884.47 |
| 1.25 | SHALE, CALCAREOUS, GREEN | 419.78 | 883.22 |
| 5.22 | SHALE, CALCAREOUS, SANDY, GRAY | 425.00 | 878.00 |
| 1.30 | SHALE, CALCAREOUS, SANDY, GRAY/GREEN | 426.30 | 876.70 |
| 2.10 | LIMESTONE, SHALEY, GRAY | 428.40 | 874.60 |
| 4.75 | SHALE, SANDY, CALCAREOUS, GRAY | 433.15 | 869.85 |
| 2.40 | CLAYSTONE, GRAY | 435.55 | 867.45 |
| 0.22 | SHALE, BLACK | 435.77 | 867.23 |
| 4.24 | COAL (NO. 9) | 440.01 | 862.99 |
| | 2.50 COAL | | |
| | 0.40 SHALE, GRAY | | |
| | 1.30 BONE COAL | | |
| 0.25 | SHALE, BLACK | 440.26 | 862.74 |
| 1.40 | SHALE, DARK GRAY | 441.66 | 861.34 |
| 3.34 | SHALE, SANDY, CALCAREOUS, GRAY | 445.00 | 858.00 |
| 1.50 | SHALE, CALCAREOUS, GRAY | 446.50 | 856.50 |
| 2.60 | LIMESTONE, GRAY | 449.10 | 853.90 |
| 6.90 | SHALE, SANDY, CALCAREOUS, GRAY | 456.00 | 847.00 |
| 1.90 | SHALE, DARK GRAY | 457.90 | 845.10 |
| 3.00 | SHALE, CALCAREOUS, GRAY | 460.90 | 842.10 |
| 1.50 | SHALE, BLACK | 462.40 | 840.60 |
| 2.60 | SHALE, SANDY, CALCAREOUS, GRAY | 465.00 | 838.00 |
| 11.95 | LIMESTONE, GRAY | 476.95 | 826.05 |
| 1.20 | SHALE, CALCAREOUS, GRAY | 478.15 | 824.85 |
| 3.62 | LIMESTONE, GRAY | 481.77 | 821.23 |
| 0.30 | SHALE, CALCAREOUS, GRAY | 482.07 | 820.93 |
| 2.93 | LIMESTONE, GRAY | 485.00 | 818.00 |
| 0.85 | LIMESTONE, GRAY/GREEN | 485.85 | 817.15 |
| 0.30 | SHALE, BLACK, CALCAREOUS | 486.15 | 816.85 |
| 1.35 | LIMESTONE, GRAY | 487.50 | 815.50 |
| 0.50 | SHALE, GREEN | 488.00 | 815.00 |
| 1.20 | CLAYSTONE, GRAY/GREEN | 489.20 | 813.80 |
| 1.35 | SHALE, CALCAREOUS, GRAY | 490.55 | 812.45 |

DIAMOND DRILL HOLE N94-6

(Continued)

| THICK (FT.) | DESCRIPTION | DEPTH (FT.) | ELEV. (FT.) |
|---|---|---|---|
| 2.52 | LIMESTONE, GRAY | 493.07 | 809.93 |
| 2.15 | CLAYSTONE, GRAY | 495.22 | 807.78 |
| 2.43 | SHALE, BLACK | 497.65 | 805.35 |
| 12.65 | LIMESTONE, GRAY | 510.30 | 792.70 |
| 1.83 | CLAYSTONE, W/LIMESTONE NODULES, GRAY | 512.13 | 790.87 |
| 0.82 | SHALE, SANDY, CALCAREOUS, GRAY | 512.95 | 790.05 |
| 2.05 | CLAYSTONE, W/LIMESTONE NODULES, GRAY | 515.00 | 788.00 |
| 1.46 | CLAYSTONE, GRAY | 516.46 | 786.54 |
| 1.50 | SHALE, BLACK | 517.96 | 785.04 |
| 0.23 | BONE COAL | 518.19 | 784.81 |
| 0.38 | SHALE, GRAY | 518.57 | 784.43 |
| 7.08 | **COAL (NO. 8)** | **525.65** | **777.35** |
| | **0.99 COAL** | | |
| | **0.88 SHALE, GRAY** | | |
| | **1.89 COAL** | | |
| | **0.12 SHALE W/PYRITE** | | |
| | **3.20 COAL** | | |
| 1.67 | SHALE, GRAY | 527.32 | 775.68 |
| 0.54 | LIMESTONE, GRAY | 527.86 | 775.14 |
| 1.00 | CLAYSTONE, GRAY | 528.86 | 774.14 |
| 1.70 | SHALE, CALCAREOUS, GRAY | 530.56 | 772.44 |
| 0.80 | CLAYSTONE, GRAY | 531.36 | 771.64 |
| 0.70 | LIMESTONE, GRAY | 532.06 | 770.94 |

AMOUNT OF HARD ROCK ABOVE NO. 8 SEAM

HARD ROCK: 135.33 FT. (25.75%) OF CORE

SOFT ROCK: 390.32 FT. (74.25%) OF CORE

PROJECTED AQUIFERS

1. 0.00 TO 35.05
2. 36.74 TO 39.00 (MINOR)
3. 45.85 TO 47.00 (MINOR)
4. 64.35 TO 64.85 (MINOR)

ATTACHMENT 13

**DIAMOND DRILL HOLE: N97-02**

ENGINEER: W. J. SIPLIVY, PE, CPG
ELEVATION: 1304.86
STATE PLANE COORDINATES: E 2,420,421 N 731,278

DRILLER: L. J. Hughes & Sons, Inc., Dale Jarvis

TOWNSHIP: Smith
SECTION: SE ¼ Sec 34
COUNTY: Belmont

SURFACE OWNER: Simpson
DATE STARTED: 13 March 1997
DATE COMPLETED: 14 March 1997

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 20.00 | 20.00 | Non-coring | | |
| 3.00 | 23.00 | Shale, brown, sandy w/ Fe-stained joints | yes | CM, EM |
| 0.30 | 23.30 | Sandstone, l. gray w/Fe-stained joint | yes | CS, ES |
| 4.40 | 27.70 | Shale, brown, sandy w/ Fe-stained joints | yes | CM, EM |
| 1.35 | 29.05 | Sandstone, l. gray w/Fe-stained joints | yes | CS, ES |
| 2.55 | 31.60 | Shale, m-dk. gray w/Fe-stains | yes | CM, EM |
| 0.60 | 32.20 | Limestone, l. gray w/Fe-stains | yes | AK, CS, ES |
| 2.75 | 34.95 | Claystone, m. gray, w/Ls nodules, Fe-stained | yes | AK, CV, EV |
| 1.55 | 36.50 | Claystone, red, Fe-stained | yes | CV, EV |
| 9.50 | 46.00 | Claystone, red-gray | | CV, EV |
| 5.80 | 51.80 | Shale, m-dk. gray-brown w/Fe-stains | yes | CM, EM |
| 3.20 | 55.00 | Sandstone, l. gray, silty | | CS, ES |
| 2.70 | 57.70 | Shale, m-dk. gray w/Fe-stains | yes | CM, EM |
| 1.50 | 59.20 | Sandstone, l. gray-brown w/Fe-stained joints | yes | CS, ES |
| 6.40 | 65.60 | Shale, m. gray | | CM, EM |
| 0.20 | 65.80 | Shale, black, carbonaceous | | AC, CM, EM |
| 2.70 | 68.50 | Claystone, m. gray, w/Ls nodules | | CV, EV |
| 1.50 | 70.00 | Limestone, l. gray | | AK, CS, ES |
| 2.90 | 72.90 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 1.60 | 74.50 | Limestone, l. gray | | AK, CS, ES |
| 4.30 | 78.80 | Claystone, m. gray-green | | CV, EV |
| 4.20 | 83.00 | Shale, m. gray & red | | CM, EM |
| 0.75 | 83.75 | Limestone, l. gray | | AK, CS, ES |
| 0.60 | 84.35 | Shale, m. gray | | CM, EM |
| 1.25 | 85.60 | Limestone, l. gray | | AK, CS, ES |
| 4.20 | 89.80 | Claystone, m. gray | | CV, EV |
| 1.50 | 91.30 | Limestone, l. gray | | AK, CS, ES |
| 25.25 | 116.55 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.50 | 117.05 | Limestone, l. gray | | AK, CS, ES |
| 3.35 | 120.40 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 1.70 | 122.10 | Limestone, l. gray | | AK, CS, ES |
| 1.60 | 123.70 | Claystone, m. gray | | CV, EV |
| 1.40 | 125.10 | Limestone, l. gray | | AK, CS, ES |
| 6.10 | 131.20 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.60 | 131.80 | Sandstone, l. gray, silty | | CS, ES |
| 12.00 | 143.80 | Shale, m. gray | | CM, EM |
| 1.60 | 145.40 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 1.60 | 147.00 | Claystone, m. gray | | CV, EV |
| 0.35 | 147.35 | Limestone, l. gray | | AK, CS, ES |
| 1.10 | 148.45 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 3.05 | 151.50 | Limestone, l. gray | | AK, CS, ES |
| 7.60 | 159.10 | Claystone, m-dk gray | | CV, EV |
| 0.65 | 159.75 | Shale, black w/thin coal ptgs. | | AC, CM, EM |
| 6.25 | 166.00 | Shale, dk. gray-black | | CM, EM |
| 1.40 | 167.40 | Sandstone, l. gray w/Sh ptgs. | | CS, ES |
| 1.80 | 169.20 | Shale, dk. gray-black | | CM, EM |
| 0.08 | 169.28 | Coal | | AC, CM, EM |
| 0.72 | 170.00 | Claystone, m. gray | | CV, EV |
| 4.60 | 174.60 | Shale, m. gray, silty | | CM, EM |
| 3.00 | 177.60 | Claystone, m. gray | | CV, EV |
| 2.45 | 180.05 | Shale, m. gray | | CM, EM |
| 0.83 | 180.88 | Shale, black w/thin coal ptgs. | | AC, CM, EM |
| 19.32 | 200.20 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.85 | 201.05 | Shale, m. gray, silty | | CM, EM |
| 2.95 | 204.00 | Sandstone, l. gray w/thin Sh ptgs. | | CS, ES |
| 3.40 | 207.40 | Shale, m. gray, silty | | CM, EM |

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 6.60 | 214.00 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 2.05 | 216.05 | Shale, m. gray, silty | | CM, EM |
| 2.45 | 218.50 | Sandstone, l. gray | | CS, ES |
| 1.50 | 220.00 | Claystone, m. gray | | CV, EV |
| 0.55 | 220.55 | Shale, m. gray | | CM, EM |
| 15.75 | 236.30 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 10.10 | 246.40 | Shale, m. gray | | CM, EM |
| 0.45 | 246.85 | Limestone, l. gray | | AK, CS, ES |
| 3.15 | 250.00 | Claystone, m. gray | | CV, EV |
| 4.50 | 254.50 | 0.07 bone | | 0 |
| 2.05 | 256.55 | Sandstone, l. gray, silty | | CS, ES |
| 4.45 | 261.00 | Shale, m. gray w/occ. Ss ptgs. | | CM, EM |
| 1.90 | 262.90 | Sandstone, l. gray | | CS, ES |
| 3.15 | 266.05 | Shale, m-dk. gray | | CM, EM |
| 0.50 | 266.55 | Shale, black, carbonaceous | | AC, CM, EM |
| 2.61 | 269.16 | **Coal, WAYNESBURG No. 11** | | AC, CM, EM |
| | | 0.35 coal | | |
| | | 0.07 bone | | |
| | | 1.17 coal | | |
| | | 0.06 bone | | |
| | | 0.73 coal | | |
| | | 0.05 bone | | |
| | | 0.18 coal | | |
| | | **2.61 total seam thickness** | | |
| 1.44 | 270.60 | Claystone, dk. gray | | CV, EV |
| 0.07 | 270.67 | **Coal** | | AC, CM, EM |
| 10.53 | 281.20 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 5.90 | 287.10 | Shale, m. gray | | CM, EM |
| 6.40 | 293.50 | Shale, m. gray w/occ. Ss ptgs. | | CM, EM |
| 5.70 | 299.20 | Shale, m. gray | | CM, EM |
| 2.80 | 302.00 | Sandstone, l. gray w/thin Sh ptgs. | | CS, ES |
| 2.80 | 304.80 | Shale, m. gray w/occ. thin Ss ptgs. | | CM, EM |
| 0.80 | 305.60 | Sandstone, l. gray | | CS, ES |
| 6.25 | 311.85 | Shale, m. gray w/occ. thin Ss ptgs. | | CM, EM |
| 2.00 | 313.85 | **Coal, UNIONTOWN No. 10** | | AC, CM, EM |
| | | 0.19 bone coal | | |
| | | 0.63 coal w/bone ptgs. | | |
| | | 0.09 bone | | |
| | | 0.24 coal w/pyrite lense | | |
| | | 0.10 shale | | |
| | | 0.07 bone | | |
| | | 0.58 coal | | |
| | | 0.10 coal w/sh ptgs. | | |
| | | **2.00 total seam thickness** | | |
| 2.65 | 316.50 | Claystone, dk. gray | | CV, EV |
| 0.80 | 317.30 | Sandstone, l. gray, silty | | CS, ES |
| 10.20 | 327.50 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 4.30 | 331.80 | Sandstone, l. gray | | CS, ES |
| 7.60 | 339.40 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.60 | 340.00 | Limestone, l. gray | | AK, CS, ES |
| 3.10 | 343.10 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 3.90 | 347.00 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 2.10 | 349.10 | Claystone, m. gray-green | | CV, EV |
| 1.90 | 351.00 | Limestone, l. gray | | AK, CS, ES |
| 7.15 | 358.15 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.70 | 358.85 | Limestone, l. gray | | AK, CS, ES |
| 1.85 | 360.70 | Shale, m. gray, calc. | | AK, CM, EM |
| 2.45 | 363.15 | Limestone, l. gray | | AK, CS, ES |
| 0.85 | 364.00 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 1.45 | 365.45 | Limestone, l. gray, nodular | | AK, CS, ES |
| 14.75 | 380.20 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 0.70 | 380.90 | Limestone, l. gray | | AK, CS, ES |
| 8.10 | 389.00 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 1.50 | 390.50 | Limestone, l. gray | | AK, CS, ES |

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 0.90 | 391.40 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 0.85 | 392.25 | Limestone, l. gray | | AK, CS, ES |
| 0.75 | 393.00 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 1.00 | 394.00 | Limestone, l. gray | | AK, CS, ES |
| 3.85 | 397.85 | Shale, m. gray-green wLs ptgs. | | AK, CM, EM |
| 2.15 | 400.00 | Limestone, l. gray | | AK, CS, ES |
| 10.40 | 410.40 | Shale, m. gray-green, calc. | | AK, CM, EM |
| 7.00 | 417.40 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 3.75 | 421.15 | Claystone, m. gray | | CV, EV |
| 3.58 | 424.73 | **Coal, SEWICKLEY No. 9** | | AC, CM, EM |
| | | 0.13 bone | | |
| | | 1.90 coal w/bone ptgs. | | |
| | | 0.84 bone | | |
| | | 0.63 coal | | |
| | | 0.08 bone w/coal | | |
| | | **3.58 total seam thickness** | | |
| 1.07 | 425.80 | Claystone, dk. gray | | CV, EV |
| 3.55 | 429.35 | Shale, m. gray | | CM, EM |
| 0.50 | 429.85 | Limestone, l. gray | | AK, CS, ES |
| 2.55 | 432.40 | Shale, m. gray, calc. | | AK, CM, EM |
| 1.00 | 433.40 | Limestone, l. gray | | AK, CS, ES |
| 1.00 | 434.40 | Shale, m. gray, calc. | | AK, CM, EM |
| 9.10 | 443.50 | Shale, m. gray w/occ. thin Ss ptg | | CM, EM |
| 0.70 | 444.20 | Limestone, l. gray | | AK, CS, ES |
| 0.70 | 444.90 | Claystone, m. gray | | CV, EV |
| 0.60 | 445.50 | Limestone, l. gray | | AK, CS, ES |
| 1.30 | 446.80 | Claystone, dk. gray | | CV, EV |
| 0.50 | 447.30 | Shale, black, carbonaceous | | AC, CM, EM |
| 0.85 | 448.15 | Shale, m. gray, calc. | | AK, CM, EM |
| 8.55 | 456.70 | Limestone, m. gray, silty, hard | | AK, CS, ES |
| 3.30 | 460.00 | Flintclay, gray-tan, hard | | CM,EM |
| 3.20 | 463.20 | Shale, m. gray-green | | CM, EM |
| 3.60 | 466.80 | Limestone, l. gray | | AK, CS, ES |
| 1.10 | 467.90 | Claystone, green | | CV, EV |
| 4.70 | 472.60 | Limestone, l. gray | | AK, CS, ES |
| 4.40 | 477.00 | Claystone, green | | CV, EV |
| 1.90 | 478.90 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 2.80 | 481.70 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 0.55 | 482.25 | Shale, black, carbonaceous | | AC, CM, EM |
| 1.75 | 484.00 | Claystone, m. gray | | CV, EV |
| 3.00 | 487.00 | Limestone, l. gray | | AK, CS, ES |
| 1.10 | 488.10 | Shale, m. gray | | CM, EM |
| 1.90 | 490.00 | Limestone, l. gray w/ Cs ptgs. | | AK, CS, ES |
| 3.10 | 493.10 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |
| 1.70 | 494.80 | Limestone, l. gray | | AK, CS, ES |
| 9.50 | 504.30 | Claystone, m. gray | | CV, EV |
| 0.16 | 504.46 | Claystone, dk. gray, carbonaceous | | AC, CV, EV |
| 1.49 | 505.95 | **Coal, ROOF COAL** | | AC, CM, EM |
| | 505.95 | 0.19 coal | | |
| | 505.95 | 0.17 shale | | |
| | 505.95 | 0.95 coal | | |
| | | 0.11 shale w/coal | | |
| | | 0.07 coal | | |
| | | **1.49 total seam thickness** | | |
| 0.85 | 506.80 | Claystone, m. gray | | CV, EV |
| 5.06 | 511.86 | **Coal, PITTSBURGH No. 8** | | AC, CM, EM |
| | | 0.15 bone | | |
| | | 2.16 coal | | |
| | | 0.04 bone | | |
| | | 2.46 coal | | |
| | | 0.25 coal w/bone ptgs. | | |
| | | **5.06 total seam thickness** | | |
| 0.39 | 512.25 | Shale, dk. gray | | CM, EM |
| 0.45 | 512.70 | Limestone, m. gray | | AK, CS, ES |

## DIAMOND DRILL HOLE: N97-02

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 0.60 | 513.30 | Claystone, m. gray | | CV, EV |
| 0.30 | 513.60 | Limestone, m. gray | | AK, CS, ES |
| 0.15 | 513.75 | Claystone, m. gray | | CV, EV |
| 0.55 | 514.30 | Limestone, m. gray | | AK, CS, ES |
| 0.75 | 515.05 | Claystone, m. gray | | CV, EV |
| 1.00 | 516.05 | Limestone, m. gray | | AK, CS, ES |
| 0.55 | 516.60 | Claystone, m. gray | | CV, EV |
| 1.50 | 518.10 | Limestone, m. gray | | AK, CS, ES |
| 1.90 | 520.00 | Claystone, m. gray, w/Ls nodules | | AK, CV, EV |

**Amount of hard and soft rock overlying Pittsburgh No. 8 coalbed:**

1. Hard rock: 95.7 feet or 18.97%
2. Soft rock: 408.76 feet or 81.02%

**ACID/BASE ACCOUNTING for Mining Pittsburgh No. 8 coalbed**

| Stratum | Neutralization Potential (/1000 tons) | Total Sulphur % | Pyritic Sulphur % | Potential Acidity Mg/l as CaCO3 | CaCO3 Deficiency (/1000 tons) |
|---|---|---|---|---|---|
| Roof | 86.00 | 3.16 | 1.15 | 98.70 | 12.68 |
| Coal | 6.30 | 4.40 | 2.07 | 137.00 | 131.00 |
| Bottom | 551.00 | 3.00 | 2.12 | 93.70 | -458.00 |

**Physical Properties Legend**

AC - Acid Producing
AK - Alkaline Producing
C - Compactible (V - very, M - moderate, S - slight)
E - Erodible (V - very, M - moderate, S- slight)

## DIAMOND DRILL HOLE: N98-26

ENGINEER: W. J. Siplivy
ELEVATION: 1303.00
STATE PLANE COORDINATES (1927): N 730,519.25 E 2,423,536.14

DRILLER: Kerogen Resources, Kim Cecil

TOWNSHIP: Smith
SECTION: 28, W 1/2
COUNTY: Belmont

SURFACE OWNER: Stanley W. Hart
DATE STARTED: 1 July 1998
DATE COMPLETED: 1 July 1998

| Thickness (ft) | Depth (ft) | Strata | Water Bearing | Physical Properties |
|---|---|---|---|---|
| 1.30 | 1.30 | Silty loam, brown, rooted | | CV, EV |
| 2.90 | 4.20 | Clay loam, brown | | CV, EV |
| 1.20 | 5.40 | Shale, sandy, brown, weathered, broken | | CS, ES |
| 28.00 | 33.40 | Sandstone, brown w/Fe-stains, broken | yes | CS, ES |

END OF LOG

| Physical Properties Legend |
|---|
| AC - Acid Producing |
| AK - Alkaline Producing |
| C - Compactible (V - very, M - moderate, S - slight) |
| E - Erodible (V - very, M - moderate, S- slight) |

George V. Voinovich ◦ Governo
Donald C. Anderson ◦ Director

DATE August 18, 1998

## ANALYSIS OF EXISTING GROUND WATER FILE DATA

PREPARED BY: Bill Haiker BH, HYDROGEOLOGIST

OPERATOR: Ohio Valley Coal Company

COUNTY: Belmont

TOWNSHIP: Smith

SECTION (S): 21, 22, 27, 28, 33, 34

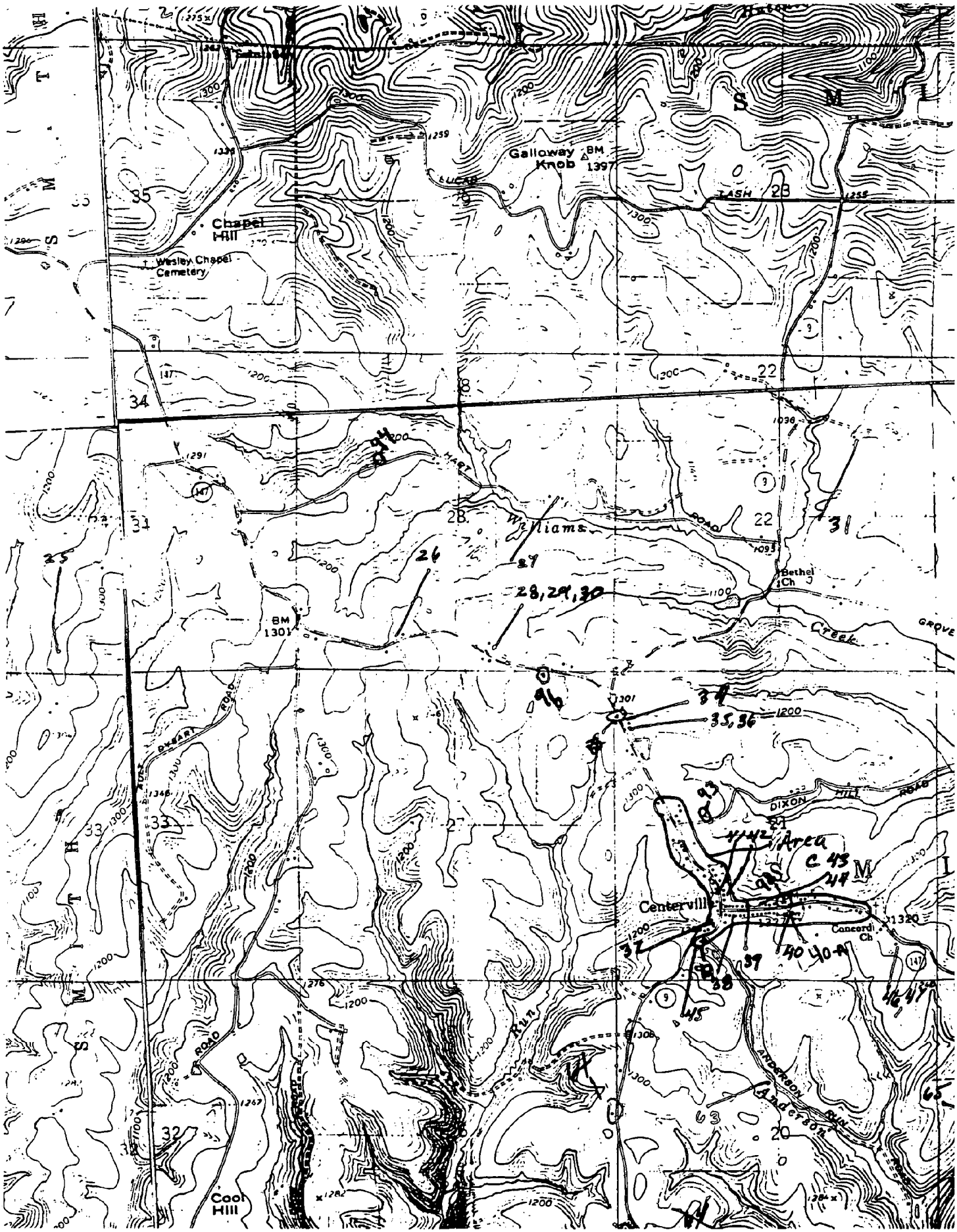
NUMBER OF WATER WELL LOGS WITHIN 1,000 FOOT RADIUS OF SITE (COPIES ATTACHED) 26 : FIELD LOCATED: 26

GENERAL DESCRIPTION OF LOCAL HYDROLOGY:
(USE ADDITIONAL SHEET IF NECESSARY)

Ground water is generally obtained from interbedded shale, sandstone and limestone bedrock. Well depths range from 35 to 150 feet with sustained yields of less than 2 gallons per minute.

AREAS OF PARTICULAR CONCERN:
(USE ADDITIONAL SHEET IF NECESSARY)

Longwall mining the #8 coal seam at an elevation of 718 to 800 feet M.S.L. will adversely affect wells within the permit boundary. All wells should be monitored for any quantity or quality changes.


Galloway Knob
BM 1397
Chapel Hill
Wesley Chapel Cemetery
LUCAS
LASH
HART
Williams
ROAD
Bethel Ch
Creek
GROVE
BM 1301
DYSART
ROAD
DIXON
HILL
ROAD
Area
Centerville
Concordia Ch
1320
Run
ANDERSON
RUN
Anderson
Cool Hill
28,29,30
35,36
26
27
31
34
35
33
32
20
22
28
25
96
93
41,42
C 43
44
37
38
39
40
40-A
45
46,47
65
63

TOVCC 12076

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 221729

County: Belmont Township: Smith Section of Township: 28

Owner: Foster Funkhouser Address: Warnock, Ohio Rt 1

Location of property: Farm House, on Co. Rd. off Route 9.

## CONSTRUCTION DETAILS

Casing diameter: 10" Length of casing: 20'6"

Type of screen: Length of screen:

Type of pump:

Capacity of pump:

Depth of pump setting: –

Date of completion:

## BAILING OR PUMPING TEST

Pumping rate: 1 G.P.M. Duration of test:

Drawdown: 23 ft. Date:

Developed capacity: 1 gal per min.

Static level—depth to water: 37

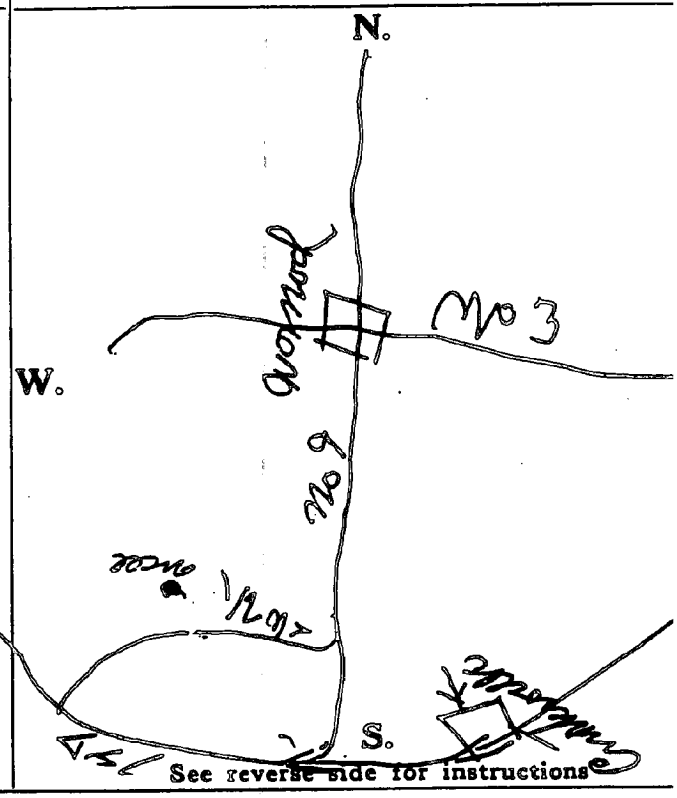
Pump installed by:

## WELL LOG

| Formations Sandstone, shale, limestone, gravel and clay | From | To |
|---|---|---|
| Clay | 0 Feet | 3 Ft. |
| Sand Rock | 3 | 10 |
| quick sand | 10 | 14 |
| Sand Rock | 14 | 18 |
| gray slate | 18 | 25 |
| Coal Blossom | 25 | 27 |
| gray slate | 27 | 37 |
| Rock | 37 | 39 |
| gray slate | 39 | 57 |
| Rock | 57 | 55 |
| Slate Rock | 55 | 60 |

## SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads,




See reverse side for instructions

Drilling Firm: McDougal & Wilhelm Date: 7-23-59

Address: 106 Taylor Lane St Clairsville, Ohio Signed: C. W. McDougal

TR 246

WL-168

TOVCC 12077

State of Ohio
**DEPARTMENT OF NATURAL RESOURCES**
Division of Water
1500 Dublin Road
Columbus, Ohio

No. 221729

County Belmont Township Smith Section of Township 2 E

Owner Foster Funkhouser Address Warnock Ohio RD

Location of property Farm House on Co. Rd. off Route 9.

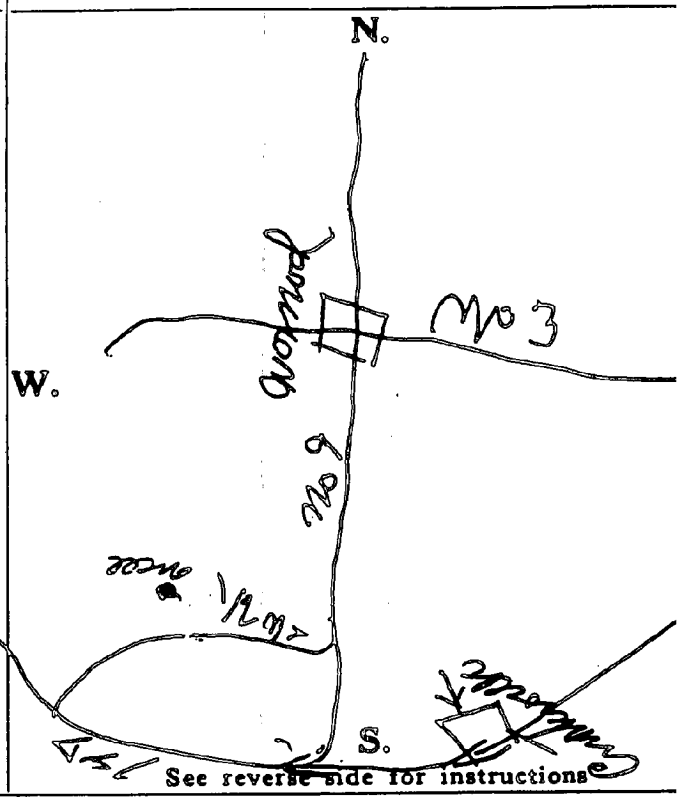
| CONSTRUCTION DETAILS | BAILING OR PUMPING TEST |
|---|---|
| Casing diameter 10" Length of casing 20'6" | Pumping rate 1 G.P.M. Duration of test |
| Type of screen Length of screen | Drawdown 23 ft. Date |
| Type of pump | Developed capacity 1 gal per min. |
| Capacity of pump | Static level—depth to water 37 |
| Depth of pump setting — | Pump installed by |
| Date of completion | |

**WELL LOG**

| Formations Sandstone, shale, limestone, gravel and clay | From | To |
|---|---|---|
| Clay | 0 Feet | 3 Ft. |
| Sand Rock | 3 | 10 |
| quick sand | 10 | 14 |
| Sand Rock | 14 | 18 |
| gray slate | 18 | 25 |
| Coal Blossom | 25 | 27 |
| gray slate | 27 | 37 |
| Rock | 37 | 39 |
| gray slate | 39 | 51 |
| Rock | 51 | 55 |
| Slate Rock | 55 | 60 |

**SKETCH SHOWING LOCATION**

Locate in reference to numbered State Highways, St. Intersections, County roads,




See reverse side for instructions

Drilling Firm McDougal & Wilhelm Date 7-23-59

Address 106 Taylor Lane Signed C. W. McDougal

St Clairsville, Ohio TR 246

WL-168

TOVCC 12078

B. (3) For those areas to be affected by underground mining surface operations where removal of the overburden down to the level of the coal seam will occur, submit Attachment 12(s) as required by paragraphs (C)(2)(a) and (c) of rule 1501:13-4-13 of the Administrative Code. N/A

(4) For those areas within the shadow area where the stratum above the coal seam to be mined will not be removed, submit Attachment 13(s) as required by paragraphs (C)(2)(d) and (e) of rule 1501:13-4-13 of the Administrative Code. See Attachment 13's

C. GROUND WATER INFORMATION-Permit, Shadow Area, and Adjacent Are

(1) Submit an Attachment 14B which describes the ground water hydrology of the proposed permit area, shadow area, and adjacent area. The Attachment 14B is to include information on each waterbearing stratum or zone as required by paragraph (D) of rule 1501:13-4-13 of the Administrative Code, including the first waterbearing stratum below the coal to be mined.
See Attachment 14B

(2) Are there any wells on the proposed permit area, shadow area, and adjacent area? X Yes, ____ No. If "yes," submit Attachment 14C.
See Attachment 14C

(3) Are there any springs on the proposed permit area, or developed springs on the shadow area and adjacent area? X Yes, ____ No. If "yes," submit Attachment 14C.
See Attachment 14C

(4) Are there any public water supply sources on the proposed permit area, shadow area, and adjacent area? ____ Yes, X No. If "yes," submit Attachment 14A, Attachment 14D, and show location on the hydrology map.
See Attachment 14D and Hydrology Map

(5) Submit Attachment 14A for representative wells and developed springs as required by paragraph (D)(4) of rule 1501:13-4-13. Based on this data identify the seasonal variations of ground water quality and quantity. See Attachment 14A and Addenda

D. SURFACE WATER INFORMATION-Permit, Shadow Area, and Adjacent Area

(1) List the name of the watershed that will receive water discharges from the proposed permit, shadow, and adjacent areas as listed in the "Gazetteer of Ohio Streams" published by the Ohio Department of Natural Resources. McMahon Creek , Captina Creek

(2) Are there any perennial or intermittent streams or other surface water bodies on the proposed permit, shadow area, and adjacent area? X Yes, ____ No. If "yes," submit Attachment 14A and Attachment 14D and show location on application and hydrology map.
See Attachments 14A, 14D and Hydrology Map.

ADDENDUM TO PAGE 17, PART 2, D
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## SEASONAL VARIATIONS OF WATER QUALITY AND QUANTITY

Surface and groundwater data contained in the Attachment 14A and C forms included with this application indicate the seasonal variances of quality and quantity of the water in this area.

The water wells existing in the area give a fairly representative indication of the near surface water bearing zones that can be found in this region. The Probable Hydrologic Consequences of mining gives a detailed description of these characteristics.

Precipitation is one of the principal factors influencing water systems. Infiltration of precipitation increases soil moisture and influences groundwater chemical composition. The time required for infiltrating precipitation to reach lower water bearing zones increases with increasing depth. Depending on the morphological structure, character of surface vegetation, and intensity of precipitation the amounts of infiltration also vary greatly. Amounts of infiltration subsequently influences the dissolved solids contents of groundwater which, in most cases, become more dilute during periods of prolonged precipitation. Rainfall data collected at or near the Powhatan No. 6 Mine has been included in this application.

All the data will show that an increased water quantity and a decrease in chemical constituent levels is realized during times of increased precipitation and snow melt of winter and spring seasons; while a decrease in water quantity and increase in chemical constituent levels is realized in dry summer and early autumn seasons.

2927013.9
730333.5
ADJ

# ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name The Ohio Valley Coal Company LOG # 221729

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | WL168 | WL168 | WL -168 | WL -168 | WL168 | WL168 |
| 2. | Lab Identification Number | W-L2 | W-L2 | W-L2 | W-L2 | W-L2 | W-L2 |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1112 | 1112 | 1112 | 1112 | 1112 | 1112 |
| 5. | Depth of Well below Land Surface (feet) | 62' | 62' | 62' | 62' | 62' | 62' |
| 6. | Static Water Level of Well below Land Surface (feet) | 45' | 42' | 43' | 45' | 18' | 30' |
| 7. | Flow for Spring/Stream (gpm or cfs) | ---- | ---- | ---- | ---- | ---- | ---- |
| 8. | Date Above Measurements Made | 11-2 | 12-11 | 1-7 | 2-5 | 3-5 | 4-8 |
| 9. | Aquifer/Zone Identification for Well/Spring | C | C | C | C | C | C |
| 10. | pH (Standard Units) | 7.3 | 7.2 | 7.5 | 7.3 | 7.3 | 7.1 |
| 11. | Total Acidity (mg/l CAC03) | 0 | 0 | 0 | 19.76 | 17.10 | 20.14 |
| 12. | Total Alkalinity (mg/l CAC03) | 188 | 190 | 160 | 163.59 | 158.84 | 194.94 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 460 | 450 | 400 | 180 | 357 | 399 |
| 14. | Total Dissolved Solids (mg/l) | ---- | ---- | ---- | ---- | ---- | ---- |
| 15. | Total Manganese (mg/l) | 0.03 | 0.08 | 0.02 | <0.02 | <0.02 | <0.02 |
| 16. | Total Sulfates (mg/l) | 46 | 48 | 44 | 16 | 37 | 29 |
| 17. | Total Iron (mg/l) | 0.21 | 0.14 | 0.08 | 0.18 | 0.16 | <0.04 |
| 18. | Total Suspended Solids (mg/l) | 0.3 | 0.3 | 3.6 | 3.0 | 4.0 | 2.0 |
| 19. | Total Hardness (mg/l CAC03) | 156 | 82.9 | 132.8 | 180 | 176 | 210 |
| 20. | Nitrates (mg/l) | 15.4 | 11.0 | 10.12 | 1.80 | 3.38 | 4.00 |
| 21. | Date Sampled for Analysis | 11-2-90 | 12-11-90 | 1-7-91 | 2-5-91 | 3-5-91 | 4-8-91 |
| 22. | Date Last Precipitaiton Event Occurred | 10-24-90 | 12-4-90 | 1-5-91 | 1-31-91 | 3-3-91 | 4-5-91 |

Laboratory Name ERI Labs
Address P. O. Box 259 City Brockway
State Pennsylvania Zip 15824

Note: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A, a statement giving the reasons why the information is unobtainable.
Note: For each sample provide data for either item 13 or item 14.

730337.4
ADJ

# ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-169 | DW-169 | DW-169 | DW-169 | DW-169 | DW-169 |
| 2. | Lab Identification Number | W-K2 | W-K2 | W-K2 | W-K2 | W-K2 | W-K2 |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1100 | 1100 | 1100 | 1100 | 1100 | 1100 |
| 5. | Depth of Well below Land Surface (feet) | 25' | 25' | 25' | 25' | 25' | 25' |
| 6. | Static Water Level of Well below Land Surface (feet) | 19' | 18' | 19' | 19' | 19' | 19' |
| 7. | Flow for Spring/Stream (gpm or cfs) | ---- | ---- | ---- | ---- | ---- | ---- |
| 8. | Date Above Measurements Made | 11-2-90 | 12-11-90 | 1-7-91 | 2-5-91 | 3-5-91 | 4-8-91 |
| 9. | Aquifer/Zone Identification for Well/Spring | A | A | A | A | A | A |
| 10. | pH (Standard Units) | 7.0 | 6.9 | 7.3 | 7.3 | 7.2 | 7.0 |
| 11. | Total Acidity (mg/l CAC03) | 0 | 0 | 0 | 18.05 | 24.51 | 17.67 |
| 12. | Total Alkalinity (mg/l CAC03) | 204 | 194 | 60 | 158.65 | 103.93 | 113.81 |
| 13. | Specific Conductivity ($\mu$mhos/cm at 25°C) | 500 | 500 | 255 | 410 | 270 | 347 |
| 14. | Total Dissolved Solids (mg/l) | ---- | ---- | ---- | ---- | ---- | ---- |
| 15. | Total Manganese (mg/l) | 0.17 | 0.11 | 0.06 | 0.02 | 0.03 | <0.02 |
| 16. | Total Sulfates (mg/l) | 58 | 68 | 37 | 20.0 | 45.0 | 38.0 |
| 17. | Total Iron (mg/l) | 0.79 | 0.29 | 0.84 | 0.19 | 3.33 | 0.07 |
| 18. | Total Suspended Solids (mg/l) | 0.3 | 4.0 | 21.3 | 4.0 | 18 | 1.0 |
| 19. | Total Hardness (mg/l CAC03) | 178 | 103.6 | 70.2 | 176 | 136 | 132 |
| 20. | Nitrates (mg/l) | 1.72 | 13.6 | 12.32 | 1.93 | 4.18 | 5.39 |
| 21. | Date Sampled for Analysis | 11-2-90 | 12-11-90 | 1-7-91 | 2-5-91 | 3-5-91 | 4-8-91 |
| 22. | Date Last Precipitaiton Event Occurred | 10-24-90 | 12-4-90 | 1-5-91 | 1-31-91 | 3-3-91 | 4-5-91 |

Laboratory Name ERI Labs
Address P. O. Box 259 City Brockway
State Pennsylvania Zip 15824

Note: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A, a statement giving the reasons why the information is unobtainable.
Note: For each sample provide data for either item 13 or item 14.

W-172
2431433.1
730316.25
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | W-172 | W-172 | W-172 | W-172 | W-172 | W-172 |
| 2. | Lab Identification Number | W-W2 | W-W2 | W-W2 | W-W2 | W-W2 | W-W2 |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | T | T | T | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1106 | 1106 | 1106 | 1106 | 1106 | 1106 |
| 5. | Depth of Well below Land Surface (feet) | 116 | 116 | 116 | 116 | 116 | 116 |
| 6. | Static Water Level of Well below Land Surface (feet) | 21 | 19 | 17 | 20 | 17 | 25 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 11/05/90 | 10/12/90 | 01/22/91 | 02/05/91 | 03/18/91 | 04/26/91 |
| 9. | Aquifer/Zone Identification for Well/Spring | D | D | D | D | D | D |
| 10. | pH (Standard Units) | 7.0 | 6.9 | 7.0 | 7.0 | 7.0 | 7.0 |
| 11. | Total Acidity (mg/l CAC03) | 0.00 | 0.00 | 0.00 | 20.90 | 18.62 | 13.49 |
| 12. | Total Alkalinity (mg/l CAC03) | 176.00 | 180.00 | 150.00 | 156.37 | 154.85 | 175.37 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 610 | 603 | 475 | 588 | 441 | 630 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | .09 | .07 | .02 | 0 | 0 | 0 |
| 16. | Total Sulfates (mg/l) | 50.0 | 58.0 | 58.0 | 40.0 | 18.0 | 45.0 |
| 17. | Total Iron (mg/l) | 1.48 | 0.12 | 0.06 | 0.09 | 0.04 | 0.0 |
| 18. | Total Suspended Solids (mg/l) | 11.0 | 0.3 | 2.3 | 3.0 | 2.0 | 4. |
| 19. | Total Hardness (mg/l CAC03) | 220 | 130.3 | 154.3 | 230 | 200 | 26 |
| 20. | Nitrates (mg/l) | 36.5 | 25.96 | 16.28 | 3.69 | 6.18 | 5.6 |
| 21. | Date Sampled for Analysis | 11/05/90 | 10/12/90 | 01/22/91 | 02/05/91 | 03/18/91 | 04/26/9 |
| 22. | Date Last Precipitaiton Event Occurred | 10/24/90 | 12/04/90 | 01/02/91 | 01/31/91 | 03/17/91 | 04/24/9 |

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE
State WEST VIRGINIA Zip 26038

W-173
2430913.6
730838.51
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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-173 | DW-173 | DW-173 | DW-173 | DW-173 | DW-173 |
| 2. | Lab Identification Number | W-J2 | W-J2 | W-J2 | W-J2 | W-J2 | W-J2 |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1166 | 1166 | 1166 | 1166 | 1166 | 1166 |
| 5. | Depth of Well below Land Surface (feet) | 25 | 25 | 25 | 25 | 25 | 25 |
| 6. | Static Water Level of Well below Land Surface (feet) | 17 | 18 | 13 | 16 | 17 | 15 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 11/02/90 | 12/11/90 | 01/04/91 | 02/04/91 | 03/18/91 | 04/11/91 |
| 9. | Aquifer/Zone Identification for Well/Spring | A | A | A | A | A | A |
| 10. | pH (Standard Units) | 7.3 | 7.3 | 7.3 | 7.3 | 7.3 | 7.0 |
| | Total Acidity (mg/l CAC03) | 0.00 | 0.00 | 0.00 | 27.55 | 25.27 | 18.24 |
| 12. | Total Alkalinity (mg/l CAC03) | 240.00 | 254.00 | 260.00 | 245.86 | 245.67 | 235.03 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 550 | 520 | 560 | 567 | 473 | 483 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | .23 | .34 | .06 | .06 | 0 | .02 |
| 16. | Total Sulfates (mg/l) | 47.0 | 56.0 | 61.0 | 35.0 | 34.0 | 34.0 |
| 17. | Total Iron (mg/l) | 0.19 | 0.15 | 0.16 | 0.34 | 0.00 | 0.04 |
| 18. | Total Suspended Solids (mg/l) | 1.7 | 4.0 | 3.6 | 18.0 | 6.0 | 5.0 |
| 19. | Total Hardness (mg/l CAC03) | 219 | 134.6 | 205.3 | 275 | 268 | 25: |
| 20. | Nitrates (mg/l) | 15.4 | 13.6 | 9.24 | 1.89 | 4.48 | 3.91 |
| 21. | Date Sampled for Analysis | 11/02/90 | 12/11/90 | 01/04/91 | 02/04/91 | 03/18/91 | 04/11/9 |
| 22. | Date Last Precipitaiton Event Occurred | 10/24/90 | 12/04/90 | 12/30/90 | 01/31/91 | 03/17/91 | 04/09/9 |

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE
State WEST VIRGINIA Zip 26038

9/88

W-323
2428247.8
730732.16
ADJ

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION
ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

STATE PLANE COORDINATES: X 2,428,446 Y 730,695

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | W-323 | W-323 | | | | |
| 2. Lab Identification Number | 94-06-994 | 94-07-665 | | | | |
| 3. High (H)/Low (L) Designation (if applicable) | I | I | | | | |
| 4. Surface Elevation for Sampling Station (msl) | 1138 | 1138 | | | | |
| 5. Depth of Well below Land Surface (feet) | 120 | 120 | | | | |
| 6. Static Water Level of Well below Land Surface (feet) | 59 | 62 | | | | |
| 7. Flow for Spring/Stream (gpm or cfs) | - | - | | | | |
| 8. Date Above Measurements M. | 06/25/94 | 07/26/94 | | | | |
| 9. Aqu. .r/Zone Identification for Well/Spring | D | D | | | | |
| 10. pH (Standard Units) | 8.3 | 8.9 | | | | |
| 11. Total Acidity (mg/l CAC03) | 0.0 | 0 | | | | |
| 12. Total Alkalinity (mg/l CAC03) | 344.80 | 351 | | | | |
| 13. Specific Conductivity (μmhos/cm at 25°C) | 663 | 665 | | | | |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | <0.02 | <0.02 | | | | |
| 16. Total Sulfates (mg/l) | <10.0 | 5.0 | | | | |
| 17. Total Iron (mg/l) | 0.06 | 0.62 | | | | |
| 18. Total Suspended Solids (mg/l) | 3.0 | 14.0 | | | | |
| 19. Total Hardness (mg/l CAC03) | 80.0 | 682 | | | | |
| 20. Nitrates (mg/l) | 3.16 | <0.50 | | | | |
| 21. Date Sampled for Analysis | 06/25/94 | 07/26/94 | | | | |
| 22. Date Last Precipitaiton Event Occurred | 06/24/94 | 07/25/94 | | | | |

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE
State WEST VIRGINIA Zip 26038

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | W-396 | W-396 | W-396 | W-396 | W-396 | W-396 |
| 2. | Lab Identification Number | 9701306 | 9702311 | 9703259 | 9704337 | 9705259 | 9706282 |
| 3. | High (H)/Low (L) Designation (if applicable) | I | H | H | H | I | I |
| 4. | Surface Elevation for Sampling Station (msl) | 1305 | 1305 | 1305 | 1305 | 1305 | 1305 |
| 5. | Depth of Well below Land Surface (msl) | 70 | 70 | 70 | 70 | 70 | 70 |
| 6. | Static Water Level of Well below Land Surface (msl) | 37 | 37 | 36 | 37 | 38 | 39 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 01/30/97 | 02/27/97 | 03/22/97 | 04/25/97 | 05/22/97 | 06/27/97 |
| 9. | Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. | pH (Standard Units) | 7.3 | 7.3 | 7.2 | 7.3 | 7.3 | 7.5 |
| 11. | Total Acidity (mg/l CAC03) | 34 | 9 | 17 | 12 | 9.4 | 9.1 |
| 12. | Total Alkalinity (mg/l CAC03) | 180 | 170 | 170 | 200 | 200 | 190 |
| 13. | Specific Conductivity (µmhos/cm at 25°C) | 380 | 430 | 440 | 480 | 460 | 510 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16. | Total Sulfates (mg/l) | 54 | 58 | 57 | 54 | 44 | 52 |
| 17. | Total Iron (mg/l) | 0 | 0 | 0 | 0.07 | 0 | 0 |
| 18. | Total Suspended Solids (mg/l) | 0 | 0 | 0 | 0 | 0 | 0 |
| 19. | Total Hardness (mg/l CAC03) | 240 | 240 | 190 | 250 | 240 | 250 |
| 20. | Nitrates (mg/l) | 2.4 | 2.6 | 2 | 11 | 1.6 | 2.4 |
| 21. | Date Sampled for Analysis | 01/30/97 | 02/27/97 | 03/22/97 | 04/25/97 | 05/22/97 | 06/27/97 |
| 22. | Date Last Precipitaiton Event Occurred | 01/28/97 | 02/26/97 | 03/18/97 | 04/25/97 | 05/19/97 | 06/26/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | W-405 | W-405 | W-405 | W-405 | W-405 | W-405 |
| 2. Lab Identification Number | 9702136 | 9703236 | 9704290 | 9705228 | 9707014 | 9707257 |
| 3. High (H)/Low (L) Designation (if applicable) | L | H | H | L | L | L |
| 4. Surface Elevation for Sampling Station (msl) | 1322 | 1322 | 1322 | 1322 | 1322 | 1322 |
| 5. Depth of Well below Land Surface (msl) | 103 | 103 | 103 | 103 | 103 | 103 |
| 6. Static Water Level of Well below Land Surface (msl) | 76 | 74 | 78 | 77 | 78 | 78 |
| 7. Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 7 | 7.3 | 7.3 | 7.3 | 7.7 | 7.7 |
| 11. Total Acidity (mg/l CAC03) | 14 | 8.6 | 8.6 | 11 | 6.3 | 5.8 |
| 12. Total Alkalinity (mg/l CAC03) | 180 | 270 | 190 | 170 | 180 | 180 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 460 | 440 | 440 | 430 | 480 | 410 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.08 | 0.37 | 0.02 | 0.00 | 0.03 | 0.00 |
| 16. Total Sulfates (mg/l) | 49 | 45 | 49 | 45 | 50 | 49 |
| 17. Total Iron (mg/l) | 2 | 12 | 1 | 0.3 | 0.76 | 0.23 |
| 18. Total Suspended Solids (mg/l) | 26 | 740 | 7.3 | 11 | 6 | 0 |
| 19. Total Hardness (mg/l CAC03) | 250 | 330 | 220 | 180 | 250 | 210 |
| 20. Nitrates (mg/l) | 2.6 | 1.8 | 4.7 | 4.4 | 3.1 | 5 |
| 21. Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 22. Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet. Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-406 | DW-406 | DW-406 | DW-406 | DW-406 | DW-406 |
| 2. | Lab Identification Number | 9702120 | 9703237 | 9704291 | 9705229 | 9707015 | 9707258 |
| 3. | High (H)/Low (L) Designation (if applicable) | I | H | H | I | I | I |
| 4. | Surface Elevation for Sampling Station (msl) | 1322 | 1322 | 1322 | 1322 | 1322 | 1322 |
| 5. | Depth of Well below Land Surface (msl) | 24 | 24 | 24 | 24 | 24 | 24 |
| 6. | Static Water Level of Well below Land Surface (msl) | 22 | 20 | 22 | 21 | 22 | 23 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 9. | Aquifer/Zone Identification for Well/Spring | A | A | A | A | A | A |
| 10. | pH (Standard Units) | 6.9 | 7 | 7.3 | 7.3 | 7.2 | 7.3 |
| 11. | Total Acidity (mg/l CAC03) | 25 | 7.4 | 4.7 | 19 | 11 | 8.5 |
| 12. | Total Alkalinity (mg/l CAC03) | 100 | 94 | 94 | 76 | 120 | 120 |
| 13. | Specific Conductivity (µmhos/cm at 25°C) | 350 | 360 | 350 | 420 | 430 | 390 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | 0.04 | 0.00 | 0.00 | 0.00 | 0.05 | 0.04 |
| 16. | Total Sulfates (mg/l) | 46 | 47 | 42 | 53 | 45 | 45 |
| 17. | Total Iron (mg/l) | 0.21 | 0.08 | 0.5 | 0.68 | 1.1 | 0.47 |
| 18. | Total Suspended Solids (mg/l) | 4 | 0 | 13 | 0 | 0 | 0 |
| 19. | Total Hardness (mg/l CAC03) | 170 | 140 | 140 | 150 | 290 | 160 |
| 20. | Nitrates (mg/l) | 5 | 4.8 | 4.6 | 6.5 | 7 | 5 |
| 21. | Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 22. | Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | W-407 | W-407 | W-407 | W-407 | W-407 | W-407 |
| 2. Lab Identification Number | 9702127 | 9703239 | 9704292 | 9705230 | 9707016 | 9707260 |
| 3. High (H)/Low (L) Designation (if applicable) | I | H | H | I | I | I |
| 4. Surface Elevation for Sampling Station (msl) | 1306 | 1306 | 1306 | 1306 | 1306 | 1306 |
| 5. Depth of Well below Land Surface (msl) | 63 | 63 | 63 | 63 | 63 | 63 |
| 6. Static Water Level of Well below Land Surface (msl) | 56 | 58 | 56 | 56 | 58 | 59 |
| 7. Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 7.3 | 7.3 | 7.2 | 7.2 | 7.1 | 7.3 |
| 11. Total Acidity (mg/l CAC03) | 16 | 12 | 9.6 | 28 | 39 | 28 |
| 12. Total Alkalinity (mg/l CAC03) | 180 | 190 | 200 | 220 | 230 | 240 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 970 | 910 | 880 | 1000 | 1100 | 930 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.30 | 0.02 | 1.30 | 0.38 | 0.13 | 1.90 |
| 16. Total Sulfates (mg/l) | 72 | 77 | 88 | 78 | 8 | 77 |
| 17. Total Iron (mg/l) | 0.55 | 0.12 | 1 | 0.17 | 0.3 | 0.91 |
| 18. Total Suspended Solids (mg/l) | 5.3 | 0 | 0 | 0 | 0 | 10 |
| 19. Total Hardness (mg/l CAC03) | 450 | 450 | 480 | 530 | 460 | 500 |
| 20. Nitrates (mg/l) | 10 | 15 | 1.3 | 13 | 7.6 | 4 |
| 21. Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 22. Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet. Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map : | DW-408 | DW-408 | DW-408 | DW-408 | DW-408 | DW-408 |
| 2. | Lab Identification Number | 9702122 | 9703238 | 9704293 | 9705226 | 9707009 | 9707259 |
| 3. | High (H)/Low (L) Designation (if applicable) | I | H | H | I | I | I |
| 4. | Surface Elevation for Sampling Station (msl) | 1305 | 1305 | 1305 | 1305 | 1305 | 1305 |
| 5. | Depth of Well below Land Surface (msl) | 33 | 33 | 33 | 33 | 33 | 33 |
| 6. | Static Water Level of Well below Land Surface (msl) | 26 | 22 | 27 | 27 | 27 | 28 |
| 7. | Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. | Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 9. | Aquifer/Zone Identification for Well/Spring | A | A | A | A | A | A |
| 10. | pH (Standard Units) | 7.3 | 7.1 | 7.2 | 6.9 | 7 | 7.3 |
| 11. | Total Acidity (mg/l CAC03) | 12 | 8 | 4.9 | 22 | 16 | 9.9 |
| 12. | Total Alkalinity (mg/l CAC03) | 90 | 87 | 98 | 86 | 110 | 130 |
| 13. | Specific Conductivity (µmhos/cm at 25°C) | 660 | 610 | 640 | 450 | 720 | 680 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16. | Total Sulfates (mg/l) | 59 | 58 | 53 | 49 | 41 | 55 |
| 17. | Total Iron (mg/l) | 0.12 | 1.7 | 0.06 | 0.29 | 0 | 0.23 |
| 18. | Total Suspended Solids (mg/l) | 0 | 0 | 1.3 | 0 | 0 | 0 |
| 19. | Total Hardness (mg/l CAC03) | 270 | 230 | 240 | 160 | 250 | 270 |
| 20. | Nitrates (mg/l) | 7 | 7.3 | 11 | 7.8 | 10 | 11 |
| 21. | Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 |
| 22. | Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

2429599.4
730712.48
ADJ

ATTACHMENT 14A

Stream flow = CFS

(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DS 223 | DS 223 | DS 223 | DS 223 | DS 223 | DS 223 |
| 2. | Lab Identification Number | | | | | | |
| 3. | High (H)/Low (L) Designation (if applicable) | L | L | L | L | L | L |
| 4. | Surface Elevation for Sampling Station (msl) | 1130 | 1130 | 1130 | 1130 | 1130 | 1130 |
| 5. | Depth of Well below Land Surface (feet) | ---- | ---- | ---- | ---- | ---- | ---- |
| 6. | Static Water Level of Well below Land Surface (feet) | ---- | ---- | ---- | ---- | ---- | ---- |
| 7. | Flow for Spring/Stream (gpm or cfs) | 2.0 | .5 | .75 | .326 | .326 | .227 |
| 8. | Date Above Measurements Made | 5-30-91 | 6-25-91 | 7-30-91 | 8-22-91 | 9-13-91 | 10-29-91 |
| 9. | Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. | pH (Standard Units) | 7.5 | 6.8 | 6.9 | 6.9 | 7.8 | 7.0 |
| 11. | Total Acidity (mg/l CAC03) | 8.93 | 12.92 | 8.36 | 14.63 | 11.59 | 7.60 |
| 12. | Total Alkalinity (mg/l CAC03) | 127.49 | 174 | 174 | 147.6 | 183 | 191.14 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 310 | 389 | 347 | 347 | 399 | 378 |
| 14. | Total Dissolved Solids (mg/l) | ---- | ---- | ---- | ---- | ---- | ---- |
| 15. | Total Manganese (mg/l) | 0.03 | <0.02 | <0.02 | 0.06 | 0.03 | 0.07 |
| 16. | Total Sulfates (mg/l) | 11.0 | 21.0 | <10.0 | <10.0 | 14.0 | 20.0 |
| 17. | Total Iron (mg/l) | <0.04 | 0.08 | 0.04 | 0.16 | 0.26 | 0.48 |
| 18. | Total Suspended Solids (mg/l) | 4.0 | 1.0 | 7.0 | 2.0 | 10.0 | 56.0 |
| 19. | Total Hardness (mg/l CAC03) | 162 | 152 | 159 | 132 | 183 | 189 |
| 20. | Nitrates (mg/l) | 4.11 | 0.51 | 0.69 | 0.69 | 0.88 | <1.00 |
| 21. | Date Sampled for Analysis | 5-30-91 | 6-25-91 | 7-30-91 | 8-22-91 | 9-13-91 | 10-29-91 |
| 22. | Date Last Precipitaiton Event Occurred | 5-28-91 | 6-16-91 | 7-25-91 | 8-21-91 | 9-11-91 | 10-26-91 |

Laboratory Name ERI Labs

Address P. O. Box 259 City Brockway

State Pennsylvania Zip 15824

Note: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A, a statement giving the reasons why the information is unobtainable.

Note: For each sample provide data for either item 13 or item 14.

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | DS-282 | DS-282 | DS-282 | DS-282 | DS-282 | DS-282 |
| 2. Lab Identification Number | 9702123 | 9703240 | 9704294 | 9705227 | 9706291 | 9707261 |
| 3. High (H)/Low (L) Designation (if applicable) | L | H | H | L | L | L |
| 4. Surface Elevation for Sampling Station (msl) | 1268 | 1268 | 1268 | 1268 | 1268 | 1268 |
| 5. Depth of Well below Land Surface (msl) | | | | | | |
| 6. Static Water Level of Well below Land Surface (msl) | | | | | | |
| 7. Flow for Spring/Stream (gpm or cfs) | 2.7 | 8.5 | 1.75 | 1 | 1 | 0.19 |
| 8. Date Above Measurements Made | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/27/97 | 07/20/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 6.9 | 6.8 | 7 | 7 | 6.9 | 7.2 |
| 11. Total Acidity (mg/l CAC03) | 22 | 24 | 13 | 6.4 | 17 | 14 |
| 12. Total Alkalinity (mg/l CAC03) | 150 | 150 | 160 | 86 | 170 | 170 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 570 | 610 | 600 | 450 | 690 | 630 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 16. Total Sulfates (mg/l) | 57 | 57 | 56 | 48 | 53 | 51 |
| 17. Total Iron (mg/l) | 0.06 | 0.06 | 0.28 | 0.22 | 0.12 | 0.11 |
| 18. Total Suspended Solids (mg/l) | 2.7 | 0 | 1.3 | 0 | 2 | 0 |
| 19. Total Hardness (mg/l CAC03) | 240 | 260 | 240 | 210 | 260 | 260 |
| 20. Nitrates (mg/l) | 5.1 | 6.6 | 6.6 | 7.8 | 4.1 | 5.3 |
| 21. Date Sampled for Analysis | 02/13/97 | 03/19/97 | 04/23/97 | 05/27/97 | 06/27/97 | 07/20/97 |
| 22. Date Last Precipitaiton Event Occurred | 02/13/97 | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

RECEIVED
SEP 9 2002
DIVISION OF MINERAL RESOURCES MANAGEMENT

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | DS-286 | DS-286 | DS-286 | DS-286 | DS-286 | DS-286 |
| 2. Lab Identification Number | 9703267 | 9704295 | 9705231 | | | |
| 3. High (H)/Low (L) Designation (if applicable) | H | H | I | I | I | L |
| 4. Surface Elevation for Sampling Station (msl) | 1220 | 1220 | 1220 | 1220 | 1220 | 1220 |
| 5. Depth of Well below Land Surface (msl) | | | | | | |
| 6. Static Water Level of Well below Land Surface (msl) | | | | | | |
| 7. Flow for Spring/Stream (gpm or cfs) | 2.6 | 0.37 | 1.25 | 0 | 0 | 0 |
| 8. Date Above Measurements Made | 03/20/97 | 04/23/97 | 05/22/97 | 06/28/97 | 07/20/97 | 08/23/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 6.9 | 7.1 | 7.1 | | | |
| 11. Total Acidity (mg/l CAC03) | 12 | 9.4 | 16 | | | |
| 12. Total Alkalinity (mg/l CAC03) | 140 | 170 | 82 | | | |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 390 | 400 | 240 | | | |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.00 | 0.02 | 0.00 | | | |
| 16. Total Sulfates (mg/l) | 31 | 36 | 32 | | | |
| 17. Total Iron (mg/l) | 0 | 0.81 | 0 | | | |
| 18. Total Suspended Solids (mg/l) | 0 | 9.3 | 0 | | | |
| 19. Total Hardness (mg/l CAC03) | 180 | 200 | 140 | | | |
| 20. Nitrates (mg/l) | 13 | 3.7 | 1.4 | | | |
| 21. Date Sampled for Analysis | 03/20/97 | 04/23/97 | 05/22/97 | 06/28/97 | 07/20/97 | 08/23/97 |
| 22. Date Last Precipitaiton Event Occurred | 03/18/97 | 04/23/97 | 05/19/97 | 06/26/97 | 07/09/97 | 08/21/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | DS-287 | DS-287 | DS-287 | DS-287 | DS-287 | DS-287 |
| 2. Lab Identification Number | 9703268 | 9704296 | 9705232 | 9707017 | 9707255 | 9708219 |
| 3. High (H)/Low (L) Designation (if applicable) | L | H | H | L | L | L |
| 4. Surface Elevation for Sampling Station (msl) | 1220 | 1220 | 1220 | 1220 | 1220 | 1220 |
| 5. Depth of Well below Land Surface (msl) | | | | | | |
| 6. Static Water Level of Well below Land Surface (msl) | | | | | | |
| 7. Flow for Spring/Stream (gpm or cfs) | 2.4 | 0.25 | 1.15 | 0.75 | 0.68 | 0.11 |
| 8. Date Above Measurements Made | 03/20/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 | 08/23/97 |
| 9. Aquifer/Zone Identification for Well/Spring | B | B | B | B | B | B |
| 10. pH (Standard Units) | 7 | 7.3 | 7.3 | 7.1 | 7.6 | 7.6 |
| 11. Total Acidity (mg/l CAC03) | 12 | 8.4 | 12 | 14 | 7.8 | 8.7 |
| 12. Total Alkalinity (mg/l CAC03) | 120 | 150 | 120 | 160 | 170 | 160 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 370 | 530 | 400 | 630 | 580 | 520 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.06 |
| 16. Total Sulfates (mg/l) | 37 | 39 | 33 | 38 | 38 | 41 |
| 17. Total Iron (mg/l) | 0.07 | 0 | 0.08 | 0.18 | 0.12 | 0.24 |
| 18. Total Suspended Solids (mg/l) | 0 | 0 | 0 | 0 | 0 | 0 |
| 19. Total Hardness (mg/l CAC03) | 200 | 250 | 200 | 290 | 230 | 270 |
| 20. Nitrates (mg/l) | 7.2 | 2.8 | 2.1 | 2 | 2.2 | 1.6 |
| 21. Date Sampled for Analysis | 03/20/97 | 04/23/97 | 05/27/97 | 06/28/97 | 07/20/97 | 08/23/97 |
| 22. Date Last Precipitaiton Event Occurred | 03/18/97 | 04/23/97 | 05/25/97 | 06/26/97 | 07/09/97 | 08/21/97 |

Laboratory Name Tradet, Inc.
Address P.O. Box 2019
State Wheeling, West Virginia 26003

SPRING FLOW = GPM
STREAM FLOW = CFS

DIVISION OF RECLAMATION

ATTACHMENT 14A

(HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

STATE PLANE COORDINATES: X 2,427,826.06 Y 730,804.51 LOCATION ADJ

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | U34-001 | U34-001 | U34-001 | U34-001 | U34-001 | U34-001 |
| 2. | Lab Identification Number | NA | NA | NA | NA | NA | NA |
| 3. | High (H)/Low (L) Designation (if applicable) | T/L | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1100 | 1100 | 1100 | 1100 | 1100 | 1100 |
| 5. | Depth of Well below Land Surface (msl) | NA | NA | NA | NA | NA | NA |
| 6. | Static Water Level of Well below Land Surface (msl) | NA | NA | NA | NA | NA | NA |
| 7. | Flow for Spring/Stream (gpm or cfs) | 0.03 | 0.33 | 0.00 | 0.00 | 0.00 | 0.02 |
| 8. | Date Above Measurements Made | 11/02/90 | 12/11/90 | 01/01/91 | 02/05/91 | 03/05/91 | 04/08/91 |
| 9. | Aquifer/Zone Identification for Well/Spring | NA | NA | NA | NA | NA | NA |
| 10. | pH (Standard Units) | 7.7 | 7.4 | 7 | 7 | 7.6 | 7.5 |
| 11. | Total Acidity (mg/l CAC03) | 0.00 | 0.00 | 0.00 | 2.66 | 17.86 | 10.45 |
| 12. | Total Alkalinity (mg/l CAC03) | 108 | 196 | 80 | 42.37 | 74.48 | 113.05 |
| 13. | Specific Conductivity (µmhos/cm at 25°C) | 260 | 250 | 230 | 100 | 160 | 260 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | 0.12 | 0.59 | 1.79 | 0.15 | 0.27 | 0.4 |
| 16. | Total Sulfates (mg/l) | 29 | 28 | 36 | | 16 | 18 |
| 17. | Total Iron (mg/l) | 0.43 | 0.8 | 3.43 | 0.14 | 0.45 | 1.59 |
| 18. | Total Suspended Solids (mg/l) | 3.7 | 17 | 4.3 | 6 | 13 | 28 |
| 19. | Total Hardness (mg/l CAC03) | 94 | 91 | 69.4 | 40 | 80 | 114 |
| 20. | Nitrates (mg/l) | 1.1 | 2.77 | 4.84 | 0.00 | 1.46 | 2.32 |
| 21. | Date Sampled for Analysis | 11/02/90 | 12/11/90 | 01/01/91 | 02/05/91 | 03/05/91 | 04/08/91 |
| 22. | Date Last Precipitation Event Occurred | 11/01/90 | 12/04/90 | 12/30/90 | 02/05/91 | 03/03/91 | 04/08/91 |

Laboratory Name ERI LABS

Address PO BOX 259

State bROCKWAY, PA 15824

SPRING FLOW = GPM
STREAM FLOW = CFS

2431387.9
730854.8
ADJ

DIVISION OF RECLAMATION

ATTACHMENT 14A

(HYDROLOGIC MEASUREMENTS AND ANALYSES)

plicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| . | Identification No. of Sampling Station from Hydrology Map | U34-143 | U34-143 | U34-143 | U34-143 | U34-143 | U34-143 |
| 2. | Lab Identification Number | | | | | | |
| 3. | High (H)/Low (L) Designation (if applicable) | I | I | I | I | H | H |
| 4. | Surface Elevation for Sampling Station (msl) | 1110 | 1110 | 1110 | 1110 | 1110 | 1110 |
| 5. | Depth of Well below Land Surface (feet) | | | | | | |
| 6. | Static Water Level of Well below Land Surface (feet) | | | | | | |
| 7. | Flow for Spring/Stream (gpm or cfs) | 0.006 cfs | 0.033 cfs | 0.066 cfs | 0.044 cfs | 0.033 cfs | 0.022 cfs |
| 8. | Date Above Measurements Made | 11/30/90 | 12/26/90 | 01/15/91 | 02/04/91 | 03/08/91 | 04/24/91 |
| 9. | Aquifer/Zone Identification for Well/Spring | | | | | | |
| 10. | pH (Standard Units) | 7.7 | 7.9 | 7.9 | 7.8 | 8.0 | 8.1 |
| 11. | Total Acidity (mg/l CAC03) | 0.00 | 0.00 | 0.00 | 13.11 | 7.03 | 18.43 |
| . | Total Alkalinity (mg/l CAC03) | 236.00 | 200.00 | 170.00 | 196.46 | 198.55 | 215.65 |
| 13. | Specific Conductivity (μmhos/cm at 25°C) | 400 | 440 | 420 | 472 | 441 | 441 |
| 14. | Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. | Total Manganese (mg/l) | 0.65 | 0.22 | 0.14 | 0.26 | 0.07 | 0.51 |
| 16. | Total Sulfates (mg/l) | 34.0 | 40.0 | 37.0 | 26.0 | 27.0 | 17.0 |
| 17. | Total Iron (mg/l) | 2.50 | 0.94 | 0.94 | 2.66 | 0.37 | 5.60 |
| 18. | Total Suspended Solids (mg/l) | 10.0 | 0.3 | 24.3 | 22.0 | 10.0 | 37.0 |
| 19. | Total Hardness (mg/l CAC03) | 188.0 | 119.6 | 157.1 | 230.0 | 204.0 | 228.0 |
| 20. | Nitrates (mg/l) | 4.05 | 7.04 | 3.78 | 1.40 | 2.42 | 3.26 |
| 21. | Date Sampled for Analysis | 11/30/90 | 12/26/90 | 01/15/91 | 02/04/91 | 03/08/91 | 04/24/91 |
| 22. | Date Last Precipitaiton Event Occurred | 11/27/90 | 12/24/90 | 01/14/91 | 01/31/91 | 03/06/91 | 04/22/91 |

Laboratory Name INDUSTRIAL LAB ANALYSIS

Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE

State WEST VIRGINIA Zip 26038

9/88

U34-164
2425273.6
730219.96
ADJ

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | U34-164 | U34-164 | U34-164 | U34-164 | U34-164 | U34- |
| 2. Lab Identification Number | 93-11-969 | 93-12-797 | 94-01-648 | 94-02-687 | 94-03-987 | 94-04 |
| 3. High (H)/Low (L) Designation (if applicable) | I | I | I | H | H | H |
| 4. Surface Elevation for Sampling Station (msl) | 1110 | 1110 | 1110 | 1110 | 1110 | |
| 5. Depth of Well below Land Surface (feet) | N/A | N/A | N/A | N/A | N/A | N/ |
| 6. Static Water Level of Well below Land Surface (feet) | - | - | - | - | - | - |
| 7. Flow for Spring/Stream (gpm or cfs) | .4 | 0.40 | 0.49 | 2.82 | 1.0 | .4 |
| 8. Date Above Measurements Made | 11/30/93 | 12/16/93 | 01/24/94 | 02/21/94 | 03/24/94 | 04 |
| 9. Aquifer/Zone Identification for Well/Spring | N/A | N/A | N/A | N/A | N/A | N/ |
| 10. pH (Standard Units) | 7.8 | 8.1 | 7.8 | 7.3 | 7.8 | 7. |
| 11. Total Acidity (mg/l CAC03) | 4.60 | 1.20 | 2.80 | 5.00 | 5.20 | 5.6 |
| 12. Total Alkalinity (mg/l CAC03) | 107.20 | 148.80 | 147.20 | 80.40 | 114.00 | 142 |
| 13. Specific Conductivity (μmhos/cm at 25°C) | 395 | 391 | 452 | 320 | 382 | 37 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.12 | <0.02 | 0.04 | 0.04 | 0.02 | 0.( |
| 16. Total Sulfates (mg/l) | 25.0 | 28.0 | 28.0 | 27.0 | 34.0 | 28 |
| 17. Total Iron (mg/l) | 0.56 | <0.04 | 0.13 | 0.35 | 0.14 | 0. |
| 18. Total Suspended Solids (mg/l) | 30.0 | 8.0 | 4.0 | 10.0 | 6.0 | 6. |
| 19. Total Hardness (mg/l CAC03) | 159.0 | 203.0 | 188.0 | 124.0 | 160.0 | 17 |
| 20. Nitrates (mg/l) | 0.78 | 1.20 | 1.25 | 1.76 | 0.80 | 0. |
| 21. Date Sampled for Analysis | 11/30/93 | 12/16/93 | 01/24/94 | 02/21/94 | 03/25/94 | 0 |
| 22. Date Last Precipitaiton Event Occurred | 11/28/93 | 12/15/93 | 01/24/94 | 02/21/94 | 03/23/94 | 0 |

Laboratory Name INDUSTRIAL LAB ANALYSIS Spring flow = GPM
Address 2240 WILLIAMSBURG FARM, P. O. BOX 81, GLEN DALE Stream flow = CFS
State WEST VIRGINIA Zip 26038

9/88
U34-166
2426895.6
730201.94
ADJ

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | U34-166 | U34-166 | U34-166 | U34-166 | U34-166 | U34- |
| 2. Lab Identification Number | 93-11-971 | 93-12-552 | 94-01-742 | 94-02-575 | 94-03-989 | 94-04 |
| 3. High (H)/Low (L) Designation (if applicable) | I | I | I | H | H | H |
| 4. Surface Elevation for Sampling Station (msl) | 1075 | 1075 | 1075 | 1075 | 1075 | |
| 5. Depth of Well below Land Surface (feet) | N/A | N/A | N/A | N/A | N/A | N/ |
| 6. Static Water Level of Well below Land Surface (feet) | - | - | - | - | - | - |
| 7. Flow for Spring/Stream (gpm or cfs) | 2.90 | 2.024 | 29.51 | 3.15 | 8.3 | 3. |
| 8. Date Above Measurements Made | 11/29/93 | 12/15/93 | 01/27/94 | 02/16/94 | 03/24/94 | 04 |
| 9. Aquifer/Zone Identification for Well/Spring | N/A | N/A | N/A | N/A | N/A | N/ |
| 10. pH (Standard Units) | 7.8 | 7.9 | 7.3 | 7.8 | 7.8 | 7. |
| 11. Total Acidity (mg/l CAC03) | 5.40 | 0.60 | 8.40 | 5.00 | 3.80 | 7.4 |
| 12. Total Alkalinity (mg/l CAC03) | 109.00 | 121.40 | 70.40 | 108.00 | 99.20 | 130. |
| 13. Specific Conductivity (μmhos/cm at 25°C) | 310 | 354 | 250 | 310 | 290 | 31 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.17 | 0.17 | 1.27 | 0.05 | 0.03 | 0.1 |
| 16. Total Sulfates (mg/l) | 41.0 | 21.0 | 25.0 | 30.0 | 35.0 | 33. |
| 17. Total Iron (mg/l) | 1.24 | 0.31 | 9.80 | 0.17 | 0.22 | 0.7 |
| 18. Total Suspended Solids (mg/l) | 44.0 | 9.0 | 41.0 | 4.0 | 3.0 | 40 |
| 19. Total Hardness (mg/l CAC03) | 150.0 | 161.0 | 95.0 | 161.0 | 132.0 | 15 |
| 20. Nitrates (mg/l) | 0.84 | 0.62 | 1.33 | 0.61 | 0.67 | 0. |
| 21. Date Sampled for Analysis | 11/29/93 | 12/15/93 | 01/27/94 | 02/16/94 | 03/25/94 | 0 |
| 22. Date Last Precipitaiton Event Occurred | 11/28/93 | 12/15/93 | 01/27/94 | 02/13/94 | 03/23/94 | 0 |

Laboratory Name INDUSTRIAL LAB ANALYSIS Spring flow = GPM
Address 2240 WILLIAMSBURG FARM. P. O. BOX 81, GLEN DALE Stream flow = CFS
State WEST VIRGINIA Zip 26038

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION
## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

Applicant's Name THE OHIO VALLEY COAL COMPANY

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Identification No. of Sampling Station from Hydrology Map | W -294 | W -294 | W -294 | W -294 | W -294 | W -294 |
| 2. Lab Identification Number | 93-11-605 | 93-12-560 | 94-01-743 | 94-02-560 | 94-03-1380 | 94-04-980 |
| 3. High (H)/Low (L) Designation (if applicable) | I | I | I | H | H | H |
| 4. Surface Elevation for Sampling Station (msl) | 1125 | 1125 | 1125 | 1125 | 1125 | 1125 |
| 5. Depth of Well below Land Surface (msl) | 57 | 57 | 57 | 57 | 57 | 57 |
| 6. Static Water Level of Well below Land Surface (msl) | 42 | 42 | 44 | 43 | 43 | 53 |
| 7. Flow for Spring/Stream (gpm or cfs) | | | | | | |
| 8. Date Above Measurements Made | 11/17/93 | 12/15/93 | 01/27/94 | 02/16/94 | 03/31/94 | 04/29/94 |
| 9. Aquifer/Zone Identification for Well/Spring | C | C | C | C | C | C |
| 10. pH (Standard Units) | 7.8 | 7.4 | 7.4 | 7.7 | 7.6 | 7.7 |
| 11. Total Acidity (mg/l CAC03) | 0 | 7.2 | 6.6 | 5.6 | 5 | 8.4 |
| 12. Total Alkalinity (mg/l CAC03) | 213.2 | 209.6 | 215.2 | 204 | 181.2 | 210.6 |
| 13. Specific Conductivity (µmhos/cm at 25°C) | 426 | 452 | 435 | 413 | 447 | 399 |
| 14. Total Dissolved Solids (mg/l) | - | - | - | - | - | - |
| 15. Total Manganese (mg/l) | 0.00 | 0.03 | 0.02 | 0.00 | 0.12 | 0.00 |
| 16. Total Sulfates (mg/l) | 0 | 5 | 0 | 12 | 12 | 0 |
| 17. Total Iron (mg/l) | 0.1 | 0.56 | 0.53 | 0.14 | 6 | 0.29 |
| 18. Total Suspended Solids (mg/l) | 1 | 5 | 6 | 2 | 15 | 4 |
| 19. Total Hardness (mg/l CAC03) | 0 | 197 | 200 | 197 | 188 | 184 |
| 20. Nitrates (mg/l) | 1 | 0.85 | 0.61 | 0.42 | 0.33 | 0.6 |
| 21. Date Sampled for Analysis | 11/17/93 | 12/15/93 | 01/27/94 | 02/16/94 | 03/31/94 | 04/29/94 |
| 22. Date Last Precipitaiton Event Occurred | 11/17/93 | 12/15/93 | 01/27/94 | 02/12/94 | 03/28/94 | 04/29/94 |

Laboratory Name INDUSTRIAL LAB ANALYSIS
Address 2240 WILLIAMSBURG FARM. BOX 81
State GLEN DALE, WV 26038

SPRING FLOW = GPM
STREAM FLOW = CFS

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT: The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | W-458 | U34-H | U34-001 | U34-009 | W-316 | DS-244 |
| 2. | Identification Number | 0202151 | 0202029 | 0202030 | 0202031 | | 0201430 |
| 3. | High (H)/Low (L)/Intermediate (I) Designation (if applicable) | T/L | T/L | T/L | T/L | T/L | T/L |
| 4. | Surface Elevation for Sampling Station (msl) | 1070 | 1100 | 1100 | 1045 | 1203 | 1290 |
| 5. | Depth of Well below Land Surface (feet) | 25' | | | | 72' | |
| 6. | Static Water Level of Well Below Land Surface (feet) | 6' | | | | 57' | |
| 7. | Flow for Spring and Stream (gpm or cfs) | | .0001 gpm | .07 cfs | 2.7 cfs | | .94 gpm |
| 8. | Date Above Measurements Made | 2/6/02 | 2/1/02 | 2/1/02 | 2/1/02 | 1/30/02 | 1/30/02 |
| 9. | Aquifer/Zone Identification for Well/Spring | B | | | | B | B |
| 10. | pH (Standard Units) | 7.5 | 7.3 | 7.9 | 8.1 | NOT | 7.2 |
| 11. | Total Acidity (mg/l CaCO3) | 13 | 3.8 | 7.6 | 7.6 | ABLE | 5.7 |
| 12. | Total Alkalinity (mg/l CaCO3) | 180 | 10 | 68 | 130 | TO | 240 |
| 13. | Specific Conductivity (µmhos/cm at 25° C) | 430 | 90 | 190 | 300 | GET | 710 |
| 14. | Total Dissolved Solids (mg/l) | | | | | SAMPLE | |
| 15. | Total Manganese (mg/l) | 0.39 | 0.10 | 0.23 | 0.07 | | <0.02 |
| 16. | Total Sulfates (mg/l) | 34 | 26 | 33 | 38 | | 47 |
| 17. | Total Iron (mg/l) | <0.05 | 0.99 | 1.1 | 0.36 | | <0.05 |
| 18. | Total Suspended Solids (mg/l) | <1.0 | 59 | 28 | <1.0 | | <1.0 |
| 19. | Total Hardness (mg/l as CaCO3) | 170 | 20 | 80 | 140 | | 310 |
| 20. | Nitrates (mg/l) | <0.09 | 0.94 | 0.39 | 0.97 | | 2.7 |
| 21. | Date Sampled for Analysis | 2/6/02 | 2/1/02 | 2/1/02 | 2/1/02 | | 1/30/02 |
| 22. | Date Last Precipitation Event Occurred | 2/4/02 | 1/31/02 | 1/31/02 | 1/31/02 | 1/29/02 | 1/29/02 |

Laboratory Name: Tra-Det, Inc
Address: P.O. Box 2019 City Wheeling
State: West Virginia Zip 26003

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT: The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DW-406 | DS-282 | DS-235 | W-409 | W-409 | |
| 2. | Identification Number | 0201459 | 0201462 | 0201427 | | | |
| 3. | High (H)/Low (L)/Intermediate (I) Designation (if applicable) | T/L | T/L | T/L | T/L | H | |
| 4. | Surface Elevation for Sampling Station (msl) | 1324 | 1268 | 1179 | 1318 | 1318 | |
| 5. | Depth of Well below Land Surface (feet) | 24 | | | 83 | 83 | |
| 6. | Static Water Level of Well Below Land Surface (feet) | 20.5' | | | INACC. | INACC. | |
| 7. | Flow for Spring and Stream (gpm or cfs) | | 2.5 gpm | 0.03 gpm | | | |
| 8. | Date Above Measurements Made | 1/31/02 | 1/31/02 | 1/30/02 | 1/31/02 | 2/26/02 | |
| 9. | Aquifer/Zone Identification for Well/Spring | A | B | B | CASING | CASING | |
| 10. | pH (Standard Units) | 7.2 | 7.0 | 8.0 | IS | IS | |
| 11. | Total Acidity (mg/l CaCO3) | 0 | 5.7 | 3.8 | PINCHED | PINCHED | |
| 12. | Total Alkalinity (mg/l CaCO3) | 52 | 130 | 200 | | | |
| 13. | Specific Conductivity (µmhos/cm at 25° C) | 180 | 490 | 450 | | | |
| 14. | Total Dissolved Solids (mg/l) | | | | | | |
| 15. | Total Manganese (mg/l) | 0.04 | <0.02 | <0.02 | | | |
| 16. | Total Sulfates (mg/l) | 33 | 46 | 36 | | | |
| 17. | Total Iron (mg/l) | 0.85 | 0.08 | <0.05 | | | |
| 18. | Total Suspended Solids (mg/l) | 49 | 2.0 | <1.0 | | | |
| 19. | Total Hardness (mg/l as CaCO3) | 60 | 180 | 210 | | | |
| 20. | Nitrates (mg/l) | 0.87 | 3.00 | 0.39 | | | |
| 21. | Date Sampled for Analysis | 1/31/02 | 1/31/02 | 1/30/02 | | | |
| 22. | Date Last Precipitation Event Occurred | 1/30/02 | 1/30/02 | 1/30/02 | 1/30/02 | 2/25/02 | |

Laboratory Name: Tra-Det, Inc
Address: P.O. Box 2019 City Wheeling
State: West Virginia Zip 26003

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NOTE: For each sample provide data for either item 13 or 14.

9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF MINERAL RESOURCES MANAGEMENT

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT: The Ohio Valley Coal Company

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Identification No. of Sampling Station from Hydrology Map | DS-223 | W-323 | U37-007 | W-458 | | |
| 2. | Identification Number | 0202411 | 0202412 | 0202415 | 0203091 | | |
| 3. | High (H)/Low (L)/Intermediate (I) Designation (if applicable) | H | H | H | H | | |
| 4. | Surface Elevation for Sampling Station (msl) | 1130 | 1138 | 1110 | 1070 | | |
| 5. | Depth of Well below Land Surface (feet) | | 120' | | 25' | | |
| 6. | Static Water Level of Well Below Land Surface (feet) | | 63' | | 6' | | |
| 7. | Flow for Spring and Stream (gpm or cfs) | 8.3 gpm | | .0004 cfs | | | |
| 8. | Date Above Measurements Made | 2/26/02 | 2/26/02 | 2/25/02 | 3/8/02 | | |
| 9. | Aquifer/Zone Identification for Well/Spring | B | D | | B | | |
| 10. | pH (Standard Units) | 7.1 | 8.5 | 8.0 | 7.5 | | |
| 11. | Total Acidity (mg/l CaCO3) | 11 | 3.7 | 17 | 6.4 | | |
| 12. | Total Alkalinity (mg/l CaCO3) | 120 | 420 | 160 | 190 | | |
| 13. | Specific Conductivity (µmhos/cm at 25° C) | 240 | 790 | 340 | 360 | | |
| 14. | Total Dissolved Solids (mg/l) | | | | | | |
| 15. | Total Manganese (mg/l) | 0.02 | 0.02 | 0.25 | 1.3 | | |
| 16. | Total Sulfates (mg/l) | 24 | 11 | 40 | 34 | | |
| 17. | Total Iron (mg/l) | 0.04 | <0.04 | 0.69 | 0.14 | | |
| 18. | Total Suspended Solids (mg/l) | <1.0 | <1.0 | 35 | <1.0 | | |
| 19. | Total Hardness (mg/l as CaCO3) | 120 | 30 | 180 | 170 | | |
| 20. | Nitrates (mg/l) | 0.26 | <0.09 | 0.16 | 0.11 | | |
| 21. | Date Sampled for Analysis | 2/26/02 | 2/26/02 | 2/25/02 | 3/8/02 | | |
| 22. | Date Last Precipitation Event Occurred | 2/25/02 | 2/25/02 | 2/21/02 | 3/2/02 | | |

Laboratory Name: Tra-Det, Inc
Address: P.O. Box 2019 City Wheeling
State: West Virginia Zip 26003

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9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-077 | DS-111 | DS-112 | DS-118 | DS-217 | DS-223 |
| 2 | Identification Number | 311809 | 311577 | 311810 | 311747 | 311811 | 311578 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1230 | 1121 | 1082 | 1089 | 1165 | 1122 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .06 GPM | .75 GPM | .16 GPM | 1.5 GPM | 1.3 GPM | 2.8 GPM |
| 8 | Date Above Measurements Made | 7-21-01 | 7-18-01 | 7-21-01 | 7-19-01 | 7-21-01 | 7-18-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | C | C | C | B | B |
| 10 | pH (Standard Units) | 7.78 | 7.39 | 7.58 | 6.66 | 7.43 | 7.22 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 4.00 | 3.00 | 14.00 | 4.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 200.00 | 142.00 | 100.00 | 210.00 | 164.00 | 144.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 499 | 336 | 347 | 440 | 401 | 338 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.029 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 143.23 | 97.13 | 140.76 | 256.83 | 137.47 | 167.93 |
| 17 | Total Iron (mg/l) | <0.03 | 0.151 | <0.03 | 0.425 | <0.03 | 0.053 |
| 18 | Total Suspended Solids (mg/l) | 4 | 2 | <1 | <1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 299.70 | 231.76 | 154.33 | 243.06 | 208.47 | 217.69 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-21-01 | 7-18-01 | 7-21-01 | 7-19-01 | 7-21-01 | 7-18-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-242 | DS-243 | DS-244 | DS-245 | DS-246 | DS-275 |
| 2 | Identification Number | 311581 | 311813 | 311774 | 311814 | 311815 | 311416 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1090 | 1220 | 1290 | 1280 | 1284 | 1230 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | 1 GPM | .94 GPM | .17 GPM | .63 GPM | .13 GPM | .27 GPM |
| 8 | Date Above Measurements Made | 7-18-01 | 7-21-01 | 7-20-01 | 7-21-01 | 7-21-01 | 7-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | B | B | B |
| 10 | pH (Standard Units) | 7.27 | 7.34 | 7.22 | 7.19 | 7.18 | 7.30 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 6.00 | 14.00 | 10.00 | 10.00 | 3.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 190.00 | 164.00 | 244.00 | 160.00 | 172.00 | 210.0 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 554 | 385 | 630 | 800 | 945 | 479 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.067 | <0.01 | 0.109 | <0.01 |
| 16 | Total Sulfates (mg/l) | 121.83 | 151.46 | 128.41 | 168.75 | 194.27 | 115.24 |
| 17 | Total Iron (mg/l) | 0.035 | <0.03 | <0.03 | <0.03 | <0.03 | 0.037 |
| 18 | Total Suspended Solids (mg/l) | <1 | 131 | 2 | <1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 142.61 | 230.46 | 263.26 | 342.75 | 393.08 | 114.62 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-21-01 | 7-20-01 | 7-21-01 | 7-21-01 | 7-12-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-7-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-282 | DS-283 | DS-284 | DS-285 | DS-287 | DS-289 |
| 2 | Identification Number | 312197 | 312198 | 311779 | 311582 | 312199 | 312190 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1268 | 1270 | 1170 | 1190 | 1220 | 1190 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .16 GPM | .75 GPM | .59 GPM | 3.8 GPM | .63 GPM | .54 GPM |
| 8 | Date Above Measurements Made | 7-28-01 | 7-28-01 | 7-20-01 | 7-18-01 | 7-28-01 | 7-26-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | C | B | C |
| 10 | pH (Standard Units) | 7.85 | 7.70 | 7.23 | 7.56 | 7.72 | 7.73 |
| 11 | Total Acidity (mg/l CaCO3) | 12.00 | 10.00 | 12.00 | 2.00 | 12.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 156.00 | 132.00 | 226.00 | 168.00 | 148.00 | 134.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 498 | 683 | 776 | 364 | 545 | 346 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 263.42 | 168.75 | 113.60 | 57.62 | 200.03 | 224.73 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | 0.055 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | <1 | <1 | <1 | 8 | 425 | 23 |
| 19 | Total Hardness (mg/l as CaCO3) | 263.78 | 116.10 | 259.83 | 261.23 | 121.45 | 165.94 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-28-01 | 7-28-01 | 7-20-01 | 7-18-01 | 7-28-01 | 7-26-01 |
| 22 | Date Last Precipitation Event Occurred | 7-28-01 | 7-28-01 | 7-18-01 | 7-18-01 | 7-28-01 | 7-26-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

### ATTACHMENT 14A
### (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DW-162 | W-164 | W-165 | W-166 | W-167 | WL-168 |
| 2 | Identification Number | 312200 | 311836 | 312181 | 311837 | 311838 | 311608 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1296 | 1200 | 1140 | 1106 | 1105 | 1112 |
| 5 | Depth of Well Below Land Surface (feet) | 29' | 65' | 71' | 108' | 96' | 62' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 26' | 47' | 35' | 68.5' | 66.5' | 42' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-28-01 | 7-21-01 | 7-25-01 | 7-21-01 | 7-21-01 | 7-18-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | A | B | C | D | D | C |
| 10 | pH (Standard Units) | 7.17 | 7.95 | 7.39 | 7.77 | 8.26 | 7.74 |
| 11 | Total Acidity (mg/l CaCO3) | 18.00 | 22.00 | 26.00 | 18.00 | 18.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 152.00 | 252.00 | 266.00 | 160.00 | 500.00 | 224.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 971 | 521 | 518 | 428 | 984 | 415 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 125.12 | 256.83 | 253.54 | 177.81 | 271.65 | 130.88 |
| 17 | Total Iron (mg/l) | <0.03 | 0.038 | <0.03 | 0.036 | 0.033 | 0.045 |
| 18 | Total Suspended Solids (mg/l) | 40 | 6 | <1 | 14 | 3 | 1 |
| 19 | Total Hardness (mg/l as CaCO3) | 98.39 | 376.74 | 112.31 | 230.14 | 51.02 | 262.68 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-28-01 | 7-21-01 | 7-25-01 | 7-21-01 | 7-21-01 | 7-18-01 |
| 22 | Date Last Precipitation Event Occurred | 7-28-01 | 7-18-01 | 7-24-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DW-169 | W-170 | W-172 | DW-173 | W-174 | W-179 |
| 2 | Identification Number | 311587 | 311766 | 311767 | 311739 | 311768 | 311769 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1100 | 1105 | 1106 | 1166 | 1117 | 1060 |
| 5 | Depth of Well Below Land Surface (feet) | 25' | 75' | 116' | 25' | 101' | 34' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 18.5' | 53' | 20' | 21' | 38' | 23.5' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-18-01 | 7-19-01 | 7-19-01 | 7-19-01 | 7-19-01 | 7-19-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | A | C | D | A | D | C |
| 10 | pH (Standard Units) | 7.30 | 7.53 | 7.38 | 7.25 | 7.52 | 7.12 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 12.00 | 14.00 | 12.00 | 12.00 | 12.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 180.00 | 120.00 | 150.00 | 214.00 | 170.00 | 192.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 412 | 1030 | 663 | 503 | 580 | 407 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | 0.033 | 0.073 | 0.046 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 115.24 | 256.83 | 171.22 | 213.20 | 153.93 | 173.69 |
| 17 | Total Iron (mg/l) | 0.038 | 0.197 | 0.089 | <0.03 | <0.03 | 0.125 |
| 18 | Total Suspended Solids (mg/l) | 71 | <1 | 25 | <1 | 16 | 72 |
| 19 | Total Hardness (mg/l as CaCO3) | 290.93 | 37.55 | 292.96 | 277.59 | 264.04 | 226.84 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-19-01 | 7-19-01 | 7-19-01 | 7-19-01 | 7-19-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-292 | W-293 | W -294 | W-295 | W-296 | W-297 |
| 2 | Identification Number | 311842 | 311797 | 311609 | 312205 | 311798 | 311799 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1310 | 1302 | 1125 | 1264 | 1290 | 1280 |
| 5 | Depth of Well Below Land Surface (feet) | 94' | 289' | 57' | 42' | 88' | 90' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 68.5' | 53.5' | 54.5' | 41.5' | 58' | 28.5' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-21-01 | 7-20-01 | 7-18-01 | 7-28-01 | 7-20-01 | 7-20-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | C | C | B | B | B |
| 10 | pH (Standard Units) | 7.88 | 8.25 | 7.78 | 7.56 | 8.38 | 8.41 |
| 11 | Total Acidity (mg/l CaCO3) | 12.00 | 8.00 | 10.00 | 26.00 | 8.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 210.00 | 170.00 | 326.00 | 344.00 | 194.00 | 128.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 465 | 415 | 593 | 601 | 521 | 425 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.017 | <0.01 | 0.036 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 258.48 | 262.60 | 175.34 | 152.29 | 273.30 | 200.86 |
| 17 | Total Iron (mg/l) | <0.03 | 0.060 | 0.047 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 5 | <1 | <1 | <1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 344.46 | 187.83 | 165.50 | 134.21 | 204.20 | 282.47 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-21-01 | 7-20-01 | 7-18-01 | 7-28-01 | 7-20-01 | 7-20-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-28-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHI
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | WL-321 | W-323 | W-374 | W-396 | WL-397 | WL-398 |
| 2 | Identification Number | 311854 | 311605 | 311606 | 311430 | 311432 | 311433 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1304 | 1138 | 1285 | 1305 | 1310 | 1303 |
| 5 | Depth of Well Below Land Surface (feet) | 79' | 120' | 51' | 70' | 51' | 60' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 54' | 66' | 44' | 35' | 44.5' | 44' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-21-01 | 7-18-01 | 7-18-01 | 7-12-01 | 7-12-01 | 7-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | D | B | B | B | B |
| 10 | pH (Standard Units) | 7.62 | 8.31 | 7.94 | 7.83 | 7.75 | 7.42 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 2.00 | 4.00 | 4.00 | 2.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 212.00 | 472.00 | 150.00 | 184.00 | 186.00 | 220.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 556 | 889 | 309 | 403 | 433 | 533 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 1366.65 | 167.10 | 116.89 | 78.20 | 73.26 | 63.38 |
| 17 | Total Iron (mg/l) | <0.03 | 0.037 | 0.041 | 0.037 | 0.035 | 0.035 |
| 18 | Total Suspended Solids (mg/l) | 2 | <1 | <1 | 1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 432.29 | 35.02 | 199.09 | 304.15 | 93.28 | 93.28 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-21-01 | 7-18-01 | 7-18-01 | 7-12-01 | 7-12-01 | 7-12-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-7-01 | 7-7-01 | 7-7-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHI
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | ✓ | ✓ | ✓ |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DW-399 | W-400 | W-403 | W-405 | DW-406 | W-407 |
| 2 | Identification Number | 311425 | 311431 | 311850 | 312206 | 312201 | 311433 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1315 | 1315 | 1345 | 1322 | 1322 | 1303 |
| 5 | Depth of Well Below Land Surface (feet) | 30' | ~~47'~~ 53.5' | 119' | 103' | 24' | 60' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 22' | 45' | 45' | 78' | 22.5' | 44' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-12-01 | 7-12-01 | 7-21-01 | 7-28-01 | 7-28-01 | 7-28-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | A | B | B | B | A | B |
| 10 | pH (Standard Units) | 7.49 | 7.45 | 7.93 | 7.78 | 7.42 | 7.42 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 4.00 | 14.00 | 14.00 | 8.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 154.00 | 164.00 | 206.00 | 248.00 | 102.00 | 220.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 627 | 466 | 527 | 418 | 456 | 533 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 182.75 | 109.48 | 191.80 | 115.24 | 188.51 | 63.38 |
| 17 | Total Iron (mg/l) | 0.035 | 0.043 | 0.031 | <0.03 | <0.03 | 0.035 |
| 18 | Total Suspended Solids (mg/l) | <1 | <1 | <1 | 10 | 5 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 85.91 | 338.50 | 392.79 | 236.78 | 166.95 | 93.28 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-12-01 | 7-12-01 | 7-21-01 | 7-28-01 | 7-28-01 | 7-28-01 |
| 22 | Date Last Precipitation Event Occurred | 7-7-01 | 7-7-01 | 7-18-01 | 7-28-01 | 7-28-01 | 7-28-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
# DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DW-408 | WL-419 | DW-420 | DW-481 | W-452 | W-458 |
| 2 | Identification Number | 312202 | 311434 | 311426 | 311588 | 311607 | 311805 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1305 | 1261 | 1241 | 1155 | 1170 | 1170 |
| 5 | Depth of Well Below Land Surface (feet) | 33' | 101' | 23' | 12' | 68.5' | UNKNOWN |
| 6 | Static Water Level of Well Below Land Surface (feet) | 26' | 38' | 19' | 7' | 22' | 8' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 7-28-01 | 7-12-01 | 7-12-01 | 7-18-01 | 7-18-01 | 7-20-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | A | B | A | A | C | B |
| 10 | pH (Standard Units) | 7.50 | 7.30 | 7.22 | 7.57 | 7.89 | 8.43 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 8.00 | 6.00 | 6.00 | 4.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 98.00 | 210.00 | 140.00 | 234.00 | 252.00 | 160.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 648 | 565 | 479 | 474 | 404 | 407.00 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | --- |
| 15 | Total Manganese (mg/l) | 0.016 | 0.016 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 127.59 | 46.92 | 93.02 | 87.25 | 139.94 | 219.79 |
| 17 | Total Iron (mg/l) | <0.03 | 0.046 | 0.036 | <0.03 | 0.036 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 3 | <1 | <1 | 1 | <1 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 86.03 | 386.53 | 317.00 | 132.34 | 304.39 | 316.49 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-28-01 | 7-12-01 | 7-12-01 | 7-18-01 | 7-18-01 | 7-20-01 |
| 22 | Date Last Precipitation Event Occurred | 7-28-01 | 7-7-01 | 7-7-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-001 | U34-002 | U34-003 | U34-004 | U34-007 | U34-008 |
| 2 | Identification Number | 311590 | 311591 | 311592 | 311593 | 311594 | 311595 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1100 | 1072 | 1070 | 1069 | 1085 | 1055 |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .01 CFS | 1.35 CFS | 1.35 CFS | 1.35 CFS | .19 CFS | .15 CFS |
| 8 | Date Above Measurements Made | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | --- |
| 10 | pH (Standard Units) | 7.33 | 7.79 | 7.69 | 7.75 | 7.93 | 7.97 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 80.00 | 140.00 | 148.00 | 144.00 | 154.00 | 140.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 217 | 365 | 377 | 357 | 374 | 359 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | -- | --- |
| 15 | Total Manganese (mg/l) | 0.040 | 0.015 | 0.014 | 0.015 | 0.013 | 0.011 |
| 16 | Total Sulfates (mg/l) | 64.14 | 41.98 | 74.91 | 52.68 | 27.98 | 22.22 |
| 17 | Total Iron (mg/l) | 1.57 | 0.418 | 0.395 | 0.400 | 0.265 | 0.289 |
| 18 | Total Suspended Solids (mg/l) | 25 | 28 | 35 | 17 | 15 | 22 |
| 19 | Total Hardness (mg/l as CaCO3) | 112.20 | 200.25 | 208.64 | 208.39 | 216.67 | 206.97 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-143 | U34-145 | U34-146 | U34-147 | U34-149 | U34-150 |
| 2 | Identification Number | 311765 | 312191 | 312192 | 312193 | 311598 | 311599 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1105 | 1182 | 1138 | 1250 | 1190 | 1152 |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .0004 CFS | .02 CFS | .14 CFS | .002 CFS | .18 CFS | .18 CFS |
| 8 | Date Above Measurements Made | 7-19-01 | 7-26-01 | 7-26-01 | 7-26-01 | 7-18-01 | 7-18-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | --- |
| 10 | pH (Standard Units) | 8.02 | 8.01 | 7.85 | 7.98 | 7.87 | 7.93 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 10.00 | 12.00 | 12.00 | 4.00 | 2.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 240.00 | 158.00 | 170.00 | 182.00 | 176.00 | 158.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 520 | 405 | 407 | 685 | 374 | 401 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | -- | --- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.171 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 205.80 | 245.31 | 232.14 | 170.40 | 37.04 | 44.45 |
| 17 | Total Iron (mg/l) | 0.158 | 0.041 | 0.084 | <0.03 | 0.113 | 0.111 |
| 18 | Total Suspended Solids (mg/l) | 29 | 49 | 34 | 95 | 9 | 5 |
| 19 | Total Hardness (mg/l as CaCO3) | 205.49 | 186.07 | 205.78 | 265.27 | 232.28 | 242.52 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-19-01 | 7-26-01 | 7-26-01 | 7-26-01 | 7-18-01 | 7-18-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-26-01 | 7-26-01 | 7-26-01 | 7-18-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-163 | U34-164 | U34-165 | U34-166 | U34-167 | U34-G |
| 2 | Identification Number | 311600 | 311601 | 311602 | 311603 | 312194 | 311751 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1115 | 1110 | 1112 | 1075 | 1220 | 1085 |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .03 CFS | .04 CFS | .04 CFS | 1.3 CFS | .001 CFS | .0008 CFS |
| 8 | Date Above Measurements Made | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-19-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | --- |
| 10 | pH (Standard Units) | 7.85 | 7.92 | 7.86 | 7.88 | 7.81 | 7.34 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 6.00 | 6.00 | 4.00 | 10.00 | 12.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 156.00 | 174.00 | 150.00 | 178.00 | 134.00 | 170.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 336 | 365 | 303 | 355 | 343 | 405 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | -- | --- |
| 15 | Total Manganese (mg/l) | 0.057 | 0.011 | 0.012 | 0.012 | <0.01 | 0.025 |
| 16 | Total Sulfates (mg/l) | 30.40 | 29.63 | 162.17 | 128.41 | 113.60 | 256.89 |
| 17 | Total Iron (mg/l) | 0.193 | 0.127 | 0.160 | 0.425 | <0.03 | 0.123 |
| 18 | Total Suspended Solids (mg/l) | 2 | 25 | 98 | 46 | 7 | 114 |
| 19 | Total Hardness (mg/l as CaCO3) | 208.79 | 254.73 | 196.23 | 201.29 | 166.60 | 209.78 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-26-01 | 7-19-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-24-01 | 7-18-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECLAMATION

ATTACHMENT 14A
(HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360 -13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U37-000 | U37-001 | U37-002 | U37-004 | D19-000 | D-19A |
| 2 | Identification Number | 311604 | 311427 | 311428 | 311429 | 311575 | 311413 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | I |
| 4 | Surface Elevation for Sampling Station (msl) | 1130 | 1135 | 1125 | 1045 | 1135 | 1075 |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | --- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .12 CFS | .03 CFS | .11 CFS | .57 CFS | .25 CFS | .14 CFS |
| 8 | Date Above Measurements Made | 7-18-01 | 7-12-01 | 7-18-01 | 7-18-01 | 7-18-01 | 7-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | --- |
| 10 | pH (Standard Units) | 8.02 | 7.94 | 7.02 | 7.85 | 7.78 | 7.99 |
| 11 | Total Acidity (mg/l CaCO3) | 4.00 | 4.00 | 2.00 | 4.00 | 2.00 | 2.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 156.00 | 186.00 | 220.00 | 200.00 | 176.00 | 154.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 340 | 371 | 450 | 393 | 374 | 394 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | -- | --- |
| 15 | Total Manganese (mg/l) | 0.011 | 0.011 | <0.01 | 0.013 | 0.012 | <0.01 |
| 16 | Total Sulfates (mg/l) | 112.77 | 75.73 | 71.61 | 109.48 | 116.07 | 135.82 |
| 17 | Total Iron (mg/l) | 0.266 | 0.047 | 0.052 | 0.097 | 0.256 | 0.062 |
| 18 | Total Suspended Solids (mg/l) | 40 | <1 | 6 | 49 | 34 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 208.45 | 221.28 | 328.94 | 273.16 | 244.39 | 254.87 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 7-18-01 | 7-12-01 | 7-12-01 | 7-12-01 | 7-18-01 | 7-12-01 |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-7-01 | 7-7-01 | 7-7-01 | 7-18-01 | 7-7-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | D-21A | D-37A | D34-001 | D37-000 | U19-007 | |
| 2 | Identification Number | 311770 | 311414 | 311576 | 311415 | 311589 | |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | I | I | I | I | I | |
| 4 | Surface Elevation for Sampling Station (msl) | 1050 | 1010 | 1075 | 1195 | 1110 | |
| 5 | Depth of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | |
| 6 | Static Water Level of Well Below Land Surface (feet) | --- | --- | --- | --- | --- | |
| 7 | Flow for Spring and Stream (gpm or cfs) | .42 CFS | 1.4 CFS | 1.34 CFS | .21 CFS | .002 CFS | |
| 8 | Date Above Measurements Made | 7-20-01 | 7-12-01 | 7-18-01 | 7-12-01 | 7-18-01 | |
| 9 | Aquifer/Zone Identification For Well/Spring | --- | --- | --- | --- | --- | |
| 10 | pH (Standard Units) | 7.72 | 8.03 | 7.85 | 7.86 | 7.41 | |
| 11 | Total Acidity (mg/l CaCO3) | 12.00 | 2.00 | 4.00 | 2.00 | 6.00 | |
| 12 | Total Alkalinity (mg/l CaCO3) | 146.00 | 156.00 | 144.00 | 162.00 | 210.00 | |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 406 | 391 | 362 | 416 | 384 | |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | --- | --- | |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.011 | 0.017 | 0.017 | |
| 16 | Total Sulfates (mg/l) | 112.77 | 102.07 | 116.89 | 88.90 | 62.56 | |
| 17 | Total Iron (mg/l) | <0.03 | 0.090 | 0.404 | 0.089 | 0.072 | |
| 18 | Total Suspended Solids (mg/l) | 18 | 13 | 34 | <1 | 24 | |
| 19 | Total Hardness (mg/l as CaCO3) | 255.09 | 256.80 | 203.74 | 278.80 | 287.92 | |
| 20 | Nitrates | --- | --- | --- | — | --- | |
| 21 | Date Sampled for Analysis | 7-20-01 | 7-12-01 | 7-18-01 | 7-12-01 | 7-18-01 | |
| 22 | Date Last Precipitation Event Occurred | 7-18-01 | 7-7-01 | 7-18-01 | 7-7-01 | 7-18-01 | |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-223 | DS-226A | DS-226B | DS-227 | DS-229 | DS-230 |
| 2 | Identification Number | 314429 | 315475 | 314430 | 315485 | 315486 | 315487 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1122 | 1173 | 1155 | 1082 | 1290 | 1170 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | 1.2 GPM | .16 GPM | .1 GPM | .1 GPM | .4 GPM | .37 GPM |
| 8 | Date Above Measurements Made | 9-17-01 | 10-3-01 | 10-5-01 | 9-17-01 | 9-12-01 | 9-17-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | B | B | B |
| 10 | pH (Standard Units) | 7.71 | 8.08 | 7.85 | 7.52 | 7.86 | 7.87 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 8.00 | 8.00 | 8.00 | 6.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 170.00 | 242.00 | 162.00 | 216.00 | 158.00 | 198.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 378 | 546 | 369 | 950 | 496 | 488 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 72.44 | 170.40 | 17.28 | 107.13 | 181.92 | 200.37 |
| 17 | Total Iron (mg/l) | <0.03 | 0.036 | 0.158 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 2 | 3 | 25 | 6 | 5 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 207.64 | 279.19 | 221.15 | 106.38 | 251.27 | 254.97 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 10-3-01 | 9-17-01 | 10-4-01 | 10-4-01 | 10-4-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-29-01 | 9-13-01 | 9-29-01 | 9-29-01 | 9-29-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-240 | DS-241 | DS-242 | DS-243 | DS-245 | DS-246 |
| 2 | Identification Number | 315504 | 314431 | 314432 | 315510 | 315511 | 315492 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1170 | 1200 | 1090 | 1220 | 1280 | 1284 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | 1 GPM | .94 GPM | .37 GPM | .45 GPM | .15GPM | .14 GPM |
| 8 | Date Above Measurements Made | 10-5-01 | 9-17-01 | 9-17-01 | 10-8-01 | 10-8-01 | 10-2-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | B | B | B |
| 10 | pH (Standard Units) | 7.74 | 7.69 | 7.73 | 7.56 | 7.48 | 7.71 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 12.00 | 14.00 | 8.00 | 12.00 | 6.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 244.00 | 252.00 | 252.00 | 192.00 | 232.00 | 208.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 576 | 630 | 628 | 440 | 1060 | 1020 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 130.06 | 39.51 | 35.39 | 124.30 | 239.55 | 195.92 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | <1 | 20 | <1 | 1 | <1 | 2 |
| 19 | Total Hardness (mg/l as CaCO3) | 289.63 | 127.95 | 130.42 | 237.88 | 168.71 | 131.66 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 10-5-01 | 9-17-01 | 9-17-01 | 10-8-01 | 10-8-01 | 10-4-01 |
| 22 | Date Last Precipitation Event Occurred | 9-29-01 | 9-13-01 | 9-13-01 | 10-6-01 | 10-6-01 | 9-29-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | D-19A | D-21A | D-37A | D34-001 | D37-000 | |
| 2 | Identification Number | 314388 | 314767 | 314390 | 314427 | 314391 | |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | |
| 4 | Surface Elevation for Sampling Station (msl) | 1075 | 1050 | 1010 | 1075 | 1195 | |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | |
| 7 | Flow for Spring and Stream (gpm or cfs) | .004 CFS | .06 CFS | .02 CFS | .02 CFS | .009 CFS | |
| 8 | Date Above Measurements Made | 9-12-01 | 9-22-01 | 9-12-01 | 9-17-01 | 9-12-01 | |
| 9 | Aquifer/Zone Identification For Well/Spring | -- | -- | -- | -- | -- | |
| 10 | pH (Standard Units) | 7.16 | 7.89 | 7.81 | 7.73 | 8.72 | |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 8.00 | 10.00 | 8.00 | 8.00 | |
| 12 | Total Alkalinity (mg/l CaCO3) | 194.00 | 172.00 | 178.00 | 180.00 | 156.00 | |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 420 | 488 | 380 | 420 | 350 | |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | |
| 15 | Total Manganese (mg/l) | <0.01 | 0.015 | 0.064 | 0.141 | 0.093 | |
| 16 | Total Sulfates (mg/l) | 49.39 | 63.38 | 63.38 | 55.15 | 33.75 | |
| 17 | Total Iron (mg/l) | 0.038 | 0.079 | <0.03 | 0.098 | 0.129 | |
| 18 | Total Suspended Solids (mg/l) | 1 | 15 | <1 | 21 | 8 | |
| 19 | Total Hardness (mg/l as CaCO3) | 208.59 | 230.42 | 208.86 | 224.49 | 179.22 | |
| 20 | Nitrates | --- | --- | --- | --- | --- | |
| 21 | Date Sampled for Analysis | 9-12-01 | 9-22-01 | 9-12-01 | 9-17-01 | 9-12-01 | |
| 22 | Date Last Precipitation Event Occurred | 9-10-01 | 9-20-01 | 9-10-01 | 9-13-01 | 9-10-01 | |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

### ATTACHMENT 14A
### (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | DS-283 | DS-284 | DS-285 | DS-287 | DS-289 | DS-290 |
| 2 | Identification Number | 314760 | 314761 | 314392 | 314762 | 314393 | 314773 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1270 | 1170 | 1190 | 1220 | 1190 | 1185 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .69 GPM | .21 GPM | 1.5 GPM | ..34 GPM | .36 GPM | .54 GPM |
| 8 | Date Above Measurements Made | 9-22-01 | 9-22-01 | 9-12-01 | 9-22-01 | 9-12-01 | 9-22-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | C | B | C | B |
| 10 | pH (Standard Units) | 7.76 | 7.90 | 8.02 | 7.83 | 7.90 | 7.70 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 6.00 | 6.00 | 6.00 | 8.00 | 10.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 158.00 | 168.00 | 184.00 | 168.00 | 150.00 | 218.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 869 | 436 | 406 | 663 | 375 | 577 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 28.82 | 22.81 | 34.57 | 35.39 | 76.55 | 64.20 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 7 | 3 | 17 | 42 | 4 | 9 |
| 19 | Total Hardness (mg/l as CaCO3) | 409.45 | 230.81 | 214.76 | 356.81 | 192.09 | 303.96 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-22-01 | 9-22-01 | 9-12-01 | 9-22-01 | 9-12-01 | 9-22-01 |
| 22 | Date Last Precipitation Event Occurred | 9-20-01 | 9-20-01 | 9-10-01 | 9-20-01 | 9-10-01 | 9-20-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-165 | W-166 | W-167 | WL-168 | DW-169 | W-170 |
| 2 | Identification Number | 314744 | 314445 | 314446 | 314447 | 314433 | 314423 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1140 | 1106 | 1105 | 1112 | 1100 | 1105 |
| 5 | Depth of Well Below Land Surface (feet) | 71' | 108' | 96' | 62' | 25' | 75' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 37.5' | 70' | 70' | 43.5' | 19' | 54' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | C | D | D | C | A | C |
| 10 | pH (Standard Units) | 7.57 | 7.75 | 8.06 | 7.88 | 7.55 | 7.49 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 8.00 | 8.00 | 8.00 | 12.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 272.00 | 200.00 | 432.00 | 212.00 | 198.00 | 100.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 506 | 441 | 941 | 462 | 458 | 789 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.019 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 47.74 | 130.88 | 20.58 | 38.69 | 25.51 | 73.26 |
| 17 | Total Iron (mg/l) | 0.044 | <0.03 | <0.03 | <0.03 | <0.03 | 0.120 |
| 18 | Total Suspended Solids (mg/l) | 6 | <1 | 8 | 26 | 76 | 43 |
| 19 | Total Hardness (mg/l as CaCO3) | 321.29 | 196.35 | 67.93 | 239.58 | 262.93 | 198.31 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-12-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-13-01 | 9-13-01 | 9-13-01 | 9-13-01 | 9-10-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-172 | DW-173 | W-174 | W-179 | DW-180 | W-229 |
| 2 | Identification Number | 314424 | 315477 | 314425 | 314426 | 314411 | 315454 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1106 | 1166 | 1117 | 1060 | 1083 | 1290 |
| 5 | Depth of Well Below Land Surface (feet) | 116' | 25' | 101' | 34' | 32' | 100' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 19.5' | 23.5' | 38.5' | 24' | 24' | 58' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-12-01 | 10-3-01 | 9-12-01 | 9-12-01 | 9-12-01 | 10-2-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | D | A | D | C | A | B |
| 10 | pH (Standard Units) | 7.16 | 7.67 | 7.56 | 7.30 | 6.92 | 7.74 |
| 11 | Total Acidity (mg/l CaCO3) | 14.00 | 8.00 | 12.00 | 10.00 | 12.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 170.00 | 232.00 | 208.00 | 240.00 | 140.00 | 226.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 547 | 561 | 579 | 449 | 378 | 668 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 0.015 |
| 16 | Total Sulfates (mg/l) | 42.80 | 101.25 | 36.22 | 13.99 | 83.14 | 184.39 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 2 | 23 | 37 | 156 | 87 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 63.00 | 283.19 | 81.45 | 239.77 | 169.90 | 46.88 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-12-01 | 10-3-01 | 9-12-01 | 9-12-01 | 9-12-01 | 10-2-01 |
| 22 | Date Last Precipitation Event Occurred | 9-10-01 | 9-29-01 | 9-10-01 | 9-10-01 | 9-10-01 | 9-29-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W -294 | W-295 | W-296 | W-297 | W-299 | W-300 |
| 2 | Identification Number | 315519 | 315460 | 315461 | 315462 | 314802 | 314803 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1125 | 1264 | 1290 | 1280 | 1324 | 1321 |
| 5 | Depth of Well Below Land Surface (feet) | 57' | 42' | 88' | 90' | 103' | 116' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 56' | 41.75' | 61.5' | 32' | 81' | 80' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 10-8-01 | 10-2-01 | 10-2-01 | 10-2-01 | 9-22-01 | 9-22-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | C | B | B | B | B | B |
| 10 | pH (Standard Units) | 7.61 | 7.47 | 7.58 | 7.68 | 7.85 | 7.82 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 10.00 | 8.00 | 6.00 | 8.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 262.00 | 302.00 | 212.00 | 152.00 | 184.00 | 206.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 508 | 829 | 696 | 600 | 576 | 548 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.090 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 152.29 | 113.60 | 153.93 | 65.30 | 83.96 | 71.61 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | <1 | 10 | 12 | 23 | <1 | 5 |
| 19 | Total Hardness (mg/l as CaCO3) | 219.25 | 146.50 | 139.05 | 121.01 | 303.02 | 280.05 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 10-8-01 | 10-2-01 | 10-2-01 | 10-2-01 | 9-22-01 | 9-22-01 |
| 22 | Date Last Precipitation Event Occurred | 10-6-01 | 9-29-01 | 9-29-01 | 9-29-01 | 9-20-01 | 9-20-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-315 | DW-318 | WL-319 | WL-321 | W-322 | W-323 |
| 2 | Identification Number | 314746 | 314763 | 315501 | 315520 | 315517 | 314448 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1280 | 1294 | 1325 | 1304 | 1310 | 1138 |
| 5 | Depth of Well Below Land Surface (feet) | 88' | 18' | 89' | 79' | BURIED | 120' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 43' | 8' | 62' | 60.5' | SEALED | 67' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-17-01 | 9-22-01 | 10-4-01 | 10-8-01 | 10-8-01 | 9-17-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | A | B | B | UNKNOWN | D |
| 10 | pH (Standard Units) | 7.66 | 7.36 | 7.60 | 7.54 | 7.67 | 8.43 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 12.00 | 8.00 | 8.00 | 8.00 | 0.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 230.00 | 240.00 | 204.00 | 190.00 | 168.00 | 408.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 532 | 756 | 560 | 746 | 447 | 938 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | 0.071 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 53.50 | 41.98 | 131.71 | 107.83 | 263.42 | 41.16 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | 0.061 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 22 | 6 | 2 | <1 | 2 | 5 |
| 19 | Total Hardness (mg/l as CaCO3) | 404.59 | 86.66 | 224.19 | 342.78 | 220.20 | 30.38 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 9-22-01 | 10-4-01 | 10-8-01 | 10-8-01 | 9-17-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-20-01 | 9-29-01 | 10-6-01 | 10-6-01 | 9-13-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

NOTE: If information required by items 5, 6, and 9 is unobtainable, submit as an addendum to Attachment 14A a statement giving the reasons why the information is unobtainable.
NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-374 | W-396 | WL-397 | WL-398 | DW-399 | W-400 |
| 2 | Identification Number | 314405 | 314406 | 314408 | 314409 | 314401 | 314804 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1285 | 1305 | 1310 | 1303 | 1315 | 1315 |
| 5 | Depth of Well Below Land Surface (feet) | 51' | 70' | 51' | 60' | 30' | 47' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 45' | 40.5' | 47.5' | 48' | 23' | 35.5' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-12-01 | 9-12-01 | 9-12-01 | 9-12-01 | 9-12-01 | 9-22-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | B | A | B |
| 10 | pH (Standard Units) | 7.86 | 7.91 | 7.91 | 7.58 | 7.48 | 7.75 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 6.00 | 8.00 | 12.00 | 12.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 142.00 | 202.00 | 210.00 | 216.00 | 280.00 | 204.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 365 | 427 | 429 | 501 | 650 | 554 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| 16 | Total Sulfates (mg/l) | 85.61 | 89.72 | 55.97 | 81.49 | 95.49 | 109.48 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 8 | 6 | 12 | 8 | 30 | <1 |
| 19 | Total Hardness (mg/l as CaCO3) | 191.13 | 260.08 | 262.29 | 313.55 | 73.67 | 309.10 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-12-01 | 9-12-01 | 9-12-01 | 9-12-01 | 9-12-01 | 9-22-01 |
| 22 | Date Last Precipitation Event Occurred | 9-10-01 | 9-10-01 | 9-10-01 | 9-10-01 | 9-10-01 | 9-20-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | W-403 | W-405 | W-407 | DW-408 | W-419 | DW-420 |
| 2 | Identification Number | 315518 | 314765 | 314766 | 314764 | 314805 | 314777 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1345 | 1322 | 1306 | 1305 | 1261 | 1241 |
| 5 | Depth of Well Below Land Surface (feet) | 119' | 103' | 63' | 33' | 101' | 23' |
| 6 | Static Water Level of Well Below Land Surface (feet) | 45' | 78.5' | 57.5' | 27' | 39' | 22.5' |
| 7 | Flow for Spring and Stream (gpm or cfs) | -- | -- | -- | -- | -- | -- |
| 8 | Date Above Measurements Made | 9-12-01 | 9-22-01 | 9-22-01 | 9-22-01 | 9-22-01 | 9-22-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | B | B | B | A | B | A |
| 10 | pH (Standard Units) | 7.57 | 7.48 | 7.41 | 7.92 | 7.68 | 7.43 |
| 11 | Total Acidity (mg/l CaCO3) | 10.00 | 6.00 | 14.00 | 8.00 | 6.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 292.00 | 114.00 | 308.00 | 130.00 | 208.00 | 204.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 656 | 524 | 1100 | 809 | 579 | 639 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | 0.057 | 1.86 | <0.01 | <0.01 | 0.217 |
| 16 | Total Sulfates (mg/l) | 108.66 | 52.68 | 60.91 | 54.33 | 89.72 | 97.13 |
| 17 | Total Iron (mg/l) | <0.03 | 0.035 | 0.050 | <0.03 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | <1 | 81 | 55 | 18 | <1 | 8 |
| 19 | Total Hardness (mg/l as CaCO3) | 337.56 | 223.54 | 234.87 | 345.77 | 312.57 | 312.69 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 10-8-01 | 9-22-01 | 9-22-01 | 9-22-01 | 9-22-01 | 9-22-01 |
| 22 | Date Last Precipitation Event Occurred | 10-6-01 | 9-20-01 | 9-20-01 | 9-20-01 | 9-20-01 | 9-20-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-050 | U34-051 | U34-053 | U34-143 | U34-145 | U34-146 |
| 2 | Identification Number | 314739 | 314740 | 314741 | 314422 | 315495 | 315496 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1160 | 1100 | 1070 | 1105 | 1182 | 1138 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .002 CFS | .008 CFS | .01 CFS | .0003 CFS | .004 CFS | .01 CFS |
| 8 | Date Above Measurements Made | 9-17-01 | 9-17-01 | 9-17-01 | 9-12-01 | 10-4-01 | 10-4-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | -- | -- | -- | -- | -- | -- |
| 10 | pH (Standard Units) | 7.89 | 8.12 | 8.09 | 8.01 | 7.82 | 7.65 |
| 11 | Total Acidity (mg/l CaCO3) | 6.00 | 8.00 | 8.00 | 14.00 | 8.00 | 12.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 150.00 | 234.00 | 214.00 | 256.00 | 204.00 | 240.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 547 | 476 | 466 | 494 | 488 | 577 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.030 | <0.01 | <0.01 | 0.440 | <0.01 | 0.472 |
| 16 | Total Sulfates (mg/l) | 57.62 | 32.10 | 46.92 | 39.51 | 136.65 | 55.15 |
| 17 | Total Iron (mg/l) | 0.038 | 0.034 | <0.03 | 0.039 | <0.03 | <0.03 |
| 18 | Total Suspended Solids (mg/l) | 22 | 17 | 15 | 26 | 2 | 4 |
| 19 | Total Hardness (mg/l as CaCO3) | 324.37 | 337.86 | 318.77 | 72.02 | 187.43 | 212.59 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 9-17-01 | 9-17-01 | 9-12-01 | 10-4-01 | 10-4-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-13-01 | 9-13-01 | 9-10-01 | 9-29-01 | 9-29-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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NOTE: For each sample provide data for either item 13 or 14.

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360-13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-149 | U34-150 | U34-163 | U34-164 | U34-165 | U34-166 |
| 2 | Identification Number | 315506 | 315507 | 314441 | 314442 | 314443 | 314444 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1190 | 1152 | 1115 | 1110 | 1112 | 1075 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .0002 CFS | .02 CFS | .0002 CFS | .009 CFS | .004 CFS | .02 CFS |
| 8 | Date Above Measurements Made | 10-5-01 | 10-5-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | -- | -- | -- | -- | -- | -- |
| 10 | pH (Standard Units) | 7.89 | 8.01 | 7.64 | 7.96 | 7.88 | 8.02 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 10.00 | 10.00 | 8.00 | 8.00 | 10.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 208.00 | 212.00 | 182.00 | 194.00 | 178.00 | 198.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 561 | 556 | 389 | 442 | 375 | 427 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | <0.01 | <0.01 | 0.072 | 0.027 | 0.467 | 0.135 |
| 16 | Total Sulfates (mg/l) | 206.62 | 170.40 | 55.15 | 62.56 | 73.26 | 53.50 |
| 17 | Total Iron (mg/l) | <0.03 | <0.03 | 0.064 | 0.038 | 0.080 | 0.103 |
| 18 | Total Suspended Solids (mg/l) | 1 | 1 | 36 | 13 | 20 | 8 |
| 19 | Total Hardness (mg/l as CaCO3) | 263.13 | 262.63 | 211.24 | 263.86 | 221.34 | 231.55 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 10-5-01 | 10-5-01 | 9-17-01 | 9-17-01 | 9-17-01 | 9-17-01 |
| 22 | Date Last Precipitation Event Occurred | 9-29-01 | 9-29-01 | 9-13-01 | 9-13-01 | 9-13-01 | 9-13-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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9/88

# OHIO DEPARTMENT OF NATURAL RESOURCES
## DIVISION OF RECLAMATION

## ATTACHMENT 14A
## (HYDROLOGIC MEASUREMENTS AND ANALYSES)

APPLICANT THE OHIO VALLEY COAL COMPANY (D-0360 -13)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Identification No. of Sampling Station from Hydrology Map | U34-167 | U37-000 | U37-001 | U37-002 | U37-004 | D19-000 |
| 2 | Identification Number | 314742 | 314403 | 314404 | 314800 | 314801 | 314389 |
| 3 | High (H)/Low (L) Intermediate (I) Designation (if applicable) | L | L | L | L | L | L |
| 4 | Surface Elevation for Sampling Station (msl) | 1220 | 1130 | 1135 | 1125 | 1045 | 1135 |
| 5 | Depth of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 6 | Static Water Level of Well Below Land Surface (feet) | -- | -- | -- | -- | -- | -- |
| 7 | Flow for Spring and Stream (gpm or cfs) | .00002 CFS | .0005 CFS | .006 CFS | .009 CFS | .02 CFS | .005 CFS |
| 8 | Date Above Measurements Made | 9-17-01 | 9-12-01 | 9-12-01 | 9-22-01 | 9-22-01 | 9-12-01 |
| 9 | Aquifer/Zone Identification For Well/Spring | -- | -- | -- | -- | -- | -- |
| 10 | pH (Standard Units) | 7.31 | 7.81 | 8.02 | 8.16 | 8.02 | 7.68 |
| 11 | Total Acidity (mg/l CaCO3) | 8.00 | 8.00 | 6.00 | 6.00 | 6.00 | 8.00 |
| 12 | Total Alkalinity (mg/l CaCO3) | 162.00 | 148.00 | 130.00 | 220.00 | 182.00 | 202.00 |
| 13 | Specific Conductivity (umhos/cm at 25° C) | 340 | 384 | 312 | 531 | 451 | 416 |
| 14 | Total Dissolved Solids (mg/l) | -- | -- | -- | -- | -- | -- |
| 15 | Total Manganese (mg/l) | 0.230 | 0.017 | <0.01 | 0.056 | 0.148 | <0.01 |
| 16 | Total Sulfates (mg/l) | 23.87 | 108.66 | 64.20 | 46.09 | 54.33 | 79.85 |
| 17 | Total Iron (mg/l) | 0.094 | 0.078 | 0.038 | <0.03 | 0.099 | 0.107 |
| 18 | Total Suspended Solids (mg/l) | 26 | 23 | 8 | 10 | 7 | 31 |
| 19 | Total Hardness (mg/l as CaCO3) | 227.41 | 200.04 | 154.82 | 280.87 | 200.70 | 249.61 |
| 20 | Nitrates | --- | --- | --- | --- | --- | --- |
| 21 | Date Sampled for Analysis | 9-17-01 | 9-12-01 | 9-12-01 | 9-22-01 | 9-22-01 | 9-12-01 |
| 22 | Date Last Precipitation Event Occurred | 9-13-01 | 9-10-01 | 9-10-01 | 9-20-01 | 9-20-01 | 9-10-01 |

Laboratory Name REAM & HAAGER LABORATORIES, INC.
Address 1226 KADERLY STREET NW City NEW PHILADELPHIA
State OHIO Zip 44663

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OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND RECLAMATION

ATTACHMENT 14B
(GROUND WATER HYDROLOGY DESCRIPTION)

APPLICANT'S NAME The Ohio Valley Coal Company

| Aquifer/Zone Identification | Aquifer/Zone Lithology | Aquifer/Zone Thickness | Aquifer/Zone Elevation (msl) | Aquifer/Zone Horiz. Extent | Aquifer/Zone Known Uses | Approx. Rate of Discharge/Usage of Aquifer/Zone (gpm or cfs) |
|---|---|---|---|---|---|---|
| (A) Unconsolidated Material | Silt, Sand & Gravel Weathered Bedrock | Up to 30 feet | 980 to 1346 msl | Sand & Gravel Primarily along main stream valleys * Weathered Bedrock Throughout application area | Domestic | Variable-Generally <2 to >20 gpm |
| (B) Washington No. 12 Cyclothem | Silt, Sandstone, Limestone, Coal | Approximately 140 feet | 1080 to 1300 msl | Local-Primarily where less than 100 feet deep | Domestic Livestock | Variable-Generally less than 2 gpm |
| (C) Waynesburg No. 11 Cyclothem | Silt, Sandstone, Limestone, Coal | Approximately 100 feet | 980 to 1150 msl | Local-Primarily where less than 100 feet deep | Domestic Livestock | Variable-Generally less than 2 gpm |
| (D) Sewickley No. 9 Cyclothem | Silt, Sandstone, Limestone, Coal | Approximately 120 feet | 820 to 1050 msl | Local-Primarily where less than 100 feet deep | Domestic | Variable-Generally less than 2 gpm |
| | | | | * - e.g., Captina Creek | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

TOVCC 12130

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINERAL RESOURCES MANAGEMENT**

**ATTACHMENT 14C**
**(WELL/SPRING INVENTORY)**

Applicant's Name THE OHIO VALLEY COAL COMPANY (D-0360-13)

| Well/Spring Identification Number | Name of Owner of Well/Spring | Surface Elevation of Well/Spring | Depth of Well in Feet Below Land Surface | Static Water Level of Well in Feet Below Land Surface | Lithology of Supplying Aquifer/ Waterbearing Zone | Known Uses of Well/Spring (if spring give discharge rate) |
|---|---|---|---|---|---|---|
| WL-168 | A. FUNKHOUSER | 1112 | 62' | 37' | C | DOMESTIC |
| DW-169 | A. FUNKHOUSER | 1100 | 25' | 19' | A | DOMESTIC |
| W-172 | A. MAY | 1106 | 116' | 20' | D | NOT IN USE |
| DW-173 | S. RICE | 1166 | 25' | 16' | A | OCCASIONAL DOMESTIC |
| W-294 | J. WILSON | 1125 | 57' | 45' | C | DOMESTIC |
| W-323 | F. FUNKHOUSER | 1138 | 120' | 61' | D | DOMESTIC |
| W-396 | C. WORKMAN | 1305 | 70' | 37' | B | DOMESTIC |
| W-405 | F. SIMPSON | 1322 | 103' | 77' | B | NOT IN USE |
| DW-406 | F. SIMPSON | 1322 | 24' | 22' | A | NOT IN USE |
| W-407 | F. SIMPSON | 1306 | 63' | 57' | B | NOT IN USE |
| DW-408 | F. SIMPSON | 1305 | 33' | 26' | A | DOMESTIC |
| DS-223 | S. RICE | 1130 | N/A | N/A | B | AGRICULTURAL 1.11 GPM |
| DS-242 | R. SAFFELL | 1090 | N/A | N/A | C | AGRICULTURAL 3.1 GPM |
| DS-282 | F. SIMPSON | 1268 | N/A | N/A | B | NONE 4.35 GPM |
| DS-286 | F. SIMPSON | 1220 | N/A | N/A | B | UNUSED/1.4 GPM |
| DS-287 | F. SIMPSON | 1220 | N/A | N/A | B | UNUSED/.89 GPM |

**OHIO DEPARTMENT OF NATURAL RESOURCES**
**DIVISION OF MINES AND RECLAMATION**

**ATTACHMENT 14D**
**SURFACE BODIES/PUBLIC WATER SUPPLIES**

**APPLICANT'S NAME** THE OHIO VALLEY COAL COMPANY

| Surface Water/ Public Supply Identification # | Type of Surface Water/Public Supply | Name of Owner of Surface Water/ Public Supply | Known Uses of Surface Water/ Public Supply |
|---|---|---|---|
| Williams Creek | Perenial Stream | See Application Map | As Noted: |
| U34-166 | Stream (Perennial) | SAFFELL | LIVESTOCK |
| | | | |
| Williams Creek Tributaries | Intermittent Streams | See Application Map | As Noted: |
| U34-007, U34-008 | Stream | FUNKHOUSER | UNUSED |
| U34-143 | Stream | STUDENC | UNUSED |
| U34-164 | Stream | SAFFELL | UNUSED |
| U34-001 | Pond P-16 | FUNKHOUSER | UNUSED |
| Joy Fork Tributaries | Intermittent Streams | See Application Map | As Noted: |
| These points are outside the hydrologic boundary but they define the stream through the application area. | | | |
| U37-000 | Stream | KEMP | UNUSED |
| U37-001 | Pond P-7 | HENNEBERT | RECREATIONAL |
| D37-000 | Stream | HENNEBERT | LIVESTOCK |
| PUBLIC WATER | | | |
| P-3 | PUBLIC WATER | M.D. & K. MAY | DOMESTIC |
| P-4 | PUBLIC WATER | A.A. MAY | DOMESTIC |
| P-5 | PUBLIC WATER | RHODES ET AL. | DOMESTIC |
| P-6 | PUBLIC WATER | STUDENC | DOMESTIC |
| P-8 | PUBLIC WATER | RICE | DOMESTIC |

PRECIPITATION RECORD FOR USE WITH YOUR
Taylor 11" CLEAR-VU RAIN GAGE

LOCATION TraDat, Inc.

COUNTY Ohio STATE West Virginia

TIME OF OBSERVATION 8:30 AM YEAR 1990

ADDENDUM TO PAGE 19, PART 2, D(3)

| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.01 | 0.16 | 0.00 | 0.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 | 0.00 | s - melted snow |
| 2 | Trace | 0.10 | 0.00 | 0.10 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 | |
| 3 | 0.10 | 0.70 | 0.00 | 0.07 | 0.12 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | |
| 4 | 0.16 | 0.35 | 0.00 | 0.05 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 | 0.00 | Trace | |
| 5 | 0.00 | 0.00 | 0.00 | 0.12 | 0.30 | 0.06 | 0.19 | 0.05 | 0.20 | 0.00 | 0.53 | 0.00 | |
| 6 | 0.06 | Trace | 0.00 | 0.25 | 0.00 | 0.43 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 | |
| 7 | 0.00 | 0.10 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 1.25 | 0.00 | Trace | 0.00 | |
| 8 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.86 | 0.15 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | |
| 9 | Trace | 0.60 | 0.08 | Trace | 0.04 | 0.38 | 0.47 | 0.70 | 0.91 | 0.05 | 0.28 | 0.00 | |
| 10 | 0.00 | 0.00 | 0.00 | 0.90 | 0.22 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 11 | 0.04 | 0.15 | 0.07 | 0.16 | 0.00 | 0.00 | 2.33 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | |
| 12 | Trace | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 13 | 0.00 | 0.04 | 0.00 | 0.17 | 0.21 | 0.00 | 0.77 | 0.20 | 0.00 | 0.01 | 0.00 | 0.00 | |
| 14 | 0.01 | 0.54 | 0.00 | 0.30 | 0.00 | 0.95 | 0.17 | 0.00 | 0.71 | 0.00 | 0.00 | 0.10 | |
| 15 | 0.09 | 0.41 | 0.00 | 0.00 | 0.05 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.67 | |
| 16 | 0.00 | 0.06 | 0.80 | 0.01 | 1.12 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.40 | 0.00 | |
| 17 | 0.12 | 0.00 | 0.00 | 0.09 | 0.00 | 0.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 | |
| 18 | 0.00 | 0.00 | Trace | 0.00 | 0.00 | 0.00 | 0.00 | Trace | 0.02 | 0.00 | 0.00 | 0.93 | |
| 19 | 0.08 | 0.00 | 0.25 | Trace | 0.15 | 0.00 | 0.00 | 1.45 | 0.40 | 0.50 | 0.00 | 0.00 | |
| 20 | 0.93 | 0.00 | 0.00 | 0.30 | 0.15 | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 21 | 0.03 | 0.00 | 0.00 | 0.04 | 0.00 | 0.02 | 0.27 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | |
| 22 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.18 | 0.74 | 0.20 | 0.00 | 0.00 | 0.53 | 0.15 | |
| 23 | 0.08 | 0.14s | 0.20 | 0.00 | 0.00 | 0.06 | 0.02 | 0.40 | 0.27 | 0.40 | 0.00 | 0.47 | |
| 24 | 0.01s | 0.06 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.02 | |
| 25 | 0.09 | 0.00 | 0.00 | 0.16 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 26 | 0.07 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | |
| 27 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.13s | |
| 28 | 0.40 | 0.00 | 0.00 | 0.00 | 1.08 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 29 | 0.74 | — | 0.02 | 0.00 | 0.39 | 0.00 | 0.00 | 0.18 | 0.53 | 0.00 | 0.00 | 0.09 | |
| 30 | 0.00 | — | 0.08 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.12 | 0.00 | 0.00 | 1.40 | |
| 31 | 0.00 | — | 0.21 | — | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | |
| Total | 2.87 | 3.63 | 1.78 | 3.46 | 5.84 | 3.94 | 6.29 | 3.18 | 6.03 | 1.84 | 2.45 | 5.41 | |

SYBRON Taylor

Total Annual 46.72

**PRECIPITATION RECORD FOR USE WITH YOUR**
**Taylor 11" CLEAR-VU RAIN GAGE**

**LOCATION** TraDet, Inc.

**COUNTY** Ohio **STATE** West Virginia

**TIME OF OBSERVATION** **YEAR** 1991

ADDENDUM TO PAGE 19, PART 2, D(3)

| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.05s | 0.00 | 0.11 | 0.00 | 0.40 | | | | | | s - melted snow |
| 2 | 0.00 | 0.00 | 0.02s | 0.00 | 0.00 | 0.00 | 0.20 | | | | | | |
| 3 | 0.00 | 0.00 | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | |
| 4 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.84 | | | | | | |
| 5 | 0.15 | 0.31 | 0.00 | 0.13 | 0.93 | 0.00 | 0.00 | | | | | | |
| 6 | 0.00 | 0.30 | 0.65 | 0.00 | 0.08 | 0.00 | 0.00 | | | | | | |
| 7 | 0.19 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 1.18 | | | | | | |
| 8 | 0.18 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.19 | | | | | | |
| 9 | 0.02 | 0.00 | 0.01 | 0.55 | 0.00 | 0.00 | 0.00 | | | | | | |
| 10 | 0.49 | 0.21 | Tracs | 0.00 | 0.00 | 0.00 | | | | | | | |
| 11 | Trace | 0.00 | 0.00 | 0.00 | 0.00 | 1.63 | | | | | | | |
| 12 | 0.00 | 0.00 | 0.12 | Trace | 0.00 | 0.00 | | | | | | | |
| 13 | Trace | 0.22 | 0.25 | 0.86 | 0.00 | 0.00 | | | | | | | |
| 14 | Trace | 0.29 | 0.00 | 0.24 | 0.00 | 0.00 | | | | | | | |
| 15 | 0.36 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 16 | 0.19 | 0.06s | 0.00 | 0.00 | 0.00 | 0.25 | | | | | | | |
| 17 | 0.01 | 0.05 | 0.09 | 0.10 | 0.02 | 0.00 | | | | | | | |
| 18 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 19 | Trace | 0.20 | 0.00 | 0.05 | 0.00 | 0.00 | | | | | | | |
| 20 | 0.28s | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 21 | 0.02s | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 22 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 23 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 24 | 0.01s | 0.00 | 0.11 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 25 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 26 | 0.01s | 0.31s | 0.14 | 0.00 | Trace | 0.00 | | | | | | | |
| 27 | 0.30s | Trace s | 0.02 | 0.00 | 0.07 | 0.00 | | | | | | | |
| 28 | 0.00 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | | | | | | | |
| 29 | 0.40 | - | 0.00 | 0.13 | 0.00 | 0.00 | | | | | | | |
| 30 | 0.17 | - | 0.05s | 0.00 | 0.65 | 0.25 | | | | | | | |
| 31 | 0.61s | - | 0.04 | - | 0.04 | - | | | | | | | |
| Total | 2.74 | 1.51 | 2.63 | 2.18 | 1.97 | 2.13 | | | | | | | |

SYBRON Taylor

Total Annual

TOVCC 12134

# ANNUAL RAINFALL REPORT

Location No. 6 Mine Year 1991

| DATE | JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | SEPT. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | 0 | 0.20 | 0 | 0.15 | 0 | 0 | 0 |
| 2 | | | | | | 0 | 0.50 | 0 | 0 | 0 | 0 | 0.40 |
| 3 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 1.90 |
| 4 | | | | | | 0 | 0 | 0.30 | 0 | TRACE | 0 | TRACE m3 |
| 5 | | | | | | 0 | 0.25 | 0 | 0.50 | 0 | 0 | TRACE m3 |
| 6 | | | | | | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 |
| 7 | | | | | | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 |
| 8 | | | | | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | | | | | W | 0 | 0 | 0.38 | 0 | 0 | 0 | 0.10 |
| 10 | | | | | A | 0 | 0 | 0.10 | 0.95 | 0 | 0 | 0.25 |
| 11 | A | A | A | A | R | 0 | 0 | 0 | 0.20 | .20 | .40 | 0 |
| 12 | W | W | W | W | D | 0.30 | 0 | 0 | 0 | .25 | 0 | 0 |
| 13 | A | A | A | A | E | 0 | 0.10 | 0 | 0 | .05 | .40 m3 | 0 |
| 14 | R | R | R | R | W | 0 | 0 | 0 | 0 | 0 | TRACE | 0 |
| 15 | D | D | D | D | R | 0 | 0 | 0 | 0 | .25 | 0 | 1.00 |
| 16 | E | E | E | E | | 0 | 0 | 0 | 0 | 0 | 0.05 | 0.30 m3 |
| 17 | W | W | W | W | T | 1.00 | 0 | 0.50 | 0 | 0 | 0 | 0 |
| 18 | R | R | R | R | O | 0 | 0 | 0 | 0 | 0 | 0 | TRACE m3 |
| 19 | | | | | N | 0.10 | 0 | 0 | 0.20 | 0 | 0 | 0 |
| 20 | T | T | T | T | | 0 | 0 | 1.80 | 0 | 0 | 0.22 | 0 |
| 21 | O | O | O | O | | 0 | 0 | 0.10 | 0 | 0 | 0.10 | 0 |
| 22 | N | N | N | N | O | 0 | 0 | 0 | 0 | 0 | 0.40 | 0 |
| 23 | | | | | 0 | 0 | 0.30 | 0 | 0.23 | 0 | 1.00 | 0.40 |
| 24 | | | | | 0 | 0 | 0.40 | 0 | TRACE | 0 | 0 | 0 |
| 25 | | | | | 0 | 0 | TRACE | 0 | 1.40 | 0 | 0 | 0 |
| 26 | | | | | 0 | 0 | 0 | 0 | 0.10 | TRACE | 0 | 0 |
| 27 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | TRACE |
| 28 | | | | | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | | | | | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | | X | | | 0 | 0 | 1.50 | 0 | 0 | 0 | 0 | 0.50 |
| 31 | | X | | X | 0.16 | X | 0.15 | 0 | X | 0 | X | 0 |
| Total | | | | | | 1.40 | 3.90 | 3.18 | 3.73 | 0.75 | 2.57 | 4.85 |

TOTAL FOR YEAR

TOVCC 12135

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
RAINFALL RECORD – 1993

MONTH

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.01 | T | 0.00 | 0.20 | 0.00 | 0.00 | 1.00 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0.56 | 0.00 | 0.00 | 0.03 | T | 0.29 | 0.10 | 1.03 | 0.00 | 0.47 | T | 0.13 |
| 3 | 0.02 | 0.00 | 0.40 | 0.00 | 0.00 | 0.17 | 0.47 | 0.00 | 1.99 | 0.00 | 0.10 | 0.00 |
| 4 | 0.63 | 0.00 | 1.45 | 0.00 | 0.16 | 0.50 | 0.46 | 0.01 | 0.00 | 0.00 | 0.05 | 0.79 |
| 5 | 0.01 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.01 |
| 7 | T | 0.00 | 0.04 | 0.00 | 0.00 | 0.86 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 |
| 8 | T | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 0.02 | 0.00 | 0.08 | 0.05 | 0.00 | 0.12 | 0.00 | 0.00 | 0.85 | 0.30 | 0.00 | 0.10 |
| 10 | 0.15 | 0.00 | 0.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| 11 | 0.19 | 0.39 | 0.00 | 0.06 | 0.00 | 0.00 | 0.31 | 0.00 | 0.00 | T | 0.00 | T |
| 12 | 0.00 | 0.00 | 0.00 | 0.06 | 0.49 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 0.39 | 0.20 | 0.40 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.90 | 0.00 |
| 14 | T | 0.01 | 0.00 | 0.07 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 |
| 15 | 0.00 | 0.40 | 0.00 | 0.30 | 0.04 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | T | 0.01 |
| 16 | 0.00 | 0.50 | 0.20 | 0.00 | 0.06 | 0.00 | 0.00 | 1.61 | 0.00 | 0.90 | T | 0.00 |
| 17 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.01 | 0.80 | 0.00 |
| 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.30 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 |
| 19 | 0.00 | 0.00 | 0.01 | 0.01 | T | 0.00 | 0.66 | 0.00 | 0.00 | 0.55 | 0.00 | 0.00 |
| 20 | T | 0.00 | 0.38 | 0.01 | T | 0.14 | 0.00 | 0.00 | T | 0.39 | 0.00 | 0.41 |
| 21 | 0.70 | 0.73 | 0.00 | 0.03 | T | 0.78 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.03 |
| 22 | 0.05 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.10 |
| 23 | 0.00 | 0.02 | 0.49 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 |
| 24 | 0.50 | 0.00 | 0.02 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |
| 25 | 0.00 | 0.15 | 0.00 | 2.20 | 0.00 | 0.72 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.10 |
| 26 | 0.00 | T | 0.00 | 0.10 | 0.00 | 0.10 | 0.31 | 0.00 | 0.75 | 0.00 | 0.16 | 0.00 |
| 27 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.62 | 0.00 |
| 28 | 0.00 | 0.00 | T | 0.00 | 0.13 | 0.39 | 0.35 | 0.00 | 0.10 | 0.00 | T | 0.00 |
| 29 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | T | 0.00 | 0.00 |
| 30 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.04 |
| 31 | 0.00 | | 0.38 | | 0.65 | | 0.00 | T | | 1.50 | | 0.06 |
| TOT. | 3.23 | 2.46 | 4.96 | 3.12 | 1.85 | 4.37 | 4.00 | 3.07 | 4.83 | 4.21 | 3.03 | 2.19 |

T = TRACE

ANNUAL TOTAL: 41.32

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
RAINFALL RECORD – 1994

MONTH

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.10 | 0.00 |
| 2 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | T | T | 0.10 | 0.05 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.46 | 0.00 | 0.00 | 0.00 | 0.90 |
| 5 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.06 |
| 6 | 0.28 | 0.00 | 0.00 | 0.70 | 0.20 | 0.00 | 0.83 | 0.00 | 0.00 | 0.00 | T | 0.01 |
| 7 | 0.14 | 0.00 | 0.19 | 0.00 | 0.83 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 8 | 0.00 | 0.81 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.59 | 0.00 |
| 9 | 0.00 | T | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 |
| 10 | 0.00 | 0.00 | T | 1.38 | 0.00 | 0.00 | T | 0.00 | T | 0.00 | 0.00 | 0.61 |
| 11 | 0.30 | T | 0.00 | 0.11 | 0.30 | 0.90 | 0.00 | T | 0.00 | 0.00 | 0.00 | T |
| 12 | 0.01 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | T | 0.01 | 0.20 | T | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| 14 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.36 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | T | 0.00 | 0.10 | 0.95 | 0.60 | 0.00 | 0.30 | 0.00 | T | 0.00 | 0.60 | 0.00 |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 |
| 17 | 0.86 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 | 2.30 | 0.00 | 0.00 | 0.00 |
| 18 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.03 |
| 19 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 |
| 20 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 |
| 21 | 0.00 | 0.39 | 0.68 | 0.00 | 0.00 | 0.62 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22 | 0.00 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 2.69 | 0.00 | 0.00 | 0.00 | 0.00 |
| 23 | 0.01 | 0.65 | 0.19 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 |
| 24 | 0.01 | 0.02 | 0.00 | 0.00 | T | 0.50 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 25 | 0.46 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.40 | 0.00 | 0.82 | 0.00 | 0.00 | 0.00 |
| 26 | 0.00 | 0.00 | 0.05 | 0.00 | T | 1.19 | 0.00 | 0.02 | T | 0.00 | 0.00 | 0.00 |
| 27 | 1.89 | 0.00 | 0.90 | 0.00 | 0.00 | T | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | 0.08 | T | 0.18 | T | 0.00 | 0.29 | 0.00 | 0.41 | 0.00 | 0.00 | 0.95 | 0.00 |
| 29 | 0.00 | | 0.00 | 0.04 | 0.00 | 0.25 | 0.36 | T | 0.00 | 0.00 | 0.00 | 0.00 |
| 30 | T | | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 |
| 31 | 0.01 | | 0.00 | | T | | 0.00 | 0.46 | | 0.71 | | 0.00 |
| TOT. | 5.39 | 2.51 | 5.31 | 4.08 | 2.34 | 4.17 | 3.68 | 6.28 | 3.12 | 1.16 | 2.73 | 2.09 |

T = TRACE

ANNUAL TOTAL: 42.86

**THE OHIO VALLEY COAL COMPANY**
**POWHATAN NO. 6 MINE**
**RAINFALL - 1997**

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 1.10 | 0.00 | 0.00 | 0.32 | 0.29 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | |
| 2 | 0.01 | T | 1.20 | 0.00 | 0.00 | 0.90 | T | T | 0.04 | 0.00 | 0.07 | 0.00 | |
| 3 | 0.03 | 0.14 | 0.30 | 0.00 | 0.64 | 0.03 | 0.00 | 0.40 | 0.00 | 0.00 | T | 0.21 | |
| 4 | 0.60 | 0.35 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | |
| 5 | 0.00 | 0.01 | 0.35 | 0.00 | 0.12 | 0.00 | T | 0.00 | T | 0.00 | 0.00 | 0.06 | |
| 6 | 0.00 | 0.00 | T | 0.00 | 0.01 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.09 | 0.04 | |
| 7 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.39 | 0.04 | |
| 8 | 0.00 | T | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | |
| 9 | 0.29 | 0.00 | 0.71 | 0.00 | 0.90 | 0.00 | 0.20 | 0.00 | 0.45 | 0.05 | 0.00 | 0.23 | |
| 10 | T | T | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.01 | 0.31 | |
| 11 | 0.00 | T | 0.00 | 0.21 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.01 | |
| 12 | T | 0.00 | 0.00 | 0.48 | 0.00 | 0.18 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 | T | |
| 13 | 0.00 | 0.52 | 0.29 | 0.00 | T | 0.01 | 0.00 | 0.10 | 0.00 | 0.02 | 1.30 | 0.00 | |
| 14 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 15 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 16 | 0.28 | 0.05 | 0.00 | T | 0.10 | 0.49 | 0.00 | 0.07 | 0.00 | 0.00 | 0.30 | 0.00 | |
| 17 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 2.53 | 0.09 | 0.00 | 0.00 | 0.00 | |
| 18 | 0.00 | 0.00 | 0.20 | 0.00 | 0.05 | 0.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 19 | 0.00 | 0.10 | 0.00 | 0.00 | 0.65 | 0.00 | 0.00 | 0.49 | 1.26 | 0.00 | 0.00 | 0.00 | |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 21 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.39 | 0.15 | |
| 22 | 0.27 | 0.00 | 0.00 | 0.01 | 0.00 | T | 0.50 | 0.00 | 0.00 | 0.00 | 0.01 | 0.18 | |
| 23 | 0.00 | 0.00 | 0.02 | 0.04 | 0.00 | 0.00 | 0.06 | 0.00 | T | 0.00 | 0.00 | T | |
| 24 | 0.23 | 0.00 | T | 0.79 | 0.90 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 25 | 0.01 | 0.00 | 1.04 | 0.60 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | |
| 26 | 0.00 | 0.17 | T | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 1.72 | 0.20 | 0.00 | |
| 27 | 0.79 | 0.00 | 0.00 | 0.39 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 28 | 0.08 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 1.20 | 0.00 | 0.20 | 0.10 | |
| 29 | 0.00 | | 0.00 | 0.00 | 0.20 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.30 | |
| 30 | 0.00 | | 0.18 | 0.03 | T | 0.33 | 0.00 | 0.00 | 0.18 | 0.00 | 0.12 | 0.00 | |
| 31 | 0.00 | | T | | 0.25 | | 0.00 | 0.00 | | 0.00 | | 0.00 | |
| TOTAL | 2.59 | 1.46 | 5.46 | 2.56 | 4.92 | 2.77 | 1.16 | 5.35 | 3.22 | 1.99 | 3.67 | 1.63 | 36.78 |
| H/L | L | L | H | L | H | L | L | H | L | L | H | L | |

ALLEDONIA STATION

**THE OHIO VALLEY COAL COMPANY**
**POWHATAN NO. 6 MINE**
**RAINFALL - 2001**

RAINFALL AS OF: 11/06/2001

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.01 | 0.00 | 0.11 | 0.00 | 1.50 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 2 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 | | |
| 3 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 4 | 0.04 | T | 0.75 | 0.00 | 0.00 | 0.00 | 0.28 | T | 0.00 | 0.00 | 0.00 | | |
| 5 | 0.01 | 0.01 | 0.07 | 0.33 | 0.00 | 0.43 | 0.16 | 0.00 | 0.00 | 0.28 | 0.00 | | |
| 6 | 0.01 | 0.05 | 0.01 | 0.75 | 0.00 | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 7 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | | | |
| 8 | 0.01 | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| 9 | 0.00 | 0.20 | T | 0.06 | 0.00 | 0.00 | 0.00 | 1.23 | 0.00 | 0.00 | | | |
| 10 | 0.00 | 0.00 | 0.00 | 0.88 | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | | | |
| 11 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.02 | | | |
| 12 | 0.00 | 0.00 | 0.35 | 0.00 | 0.86 | 0.00 | 0.00 | 2.28 | 0.00 | 0.50 | | | |
| 13 | 0.00 | 0.02 | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | | | |
| 14 | 0.04 | 0.70 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.37 | | | |
| 15 | T | 0.15 | 0.15 | 0.59 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | | | |
| 16 | T | 0.31 | 0.50 | 0.03 | 0.13 | 0.72 | 0.00 | 0.00 | 0.00 | 0.44 | | | |
| 17 | T | 0.00 | 0.05 | 0.00 | 0.14 | 0.00 | 0.57 | 0.00 | 0.00 | 0.00 | | | |
| 18 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.02 | 0.00 | 0.00 | | | |
| 19 | 0.00 | T | 0.00 | 0.00 | 0.44 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | | | |
| 20 | 0.41 | T | 0.41 | 0.78 | 0.00 | 0.53 | 0.00 | 0.00 | 0.46 | 0.00 | | | |
| 21 | 0.00 | 0.00 | 0.94 | 0.14 | 0.74 | 0.20 | 0.00 | 0.00 | 0.02 | 0.00 | | | |
| 22 | 0.00 | 0.08 | 0.00 | 0.00 | 0.55 | 1.05 | 0.00 | 0.16 | 0.00 | 0.00 | | | |
| 23 | 0.00 | 0.00 | 0.19 | 0.01 | 0.13 | 0.00 | 0.00 | 0.05 | T | 0.65 | | | |
| 24 | 0.01 | 0.00 | 0.04 | T | 0.40 | 0.07 | 0.02 | 0.00 | 0.57 | 0.37 | | | |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | | | |
| 26 | 0.34 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.13 | 0.57 | 0.00 | T | | | |
| 27 | T | 0.00 | 0.00 | 0.03 | 0.05 | 0.00 | 0.00 | 0.00 | T | 0.00 | | | |
| 28 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.60 | 0.07 | 0.04 | 0.00 | | | |
| 29 | 0.51 | | 0.06 | 0.00 | 0.07 | 0.31 | 0.06 | 0.00 | 0.00 | 0.00 | | | |
| 30 | T | | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| 31 | 0.01 | | 0.00 | | 0.00 | | 0.00 | 1.71 | | 0.00 | | | |
| TOTAL | 1.60 | 1.59 | 3.81 | 3.96 | 4.37 | 5.97 | 3.85 | 6.51 | 1.51 | 2.64 | 0.44 | 0.00 | 36.25 |
| H/L | L | L | H | H | H | H | L | H | L | H | L | | |

**Rain gauge is read at 7:00 am for the prior day. H/L compares the monthly rainfall with the 50 year average for this area**

TOVCC 12139

# ADDENDUM TO ATTACHMENTS 14A, 14C, 14D, THE OHIO VALLEY COAL COMPANY

| | | | State Plane Coordinates | | | | |
|---|---|---|---|---|---|---|---|
| Source I.D. | Elevation | Owner | X | Y | Township | Section | Quarter Section |
| U34-001 | 1100 | FUNKHOUSER | 2,427,965.79 | 730,795.90 | SMITH | 28 | NE |
| U34-002 | 1072 | FUNKHOUSER | 2,428,090.85 | 730,009.04 | SMITH | 28 | SE |
| U34-003 | 1070 | FUNKHOUSER | 2,428,528.74 | 729,846.94 | SMITH | 28 | SE |
| U34-004 | 1069 | FUNKHOUSER | 2,428,793.47 | 729,808.34 | SMITH | 22 | SW |
| U34-007 | 1085 | FUNKHOUSER | 2,429,469.95 | 731,348.05 | SMITH | 22 | NW |
| U34-008 | 1055 | FUNKHOUSER | 2,429,708.07 | 729,865.78 | SMITH | 22 | SW |
| U34-009 | 1055 | EARLIWINE | 2,430,118.24 | 729,647.48 | SMITH | 22 | SW |
| U34-010 | 1072 | EARLIWINE | 2,430,533.47 | 729,651.89 | SMITH | 22 | SW |
| U34-021 | 1075 | RICE | 2,431,962.76 | 730,889.89 | SMITH | 22 | NE |
| U34-022 | 1120 | RICE | 2,432,250.29 | 730,752.94 | SMITH | 22 | NE |
| U34-023 | 1090 | RICE | 2,432,254.04 | 730,312.19 | SMITH | 22 | NE |
| U34-024 | 1060 | MAY | 2,431,865.16 | 730,214.01 | SMITH | 22 | NE |
| U34-025 | 1055 | GROVES | 2,431,820.13 | 729,956.45 | SMITH | 22 | SE |
| U34-143 | 1105 | STUDENC | 2,431,596.58 | 730,843.11 | SMITH | 22 | NE |
| U34-145 | 1182 | RUBEL | 2,423,428.13 | 729,626.52 | SMITH | 28 | SW |
| U34-146 | 1138 | RUBEL | 2,424,657.56 | 729,506.94 | SMITH | 28 | SW |
| U34-150 | 1152 | SIMPSON | 2,423,349.97 | 731,276.08 | SMITH | 34 | NE |
| U34-163 | 1115 | SAFFELL | 2,427,000.25 | 731,603.88 | SMITH | 28 | NE |
| U34-164 | 1110 | SAFFELL | 2,425,474.91 | 730,245.34 | SMITH | 28 | NW |
| U34-165 | 1112 | PRICE | 2,426,699.62 | 729,628.65 | SMITH | 28 | SE |
| U34-166 | 1075 | SAFFELL | 2,427,103.28 | 730,188.86 | SMITH | 28 | NE |
| U34-167 | 1220 | HART | 2,423,075.73 | 729,546.24 | SMITH | 34 | SE |
| U-34H | 1100 | GROVES | 2,431,974.26 | 729,901.84 | SMITH | 22 | SE |
| U37-000 | 1130 | KEMP | 2,418,250.51 | 731,418.17 | GOSHEN | 4 | NE |
| U37-001 | 1135 | HENNEBERT | 2,419,391.38 | 730,093.80 | SMITH | 34 | SW |
| D34-001 | 1075 | FUNKHOUSER | 2,427,257.74 | 730,058.70 | SMITH | 28 | SE |
| D37-000 | 1195 | DUNFEE | 2,418,607.23 | 729,769.99 | SMITH | 34 | SW |
| DS-111 | 1121 | RAUCHENBERG | 2,428,264.52 | 729,659.85 | SMITH | 28 | SE |
| DS-223 | 1122 | RICE | 2,429,803.85 | 730,620.59 | SMITH | 22 | NW |
| DS-226A | 1173 | RICE | 2,431,057.10 | 730,960.62 | SMITH | 22 | NW |
| DS-226B | 1155 | RICE | 2,430,121.67 | 731,294.25 | SMITH | 22 | NW |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DS-228 | 1290 | RUBEL | 2,423,364.96 | 729,086.53 | SMITH | 28 | SW |
| DS-230 | 1170 | RUBEL | 2,424,279.06 | 729,586.43 | SMITH | 28 | SW |
| DS-231 | 1230 | RUBEL | 2,424,454.63 | 730,001.59 | SMITH | 28 | SW |
| DS-232 | 1237 | RUBEL | 2,424,170.77 | 728,330.02 | SMITH | 28 | SW |
| DS-240 | 1170 | HART | 2,423,989.47 | 731,178.95 | SMITH | 28 | NW |
| DS-241 | 1200 | SAFFELL | 2,425,632.32 | 731,029.92 | SMITH | 28 | NW |
| DS-242 | 1090 | SAFFELL | 2,426,442.03 | 730,724.03 | SMITH | 28 | NE |
| DS-244 | 1290 | MAYO | 2,422,373.81 | 729,824.17 | SMITH | 34 | SE |
| DS-277 | 1264 | MAYO | 2,422,063.00 | 730,173.29 | SMITH | 34 | SE |
| DS-278 | 1230 | WORKMAN | 2,421,109.95 | 729,887.37 | SMITH | 34 | SW |
| DS-282 | 1268 | SIMPSON | 2,421,896.69 | 730,510.13 | SMITH | 34 | NE |
| DS-283 | 1270 | SIMPSON | 2,421,609.00 | 731,576.91 | SMITH | 34 | NE |
| DS-285 | 1190 | BIANCO | 2,417,862.26 | 730,040.49 | GOSHEN | 4 | SE |
| DS-286 | 1220 | SIMPSON | 2,422,911.94 | 730,739.12 | SMITH | 34 | NE |
| DS-287 | 1220 | SIMPSON | 2,422,677.72 | 730,710.51 | SMITH | 34 | NE |
| DS-289 | 1190 | BIANCO | 2,417,916.88 | 730,862.33 | GOSHEN | 4 | SE |
| W-166 | 1106 | EARLIWINE | 2,431,127.17 | 729,567.51 | SMITH | 22 | SW |
| W-167 | 1105 | HEBRY | 2,430,792.79 | 729,777.10 | SMITH | 22 | SW |
| WL-168 | 1112 | FUNKHOUSER | 2,427,817.97 | 730,322.37 | SMITH | 28 | NE |
| DW-169 | 1100 | FUNKHOUSER | 2,427,881.52 | 730,325.78 | SMITH | 28 | NE |
| W-170 | 1105 | MAY | 2,431,577.81 | 730,086.96 | SMITH | 22 | NE |
| W-172 | 1106 | MAY | 2,431,637.18 | 730,305.13 | SMITH | 22 | NE |
| DW-173 | 1166 | RICE | 2,431,114.67 | 730,826.06 | SMITH | 22 | NW |
| W-174 | 1117 | GRANT | 2,431,688.01 | 731,164.71 | SMITH | 22 | NE |
| WL-294 | 1125 | WILSON | 2,427,681.68 | 730,415.71 | SMITH | 28 | NE |
| W-315 | 1280 | HART | 2,422,711.41 | 729,637.06 | SMITH | 34 | SE |
| W-316 | 1203 | SAFFELL | 2,425,776.05 | 730,991.09 | SMITH | 28 | NW |
| WL-317 | 1303 | HART | 2,424,662.36 | 731,095.86 | SMITH | 28 | NW |
| DW-318 | 1294 | MAYO | 2,422,408.37 | 729,922.45 | SMITH | 34 | SE |
| W-323 | 1138 | FUNKHOUSER | 2,428,971.06 | 730,339.40 | SMITH | 22 | NW |
| W-374 | 1285 | COLE | 2,417,475.69 | 730,748.27 | GOSHEN | 4 | SE |
| W-396 | 1305 | WORKMAN | 2,420,621.76 | 730,247.04 | SMITH | 34 | SW |
| WL-397 | 1310 | CRAMER | 2,420,447.23 | 729,993.06 | SMITH | 34 | SW |
| WL-398 | 1303 | HABIG | 2,420,424.21 | 729,595.73 | SMITH | 34 | SW |
| W-405 | 1322 | SIMPSON | 2,421,717.69 | 730,927.08 | SMITH | 34 | NE |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DW-406 | 1322 | SIMPSON | 2,421,675.78 | 730,928.49 | SMITH | 34 | NE |
| W-407 | 1306 | SIMPSON | 2,422,089.97 | 730,858.42 | SMITH | 34 | NE |
| DW-408 | 1305 | SIMPSON | 2,421,986.22 | 730,832.36 | SMITH | 34 | NE |
| W-409 | 1318 | SIMPSON | 2,420,712.16 | 731,237.35 | SMITH | 34 | NW |
| W-458 | 1175 | RAUSHENBERG | 2,428,459.00 | 729,987.00 | SMITH | 28 | SE |
| P-7 | 1140 | HENNEBERT | 2,419,491.00 | 730,096.00 | SMITH | 34 | SW |
| P-8 | 1240 | HART | 2,423,076.00 | 729,546.00 | SMITH | 34 | SE |
| P-16 | 1100 | FUNKHOUSER | 2,427,965.79 | 730,795.90 | SMITH | 28 | NE |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

ADDDENDUM TO ATTACHMENT 14A
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## DISTURBANCES TO WATERSHED

The D-0360-13 application area was sampled originally in 1990 and then subsequently after that time. The application was submitted in December, 2001. In the interim period, longwall mining has been conducted to the north of the application area within the Captina Creek and McMahon Creek watersheds. However, the mining to date has been over 6000 ft away from this application area and is not expected to have impacted water supplies at that distance. Wells are only impacted up about 700 ft from the mining, springs only 300 to 500 ft from the mining. There have been no other impacts to the watershed with the exception of localized construction for dwellings or other buildings.

D. (3) Based on the data listed on Attachment 14A, and other information submitted with this application, identify the seasonal variations in water quality and quantity for the streams identified in Part 2, D(2).

See Attachment 14A, Addenda, PHC

E. HYDROLOGIC DETERMINATION-Permit, Shadow Area, and Adjacent Area

Based on the information submitted in response to items B, C, and D in this part of the permit application, submit an addendum describing the probable hydrologic consequences of this proposed underground mining operation on the hydrologic regime of the proposed permit area, shadow area, and adjacent area. The description shall include findings on each of the following items:

(1) The consequences of the proposed operation on the contents of total suspended and dissolved solids, total iron, total manganese, acidity, and pH;

See Addendum to Page 18, Part 2, E

(2) Whether adverse impacts may occur to the hydrologic balance; and

See Addendum to Page 18, Part 2, E

(3) The impact the proposed operation will have on:

(a) sediment yield from the disturbed area,

(b) flooding and stream flow alteration or diminution,

(c) ground water and surface water availability.

See Addendum to Page 18, Part 2, E

F. ALTERNATIVE WATER SUPPLY INFORMATION-Permit, Shadow Area, and Adjacent Area

(1) Based on the response in Part 2, item E, submit an addendum identifying the extent to which the proposed coal mining activities may proximately result in contamination, diminution, or interruption of an underground or surface source of water within the proposed permit area, shadow area, and adjacent area that is used for domestic, agricultural, industrial, or other legitimate use. See Addendum to Page 18, Page 2, F

(2) If contamination, diminution, or interruption may result, submit an addendum identifying the alternative sources of water supply that could be developed to replace the existing sources including information on water availability and suitability of alternative sources for existing pre-mining uses and postmining land use. See Addendum to Page 18, Part 2, F

ADDENDUM TO PAGE 18, PART 2, E
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## HYDROLOGIC DETERMINATION

Based on the information submitted in this application, the enclosed probable hydrologic consequences may be expected. With partial extraction mining, no impacts are expected to occur to ground water or surface water. The quality of the surface and ground water in the application area is not expected to be changed as a result of the proposed mining activities. Specifically, the levels of pH, iron, manganese, total suspended solids, and total dissolved solids are not expected to vary from their original levels.

ADDENDUM TO PAGE 18, PART 2, E
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

# PROBABLE HYDROGEOLOGIC CONSEQUENCES OF GATE ENTRY DEVELOPMENT AT POWHATAN NO. 6 MINE

## Topographic Setting

The Powhatan No. 6 Mine is located in Belmont County, Ohio which is within the Appalachian Plateau physiographic province. The topography of the county is typically hilly with broad rounded ridges and deep v-shaped valleys dissecting the terrain. Total topographic relief within the county is approximately 800 ft. However, within the application area, maximum relief is approximately 215 ft. The elevation varies between 1305 ft. (maximum) above sea level and 1080 ft. (minimum). Figure #1 is a portion of the Hunter and Armstrong Mills, Ohio U.S.G.S. 7½ Minute Topographic maps showing the location of the area of interest.

Drainage within the western portion of the application area occurs to the south through several streams that are tributaries to Millers Run, a tributary of Captina Creek. Captina Creek is the main drainage system for the southern portion of Belmont County. Captina Creek flows eastward to the Ohio River with the confluence of the two located at Powhatan Point, Ohio.

Drainage within the western portion (north of State Route 147) of the application area occurs to the south through several streams that are tributaries to Williams Creek, a tributary of McMahon Creek. McMahon Creek is the main drainage system for the central portion of Belmont County. McMahon Creek flows eastward to the Ohio River with the confluence of the two located at Bellaire, Ohio.

## Geologic Setting

The bedrock units that underlie the study area consist of Permian through Pennsylvanian in Age. The Permian Age rocks consist of Dunkard Group. This sequence covers much of the study area at the surface. Below the Dunkard Group lies the Monongahela and Conemaugh Formations of the Pennsylvania system. The Monongahela Formation is exposed only in the stream valleys with the underlying Conemaugh Formation not exposed at all. Figure #2 is a generalized stratigraphic column showing the relationship of these bedrock units.

The Monongahela Formation consists of the Pittsburgh #8 coal seam at the base through the Waynesburg #11 coal seam. Other coal seams consist of the Redstone (No. 8A), Fishpot, Sewickley (No. 9) and Uniontown (No. 10) coal seams. Other important members of the formation are the Redstone Limestone, the Fishpot Limestone and the Benwood Limestone, all of which are found

above the Pittsburgh (No. 8) coal seam. The remaining portion of the Monongahela Formation consists of clay, sandstone and shale.

Above the Waynesburg #11 coal seam, the Dunkard Group consists of coal (Washington #12 seam), limestone, sandstone, shale and clay. The Dunkard Group is found at the cap of the hilltops at elevations above sea level of approximately 950 ft. and above.

Below the Pittsburgh #8 coal seam lies the Conemaugh Formation. The Conemaugh consists of sandstone, siltstone, mudstone, shale, clay and limestone. Much of the formation consists of undifferentiated strata, however, several important members lie relatively close to the Pittsburgh #8 coal seam. These members are the underclay to the Pittsburgh #8 coal seam, the Upper Pittsburgh Limestone, the Bellaire Sandstone and the Lower Pittsburgh Limestone. These units are not tapped as aquifers within the study area at present because adequate aquifers can be found at shallower depths.

Hydrology

Bedrock units within the study area are generally tight and have limited ground water development potential. Domestic well yields are generally less than 5 gallons per minute (g.p.m.) with transmissivities usually less than 1,000 gallons per day per foot. Ground water within the study area occurs under water table, semi-confined and confined conditions. Storage coefficients should range from $10^{-2}$ to $10^{-6}$.

Most valuable ground water supplies developed in rock units are dependent on natural fracturing or secondary porosity and permeability. Primary porosity and permeability is relatively low in the bedrock as is noted by the relatively low yield of domestic wells and the reliance on springs for domestic water supplies. Approximately 50% of the domestic water supplies within the study area rely on springs as the source. Most of these springs are contact springs located along the valley walls where bedrock units of lower permeability and porosity impede downward infiltration of ground water and force water to discharge as springs.

The aquifers within the study area that are tapped for domestic water supplies are local in extent. The relatively flat-lying orientation of the bedrock and the high topographic relief (i.e., deep v-shaped valleys) of the area, tends to isolate many of the aquifers to small upland areas. Therefore, the aerial extent of the unit is limited and so would be the recharge potential.

Downward migration of ground water is also controlled by naturally occurring fractures. These earth fractures, while not ubiquitous, do occur sporadically, over most of the mine plan area and have an effective depth of less than 200 ft. Below 200 ft., the fractures may still be present, but are either filled with silts and clays, or have healed due to lithostatic pressures. Therefore, the enhanced permeability of these fractures is regulated and the relatively low primary permeability of

the units controls ground water flow at depth. This premise is based on the general limited hydraulic communication with the No. 6 Mine.

It is a generally accepted principal of hydrogeology that joints, cleavage, and other fractures tend to be tighter and have lower permeability with increasing depth. This premise is substantiated at the local level by the water conditions exhibited in the No. 6 Mine. To date, observations indicate that the No. 6 Mine made very little water and that water flow through fractures into the mine is rare. Most areas of the mine are essentially dry with no or very little water accumulation. What water does accumulate is generally man-made, being used for dust suppression and motor cooling. This general condition (no water inflow into the mine) was reported to be true with as little as 200 feet of cover. These site specific observations coupled with the general premise of closed fractures with depth lead to the statements made in the PHC.

In a study conducted by Moody and Associates in 1980, the water make of the mine (total water inflow), was calculated to be approximately 42 gallons per day (g.p.d.) per acre mined or 26,880 g.p.d. per square mile. Most sections of the mine were essentially dry and water inflow was generally limited to areas of low cover and stream valleys or fractured zones. In the 14 years since that time, the mine has progressed to the north, away from the Captina Creek valley.

In contrast to the mine water make, the ground water recharge potential of the area has been estimated between 100,000 and 250,000 g.p.d. per square mile or 155 to 400 g.p.d. per acre. It thus appears less than 10 to 27 percent of the ground water recharge potential is intercepted by the mine. This data clearly indicates that the majority of the subsurface flow system within the mine plan area is shallow and is unaffected by deep mining.

A number of years ago, when the Powhatan No. 6 Mine was owned and operated by The NACCO Mining Company, photo lineaments were traced over the mine area. The report from the project no longer exists, but talking to Mr. William Siplivy, who was associated with the project was beneficial. Mr. Siplivy indicated that the photo lineaments were not associated with poor conditions in the mine, except that the lineaments defined stream channels.

# Probable Hydrologic Consequences

Ohio Valley Coal Company
Powhatan No. 6 Mine
Application Area D-0360-13

December 10, 2001
May 14, 2002 (Revised)

*Prepared For:*

**The Ohio Valley Coal Company**
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

*Prepared By:*

David M. Anderson, P.G.
Moody and Associates, Inc.
11548 Cotton Road
Meadville, PA, 16335

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TABLE 1 - Groundwater Quality Summary

## INTRODUCTION

Since 1987, three partial recovery and seven full recovery application areas of the Powhatan No. 6 Mine have been evaluated relative to the Probable Hydrologic Consequences (PHC) of mining activities. One combination area has been evaluated relative to the PHC. They are:

| Application Area | Year Prepared | Prepared By |
|---|---|---|
| R-0360-1 | 1989 | William Siplivy P.E. & C.P.G. (partial recovery) |
| R-0360-2 | 1989 | Moody and Associates, Inc. (full recovery) |
| D-0360-1 | 1990 | Moody and Associates, Inc. (partial recovery) |
| D-0360-2 | 1991 | Moody and Associates, Inc. (full recovery) |
| D-0360-3 | 1992 | William Siplivy P.E. & C.P.G. (Two additional applications were prepared by OVCC using this PHC for two small areas within the D-0360-3 area. They were identified as D-0360-4 and D-0360-5). (full recovery) |
| D-0360-6 | 1996 | Moody and Associates, Inc. (full recovery) (One additional application was prepared by OVCC using this PHC for one small area within the D-0360-6 area. It was identified as D-0360-10) (full recovery). |
| D-0360-7 | 1998 | Moody and Associates, Inc. (full recovery) |
| D-0360-9 | 1998 | Moody and Associates, Inc. (partial recovery) |
| D-0360-11 | 1999 | Moody and Associates, Inc. (full recovery) |
| D-0360-12 | 2001 | Moody and Associates, Inc. (full and partial recovery |

This PHC for the longwall Application Area D-0360-13 has been prepared on behalf of the Ohio Valley Coal Company by Moody and Associates, Incorporated. The information developed during the preparation of the previous PHC's has been used in the preparation of this PHC.



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## TOPOGRAPHIC SETTING

The Powhatan No. 6 Mine is located in Belmont County in southeastern Ohio. The topography of the entire application area is typical of the Appalachian Plateau Province and is characterized by narrow rounded ridges and deep V-shaped valleys dissecting the terrain, which is underlain by essentially horizontal sedimentary rocks. Topographic relief within the D-0360-13 application area is approximately 240 feet. The lowest elevation is approximately 1070 feet in a tributary to Williams Creek in the mid-east portion of the application area. The highest elevation is 1310 feet on a hilltop in the center of the application area.

The surface drainage within the application area is to the south and east. The drainage in the western portion of the application area is through unnamed tributaries to Miller's Run and Joy Fork, which are part of the Captina Creek drainage area. The eastern drainage is through Williams Creek. Williams Creek is a tributary of McMahon Creek.

Most of the developed water supplies (wells and springs) are located along the roads in the application area. There is a concentration of supplies along State Route 147, Hart Road, and Dunfee Road. There is a large group of water supplies along State Route 9 just east of the application area. There are large areas of the Joy Fork and Miller's Run drainage area, which have no identified water supplies. All of the identified water supplies are listed on the ATTACHMENT 14C.

## GEOLOGIC SETTING

A detailed discussion of the stratigraphic and structural setting of the Application Area is provided in the Geologic Section of this application. However, those properties of the geologic setting pertinent to ground water occurrence and movement are described here.

The bedrock units that outcrop in the Application Area belong to the Dunkard Group that is Upper Pennsylvanian to Permian in age. The rocks consist of interbedded sandstone, siltstone, shale, mudstone, clay, fresh to brackish water limestone and coal. The Monongahela Formation (Pennsylvanian) underlies the Dunkard Group and consists of similar rock types. The Pittsburgh (No. 8) Coal seam, which is the seam to be mined, marks the bottom of the Monongahela



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Formation. According to Mr. James M. Raab, a hydrogeologist with the Ohio Department of Natural Resources, in correspondence to Dave Bartsch of the Ohio Valley Coal Company dated January 30, 1989, water below 250 feet beneath the stream bottoms is brackish.

In addition, there is considerable horizontal and vertical variability of the rock units. Rapid facies and hydrologic property changes tend to limit the horizontal continuity of the individual rock units. With the exception of major coal seams, very few lithologic units are continuous across the proposed application area. Horizontal facies changes and corresponding changes in hydrologic properties of the rocks tend to enhance the importance of localized flow systems. In addition, most available ground water in this region is limited to the first 100 feet of the surface where enhanced secondary permeability associated with rock fracturing is present. This information is supported by the OVCC drilling records and from locally developed wells and springs. Ground water recharge in the upland or ridge top areas results in downward migration primarily within this shallow saturated zone. Because the topographic relief between ridge tops often exceeds 100 feet, there are localized flow systems under the hilltops that are not in hydrologic communication with adjacent hilltops. While the ground water under any given ridge top can be viewed as being continuous, the continuity generally does not extend to adjacent hilltops.

The geologic structures in the Application Area consist of gently folded rocks that dip to the southeast at approximately 30 feet per mile. Overburden thickness above the Pittsburgh coal seam ranges from a low of approximately 300 feet along the Williams Creek valley to a high of approximately 535 feet along the hilltops in the center of the area. Geologic structure can influence regional ground water flow patterns but local variations in hydraulic properties of the rocks tend to accentuate localized flow systems.

## GENERAL HYDROLOGIC SETTING

The source of all ground and surface water in the mine plan area is precipitation. Upon reaching the land surface, water that is not part of direct surface runoff or evapotranspiration infiltrates into the subsurface and contributes to soil moisture and ground water.

Within the bedrock aquifer system, ground water occurs in primary and secondary openings. Primary openings are pore spaces between sand, silt and clay grains formed at the time of sediment

depositions. Primary permeability is the ability of water to move between pore spaces. In this area, primary permeability is very low and limited ground water movement occurs in hard or soft rocks as a result of primary openings (Stoner 1983, Siplivy 1992).

Secondary porosity and permeability is formed by fractures or partings in the rock mass. Most available ground water in the application area occurs within the first 100 feet below the surface within these secondary openings and the success of a water well in terms of yield potential is dependent upon the well encountering water filled fracture zone(s) that transmit enough water to the well bore to meet the well's intended use (Schmitt et al, 1983; Waite, 1987).

Fractures are not ubiquitous in the area, however, and are not interconnected over large areas. For these reasons, it is very difficult to identify aquifers over large areas and the ground water flow system tends to be made up of small, localized fracture controlled systems. While fractures in hard rocks tend to stay open better than fractures in soft rock, the horizontal and vertical variability of even the hard rock units tend to produce hydraulically isolated areas.

In addition, fractures tend to close at increasing depths due to overlying lithostatic pressures, thereby limiting the effective depth of the ground water flow system (Stoner, 1983). This condition is evident throughout the Powhatan No. 6 Mine. The mine, in general, is very dry with very minor amounts of water inflow limited to the low cover areas (generally less than 200 feet). The overburden thickness in the application area ranges from 300 feet to 535 feet. No water inflow into the mine is expected in this application area.

Based on an evaluation of the geologic units presently supplying water to wells or springs in the Application Area, four aquifer units have been identified within the D-0360-13 hydrologic boundary. These units, which are also outlined on Form 14B of this application, are summarized below:

**Aquifer A: Unconsolidated Material**

Includes the layer of weathered bedrock above solid bedrock and unconsolidated deposits along stream valleys.



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**Aquifer B: Washington No. 12 Cyclothem**

Includes the rock sequence from the Washington Coal Bed to the surface of the consolidated bedrock. Occurs from approximately 350 feet to 500 feet above the No. 8 Pittsburgh Coal Bed.

**Aquifer C: Waynesburg No. 11 Cyclothem**

Includes the rock sequence from the Waynesburg No. 11 Coal Bed to the Washington No. 12 Coal Bed. Occurs from approximately 250 feet to 350 feet above the No. 8 Pittsburgh Coal Bed.

**Aquifer D: Sewickley No. 9 Cyclothem**

Includes the rock sequence from the Sewickley No. 9 Coal Bed to the Waynesburg No. 11 Coal Bed. Occurs from approximately 90 feet to 250 feet above the No. 8 Pittsburgh Coal Bed.

These units are only recognized as aquifers where they occur within 100 feet of the surface where secondary porosity and permeability is greatest.

## WATER SUPPLIES

The water supplies that serve domestic and agricultural needs have been inventoried within the hydrologic boundary of the Application Area. The Application Map illustrates the location of these supplies. ATTACHMENT 14C lists both the used and unused supplies identified in the Application area. Only the used supplies are discussed in the PHC.

There are no impacts to any of the used or unused supplies that serve domestic and agricultural areas as a result of the mining within this application area.

In addition, used ponds are shown on Attachment 14D.



TOVCC 12155

## EVALUATION OF HYDROLOGIC IMPACT IN PREVIOUSLY MINED AREAS

### Quantity Impacts In Previously Mined Areas

The monitoring data from wells and springs in the previously mined areas at the Powhatan No. 6 mine indicate that there will be no impacts to wells or springs from gate entry development. Earlier water losses in room-and-pillar areas were due to unplanned subsidence where the safety factor for the pillars was not high enough. Safety factors for the gate entry pillars are well above 2:1. and no subsidence or water loss is anticipated from this operation.

A similar evaluation was performed for the developed springs that were undermined in the previously mined areas of the Powhatan No. 6 Mine. No impacts were observed from gate entry development.

Hydrographs are presented for one developed spring and four wells undermined or adjacent to main or gate development entries. In each case. there was no impact from being mined under by the development entries. No impacts to water quantity in the D-0360-13 application area are anticipated.

### Quality Impacts In Previously Mined Areas

The water quality effects of gate entry development areas do not vary from pre-mining levels due to the mining of development (mains and gate) entries. Table 1 shows water quality before and after being mined by development entries. No impacts to water quality in the D-0360-13 application area are anticipated.



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## PROBABLE HYDROLOGIC CONSEQUENCES SUMMARY

### Surface Water

Based on a review of past data collected at the Powhatan No. 6 Mine, no surface water impacts are anticipated since there will be no subsidence associated with main or gate entry development mining.

### Ground Water

The data from earlier mined areas shows that there are no impacts from main or gate entry development mining. Water impacts are only evident when an area is subsided, and no subsidence from mining is anticipated in this application area.

### Post Mining Water Breakouts

The area with the lowest cover is located in the middle-east portion of Application Area D-0360-13, in the Williams Creek valley. The lowest surface elevation in the Application Area is approximately 1070 feet msl. The maximum coal elevation in the Application Area is approximately 800 feet msl, or 270 feet below the lowest surface elevation. The lowest surface opening elevation for the entire Powhatan No. 6 Mine is 847 feet msl. The maximum coal elevation in Application Area D-0360-13 is approximately 800 feet msl, or 47 feet below the lowest surface opening. The highest coal elevation in the Powhatan No. 6 Mine is approximately 845 msl, or 2 feet below the lowest surface opening in the Powhatan No. 6 Mine. The 845 foot coal elevation is located in the D-0360-7 Application Area to the north of the D-0360-13 area. No post mining water breakouts are predicted to occur due to mining in the D-0360-13 area.

### Water Supplies

The potential impacts on the used water supplies by mining have been evaluated based on monitoring of springs and wells located over the D-0360 approved mining areas and a review of pertinent literature.



TOVCC 12157

Since there will be no subsidence associated with gate entry development mining, there are no impacts anticipated from mining within the D-0360-13 application area. The data clearly shows that impacts only occur when subsidence occurs.



TOVCC 12158

**TABLE 1 - D-0360-13 PHC**
**THE OHIO VALLEY COAL COMPANY**
**POWHATAN NO. 6 MINE**
**PERMIT D-0360**
**SOURCES UNDERMINDED BY DEVELOPMENT ENTRIES**

| | Site ID | Field pH SU | Lab pH SU | Tot. Acidity mg/l | Tot. Alk. mg/l | Tot. Iron mg/l | Tot. Mn mg/l | Tot. TSS mg/l | Hardness mg/l | Tot. Sulfate mg/l | Spec. Cond. µmho/cm | Tot. Nitrates mg/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PRE-MINING AVG. | W-345 | 7.2-7.6 | 7.22-7.65 | 18.16 | 194.00 | 0.17 | 0.02 | 0.26 | 240.00 | 47.60 | 500.00 | 1.22 |
| POST-MINING AVG. | W-345 | 7.2-7.5 | 7.58-7.74 | 14.98 | 190.00 | 0.14 | 0.00 | 1.13 | 245.00 | 48.00 | 572.50 | 1.41 |
| | | | | | | | | | | | | |
| PRE-MINING AVG. | W-343 | 7.5-8.4 | 7.13-8.16 | 17.17 | 265.00 | 3.09 | 0.30 | 113.67 | 346.67 | 40.00 | 1043.33 | 0.47 |
| POST-MINING AVG. | W-343 | 7.1-7.5 | 7.16-7.82 | 16.37 | 220.00 | 6.30 | 0.58 | 296.43 | 560.00 | 49.33 | 1333.33 | 0.43 |
| | | | | | | | | | | | | |
| PRE-MINING AVG. | W-344 | 6.9-7.4 | 7.08-7.6 | 11.04 | 152.00 | 0.51 | 0.01 | 0.66 | 152.00 | 30.60 | 340.00 | 0.29 |
| POST-MINING AVG. | W-344 | 7.1-7.3 | 7.32-7.77 | 12.33 | 216.67 | 0.47 | 0.06 | 18.33 | 293.33 | 40.67 | 800.00 | 0.16 |
| | | | | | | | | | | | | |
| PRE-MINING AVG. | DS-107 | 7.2-7.3 | 7.36-7.56 | 13.00 | 225.00 | 0.04 | 0.00 | 0.00 | 265.00 | 51.50 | 485.00 | 2.80 |
| POST-MINING AVG. | DS-107 | 7.1-7.4 | 7.12-7.39 | 22.00 | 217.50 | 0.42 | 0.03 | 9.50 | 262.50 | 49.75 | 460.00 | 2.23 |
| | | | | | | | | | | | | |
| PRE-MINING AVG. | DW-227 | 7.2-7.3 | 7.27-7.58 | 16.00 | 215.00 | 0.36 | 0.05 | 2.31 | 345.00 | 107.00 | 715.00 | 2.35 |
| POST-MINING AVG. | DW-227 | 6.7-7.3 | 6.87-7.48 | 25.48 | 220.00 | 0.62 | 0.22 | 44.90 | 325.00 | 139.80 | 693.00 | 2.43 |

## PROBABLE HYDROLOGIC CONSEQUENCES SUMMARY

### Surface Water

Based on a review of past data collected at the Powhatan No. 6 Mine, no surface water impacts are anticipated since there will be no subsidence associated with main or gate entry development mining.

### Ground Water

The data from earlier mined areas shows that there are no impacts from main or gate entry development mining. Water impacts are only evident when an area is subsided, and no subsidence from mining is anticipated in this application area.

### Post Mining Water Breakouts

The area with the lowest cover is located in the middle-east portion of Application Area D-0360-13, in the Williams Creek valley. The lowest surface elevation in the Application Area is approximately 1070 feet msl. The maximum coal elevation in the Application Area is approximately 800 feet msl. or 270 feet below the lowest surface elevation. The lowest surface opening elevation for the entire Powhatan No. 6 Mine is 847 feet msl. The maximum coal elevation in Application Area D-0360-13 is approximately 800 feet msl. or 47 feet below the lowest surface opening. The highest coal elevation in the Powhatan No. 6 Mine is approximately 845 msl. or 2 feet below the lowest surface opening in the Powhatan No. 6 Mine. The 845 foot coal elevation is located in the D-0360-7 Application Area to the north of the D-0360-13 area. No post mining water breakouts are predicted to occur due to mining in the D-0360-13 area.

### Water Supplies

The potential impacts on the used water supplies by mining have been evaluated based on monitoring of springs and wells located over the D-0360 approved mining areas and a review of pertinent literature.



TOVCC 12160

Since there will be no subsidence associated with gate entry development mining, there are no impacts anticipated from mining within the D-0360-13 application area. The data clearly shows that impacts only occur when subsidence occurs.



TOVCC 12161

PRECIPITATION RECORD FOR USE WITH YOUR
Taylor 11" CLEAR-VU RAIN GAGE

LOCATION TraDat, Inc. STATE West Virginia
COUNTY Ohio YEAR 1990
TIME OF OBSERVATION 8:30 AM

ADDENDUM TO PAGE 19, PART 2, D(3)

| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.01 | 0.16 | 0.00 | 0.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 | 0.00 | S - melted snow |
| 2 | Trace | 0.10 | 0.00 | 0.10 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 | |
| 3 | 0.10 | 0.70 | 0.00 | 0.07 | 0.12 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | |
| 4 | 0.16 | 0.35 | 0.00 | 0.05 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 | 0.00 | Trace | |
| 5 | 0.00 | 0.00 | 0.00 | 0.12 | 0.30 | 0.00 | 0.19 | 0.05 | 0.20 | 0.00 | 0.53 | 0.00 | |
| 6 | 0.00 | Trace | 0.00 | 0.25 | 0.00 | 0.43 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 | |
| 7 | 0.00 | 0.10 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 1.25 | 0.00 | Trace | 0.00 | |
| 8 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.06 | 0.15 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | |
| 9 | Trace | 0.60 | 0.08 | Trace | 0.04 | 0.38 | 0.47 | 0.70 | 0.91 | 0.05 | 0.28 | 0.00 | |
| 10 | 0.00 | 0.00 | 0.00 | 0.90 | 0.22 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 11 | 0.04 | 0.15 | 0.07 | 0.16 | 0.00 | 0.00 | 2.33 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | |
| 12 | Trace | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 13 | 0.00 | 0.04 | 0.00 | 0.17 | 0.21 | 0.00 | 0.77 | 0.20 | 0.00 | 0.01 | 0.00 | 0.00 | |
| 14 | 0.01 | 0.54 | 0.00 | 0.30 | 0.00 | 0.95 | 0.17 | 0.00 | 0.71 | 0.00 | 0.00 | 0.10 | |
| 15 | 0.09 | 0.41 | 0.00 | 0.00 | 0.05 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.61 | |
| 16 | 0.00 | 0.06 | 0.80 | 0.00 | 1.12 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.40 | 0.00 | |
| 17 | 0.12 | 0.00 | 0.00 | 0.09 | 0.00 | 0.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 | |
| 18 | 0.00 | 0.00 | Trace | 0.00 | 0.00 | 0.00 | 0.00 | Trace | 0.02 | 0.00 | 0.00 | 0.93 | |
| 19 | 0.08 | 0.00 | 0.25 | Trace | 0.15 | 0.00 | 0.00 | 1.45 | 0.40 | 0.50 | 0.00 | 0.00 | |
| 20 | 0.93 | 0.00 | 0.00 | 0.30 | 0.15 | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 21 | 0.03 | 0.00 | 0.00 | 0.04 | 0.00 | 0.02 | 0.27 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | |
| 22 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.18 | 0.74 | 0.20 | 0.00 | 0.00 | 0.53 | 0.15 | |
| 23 | 0.08 | 0.14 | 0.20 | 0.00 | 0.00 | 0.06 | 0.02 | 0.40 | 0.27 | 0.40 | 0.00 | 0.47 | |
| 24 | 0.01 | 0.06 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.02 | |
| 25 | 0.09 | 0.00 | 0.00 | 0.16 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 26 | 0.07 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | |
| 27 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.13 | |
| 28 | 0.40 | 0.00 | 0.00 | 0.00 | 1.08 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 29 | 0.74 | — | 0.02 | 0.00 | 0.39 | 0.00 | 0.00 | 0.18 | 0.53 | 0.00 | 0.00 | 0.07 | |
| 30 | 0.00 | — | 0.08 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.12 | 0.00 | 0.00 | 1.40 | |
| 31 | 0.00 | — | 0.21 | — | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | |
| Total | 2.87 | 3.63 | 1.78 | 3.46 | 5.84 | 3.94 | 6.29 | 3.18 | 6.03 | 1.84 | 2.45 | 5.41 | |

Total Annual 46.72

BYRON Taylor

TOVCC 12162

PRECIPITATION RECORD FOR USE WITH YOUR
Taylor 11" CLEAR-VU RAIN GAGE

LOCATION TraDet, Inc.

COUNTY Ohio STATE West Virginia

TIME OF OBSERVATION YEAR 1991

ADDENDUM TO PAGE 19, PART 2, D(3)

| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.05 s | 0.00 | 0.11 | 0.00 | 0.40 | | | | | | s - melted snow |
| 2 | 0.00 | 0.00 | 0.02 s | 0.00 | 0.00 | 0.00 | 0.20 | | | | | | |
| 3 | 0.00 | 0.00 | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | |
| 4 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.84 | | | | | | |
| 5 | 0.15 | 0.31 | 0.00 | 0.13 | 0.93 | 0.00 | 0.00 | | | | | | |
| 6 | 0.00 | 0.30 | 0.65 | 0.00 | 0.08 | 0.00 | 0.00 | | | | | | |
| 7 | 0.19 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 1.18 | | | | | | |
| 8 | 0.18 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.19 | | | | | | |
| 9 | 0.02 | 0.00 | 0.01 | 0.55 | 0.00 | 0.00 | 0.00 | | | | | | |
| 10 | 0.43 | 0.41 | Trace s | 0.00 | 0.00 | 0.00 | | | | | | | |
| 11 | Trace | 0.00 | 0.00 | 0.00 | 0.00 | 1.63 | | | | | | | |
| 12 | 0.00 | 0.00 | 0.12 | Trace | 0.00 | 0.00 | | | | | | | |
| 13 | Trace | 0.22 | 0.25 | 0.86 | 0.00 | 0.00 | | | | | | | |
| 14 | Trace | 0.29 | 0.00 | 0.24 | 0.00 | 0.00 | | | | | | | |
| 15 | 0.36 | 0.04 s | 0.00 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 16 | 0.19 | 0.06 s | 0.00 | 0.00 | 0.00 | 0.25 | | | | | | | |
| 17 | 0.01 | 0.05 | 0.09 | 0.10 | 0.02 | 0.00 | | | | | | | |
| 18 | 0.00 | 0.00 | 0.19 | 0.00 | 0.10 | 0.00 | | | | | | | |
| 19 | Trace | 0.20 | 0.00 | 0.05 | 0.00 | 0.00 | | | | | | | |
| 20 | 0.28 s | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 21 | 0.02 s | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 22 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 23 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 24 | 0.01 s | 0.00 | 0.11 | 0.02 | 0.00 | 0.00 | | | | | | | |
| 25 | 0.01 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | | | | | | | |
| 26 | 0.01 s | 0.11 s | 0.14 | 0.00 | Trace | 0.00 | | | | | | | |
| 27 | 0.30 s | Trace s | 0.02 | 0.00 | 0.07 | 0.00 | | | | | | | |
| 28 | 0.00 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | | | | | | | |
| 29 | 0.40 | - | 0.00 | 0.13 | 0.00 | 0.00 | | | | | | | |
| 30 | 0.17 | - | 0.05 s | 0.00 | 0.65 | 0.25 | | | | | | | |
| 31 | 0.01 s | - | 0.04 | - | 0.04 | - | | | | | | | |
| Total | 2.74 | 1.51 | 2.63 | 2.18 | 1.97 | 2.13 | | | | | | | |

SYBRON Taylor

Total Annual

TOVCC 12163

# ANNUAL RAINFALL REPORT

Location No. 6 Mine Year 1991

| DATE | JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | SEPT. | OCT. | NOV. | DEC. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | 0 | 0.20 | 0 | 0.15 | 0 | 0 | 0 |
| 2 | | | | | | 0 | 0.50 | 0 | 0 | 0 | 0 | 0.40 |
| 3 | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 1.90 |
| 4 | | | | | | 0 | 0 | 0.30 | 0 | TRACE | 0 | TRACE m3 |
| 5 | | | | | | 0 | 0.25 | 0 | 0.50 | 0 | 0 | TRACE m3 |
| 6 | | | | | | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 |
| 7 | | | | | | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 |
| 8 | | | | | A | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | | | | | W | 0 | 0 | 0.38 | 0 | 0 | 0 | 0.10 |
| 10 | | | | | A | 0 | 0 | 0.10 | 0.95 | 0 | 0 | 0.25 |
| 11 | A | A | A | A | R | 0 | 0 | 0 | 0.20 | .20 | .40 | 0 |
| 12 | W | W | W | W | O | 0.30 | 0 | 0 | 0 | .25 | 0 | 0 |
| 13 | A | A | A | A | U | 0 | 0.10 | 0 | 0 | .05 | .40 m3 | 0 |
| 14 | R | R | R | R | W | 0 | 0 | 0 | 0 | 0 | TRACE | 0 |
| 15 | O | O | O | O | R | 0 | 0 | 0 | 0 | .25 | 0 | 1.00 |
| 16 | U | U | U | U | | 0 | 0 | 0 | 0 | 0 | 0.05 | 0.30 m3 |
| 17 | W | W | W | W | T | 1.00 | 0 | 0.50 | 0 | 0 | 0 | 0 |
| 18 | R | R | R | R | O | 0 | 0 | 0 | 0 | 0 | 0 | TRACE m3 |
| 19 | | | | | N | 0.10 | 0 | 0 | 0.20 | 0 | 0 | 0 |
| 20 | T | T | T | T | | 0 | 0 | 1.80 | 0 | 0 | 0.22 | 0 |
| 21 | O | O | O | O | | 0 | 0 | 0.10 | 0 | 0 | 0.10 | 0 |
| 22 | N | N | N | N | O | 0 | 0 | 0 | 0 | 0 | 0.40 | 0 |
| 23 | | | | | 0 | 0 | 0.30 | 0 | 0.23 | 0 | 1.00 | 0.40 |
| 24 | | | | | 0 | 0 | 0.40 | 0 | TRACE | 0 | 0 | 0 |
| 25 | | | | | 0 | 0 | TRACE | 0 | 1.40 | 0 | 0 | 0 |
| 26 | | | | | 0 | 0 | 0 | 0 | 0.10 | TRACE | 0 | 0 |
| 27 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | TRACE |
| 28 | | | | | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 29 | | | | | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 | | X | | | 0 | 0 | 1.50 | 0 | 0 | 0 | 0 | 0.50 |
| 31 | | X | | X | 0.16 | X | 0.15 | 0 | X | 0 | X | 0 |
| Total | | | | | | 1.40 | 3.90 | 3.18 | 3.73 | 0.75 | 2.57 | 4.85 |

TOTAL FOR YEAR

TOVCC 12164

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
RAINFALL RECORD – 1993

MONTH

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.01 | T | 0.00 | 0.20 | 0.00 | 0.00 | 1.00 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 0.56 | 0.00 | 0.00 | 0.03 | T | 0.29 | 0.10 | 1.03 | 0.00 | 0.47 | T | 0.13 |
| 3 | 0.02 | 0.00 | 0.40 | 0.00 | 0.00 | 0.17 | 0.47 | 0.00 | 1.99 | 0.00 | 0.10 | 0.00 |
| 4 | 0.63 | 0.00 | 1.45 | 0.00 | 0.16 | 0.50 | 0.46 | 0.01 | 0.00 | 0.00 | 0.05 | 0.79 |
| 5 | 0.01 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.01 |
| 7 | T | 0.00 | 0.04 | 0.00 | 0.00 | 0.86 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 |
| 8 | T | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9 | 0.02 | 0.00 | 0.08 | 0.05 | 0.00 | 0.12 | 0.00 | 0.00 | 0.85 | 0.30 | 0.00 | 0.10 |
| 10 | 0.15 | 0.00 | 0.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| 11 | 0.19 | 0.39 | 0.00 | 0.06 | 0.00 | 0.00 | 0.31 | 0.00 | 0.00 | T | 0.00 | T |
| 12 | 0.00 | 0.00 | 0.00 | 0.06 | 0.49 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | 0.39 | 0.20 | 0.40 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.90 | 0.00 |
| 14 | T | 0.01 | 0.00 | 0.07 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 |
| 15 | 0.00 | 0.40 | 0.00 | 0.30 | 0.04 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | T | 0.01 |
| 16 | 0.00 | 0.50 | 0.20 | 0.00 | 0.06 | 0.00 | 0.00 | 1.61 | 0.00 | 0.90 | T | 0.00 |
| 17 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.01 | 0.80 | 0.00 |
| 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.30 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 |
| 19 | 0.00 | 0.00 | 0.01 | 0.01 | T | 0.00 | 0.66 | 0.00 | 0.00 | 0.55 | 0.00 | 0.00 |
| 20 | T | 0.00 | 0.38 | 0.01 | T | 0.14 | 0.00 | 0.00 | T | 0.39 | 0.00 | 0.41 |
| 21 | 0.70 | 0.73 | 0.00 | 0.03 | T | 0.78 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.03 |
| 22 | 0.05 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.10 |
| 23 | 0.00 | 0.02 | 0.49 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 |
| 24 | 0.50 | 0.00 | 0.02 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |
| 25 | 0.00 | 0.15 | 0.00 | 2.20 | 0.00 | 0.72 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.10 |
| 26 | 0.00 | T | 0.00 | 0.10 | 0.00 | 0.10 | 0.31 | 0.00 | 0.75 | 0.00 | 0.16 | 0.00 |
| 27 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.62 | 0.00 |
| 28 | 0.00 | 0.00 | T | 0.00 | 0.13 | 0.39 | 0.35 | 0.00 | 0.10 | 0.00 | T | 0.00 |
| 29 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | T | 0.00 | 0.00 |
| 30 | 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.04 |
| 31 | 0.00 | | 0.38 | | 0.65 | | 0.00 | T | | 1.50 | | 0.06 |
| TOT. | 3.23 | 2.46 | 4.96 | 3.12 | 1.85 | 4.37 | 4.00 | 3.07 | 4.83 | 4.21 | 3.03 | 2.19 |

T = TRACE

ANNUAL TOTAL: 41.32

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
RAINFALL RECORD – 1994

MONTH

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.10 | 0.00 |
| 2 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | T | T | 0.10 | 0.05 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.46 | 0.00 | 0.00 | 0.00 | 0.90 |
| 5 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.06 |
| 6 | 0.28 | 0.00 | 0.00 | 0.70 | 0.20 | 0.00 | 0.83 | 0.00 | 0.00 | 0.00 | T | 0.01 |
| 7 | 0.14 | 0.00 | 0.19 | 0.00 | 0.83 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| 8 | 0.00 | 0.81 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.59 | 0.00 |
| 9 | 0.00 | T | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 |
| 10 | 0.00 | 0.00 | T | 1.38 | 0.00 | 0.00 | T | 0.00 | T | 0.00 | 0.00 | 0.61 |
| 11 | 0.30 | T | 0.00 | 0.11 | 0.30 | 0.90 | 0.00 | T | 0.00 | 0.00 | 0.00 | T |
| 12 | 0.01 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 13 | T | 0.01 | 0.20 | T | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 |
| 14 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.36 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15 | T | 0.00 | 0.10 | 0.95 | 0.60 | 0.00 | 0.30 | 0.00 | T | 0.00 | 0.60 | 0.00 |
| 16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 |
| 17 | 0.86 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 | 2.30 | 0.00 | 0.00 | 0.00 |
| 18 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.03 |
| 19 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 |
| 20 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 |
| 21 | 0.00 | 0.39 | 0.68 | 0.00 | 0.00 | 0.62 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22 | 0.00 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 2.69 | 0.00 | 0.00 | 0.00 | 0.00 |
| 23 | 0.01 | 0.65 | 0.19 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 |
| 24 | 0.01 | 0.02 | 0.00 | 0.00 | T | 0.50 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 25 | 0.46 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.40 | 0.00 | 0.82 | 0.00 | 0.00 | 0.00 |
| 26 | 0.00 | 0.00 | 0.05 | 0.00 | T | 1.19 | 0.00 | 0.02 | T | 0.00 | 0.00 | 0.00 |
| 27 | 1.89 | 0.00 | 0.90 | 0.00 | 0.00 | T | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28 | 0.08 | T | 0.18 | T | 0.00 | 0.29 | 0.00 | 0.41 | 0.00 | 0.00 | 0.95 | 0.00 |
| 29 | 0.00 | | 0.00 | 0.04 | 0.00 | 0.25 | 0.36 | T | 0.00 | 0.00 | 0.00 | 0.00 |
| 30 | T | | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 |
| 31 | 0.01 | | 0.00 | | T | | 0.00 | 0.46 | | 0.71 | | 0.00 |
| TOT. | 5.39 | 2.51 | 5.31 | 4.08 | 2.34 | 4.17 | 3.68 | 6.28 | 3.12 | 1.16 | 2.73 | 2.09 |

T = TRACE

ANNUAL TOTAL: 42.86

THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
RAINFALL - 1997

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.00 | 1.10 | 0.00 | 0.00 | 0.32 | 0.29 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | |
| 2 | 0.01 | T | 1.20 | 0.00 | 0.00 | 0.90 | T | T | 0.04 | 0.00 | 0.07 | 0.00 | |
| 3 | 0.03 | 0.14 | 0.30 | 0.00 | 0.64 | 0.03 | 0.00 | 0.40 | 0.00 | 0.00 | T | 0.21 | |
| 4 | 0.60 | 0.35 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | |
| 5 | 0.00 | 0.01 | 0.35 | 0.00 | 0.12 | 0.00 | T | 0.00 | T | 0.00 | 0.00 | 0.06 | |
| 6 | 0.00 | 0.00 | T | 0.00 | 0.01 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.09 | 0.04 | |
| 7 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.39 | 0.04 | |
| 8 | 0.00 | T | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.00 | |
| 9 | 0.29 | 0.00 | 0.71 | 0.00 | 0.90 | 0.00 | 0.20 | 0.00 | 0.45 | 0.05 | 0.00 | 0.23 | |
| 10 | T | T | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.01 | 0.31 | |
| 11 | 0.00 | T | 0.00 | 0.21 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.01 | |
| 12 | T | 0.00 | 0.00 | 0.48 | 0.00 | 0.18 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 | T | |
| 13 | 0.00 | 0.52 | 0.29 | 0.00 | T | 0.01 | 0.00 | 0.10 | 0.00 | 0.02 | 1.30 | 0.00 | |
| 14 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 15 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 16 | 0.28 | 0.05 | 0.00 | T | 0.10 | 0.49 | 0.00 | 0.07 | 0.00 | 0.00 | 0.30 | 0.00 | |
| 17 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 2.53 | 0.09 | 0.00 | 0.00 | 0.00 | |
| 18 | 0.00 | 0.00 | 0.20 | 0.00 | 0.05 | 0.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 19 | 0.00 | 0.10 | 0.00 | 0.00 | 0.65 | 0.00 | 0.00 | 0.49 | 1.26 | 0.00 | 0.00 | 0.00 | |
| 20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 21 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.39 | 0.15 | |
| 22 | 0.27 | 0.00 | 0.00 | 0.01 | 0.00 | T | 0.50 | 0.00 | 0.00 | 0.00 | 0.01 | 0.18 | |
| 23 | 0.00 | 0.00 | 0.02 | 0.04 | 0.00 | 0.00 | 0.06 | 0.00 | T | 0.00 | 0.00 | T | |
| 24 | 0.23 | 0.00 | T | 0.79 | 0.90 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 25 | 0.01 | 0.00 | 1.04 | 0.60 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | |
| 26 | 0.00 | 0.17 | T | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 1.72 | 0.20 | 0.00 | |
| 27 | 0.79 | 0.00 | 0.00 | 0.39 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 28 | 0.08 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 1.20 | 0.00 | 0.20 | 0.10 | |
| 29 | 0.00 | | 0.00 | 0.00 | 0.20 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.30 | |
| 30 | 0.00 | | 0.18 | 0.03 | T | 0.33 | 0.00 | 0.00 | 0.18 | 0.00 | 0.12 | 0.00 | |
| 31 | 0.00 | | T | | 0.25 | | 0.00 | 0.00 | | 0.00 | | 0.00 | |
| TOTAL | 2.59 | 1.46 | 5.46 | 2.56 | 4.92 | 2.77 | 1.16 | 5.35 | 3.22 | 1.99 | 3.67 | 1.63 | 36.78 |
| H/L | L | L | H | L | H | L | L | H | L | L | H | L | |

ALLEDONIA STATION

**THE OHIO VALLEY COAL COMPANY**
**POWHATAN NO. 6 MINE**
**RAINFALL - 2001**

RAINFALL AS OF: 11/06/2001

| DATE | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 0.01 | 0.00 | 0.11 | 0.00 | 1.50 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 2 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.44 | | |
| 3 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 4 | 0.04 | T | 0.75 | 0.00 | 0.00 | 0.00 | 0.28 | T | 0.00 | 0.00 | 0.00 | | |
| 5 | 0.01 | 0.01 | 0.07 | 0.33 | 0.00 | 0.43 | 0.16 | 0.00 | 0.00 | 0.28 | 0.00 | | |
| 6 | 0.01 | 0.05 | 0.01 | 0.75 | 0.00 | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | |
| 7 | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | | | |
| 8 | 0.01 | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| 9 | 0.00 | 0.20 | T | 0.06 | 0.00 | 0.00 | 0.00 | 1.23 | 0.00 | 0.00 | | | |
| 10 | 0.00 | 0.00 | 0.00 | 0.88 | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.00 | | | |
| 11 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01 | 0.02 | | | |
| 12 | 0.00 | 0.00 | 0.35 | 0.00 | 0.86 | 0.00 | 0.00 | 2.28 | 0.00 | 0.50 | | | |
| 13 | 0.00 | 0.02 | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | | | |
| 14 | 0.04 | 0.70 | 0.00 | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.37 | | | |
| 15 | T | 0.15 | 0.15 | 0.59 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | | | |
| 16 | T | 0.31 | 0.50 | 0.03 | 0.13 | 0.72 | 0.00 | 0.00 | 0.00 | 0.44 | | | |
| 17 | T | 0.00 | 0.05 | 0.00 | 0.14 | 0.00 | 0.57 | 0.00 | 0.00 | 0.00 | | | |
| 18 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | T | 0.02 | 0.00 | 0.00 | | | |
| 19 | 0.00 | T | 0.00 | 0.00 | 0.44 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | | | |
| 20 | 0.41 | T | 0.41 | 0.78 | 0.00 | 0.53 | 0.00 | 0.00 | 0.46 | 0.00 | | | |
| 21 | 0.00 | 0.00 | 0.94 | 0.14 | 0.74 | 0.20 | 0.00 | 0.00 | 0.02 | 0.00 | | | |
| 22 | 0.00 | 0.08 | 0.00 | 0.00 | 0.55 | 1.05 | 0.00 | 0.16 | 0.00 | 0.00 | | | |
| 23 | 0.00 | 0.00 | 0.19 | 0.01 | 0.13 | 0.00 | 0.00 | 0.05 | T | 0.65 | | | |
| 24 | 0.01 | 0.00 | 0.04 | T | 0.40 | 0.07 | 0.02 | 0.00 | 0.57 | 0.37 | | | |
| 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | | | |
| 26 | 0.34 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.13 | 0.57 | 0.00 | T | | | |
| 27 | T | 0.00 | 0.00 | 0.03 | 0.05 | 0.00 | 0.00 | 0.00 | T | 0.00 | | | |
| 28 | T | 0.00 | 0.00 | 0.00 | T | 0.00 | 0.60 | 0.07 | 0.04 | 0.00 | | | |
| 29 | 0.51 | | 0.06 | 0.00 | 0.07 | 0.31 | 0.06 | 0.00 | 0.00 | 0.00 | | | |
| 30 | T | | T | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| 31 | 0.01 | | 0.00 | | 0.00 | | 0.00 | 1.71 | | 0.00 | | | |
| TOTAL | 1.60 | 1.59 | 3.81 | 3.96 | 4.37 | 5.97 | 3.85 | 6.51 | 1.51 | 2.64 | 0.44 | 0.00 | 36.25 |
| H/L | L | L | H | H | H | H | L | H | L | H | L | | |

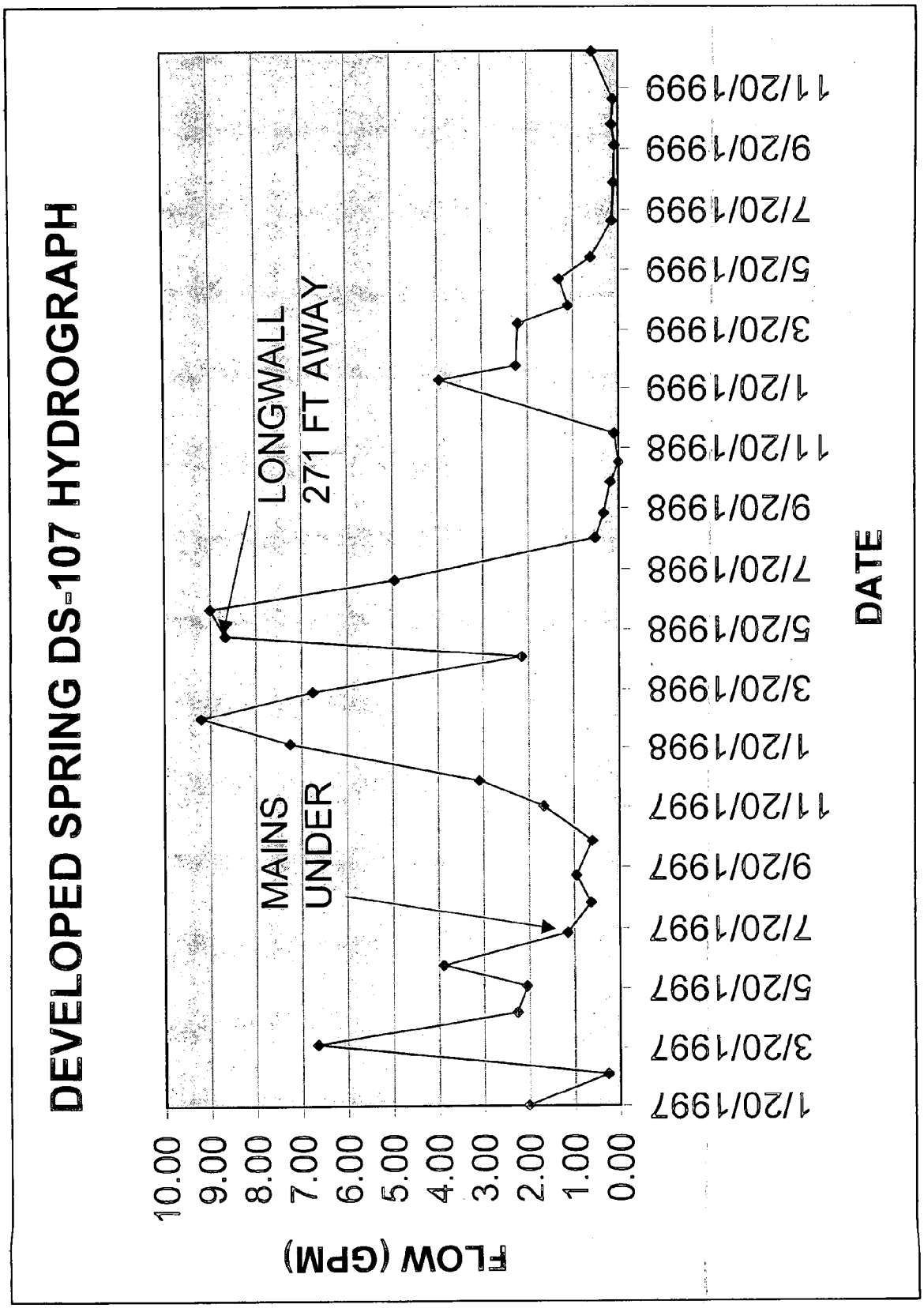
**Rain gauge is read at 7:00 am for the prior day. H/L compares the monthly rainfall with the 50 year average for this area**

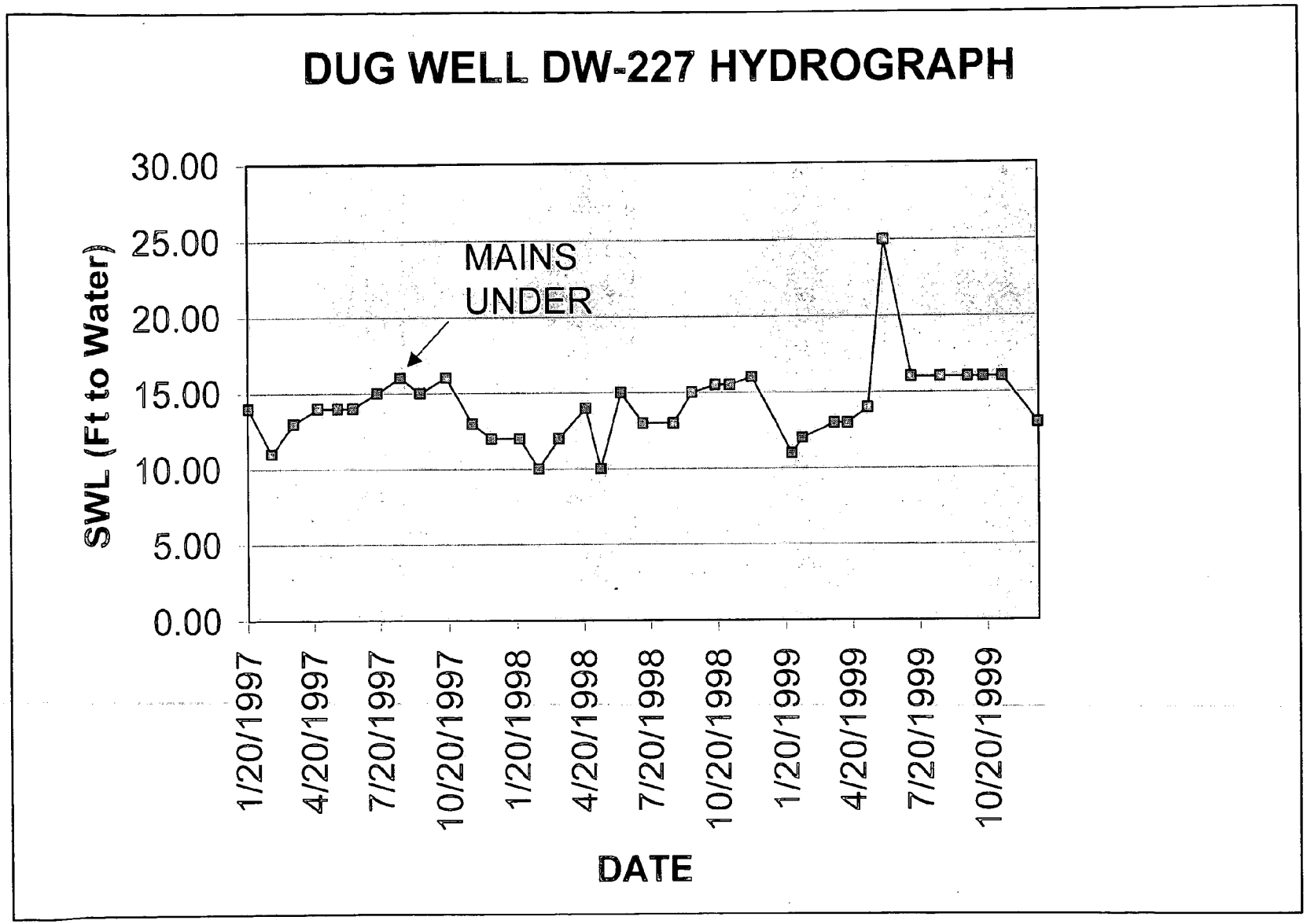
TOVCC 12168

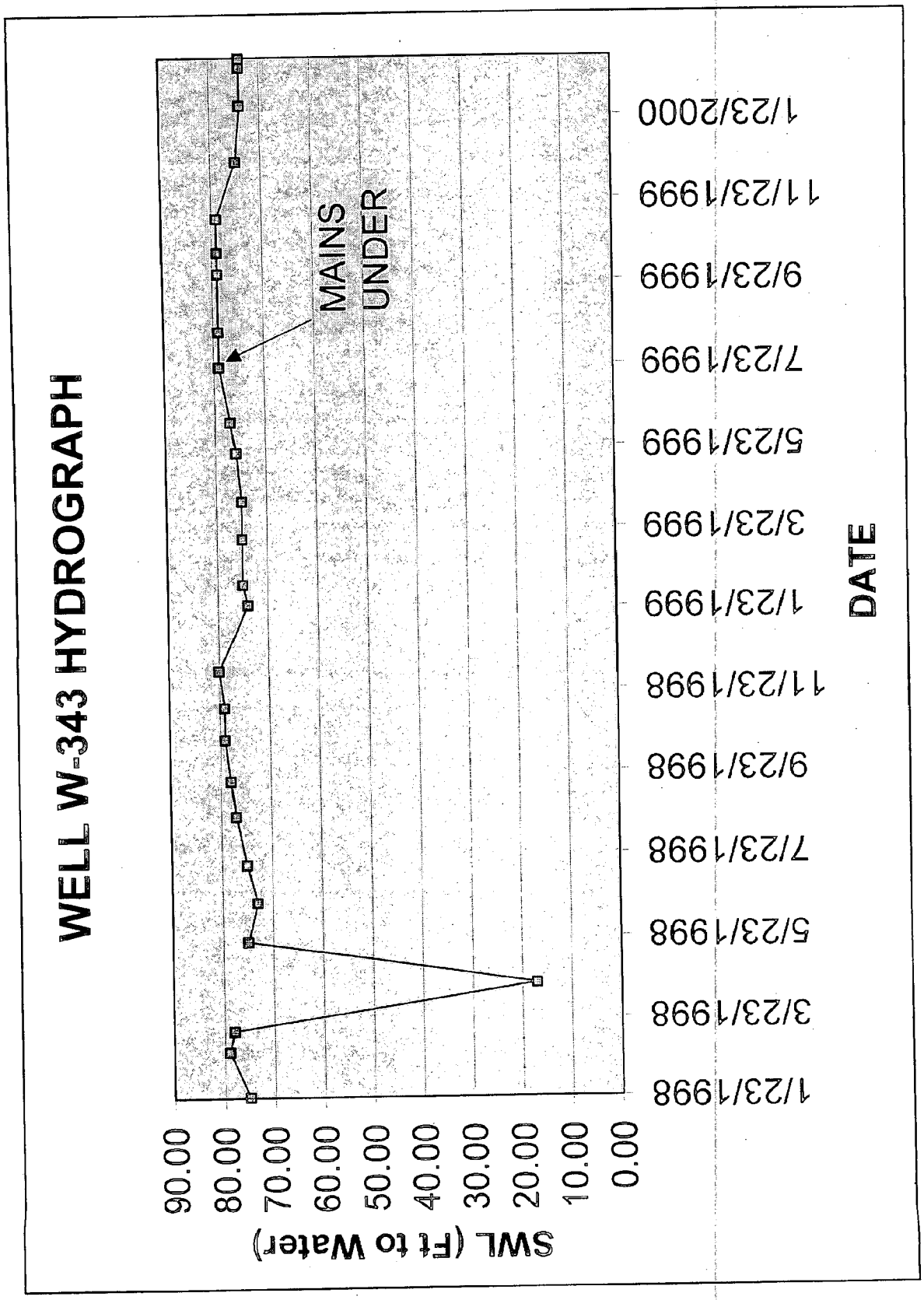
# APPENDIX A

Powhatan No. 6 Mine

Well and Spring Hydrographs


DEVELOPED SPRING DS-107 HYDROGRAPH
FLOW (GPM)
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
MAINS UNDER
LONGWALL 271 FT AWAY
1/20/1997
3/20/1997
5/20/1997
7/20/1997
9/20/1997
11/20/1997
1/20/1998
3/20/1998
5/20/1998
7/20/1998
9/20/1998
11/20/1998
1/20/1999
3/20/1999
5/20/1999
7/20/1999
9/20/1999
11/20/1999
DATE


DUG WELL DW-227 HYDROGRAPH
SWL (Ft to Water)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
MAINS
UNDER
1/20/1997
4/20/1997
7/20/1997
10/20/1997
1/20/1998
4/20/1998
7/20/1998
10/20/1998
1/20/1999
4/20/1999
7/20/1999
10/20/1999
DATE


WELL W-343 HYDROGRAPH
SWL (Ft to Water)
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
MAINS UNDER
1/23/1998
3/23/1998
5/23/1998
7/23/1998
9/23/1998
11/23/1998
1/23/1999
3/23/1999
5/23/1999
7/23/1999
9/23/1999
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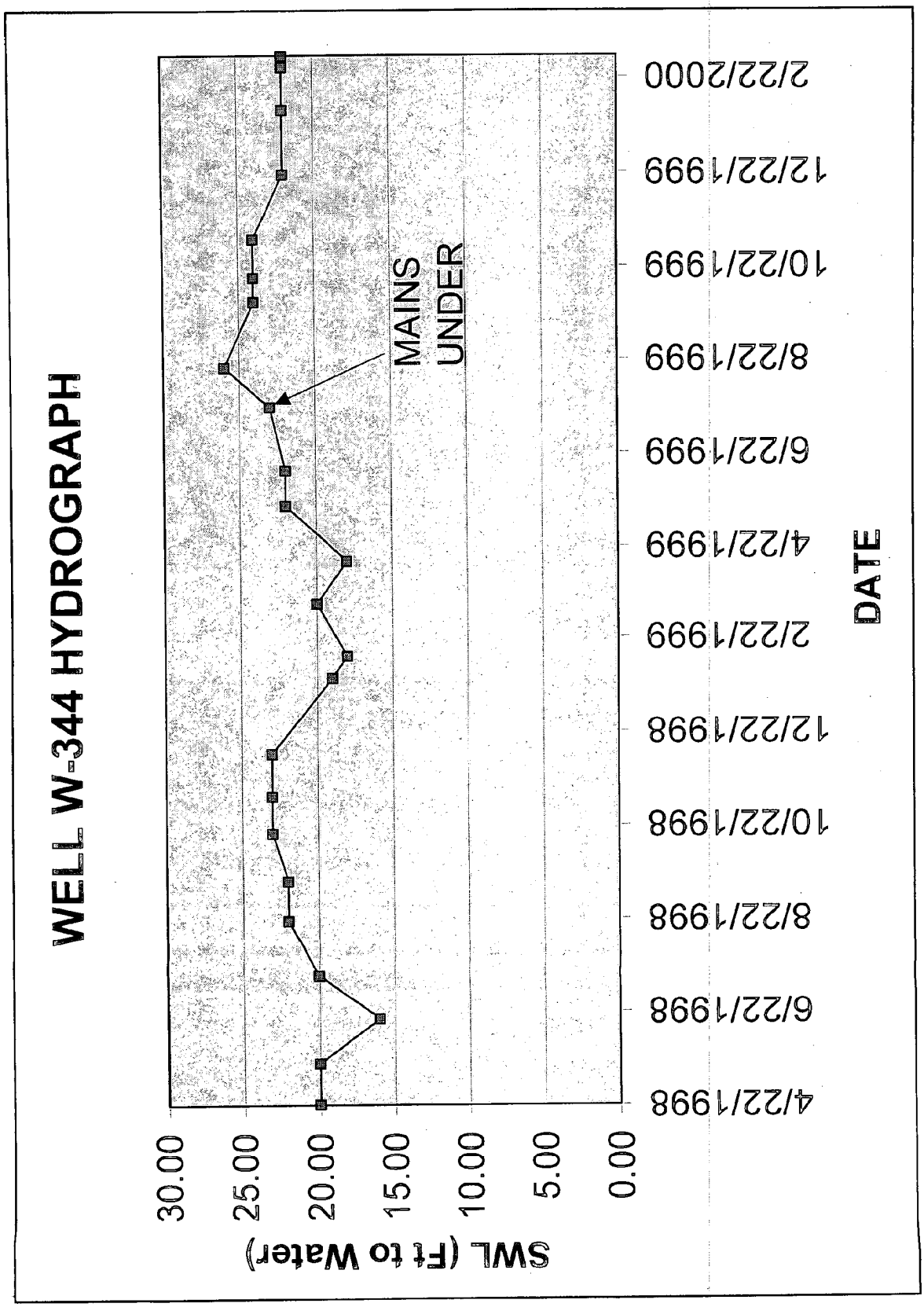
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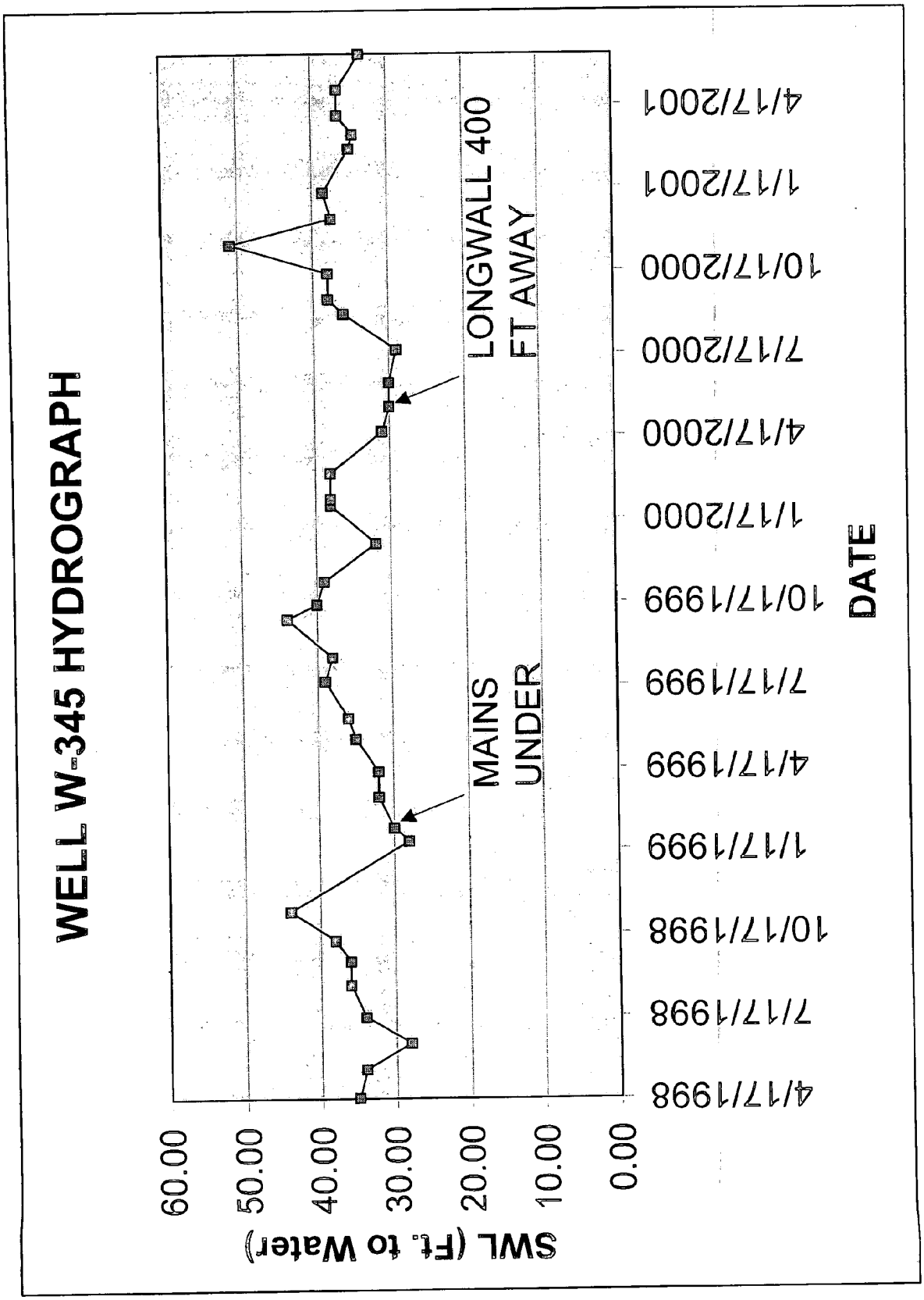
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1/17/2001
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MAINS UNDER
LONGWALL 400 FT AWAY

ADDENDUM TO PAGE 18, PART 2. F(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## DEVELOPED SUPPLIES OF GROUND AND SURFACE WATER THAT MAY BE IMPACTED AS A RESULT OF THE PROPOSED OPERATION

Of the supplies listed in Attachment 14C and 14D, no impacts to any water supply are expected as a result of the proposed operation. According to the PHC, these sources will not be impacted.

ADDENDUM TO PAGE 18, PART 2, F(2)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## ALTERNATIVE WATER SUPPLY INFORMATION

### Adjacent Areas Above Partial Recovery Mining

The PHC contained in this application indicate a low potential for diminution and/or interruption of ground water supplies in areas above and contiguous to full recovery mining operations. No contamination of such water supplies is expected. In the highly unlikely event that a utilized source is disrupted or contaminated, the following plan will be utilized.

Notwithstanding its mining rights and without waiving any of its mining rights, where water diminution, contamination, or interruption results from its mining, The Ohio Valley Coal Company will repair or install a replacement source in the adjacent area at its own expense in a manner mutually satisfactory to OVCC, the water user, and the Division of Mineral Resources Management, and to a level sufficient to meet the water user's pre-mining quantity and quality levels which will be determined by monitoring information gathered in accordance with the Monitoring Plan. While it will be the policy of OVCC to replace a water source, payment of water bills will be the responsibility of the water user, unless otherwise agreed upon by OVCC and the water user.

The steps which OVCC would take to repair or replace affected water sources in the adjacent area include:

1. Repair damaged cisterns after OVCC has determined that damage is complete;

2. On a site specific basis, re-drill existing wells, drill new wells, or connect the water user to public water supplies (if no public water supply exists, OVCC may install a line of sufficient size to service those affected by OVCC's mining operation);

3. On a site specific basis, developed springs will be replaced by a farm pond built according to accepted engineering practices, drilling of a new well, development of another spring in close proximity to the original spring, or connect the water user to public water supplies (if no public water supply exists, OVCC may install a line of sufficient size to service those affected by OVCC's mining operation);

4. Repair damaged farm ponds so as to be comparable to their pre-mining conditions;

5. Install an interim water supply until affected water supplies are replaced. Interim supplies may include hauled water or a tap to public water. OVCC will only install temporary, replacement water using a public water supply if it can be connected within 48 hours. OVCC routinely uses the local fire department to haul county water for temporary replacement supplies. This practice is expected to continue. The local fire department can haul water within a matter of hours after receiving a request. Temporary tanks and water troughs for livestock are kept in stock to facilitate quick installations. Payment of interim water bills shall be the responsibility of the OVCC.

6. Such other proven, cost effective, and reasonable techniques as OVCC may now, or in the future, deem appropriate.

It is OVCC's intention to bear the cost of the installation only of both interim and permanent replacement of developed water sources being used at the time of undermining. If contamination, diminution, or interruption of a water user's ground or surface water supply used for domestic use occurs as a proximate result of the mine's operation, OVCC will repair such water supply or install a replacement supply at OVCC's expense. OVCC will not be responsible for non-developed sources or developed sources not being used at the time of undermining. A source is considered to be developed if it has been fully developed (i.e., water delivery system and drinking facilities) and is well maintained such that it is usable at the time of undermining.

OVCC will install, at OVCC's expense, an alternate water supply system (within 48 hours) to be used until repair or replacement is completed or will reimburse the water user for the reasonable cost of obtaining a water supply from the date of any such contamination, diminution, or interruption until the supply is repaired or replaced. In cases where temporary water cannot be provided within 48 hours, OVCC will immediately notify the Chief of the Division of Mines and Reclamation who will determine if the circumstances warrant an extension of the 48 hours.

OVCC will provide the affected water user with no less of an available water supply than the water user had before mining, based on the pre-mining measurements. If required, OVCC will notify the Division of Mineral Resources Management immediately after it has been informed of the loss of developed water (ground or surface water) due to its mining activities.

As previously stated, the elevation of alternative water sources is unpredictable until the water system in the area again attains equilibrium after mining. Therefore, the alternative water supplies to be developed will be identified when the need arises.

4. Repair damaged farm ponds so as to be comparable to their pre-mining conditions;

5. Install an interim water supply until affected water supplies are replaced. Interim supplies may include hauled water or a tap to public water. OVCC will only install temporary, replacement water using a public water supply if it can be connected within 48 hours. OVCC routinely uses the local fire department to haul county water for temporary replacement supplies. This practice is expected to continue. The local fire department can haul water within a matter of hours after receiving a request. Temporary tanks and water troughs for livestock are kept in stock to facilitate quick installations. Payment of interim water bills shall be the responsibility of the OVCC.

6. Such other proven, cost effective, and reasonable techniques as OVCC may now, or in the future, deem appropriate.

It is OVCC's intention to bear the cost of the installation only of both interim and permanent replacement of developed water sources. If contamination, diminution, or interruption of a water user's ground or surface water supply used for domestic use occurs as a proximate result of the mine's operation, OVCC will repair such water supply or install a replacement supply at OVCC's expense. OVCC will not be responsible for non-developed. A source is considered to be developed if it has been fully developed (i.e., water delivery system and drinking facilities) and is well maintained such that it is usable at the time of undermining.

OVCC will install, at OVCC's expense, an alternate water supply system (within 48 hours) to be used until repair or replacement is completed or will reimburse the water user for the reasonable cost of obtaining a water supply from the date of any such contamination, diminution, or interruption until the supply is repaired or replaced. In cases where temporary water cannot be provided within 48 hours, OVCC will immediately notify the Chief of the Division of Mines and Reclamation who will determine if the circumstances warrant an extension of the 48 hours.

OVCC will provide the affected water user with no less of an available water supply than the water user had before mining, based on the pre-mining measurements. If required, OVCC will notify the Division of Mineral Resources Management immediately after it has been informed of the loss of developed water (ground or surface water) due to its mining activities.

As previously stated, the elevation of alternative water sources is unpredictable until the water system in the area again attains equilibrium after mining. Therefore, the alternative water supplies to be developed will be identified when the need arises.

Those supplies may include but not be limited to re-development of an existing well, spring, or pond, or replacement of the source with the County Water System. The County Water System has been contacted by OVCC and has assured us that there is capacity to replace each developed source with county water. A letter to that effect is enclosed.

If a water user believes that his or her underground or surface water source which is used for domestic use has been contaminated, diminished, or interrupted as a proximate result of the mine's operation, he or she should notify OVCC by calling (614) 926-1351. (After normal business hours, dial extension 221) OVCC will make a determination of liability no later than sixty (60) days after notification of the contamination, diminution, or interruption of a water supply as a proximate result of the mine's operation.

Work on installing a temporary alternate water supply will be complete within 48 hours (unless an extension of the 48 hour time frame is granted by the Chief) after OVCC learns of the contamination, diminution, or interruption to a domestic-use water supply proximately caused by the mining operation. OVCC will pay for installation costs only for a temporary, alternate water supply. Permanent repair or the installation of a replacement water supply for an affected water supply shall be completed no later than eighteen (18) months after it has been determined that the supply has been contaminated, diminished, or interrupted as a proximate result of the mine's operation. The costs of repair of the original water supply and/or the installation of a replacement supply system to provide the affected water user with no less of an available water supply than was being used before mining, based on the pre-mining measurements, shall be paid for by OVCC. If the water user opts to do so, he may install his own temporary water supply system. OVCC will reimburse the water user for the costs of installing a temporary water supply system. Payment for domestic water will be the responsibility of the water user unless otherwise agreed upon by OVCC and the water user.

In repairing or replacing a water user's ground or surface water supply system used for domestic use which is damaged as a proximate result of the mine's operation, OVCC's first preference is to repair the affected supply system. If that is neither effective nor feasible, OVCC's second preference is to replace the affected supply system with a like supply system. For example, a damaged pond, if not repairable, would be replaced with a new pond. If that is not feasible, OVCC will replace the affected supply system with a similar supply system. For example, a damaged dug well, if not repairable or replaceable with another dug well, would be replaced by a potable-type cistern, a drilled well or a similar supply system.

It should be recognized that property sites differ in such elements as geologic and hydrologic composition. Thus, the determination of whether repair of an affected water supply system is feasible or whether replacement by a specific type of water supply system is feasible must be made on a case-by-case, site-specific basis by OVCC. OVCC, in the past, has always attempted to consult and negotiate with the affected water user concerning the selection of the type of water replacement system and its site. This is done at the request of water users who prefer this procedure to that of

OVCC making unilateral decisions about replacement supplies and sites. However, OVCC, if required by the Division of Mineral Resources Management, will make these decisions unilaterally.

In some cases, OVCC reaches pre-subsidence agreements with water users, who are normally represented by counsel and in all cases, have full opportunity to consult with counsel or anyone else of their choosing. These agreements, which are typically negotiated by OVCC employees, normally cover all potential damage claims. In situations where such an agreement is reached, OVCC will comply with the water replacement terms contained in the agreement. Such an agreement will satisfy, at a minimum, this permit and ORC 1513.162.

In any situation where OVCC determines that the contamination, diminution, or interruption of a water supply was not proximately caused by the mining operation, based on evidence such as the proximity of the supply to the mining operation, site specific geologic and surface conditions, or climatological conditions, OVCC will provide the Division of Mineral Resources Management with notice of its determination and the proof in support of that determination to allow the Division of Mineral Resources Management to issue a Chief's Order deciding the issue. This Chief's Order is then appealable in accordance with O.R.C. §1513.13. The water user's water supply system will continue in operation during the time OVCC seeks review of this matter pursuant to O.R.C. §1513.13. If it is determined that contamination, diminution, or interruption of a supply is the proximate result of the mine's operation, OVCC shall bear the costs of installing temporary water system. OVCC reserves the right to proceed against the water user to recover costs incurred if it is determined that OVCC is not liable for the contamination, diminution, or interruption of the affected water supply.

ADDENDUM TO PAGE 17, C
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

GROUNDWATER INFORMATION

See Addendum to Page 17, C(1) in Application D-0360-7.

ADDENDUM TO PAGE 18, PART 2, F(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## DEVELOPED SUPPLIES OF GROUND AND SURFACE WATER THAT MAY BE IMPACTED AS A RESULT OF THE PROPOSED OPERATION

Of the supplies listed in Attachment 14C and 14D, no impacts to any water supply are expected as a result of the proposed operation. According to the PHC, and since there will be no subsidence associated with this application area, these sources will not be impacted.

G. **LAND USE INFORMATION-Permit Area**

(1) Describe the uses of the land within the proposed permit area existing at the time of the filing of this permit application and provide a map which delineates the area of each land use.

N/A - No Permit Area

(2) Was the land use described in item G(1) above changed within five years before the anticipated date of beginning this proposed mining operation? _____ Yes, _____ No. If "yes," submit an addendum describing the historic use of the land.

N/A - No Permit Area

(3) Analyze the capability of the land within the proposed permit area before any mining to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover, and hydrology of the proposed permit area.

N/A - No Permit Area

(4) Analyze the productivity of the land within the proposed permit area before any mining to include average yields obtained under high level of management.

N/A - No Permit Area

(5) Is any land within the proposed permit area classified as prime farmland? _____ Yes, _____ No.

N/A - No Permit Area

(6) Submit an addendum describing the use of the land within the permit area, including the creation of permanent water impoundments, that is proposed to be made of the land following reclamation, including information regarding the utility and capacity of the reclaimed land to support a variety of alternative uses. N/A - No Permit Area

(7) Are there existing land use classifications under local law of the proposed permit area? _____ Yes, _____ No. If "yes," describe the land use classification and submit as an addendum to the permit application, the comments of the governmental agency which would have to initiate, implement, approve or authorize the proposed use of the land following reclamation. If "no," describe the sources of information on which the determination was made.

N/A - No Permit Area

G. (8) Submit as an addendum a copy of the comments from the legal or equitable owner of record of the surface of the proposed permit area concerning the proposed land use.

N/A - No Permit Area

(9) Describe the consideration which has been given to making all of the proposed coal mining activities consistent with surface owner plans and applicable state and local land use plans and programs.

N/A - No Permit Area

(10) Describe how the proposed land use is to be achieved and the necessary support activities that may be needed to achieve the proposed land use.

N/A - No Permit Area

(11) Is the postmining land use to be different from the premining land use? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, the plans and findings required by paragraph (D) of rule 1501:13-9-17 of the Administrative Code.

N/A - No Permit Area

(12) Has the proposed permit area been previously mined? _____ Yes, _____ No. If "yes," provide the following information, if available. N/A No Permit Area

(a) Type of mining method _____

(b) Coal seam mined _____

(c) Non coal mineral mined _____

(d) Extent of mining (acres) _____

(e) Approximate dates _____

(f) Land use preceding mining _____

H. <u>PRIME FARMLAND INVESTIGATION-Permit Area</u>

(1) Does the proposed permit area include any land that is prime farmland, taking into consideration the negative determinations listed in paragraph (L)(2) of rule 1501:13-4-13 of the Administrative Code?
_____ Yes, _____ No. N/A No Permit Area

(2) If the response to item H.(1) is "yes," submit Attachment 15.

(3) If the response to item H.(1) is "no," submit Attachment 16.

PART 3 RECLAMATION AND OPERATIONS PLAN

A. GENERAL REQUIREMENTS-**Permit Area** (Items A.(1) and A.(2)- **Permit and Underground Workings)**

(1) Submit an addendum describing the type and method of coal mining procedures for this application. Explain how these procedures will maximize the use and conservation of the coal resources. Room and Pillar areas will mine the maximum amount of coal and still provide for no subsidence.

(2) Indicate the anticipated annual and total production of coal from this proposed operation.

Annual 5.0 million Total 25 million

(3) Will this operation be combined with surface coal mining activities to the extent that contemporaneous reclamation of areas disturbed by surface mining will be delayed or such that the underground workings will be within 500 feet of the surface mining activities? _____ Yes, _____ No. If "yes," submit Attachment 30.

N/A - No Permit Area

(4) Are experimental mining practices to be employed in the proposed mining operations? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, the description, maps, and plans required by paragraph (B) of rule 1501:13-4-12 of the Administrative Code.

N/A - No Permit Area

(5) Are mountaintop removal mining practices to be employed in the proposed mining operations? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application the information required by paragraph (C) of rule 1501:13-4-12 of the Administrative Code.

N/A - No Permit Area

(6) Are the natural pre-mining slopes within the permit area in excess of twenty (20) degrees? _____ Yes, _____ No. If "yes," submit an addendum demonstrating compliance with the steep slope mining provisions of paragraph (D) of rule 1501:13-4-12 and 1501:13-13-05 of the Administrative Code.

N/A - No Permit Area

(7) Is augering proposed within the permit area? _____ Yes, _____ No. If "yes," submit Attachment 18.

N/A - No Permit Area

(8) Are variances from approximate original contour to be employed for the proposed underground mining surface operations? _____ Yes, _____ No. If "yes," submit an addendum to the permit application demonstrating compliance with paragraph (E) and/or (K) of rule 1501:13-4-12 of the Administrative Code.

N/A - No Permit Area

ADDENDUM TO PAGE 21, PART 3, A(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

MINING METHODS

This application area will be mined by partial recovery methods. Pillars will be sized sufficiently to maintain a high factor of safety for long-term standup of the pillars (see the Addendum to Page 29, K(4).

A. (9) Will access to the underground workings be gained through a drift entry? _____ Yes, _____ No. If "yes," provide as an addendum sufficient information to determine the location of the entry relative to the highest elevation of the coal reserve. Is the drift entry located so as to eliminate the potential for a gravity discharge? _____ Yes, _____ No. If "no," the applicant must demonstrate that the coal seam is not acid or iron producing. Provide an analysis of the strata immediately above and below the coal, and the coal seam itself, sufficient to demonstrate that the water quality from the entry will meet effluent limitations without treatment.

N/A - No Permit Area

(10) For entries to underground workings other than drift entries, provide as an addendum sufficient information to determine the location of the entry relative to the coal reserve. Are the entries located so as to eliminate the potential for a gravity discharge? _____ Yes, _____ No. If "no," provide the following demonstration: N/A - No Permit Area

(a) the gravity discharge will meet effluent limitations without treatment, or

(b) the water will be treated to meet effluent limitations and provisions will be made for consistent maintenance of the treatment facility throughout the anticipated period of gravity discharge.

(11) Will the permanent entry seals be designed to withstand the maximum anticipated hydraulic head when the operations are abandoned? _____ Yes, _____ No. If "yes," submit the appropriate information demonstrating that this will be accomplished. If "no," provide a typical plan for the seals to be used to close the mine entries pursuant to applicable state and federal regulations. N/A - No Permit Area

(12) Submit an addendum describing the construction, modification, maintenance, and removal (unless to be retained for postmining land use), including the proposed engineering techniques and major equipment to be used, of the following facilities:

(a) dams, embankments, and other impoundments. Do any of the plans for water, sediment or slurry impoundments meet the requirements of 30 CFR 77.216? _____ Yes, _____ No. If "yes," submit as an addendum a plan that addresses each of the requirements in 30 CFR 77.216-2.

(b) overburden and topsoil handling and storage areas and structures.

N/A - No Permit Area

A. (12) (c) coal removal, handling, storage, cleaning, and transportation areas and structures; including, but not limited to, preparation plants, beltlines, tipples, rail sidings, and primary roads. For roads, conveyors and rail systems, submit an addendum describing the information required pursuant to paragraph (L) of rule 1501:13-4-14 and 1501:13-10-01 of the Administrative Code.

N/A - No Permit Area

(d) spoil removal, handling, storage, transportation, and disposal areas and structures, including underground development waste or excess spoil disposal sites. If underground development waste or excess spoil is to be generated, submit an addendum describing the information required by paragraphs (O) and (P) of rule 1501:13-4-14 and 1501:13-9-07 of the Administrative Code.

N/A - No Permit Area

(e) mine facilities such as portal/shaft development, boreholes, de-gas holes, vents, office or shop buildings and maintenance facilities.

N/A - No Permit Area

(f) water and air pollution control facilities.

N/A - No Permit Area

(13) Provide an estimate of the cost per acre to reclaim the permit area. _____ N/A - No Permit Area

(14) Will the proposed operation include any of the following: N/A - No Permit Area

(a) disposal of coal mine waste from a wash plant, tipple, or other source? _____ Yes, _____ No. If "yes," submit Attachment 28 and, if applicable, the information required by paragraph (H) of rule 1501:13-4-14 of the Administrative Code.

(b) disposal of fly ash or other noncoal wastes? _____ Yes, _____ No. If "yes," submit an addendum which addresses the disposal material and a detailed disposal plan, pursuant to paragraph (E) of rule 1501:13-9-09 of the Administrative Code.

(c) return of slurry or other mine waste or material into the abandoned underground workings? _____ Yes, _____ No. If "yes," comply with provisions contained in paragraph (N) of rule 1501:13-4-14 and paragraph (Q) of 1501:13-9-04 of the Administrative Code, and submit copies of the required MSHA approvals as an addendum.

B. <u>EXISTING STRUCTURES-Permit Area</u>

(1) Are any existing structures proposed to be used in connection with or to facilitate the coal mining and reclamation operation? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application a description of each structure. The description shall include the information required by paragraph (B)(1) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

B. (2) Are any existing structures proposed to be modified or reconstructed for use in connection with or to facilitate the coal mining and reclamation operation? _____ Yes, _____ No. If "yes," submit as an addendum to the permit application, a compliance plan for each structure. The plan shall include the information required by paragraph (B)(2) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

C. BLASTING-Permit Area

Will blasting occur within 25 feet of the surface during shaft and portal development or other on-site development? _____ Yes, _____ No. If "yes," submit Attachment 29.

N/A - No Permit Area

D. RECLAMATION PLAN - GENERAL REQUIREMENTS-Permit Area (Item D.(12)-Permit, Shadow, and Adjacent Area)

(1) Provide a detailed timetable for the completion of backfilling and grading for each mining year.

N/A

(2) Provide a detailed timetable for the completion of resoiling for each mining year.

N/A

(3) Provide a detailed timetable for the completion of planting for each mining year.

N/A

(4) Describe the plan for backfilling, compacting and grading of the disturbed permit area, including the disposal of all mine generated debris.

N/A

(5) Submit an addendum describing the plan for the removal, storage, redistribution and stabilization of topsoil, subsoil, or approved alternative resoiling material to meet the requirements of rule 1501:13-9-03 of the Administrative Code. If an alternative resoiling material is to be used, submit Attachment 19.

N/A

(6) Provide the following information for the revegetation plan:

(a) Schedule for revegetation to include planting of temporary vegetation.

N/A

D. (6) (b) List the species and amounts per acre of seeds and seedlings to be used.

N/A

(c) Describe the methods to be used in planting and seeding.

N/A

(d) Describe the mulching techniques.

N/A

(7) Describe the soil testing plan for evaluation of the results of topsoil handling and reclamation procedures related to revegetation.

N/A

(8) Submit an addendum describing the measures to be employed to handle and place acid or toxic-forming materials in accordance with paragraph (J) of rule 1501:13-9-04 and paragraph (J) of rule 1501:13-9-14 of the Administrative Code. N/A

(9) Describe the measures, including appropriate cross-sections and maps, to be used to plug, case or manage mine openings or bore holes other than those entries utilized to gain access to the underground workings, pursuant to rule 1501:13-9-02 of the Administrative Code.

N/A

(10) Is the reclamation plan consistent with local physical, environmental, and climatological conditions?
_____ Yes, _____ No. N/A

(11) Identify any other applicable air and water quality laws and regulations and health and safety standards and describe the steps to be taken to comply with each.

N/A

(12) Submit an addendum describing the plan for minimizing to the extent possible and using the best technology currently available disturbances and adverse impacts of the operation on fish and wildlife and related environmental values and achieving enhancement of such resources where practical for the permit, shadow, and adjacent areas. See Addendum to Page 25, Part 3, D(12)

ADDENDUM TO PART 3, PAGE 25, D(12)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## RECLAMATION PLAN - FISH, WILDLIFE, ENVIRONMENTAL VALUES

The proposed mining operation is not expected to impact fish, wildlife, and other related environmental values. The mining will not proceed beneath any streams where fish live. Minnows have been found in some of the larger stream segments within the application area. However, the normal annual cycle shows that during the summer and fall months, when the stream flow is minimal, the minnows swim downstream, only to return again. There are several ponds overlying the application area, and larger fish live in them. Our experience at the Powhatan No. 6 Mine is that ponds are not influenced by partial recovery mining. Wildlife has never been shown to be affected by partial recovery mining. Undeveloped springs are not impacted by partial recovery mining. If undeveveloped springs located above the application area are inadvertently dewatered they usually reposition themselves downstream. Ohio Valley will replace undeveloped springs if they are disrupted by our mining activities and are legitimately used according to our water replacement plan.

E. **RECLAMATION PLAN-PROTECTION OF HYDROLOGIC BALANCE-Permit and Adjacent Area**

Submit an addendum describing the measures to be taken during and after the proposed mining operations to:

See Addendum to Page 26, Part 3E (1-3)

(1) minimize disturbance to the hydrologic balance, including quality and quantity, within the permit and adjacent areas and to prevent material damage outside the permit area;

(2) protect the rights of present users of surface and ground water;

(3) avoid acid or toxic drainage.

F. **GROUND WATER AND SURFACE WATER MONITORING PLAN-Permit and Shadow Area**

Based upon the probable hydrologic consequences determination and analysis of all baseline hydrologic, geologic, and other information submitted in this application, address the following items in accordance with paragraph (F) of rule 1501:13-4-14 and paragraph (N) of rule 1501:13-9-04 of the Administrative Code.

See Addendum to Page 29, Part 3, F

(1) In addition to the quality and quantity parameters required for quarterly monitoring and NPDES monitoring, will any other parameters be monitored?
_____ Yes, __X__ No. If "yes," indicate the parameter(s) and the site(s) where such monitoring will occur.

(2) Do you propose or anticipate the need for a variation in the required monitoring frequency for ground and surface water sites and monthly monitoring for NPDES?
_____ Yes, __X__ No. If "yes," describe the variation in frequency and the monitoring sites to be affected.

(3) Describe the plan for collection, recording, and reporting of all surface and ground water quality and quantity monitoring data, including data collected for the NPDES program.

ADDENDUM TO PAGE 25, PART 3, D(12)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## PLAN FOR MINIMIZING TO THE EXTENT POSSIBLE AND USING THE BEST TECHNOLOGY CURRENTLY AVAILABLE DISTURBANCES AND ADVERSE IMPACTS OF THE CURRENT OPERATION ON FISH, WILDLIFE AND RELATED ENVIRONMENTAL VALUES AND ACHIEVING ENHANCEMENT OF SUCH RESOURCES WHERE PRACTICAL

The proposed operation, partial recovery mining, results in no subsidence, and minimizes to the extent possible (and is the best technology currently available) impacts on fish, wildlife, and environmental values because it occurs in a planned, predictable and controlled manner. There are no impacts anticipated to fish, wildlife, and environmental values. Areas where partial recovery mining has occurred do not show any impacts on such resources. Therefore, no impacts are anticipated to fish, wildlife, and such resources.

### Wetlands

Wetlands have been undermined by the partial recovery operations at the Powhatan No. 6 Mine without impacts.

ADDENDUM TO PAGE 26, F(3)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT 0360

## GROUND AND SURFACE WATER MONITORING

Although the D-0360-13 application is for underground works only and not surface operations, ground water and surface water monitoring as previously approved for Powhatan No. 6 Mine (Permit D-0360) will continue with respect to the surface operations. Ground water and surface water monitoring over underground areas of the mine is proposed to determine the impacts of underground mining on these areas. The proposed plan presented below is to be used in lieu of all previously proposed and existing plans for such areas.

### Surface Water

For mining areas, intermittent and perennial streams and that originate within the mining area will be monitored where the stream leaves the area; and utilized streams crossing through the mining area will be monitored for flow monthly both upstream and downstream of the property where they are being used, for a year prior to and after the area has been undermined. Monitored streams will be sampled quarterly and the water analyzed for quarterly parameters. Utilized streams will be monitored once a week for 3 weeks prior to the mining proceeding past a source and once a week for 3 weeks after the mining has past a source.

### Ground Water

For all coal mining areas, ground water monitoring will consist of monitoring and sampling all developed water sources, with the permission of the landowner, in the following manner:

> Monthly monitoring will be done for quantity (static water level/flow) for a one-year period before and after mining for developed springs and wells. This information will be reported quarterly but is available at the OVCC office.
>
> For all mining areas, quarterly monitoring will be conducted for quality for a one-year period before and after mining for developed springs, wells, and stream monitoring points. This information will be reported quarterly.
>
> Daily precipitation data from the mining area will be submitted to evaluate its impact on spring and stream flow. This information will be submitted quarterly but will be available at the OVCC office.

An attempt will be made to sample as outlined above, however, some sources may not be accessible should a landowner deny permission to sample, a well may be buried, etc. These locations, if encountered, will be documented in the quarterly reports.

All samples will be taken as outlined to the extent that existing well construction allows. Any samples that are unobtainable will be documented as such in the quarterly report.

OVCC will monitor all developed supplies in accordance with the monitoring plan outlined above regardless of the aquifers and/or saturated zones that they access. All developed supplies have been identified and have been indicated on the Application Map. All wells, both drilled and dug have been identified. Developed springs, consisting of a french drain and catchment basin, have been shown. A map will be included in the quarterly monitoring report showing the location of the wells, streams, and springs monitored and their position relative to the active mining areas of OVCC's Powhatan No. 6 Mine. OVCC will submit a request to cease monitoring following 12 months of monitoring after undermining a location.

ADDENDUM TO PAGE 26, PART 3, E(1-3)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## RECLAMATION PLAN - PROTECTION OF HYDROLOGIC BALANCE

Since this area will be mined using partial recovery mining methods, no changes to the hydrologic balance are anticipated. Experience with partial recovery operations that do not result in subsidence shows that the hydrologic balance will not be disturbed. Subsequent longwall mining adjacent to this area may occur sometime in the future, but the impacts of longwall mining are not the subject of this application.

G. DIVERSIONS AND DRAINAGE CONTROLS-Permit Area

(1) Will the proposed coal mining activities result in diversions of overland flow away from the disturbed areas? _____ Yes, _____ No. If "yes," describe, including maps and cross sections, the diversion to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

(2) Will the proposed coal mining activities result in the diversion of intermittent or perennial streams within the proposed permit area? _____ Yes, _____ No. If "yes," describe, including maps and cross sections, the diversions to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

(3) Will the proposed coal mining activities result in construction of diversions to direct runoff through a sediment pond or a series of sediment ponds? _____ Yes, _____ No. If "yes," submit an addendum to describe, including maps and cross sections, the diversions to be constructed to achieve compliance with paragraph (I) of rule 1501:13-4-14 of the Administrative Code.

N/A - No Permit Area

(4) Indicate which of the following are proposed to be constructed within the proposed permit area and submit as an addendum the detailed design plans for each structure in accordance with paragraph (H) of rule 1501:13-4-14 and 1501:13-9-04 of the Administrative Code.

_____ sedimentation pond(s) (submit Attachment 20)

_____ water impoundment(s) (submit Attachment 20)

_____ other (specify) _____

N/A - No Permit Area

(5) Submit an addendum describing the plan for the control of water drainage into, through, and out of the proposed permit area. If applicable, submit as an addendum any request for variances pursuant to paragraphs (B) and (E) of rule 1501:13-9-04 of the Administrative Code.

N/A - No Permit Area

(6) Describe the treatment, when required, of ground and surface water drainage from the area to be disturbed by the proposed coal mining activities

N/A - No Permit Area

ADDENDUM TO PAGE 25, PART 2, A(14)(a) AND PAGE 27, PART 2, D(8)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

Refuse from Area to be Mined

The refuse from the area to be mined will be disposed of according to the plans previously submitted and approved in the original submittal of Permit D-0360 (on file at the Division of Mines and Reclamation Office). In particular, see Addendum 20 and Appendix IV-9. See also approved application D-0360-8.

H. PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES-**Permit and Planned Subsidence Area**

Will the proposed coal mining activities adversely affect any public parks and places listed on the National Register of Historic Places? _____ Yes, __X__ No. If "yes," submit an addendum describing the measures to minimize or prevent these impacts. No subsidence areas.

I. MINING NEAR OR THROUGH A PUBLIC ROAD-**Permit Area**

If the response to Part 1, item D(6) of the permit application is "yes," submit an addendum describing the measures to be used to ensure that the interests of the public and landowners are protected.

N/A - No Permit Area

J. SUBSIDENCE CONTROL SURVEY-**Shadow Area**

No subsidence areas.

(1) Is this a full coal recovery operation?
_____ Yes, __X__ No. If "yes," complete Attachment 31, Subsidence Control Survey, and following items J(2) and (3).

(2) Does the shadow area contain any of the structures or facilities listed in 1501:13-12-03(J)(1-3)?
_____ Yes, __X__ No. If "yes," complete Attachment 32, Protection of Specific Structures, and specifically identify the structures or facilities on the application map.

(3) Are any aquifers or bodies of water that serve as a significant water source for any public water supply system present in the shadow area?
_____ Yes, __X__ No. If "yes," complete Attachment 32, Protection of Specific Structures, and specifically identify the areas on the application map.

K. SUBSIDENCE CONTROL PLAN-**Shadow Area**

(1) Submit an addendum which describes the method of coal removal, and indicates the size, sequence, and timing of the development of the underground workings.
See Addendum to Page 28, Part 3, K(1)/Timing, Struc. Cont., and Parcel.

(2) Utilizing the application map, specifically indicate areas where planned subsidence mining methods (i.e. longwall or pillar extraction) will be used.
See Application Map and Timing, Struc. Cont., and Parcel Map.

(3) Utilizing the application map, specifically indicate room-and-pillar mining areas where subsidence will be prevented or minimized.
See Application Map and Timing, Struc. Cont., and Parcel Map.

ADDENDUM TO PART 3, PAGE 28, (K)(1)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## ANNUAL MAP

In accordance with PPD Underground 91-1, a mine map will be submitted to coincide with the permit anniversary date. For ground water monitoring, the face location of the active panel will be provided quarterly with the monitoring data. The maps will contain the following:

1. Scale the same as the Division of Mines submittal, or 1 in. = 500 ft.
2. All base map requirements pursuant to ORC 4153.03.
3. Surface owner names and property lines.
4. Streams and other bodies of water.
5. Section lines and numbers.
6. Buildings and other surface structures.
7. Public roads and railroad tracks.
8. Mine openings and surveyed workings, showing pillar and entry size, configuration and location.
9. Survey extension dates for all workings, including longwall face or pillar recovery lines.
10. Areas of full extraction.
11. Coal elevations and extraction height.
12. Completion dates for individual sections (if sealed, date and location of seal).
13. Maximum extraction ratios for completed sections.
14. Ground water and subsidence monitoring stations.
15. The boundaries of the authorized mining area.
16. The location and extent of any other mine excavation (surface or underground) within the same seam being mined.
17. A map title block and notarized map certification.

**Method of coal removal, size, sequence, timing of development of underground works:**

The method of coal removal from this application area is development mining, where three entries are to be driven on centers of 68 ft, with cross cut centers of 120 ft. Entries are to be driven a maximum of 20 ft wide, with a mining height of 78 inches. The Timing, Deed Parcel, and Structure Contour Map shows the timing of the mining in this area. The mining will progress (sequence) from the mains (on the east side of the section) toward the west as shown on the Map. In this application area, mining is only projected to occur over a period of approximately six months, so no other mining sequence is shown

K. (4) Submit as an addendum, for those areas mapped as room-and-pillar mining, the following information:

See Addendum to Page 29, Part 3, K(4)(a-j).

(a) the maximum and average overburden thickness.

(b) the projected maximum extraction ratios for mains, submains, and butt sections, as well as the existing ranges of values for the same areas.

(c) projected maximum width of entries and cross cuts throughout the mine, as well as the existing ranges of values for the same areas.

(d) the center spacing for entries and cross cuts.

(e) minimum pillar dimensions for mains, submains, and butt sections, as well as the existing ranges of values for these areas.

(f) the barrier pillar width between butt sections, as well as the existing ranges of values for the same areas.

(g) the engineering properties of the clay/shale, or other soft rock material in the roof and floor of the mine.

(h) measures to be taken on the surface to prevent damage or lessening of the value or reasonably foreseeable use of the surface, if any.

(i) the minimum pillar safety factor, for protected structures, based upon coal strength and load.

(j) methods and calculations used to determine the safety factor.

(5) Submit as an addendum for those areas mapped as full coal recovery mining, the following information:

No full recovery areas.

(a) for each method to be employed (i.e. longwall or pillar extraction), provide the following:

i) rate and direction of dip for the coal seam.

ii) dimensions of panels or butt sections.

iii) thickness of coal to be extracted (mining height).

iv) maximum angle of draw.

v) maximum anticipated subsidence.

vi) width of barrier pillars or chain pillars between sections or panels.

vii) the maximum extraction ratio within a pillaring section.

ADDENDUM TO PAGE 29, PART 3, K(4)
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

(a) For those areas mapped as no longwall mining areas, room-and-pillar mining is anticipated, consisting mainly of main entries and gate entries. The maximum overburden thickness in these areas is 530 ft. The average overburden thickness is 410 ft.

(b) For gate entries, with pillars on 120 ft x 68 ft centers, the projected maximum extraction ratio is 48.7 percent. These dimensions are currently used at the No. 6 Mine.

(c) The projected maximum width of entries and crosscuts currently is 20 ft, and is expected to remain the same for the application area.

(d) The center spacing is discussed in part (b) above.

(e) For gate entries, the minimum pillar dimensions are 100 ft x 48 ft. These values are in use today at the Powhatan No. 6 Mine.

(f) There are no barrier pillars planned for this area.

(g) Typical floor at the Powhatan No. 6 Mine is comprised of shale, calcareous shale, or claystone. Table 13 shows the engineering properties of the floor material. Compressive strength varies from 3,930 psi to 12, 590 psi. Unit weights of floor samples varies from 158.3 lb/cu. ft to 183.2 lb/cu. ft.

(h) There are no measures planned to be taken on the surface to prevent damage or lessening of the value or reasonably foreseeable use of the surface, as these areas will not be subsided.

(i) The minimum pillar safety factor for gate entries in this area is 2.6.

(j) The method used to calculate the safety factors is the highly conservative Holland Formulae, shown on the enclosed calculation sheets.

ADDENDUM TO PAGE 29, PART 3, K(4)
PILLAR SAFETY FACTOR AND EXTRACTION RATIO
THE OHIO VALLEY COAL COMPANY
POWHATAN NO. 6 MINE
PERMIT D-0360

## PILLAR SAFETY FACTOR

The critical factor to show pillar resistance to failure, from an engineering standpoint, is the pillar safety factor. OVCC uses the Holland Method, perhaps the most conservative of the many design formulae. This formula uses the strength of a pillar scaled from a 3 in. cube, the depth (average depth plus maximum depth)/2, the pillar width and length in inches, the entry width and height in inches, plus the overburden load (1.1 psi/ft of depth). Based on these parameters, the pillar safety factor for the 22 West gate section is a modest 2.6, or more than 2.5 to 1. See enclosed safety factor calculation sheet.

## EXTRATION RATIO

Another measure of the long-term standup potential of pillars, although only rough estimate, is the extraction ratio. The rule of thumb says that if the extraction ratio is less than 50 percent of the total coal in place, there is little likelihood of pillar failure. This rule may not be true, if the safety factor is less than a minimum of 1.0. In this case, the safety factor is greater than 2.5, so it tends to reinforce the stability of the pillar.

In this instance, the extraction ratio is calculated as follows:

Extraction ratio = 100 x [(480 x 156) – (8 x 4800)]/(480 x 156) = 100 x [(74880-38400)/74880]

= 100(36480/74880) = 48.7 percent of coal extracted

Less than 49 percent of the coal will be extracted in the 22 West gate section.

## PARAMETERS

Average depth = 410 ft, Maximum depth = 530 ft
Pillar dimensions = 100 ft x 48 ft (120 ft x 68 ft. center-to-center)
Entry dimensions = 20 ft x 6.5 ft
Total coal in block of coal examined = 480 ft x 156 ft
Total coal in pillar = 100 ft x 48 ft
Total pillars in block of coal examined = 8

The Ohio Valley Coal Company
Powhatan No. 6 Mine
Pillar Safety Factor - 22 West Gate Section
HOLLAND METHOD

| | | | |
|---|---|---|---|
| PILLAR STRENGTH | 850 | PSI | Strength of a pillar scaled down from a 3 in. cube (HOLLAND) |
| DEPTH | 470 | FT | (Avg depth + Max. depth)/2 (PENG) |
| PILLAR W | 576 | IN | Pillar width in inches |
| PILLAR L | 1200 | IN | Pillar length in inches |
| ENTRY W | 240 | IN | Entry width in inches |
| ENTRY H | 78 | IN | Entry height in inches |
| OVERBURDEN LOAD | 1.1 | PSI | Per ft. of depth (PENG) |

HOLLAND FORMULAE:

| | | | |
|---|---|---|---|
| AVG STRESS | 878.9 | psi | VERT. STRESS x {[(PILLAR W + ENTRY W)x(PILLAR L + ENTRY W)]/(PILLAR W x PILLAR L)} |
| S1 | 850 | psi | (HOLLAND) |
| S2 | 2309.8 | psi | S1 x SQUARE ROOT OF (PILLAR W/ENTRY H) |
| SF | 2.6 | | S2/AVG STRESS |

From Peng , S. S. and Dutta, D., "Evaluation of Various Pillar Design Methods: A Case Study." Proceedings of the Workshop of Coal Pillar Mechanics and Design, compiled by A.T. Iannacchione, C. Mark, R. C. Repsher, R. J. Tuchman, and C.C. Jones, USBM, IC 9315, 1992, pp. 269-276.

STATE OF OHIO
DAVID L. BARTSCH
E - 50396
REGISTERED
PROFESSIONAL ENGINEER

TOVCC 12204

K. (5) (b) the anticipated effects of planned subsidence upon the land and water resources identified in the subsidence control survey and survey of ground and surface water resources.

(c) the measures to be taken to mitigate the anticipated effects of planned subsidence to the land and water resources.

(d) the anticipated effects of planned subsidence upon the structures identified in the subsidence control survey.

(e) the proposed measures to be taken to mitigate anticipated effects to structures.

(f) the proposed measures to determine the extent of mining related damages including a presubsidence survey with an indication of the timing of the survey.

(g) the provisions for repair and/or compensation for damages to structures.

(h) describe the monitoring, if any, needed to determine the commencement and degree of subsidence so that, when approriate, other measures can be taken to prevent, reduce, or correct material damage in accordance with rule 1501:13-12-03 of the Administrative Code.

(6) Will planned subsidence operations be conducted within the angle of draw of urbanized areas, cities, towns, communities, industrial or commercial buildings, major impoundments, or perennial streams?
No subsidence operations.
_____ Yes, __X__ No. If "yes," describe any measures or activities that will prevent a condition or practice that could result in an imminent danger to the health or safety of the public.

(7) Will planned subsidence operations be conducted within the angle of draw of transmission pipelines?
_____ Yes, __X__ No. If "yes," describe the procedural plan to avoid the creation of a situation of imminent danger to the health and safety of the public.
No subsidence operations.

**PART 4 FORMAT AND CONTENT**

A. FILING OF ADDENDA

If an addendum is needed to present the information required by the items in the permit application, the addendum is to be submitted with the permit application and each page, map, plan or other document in the addendum should include the applicant's name and indicate to what item the addendum applies. For example, "Addendum to Part 3, item K(2) Zebco Coal Company."

B. Provide the information requested below for all technical data submitted in the application.

| Identification of Technical Data (1) | Person/Organization that Collected Data and Date | Methodology for Collecting Data | Person/Organization that Collected Data and Date | Methodology Used to Analyze Data |
|---|---|---|---|---|
| Attachments, Addenda | D. Bartsch (OVCC) | N/A | Quality Environmental Services, Tra-Det, Inc. | Water Sampling<br>Lab Analysis<br>Field Analysis |

(1) The technical data is to be identified by referencing the particular item in the application for which the data was used in preparing the response (e.g. Part 2, B(1) Attachment 14; Part 4, A).

C. Provide the name, address, and position of officials of each private or academic research organization or governmental agency contacted in the preparation of the application for information on land uses, soils, geology, vegetation, fish and wildlife, water quantity and quality, air quality, and archeological, cultural, and historic features.

| Name and Address of Official | Position of Official | Name of Agency/ Organization | Type of information (e.g.Geology) |
|---|---|---|---|
| Bill Haiker | Hydrologist | ODNR, Division of Water | Ground Water Inventory Report |
| No contact person - Public Document | | USGS | Water Resources Data |

D. APPLICATION FOR ABANDONED MINED LAND DIRECT NEGOTIATED CONTRACT (IF APPLICABLE)

In accordance with Section 1513.27 of the Ohio Revised Code, the chief of the Division of Reclamation has been granted the authority to enter into contracts with licensed operators for reclamation of abandoned mined lands affected by coal mining prior to April 10, 1972 and located adjacent to a permit area. To be eligible for reclamation funding, the abandoned mined land must be causing offsite environmental problems, will not be affected the operator during the normal course of mining, and is not likely to be mined in the foreseeable future. If such lands exist adjacent to your per area and you are interested in contracting for reclamation of the lands, complete this application, detach and send directly to:

Robert S. Baker, Manager
Mined Land Reclamation
Division of Reclamation
Fountain Square, H-2
Columbus, Ohio 43224

Upon receipt, a representative from the Mined Land Reclamation section wil contact you.

Applicant: _____

Address: _____

City: _____ State: _____ Zip: _____

Business Telephone: _____

Contact Person: _____

Description of Abandoned Mined Land:

County: _____
Township: _____
Section/Lot: _____
Approximate Acreage _____

Environmental Problems Associated with Site:

_____

_____

_____

_____

Ohio Department of Na[illegible]sources

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56854 Pleasant Ridge Road
Alledonia, Ohio 43902

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TOVCC 12209

# Ohio Department of Natural Resources

BOB TAFT, GOVERNOR SAMUEL W. SPECK, DIRECTOR

**Division of Mineral Resources Management**
Michael L. Sponsler ∘ Chief
1855 Fountain Square Court-Bldg. H-2
Columbus, Ohio 43224-1383
Phone (614) 265-6633 Fax: (614) 265-7999


April 30, 2002

The Ohio Valley Coal Company
56854 Pleasant Ridge Road
Alledonia, Ohio 43902

Gentlemen:

The Division has reviewed coal mining and reclamation permit application # D-0360-13 and revisions are required before processing can continue. Please comply with the following application requirements.

A. Application Review

1. Page 2, F: Provide the printed name, date, signature, title and notarization acknowledging these revisions.

2. Page 3: Provide a complete copy of this page that includes all items in their entirety.

3. Page 4, A(10): Provide an Attachment 5 for American Energy Corporation.

4. Page 10, C(8)(b): Right of entry affidavits:

   a. Per the deed parcel map, deed parcel 104-1 is in section 28 only; therefore, delete section 22 from the affidavit.

5. Page 16, A: Since full recovery is planned north and south of the proposed area, it is inaccurate to indicate this area will not subside; therefore, revise to address all items as necessary.

6. Page 21, A(1): Even though partial recovery is planned for the proposed area, full coal recovery on either side will cause surface subsidence; therefore, the assertion that the area will not subside is incorrect. Revise and address accordingly.

7. Page 25, D(12): As mentioned above, if full coal recovery is anticipated on either side of the proposed area, one could reasonably assume that surface areas within the angle of draw would be impacted by subsidence; therefore, revise the

addendum to address the effects of surface subsidence on fish and wildlife resources within the proposed area.

8. Page 28, J: Presumably future full coal recovery operations conducted on D-0360-7 will extend the shadow area (or zero subsidence line) and planned subsidence onto the proposed area; therefore, revise to indicate that although partial coal recovery operations proposed for this application will not cause subsidence, future full coal recovery operations on D-0360-7 and D-0360-12 will cause the proposed area to subside. Also, reference the applicable subsidence control survey provided in D-0360-7.

9. Page 28, K(1): The referenced addendum does not address the method of coal removal, nor does it indicate the size, sequence, and timing of the development of the underground works as required. Provide an addendum that addresses requirements specified in item K(1).

B. Engineering Review

1. Please provide the strength of the clay stone floor under **saturated conditions** simulating a flooded mine. Include actual material test results from tested samples.

C. Hydrology Review

1. Page 16, B(1):

   a. Delete the 2nd page 2 from this addendum, as it starts in the middle of a sentence and has no continuity to page 1.

   b. Submit a clearer copy of Figure 2, or delete it and reference to it in the addendum, as the submitted copy is illegible.

2. Attachment 13:

   a. The first submitted drill log is illegible; submit a clearer copy.

   b. Submit a complete log for test hole N98-26, as only the last sheet was submitted.

3. Cross-Section B-B': The #8 Coal is at 785 ft. msl at test hole B&O-13, however the cross-section shows the #8 Coal to be below 770 ft. msl at this test hole. Revise.

4. Page 17, C(1): Delete the Ground Water Information addendum, as there are numerous errors within it, and the correct version of this addendum was submitted numerous times previously for the D-0360 permit.

5. Attachment 14A:

   a. Fill out the appropriate information for the sample of W-316: surface elevation, depth, and depth to static water level.

   b. Why was only the pH value reported for the DS-111 sample collected on 12/10/90?

6. Attachment 14B: According to the two submitted cross-sections, zone B, which is associated with the #12 Coal seam and its overburden, is as much as 140 feet thick. Revise.

7. Attachment 14C:

   a. Include the water supply for the Rhodes residence in central Section 22 immediately to the east of the proposed shadow area.

   b. Include DW-399, located on the Hennebert property in the SW ¼ of Section 34, in the inventory. If DW-399 is not the domestic supply for this residence, then what is? Also see comment 10b below.

   c. If W-172, W-170, and W-166, which are located in the SW ¼ of Section 22, are not in use, then what are the water supplies for the A. May, M. May, and H. Earliwine residences, respectively? Also see comment 10b below.

   d. According to the map, DS-244, DS-277, and DW-318 are located on the *F*. Mayo, not the C. Mayo, property. Similarly, DW-173 is shown to be located on the *S*. Rice property, not the R. Rice property. Revise for consistency.

   e. Revise to indicate that the 90-foot depth of WL-317 was taken from the log, not reported. If the static water level cannot be measured because this well is buried, then indicate the log value of 39 feet in the inventory.

   f. Submit logs for WL-168, WL-397, and WL-398. If there are no logs for these wells, then delete the "WL" prefix. Conversely delete logs that represent wells beyond the hydrology review limits, unless these logs have particular relevance that is addressed in the addendum. Based on its location at elevation, DS-242 is located only 315 feet (1090-775=315) above the #8 Coal seam, which means that this developed spring is recharged by zone C, not zone B. Revise the supplying aquifer entry for DS-242 accordingly.

g. Several sites, such as DS-241, show different surface elevations on the Attachment 14A's and 14C's. Revise for consistency.

h. DW-173 is shown to be an occasional domestic supply. What is the regular supply for the residence when DW-173 is not used? Clarify or revise.

8. Attachment 14D: Revise to indicate that U34-161, U34-166, D34-1, U34-004, and U-34-009 are all located on perennial Williams Creek. Separate entries should not be made for each sampling station; instead each stream should be listed as a single entry. For example, U34-007 and U-34-008 should be listed as a single entry, and the same pertains to U34-146 and U34-164.

9. Page 14, E(1-3):

a. The lowest surface elevation within the proposed application area is *1070* ft. msl on U-34-007/U34-008, not 1005 ft. msl. Accordingly, the maximum topographic relief within the application area is 240 feet. Revise the Topographic Setting on page 2.

b. Revise the Post-Mining Breakouts narrative on page 8, as the minimum overburden within the application area is *325* feet, according to the narrative in the 3rd paragraph on page 2, and not 400 feet. Also revise to indicate that the lowest surface elevation within the application area is *1070* ft. msl, per previous comment, and that the highest elevation of the #8 Coal seam is *800* ft. msl, not 765 ft. msl.

c. Replace the data on Table 1 with more current data, as the submitted data has been submitted several times previously.

d. Delete the submitted hydrographs, as they have been previously submitted numerous times with the D-0360 permit. Furthermore, since subsidence is not proposed, the subsidence monitoring data is not relevant. You may wish to submit monitoring data from room and pillar areas to substantiate the claim that no hydrologic impact is anticipated as a result of the proposed operation.

10. Page 18, F(1):

a. Make sure that revisions to surface elevations, per comment **7g** above, are carried over to Table A.

b. Per comments **7a** through **7c**, include the additional water supplies in the tables.

c. Include W-458, a domestic supply, in Table A.

d. Include the following used developed springs in the Table B inventory: DS-111, DS-223, DS-230, DS-231, DS-240, DS-241, DS-242, and DS-244.

e. According to the Attachment 14C, DS-226B is located at 1155 ft. msl. Revise Table B accordingly, as it incorrectly indicates a surface elevation of 1173 ft. msl.

11. Page 18, F(2): Revise the sentence in item 5 on page 2 which incorrectly states that the payment of interim water bills shall be the responsibility of the water user. Note that interim water bills are to be paid by the operator, per page 4 of Technical PPD 93-1.

12. Page 26, F(3):

a. Revise the 1st sentence, as it incorrectly refers to surface operations, which are not proposed.

b. Delete reference to longwall mining throughout the narrative, as longwall mining is not proposed. Revise the narrative so that it addresses the proposed room and pillar operation. For the sake of simplicity, if the monitoring plan to be implemented is identical to that which has been previously proposed for longwall mining operations at the D-0360 permit, then merely indicate this and identify the appropriate adjacent area application; in this event the remainder of the narrative can be omitted.

D. Application/ Hydrology Map Review

1. Provide a revised map date.

2. Identify sections 22, 28 & 34 and section lines.

3. Show water supply to the dwelling owned by Rhodes.

4. Show two undeveloped springs on the property owned by Funkhouser.

5. Show Williams Creek as a perennial stream.

6. Add a property hook to clearly show that F. Simpson owns the property north and northwest of Township Road 211.

7. Identify the water supply for the residence to the southwest of P-16 and the landowner name. Also include this supply in the Attachment 14C inventory and in Table A or B of the response to Page 18, F(1).

8. Note that since this is a room and pillar mining operation, the hydrology review boundary should only extend 300 feet from the limits of the proposed shadow area. Keep this in mind for future applications.

E. Structure Contour, Deed Parcel, and Timing Map Review

1. Indicate the total proposed acreage is for partial coal recovery.

2. Identify sections 22, 28 &34 and section lines.

3. Lines of cross-section obliterate the test hole labels. Clarify.

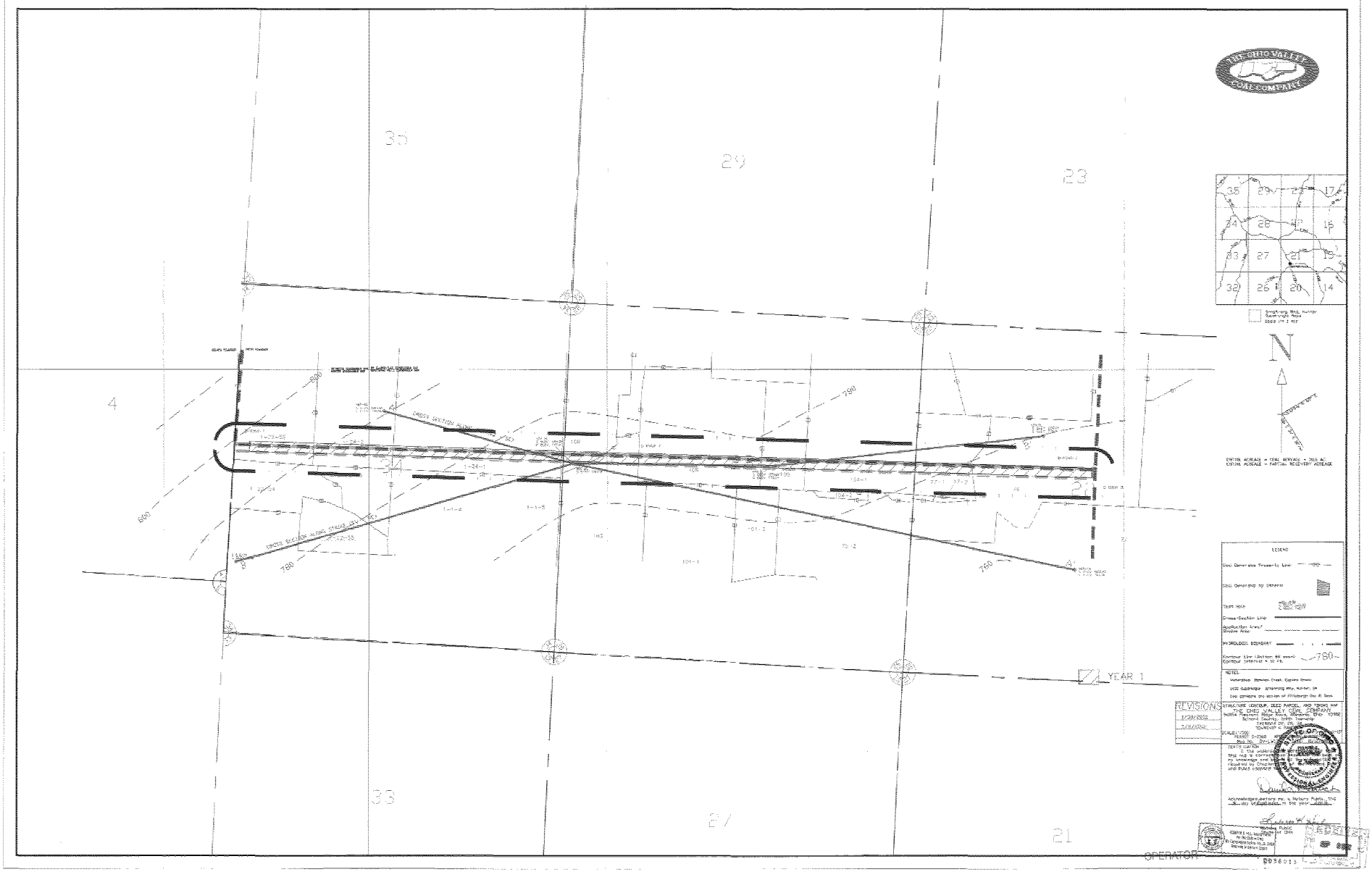
When submitting the above revisions, please submit three copies of the requested revisions. Two copies will be sent to the field for review. Three additional copies of the application will be requested at a later date. If you have any questions, feel free to e-mail me at deborah.bates@dnr.state.oh.us or call me at (614) 265-6654.

Sincerely,

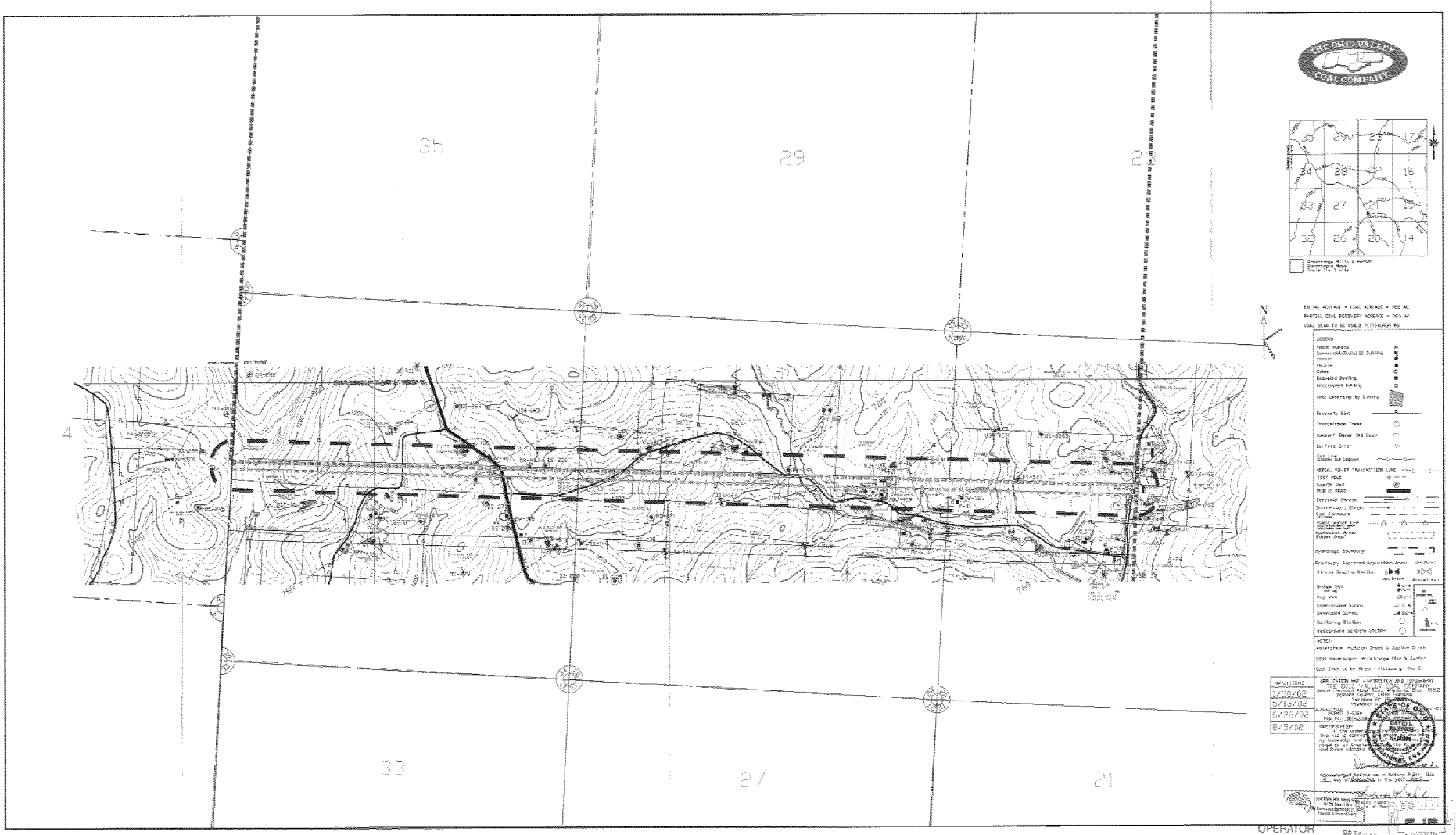
Deborah S Bates

Deborah S. Bates
Environmental Specialist
Division of Mineral Resources Management

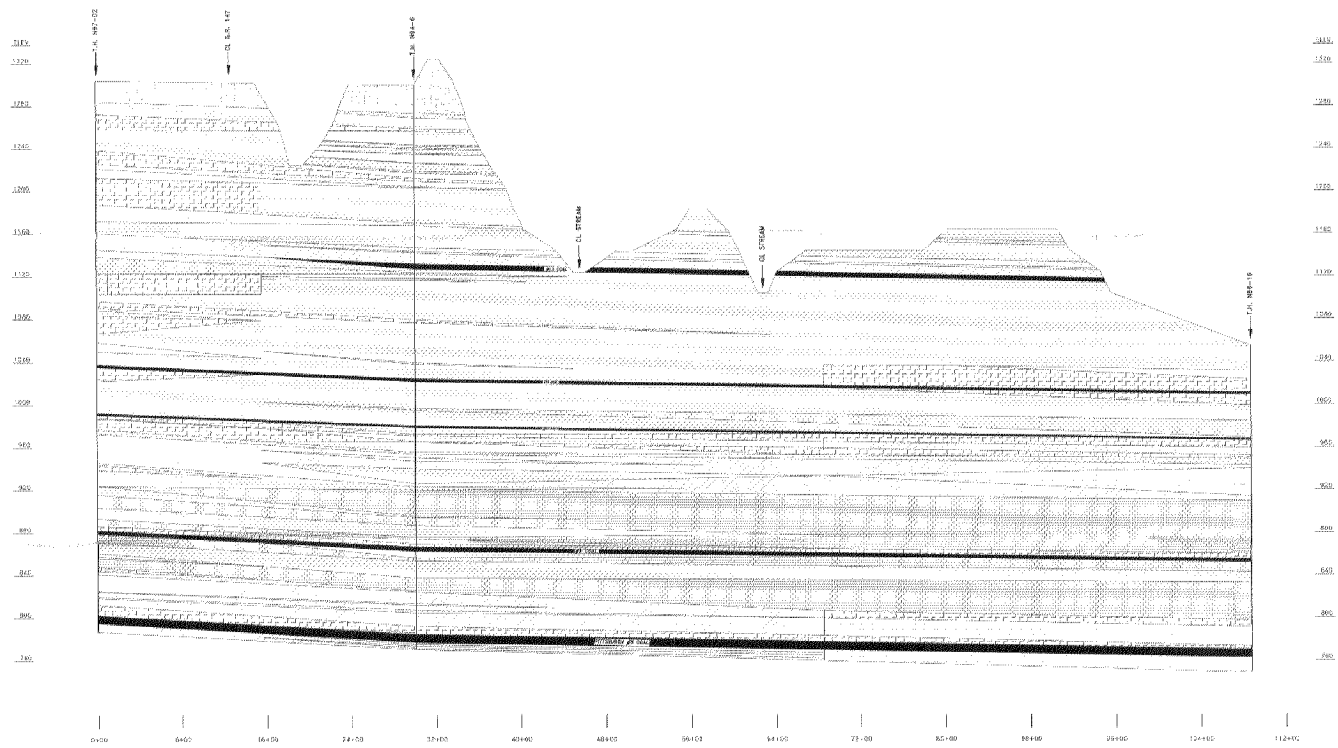
cc: Kevin Ricks
George Mychkovsky
Joe Noonan



THE OHIO VALLEY COAL COMPANY
35
29
23
4
33
27
21
YEAR 1
N
LEGEND
REVISIONS
OPERATOR


THE OHIO VALLEY COAL COMPANY
35
29
33
27
21
4
N
LEGEND
Public Building
Dwelling
Cemetery
Church
Cities
Occupied Building
Unoccupied Building
Coal Ownership by Others
Property Line
Transmission Tower
Surface Owner
Sub Line
Hydrologic Boundary
Stream Sampling Station
Underground Survey
Surveyed Survey
Monitoring Station
Background Sampling Station
NOTES:
Watershed: Hutchison Creek & Coplin Creek
USGS Quadrangle: Armstrong Mills & Hunter
Coal Seam to be Mined - Pittsburgh (No. 8)
REVISIONS
1/30/02
5/13/02
6/22/02
8/5/02
AERIALVISION MAP - ENTERPRISE AND TOPOGRAPHY
THE OHIO VALLEY COAL COMPANY
CERTIFICATION
OPERATOR

TOVCC 12217



GEOLOGIC CROSS SECTION A-A'
HORIZ. SCALE: 1" = 400'
VERT. SCALE: 1" = 40'

**LEGEND**

- UNIDENTIFIED (CASING)
- SHALE
- SANDSTONE
- CLAYSTONE
- LIMESTONE
- CHIPPED
- LIMESTONE/CLAYSTONE
- LIMESTONE/SHALE
- COAL BEAM

THE OHIO VALLEY COAL COMPANY
PERMIT D-360

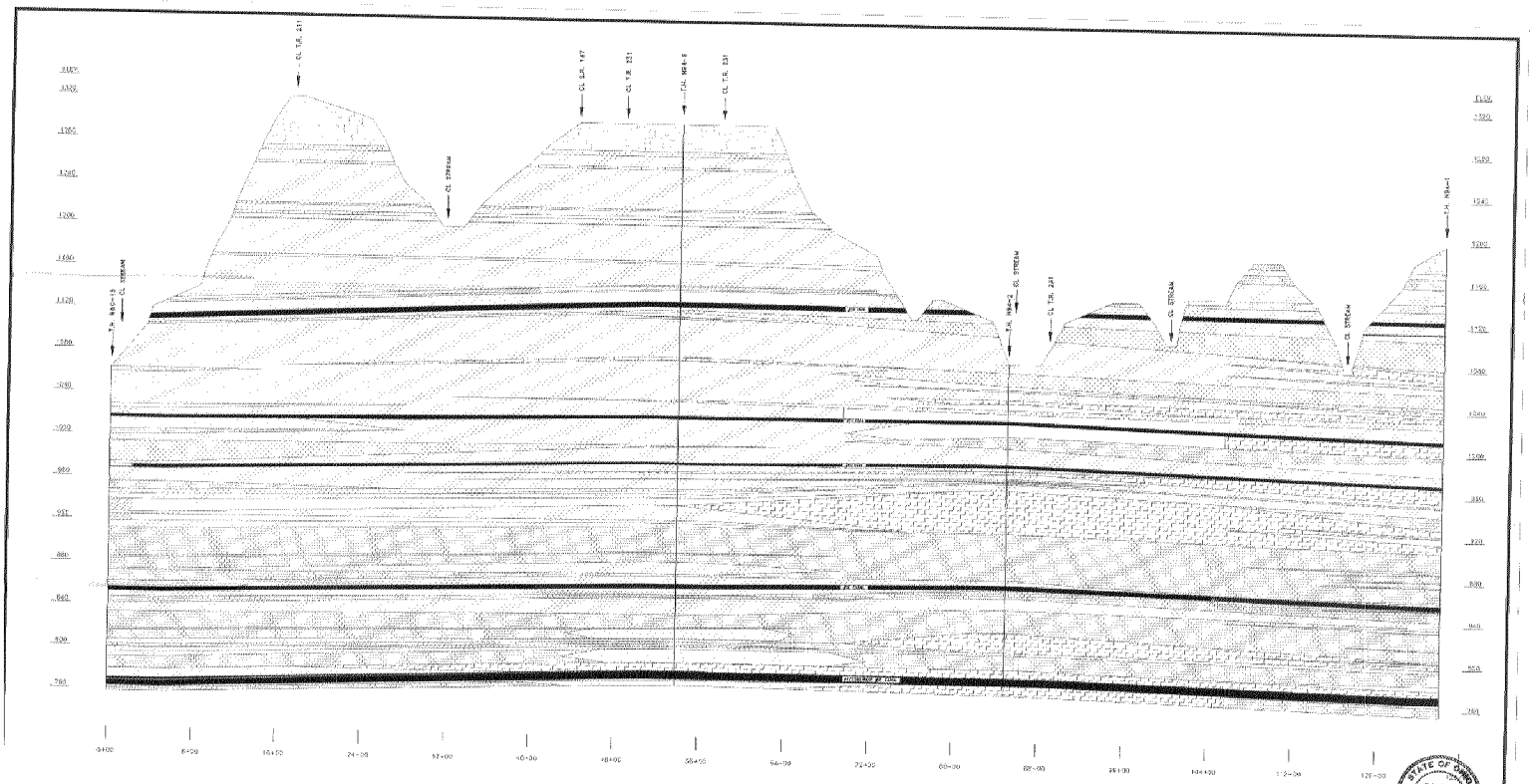
SITUATED IN SECTIONS 22, 28 &34
SMITH TOWNSHIP, BELMONT CO., OHIO

| | |
|---|---|
| SCALE: AS SHOWN | COUNTY: BELMONT |
| DRAWN BY: DAH | COMM. #469-41 |
| DATE: 11-29-01 | REV. DATE: |

Jack A. Hamilton & Associates, Inc.
Consulting Engineers & Surveyors
Box 471 342 High Street
Flushing, Ohio 43977

OPERATOR

TOVCC 12218



GEOLOGIC CROSS SECTION B-B'
HORIZ. SCALE: 1" = 400'
VERT. SCALE: 1" = 40'

**LEGEND**

- UNIDENTIFIED (CASING)
- CLAY
- SHALE
- SANDSTONE
- CLAYSTONE
- LIMESTONE
- FIRECLAY
- SANDSTONE/SHALE
- LIMESTONE/CLAYSTONE
- COAL SEAM

STATE OF OHIO
DAVID L. HARRISON
PROFESSIONAL ENGINEER

THE OHIO VALLEY COAL COMPANY
PERMIT D-360

SITUATED IN SECTIONS 22, 28 &34
SMITH TOWNSHIP, BELMONT CO., OHIO

| | |
|---|---|
| SCALE: AS SHOWN | COUNTY: BELMONT |
| DRAWN BY: DAH | COMM. #469-41 |
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