

## GROUND CONTROL PLAN INSTRUCTIONS

THIS GROUND CONTROL PLAN FORM CONSISTS OF 19 PAGES LISTED AS FOLLOWS:

INSTRUCTIONS - DO NOT SUBMIT THIS PAGE.

1. GROUND CONTROL PLAN - ALWAYS SUBMIT THIS PAGE FOR INITIAL PLAN
2. BENCHES & HIGHWALLS
3. GENERAL PRECAUTIONS
4. GENERAL PRECAUTIONS (CONT'D)
5. SURFACE BLASTING
6. AUGER MINING OPERATIONS
7. HIGHWALL MINING OPERATIONS
8. HIGHWALL MINING OPERATIONS THROUGH EXISTING AUGER HOLES
9. HIGHWALL MINING OPERATIONS THROUGH EXISTING AUGER HOLES DRAWING
10. BLASTING SAFETY PRECAUTIONS
11. PRECAUTIONS NEEDED FOR WORKING OR TRAVELING NEAR GAS LINES AND/OR WELLS
12. PRECAUTIONS NEEDED FOR WORKING OR TRAVELING NEAR GAS LINES AND/OR WELLS (CONT'D)
13. SAFETY PRECAUTIONS FOR AUGER MINING OPERATIONS
14. SAFETY PRECAUTIONS FOR AUGER MINING OPERATIONS (CONT'D)
15. SAFETY PRECAUTIONS FOR HIGHWALL MINING OPERATIONS
16. SAFETY PRECAUTIONS FOR HIGHWALL MINING OPERATIONS (CONT'D)
17. PROCEDURES RELATING TO POTENTIAL METHANE ACCUMULATIONS
18. PROCEDURES FOR DUMPING SPOIL MATERIAL (FIRST PAGE)
19. PROCEDURES FOR DUMPING SPOIL MATERIAL (SECOND PAGE)

A COMPLETE GROUND CONTROL PLAN WILL CONSIST OF:

1. A COVER LETTER DESCRIBING THE SUBMITTAL
2. THE PAGE TITLED GROUND CONTROL PLAN SIGNED AND DATED BY THE APPROPRIATE COMPANY OFFICIAL
3. ALL PAGES PERTAINING TO THE TYPE OF MINING INDICATED -- TO KEEP THE PLAN PAGES TO A MINIMUM, DO NOT INCLUDE PAGES THAT DON'T APPLY TO THE TYPE OF MINING BEING DONE. FOR EXAMPLE, IF YOU ARE NOT HIGHWALL MINING, DON'T INCLUDE PAGES REGARDING HIGHWALL MINING IN YOUR PLAN.
4. ALL SAFETY PRECAUTION PAGES PERTAINING TO THE TYPE OF MINING INDICATED
5. A DRAWING OF THE HIGHWALL/BENCH/PIT/SPOIL BANK CONFIGURATION, IF APPLICABLE
6. A COPY OF THE MINE MAP SHOWING THE SEQUENCE OF MINING
7. A STRATA PROFILE
8. ALL PAGES, DRAWINGS, AND MAPS SUBMITTED AS PART OF THE GROUND CONTROL PLAN SHOULD BE SUBMITTED IN TRIPPLICATE.

## GROUND CONTROL PLAN

Date \_\_\_\_\_

Company \_\_\_\_\_

Mine \_\_\_\_\_ ID No. \_\_\_\_\_

Mine Location (Town, County, State) \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Type of Mining (check all that apply):

- Mountain Top Removal
  Contour
  Auger  
 Highwall Miner
  Underground Face-up

Additional Information (if any) \_\_\_\_\_

	Coalbed Name	Elevation (feet)	Seam Height (inches)
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____

Mine Location: Longitude \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ "

Latitude \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ "

**NOTE:** FOR ALL UNDERGROUND MINES: THE LOCAL FIELD OFFICE OF MSHA, HAVING JURISDICTION OVER THE OPERATION, SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO SEALING OR COVERING ANY AND ALL MINE OPENINGS. THE OPERATOR WILL COMPLY WITH ANY AND ALL INSTRUCTIONS ISSUED.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Title)

## BENCHES & HIGHWALLS

List of Equipment to be used: \_\_\_\_\_

Slope of Ground to be Mined: \_\_\_\_\_ degrees      Highwall Slope: \_\_\_\_\_ degrees

Minimum Pit Width: \_\_\_\_\_ feet      Maximum Highwall Height: \_\_\_\_\_ feet

Number of Benches: \_\_\_\_\_      Minimum Bench Width : \_\_\_\_\_ feet

Maximum Spacing To And/Or Between Benches: \_\_\_\_\_ feet

Maximum Angle of spoil Bank: \_\_\_\_\_      Maximum Spoil Height: \_\_\_\_\_ feet

Additional Information (if any) \_\_\_\_\_

Please attach the following:

1. A drawing of the Highwall/Bench/Pit/Spoil Bank configuration
2. A mine map showing the sequence of mining
3. A strata profile

### BENCHES & HIGHWALL SAFETY-GENERAL

1. If it is necessary to clean/scale the highwall after it is created and an excavator or other equipment cannot reach the affected highwall area, a ramp up to the bench(s) will be constructed or alternate means of access will be used or created. Any utilized ramp shall be a minimum of 1.5 times the width of the largest equipment being used on it and shall have suitable berms on both sides.
2. The bench width for drill bench construction in natural ground and/or solid rock shall be developed to an adequate width to insure safe operation of the equipment being used.

## GENERAL PRECAUTIONS

1. If stress cracks exist or stability failure occurs in any portion of the highwall, where the highwall is developed directly above or directly adjacent to any previous underground mined areas (including highwall and auger mining), operations in the affected area will be immediately stopped, the affected area will be barricaded, and this plan will be immediately revised. The revision will identify the reason for revising the plan to alert MSHA to the conditions.
  
2. Persons will not work or travel within 30 feet of the toe of highwalls developed directly above or directly adjacent to any previous underground mined areas (including highwall and auger mining). This includes persons on foot and persons operating equipment.
  
3. Before persons on foot work near the highwall a competent person will make an examination of the highwall immediately before working near the wall and will have any unsafe conditions corrected before exposure occurs. Persons traveling on foot in close proximity to a highwall must have a spotter stationed to watch the highwall.
  
4. The cabs of track mounted equipment with side mounted cabs such as drills and excavators will be located away from the highwall at all times so as to never position the cab between the boom or drill mast of the machine and the highwall when the machine is working near the toe of the highwall unless it can be shown that failure of the highwall will not affect the operator.
  
5. A buffer, berm, or other no less effective means will be provided at the toe of live stacked spoil piles (includes back stack, dumped in place, and dragline spoils) where roadways and/or work areas exist that is of adequate design and dimension to keep material from rolling/sliding off the pile into the work areas and roadways.  
OR  
No person will work or travel near the toe of live stacked spoil piles where a buffer, berm or other no less effective means to keep material from rolling or sliding off the pile into the work area(s) and roadway(s) has not been provided.
  
6. When failure to control the developing highwall occurs such as the existence of overhangs, loose material, unconsolidated rocks, material falling into the pit, movement in the wall, or blasting practices fail to result in a clean and stable highwall, and corrective action can not be taken to eliminate the existence of these conditions, the affected area will be barricaded to prevent persons from being exposed to the conditions and the plan will be revised to safely control the highwall and provide for safe conditions.

**7. Unless a drop bench is provided trees and other vegetation will need to be removed a safe distance from the top of the highwall (this would be trees and vegetation that can fall over the highwall).**

**8. All equipment used to move material over a highwall will be required to use the double-blade method of pushing (one blade of material will be left at the edge and pushed over with the following blade of material). This will allow the machine to remain a safe distance from the edge of the wall at all times.**

## SURFACE BLASTING

Describe the blasting procedures and type(s) of explosives used:

\_\_\_\_\_

Describe the drilling equipment:

\_\_\_\_\_

Drill Hole diameter: \_\_\_\_\_ inches

Hole Depth: \_\_\_\_\_ feet

Hole Spacing: \_\_\_\_\_ feet by \_\_\_\_\_ feet

Angle of Hole: \_\_\_\_\_ degrees

Is pre-spitting to be done?  Yes  No

Additional Information (if any) \_\_\_\_\_

## AUGER MINING OPERATIONS

- Type of Mining Machine: \_\_\_\_\_
- Manufacturer: \_\_\_\_\_
- Serial Number: \_\_\_\_\_
- Model Number: \_\_\_\_\_
- Maximum penetration depth: \_\_\_\_\_ feet
- Maximum diameter/width of auger holes: \_\_\_\_\_ inches
- Minimum distance between auger holes: \_\_\_\_\_ inches
- Is the auger mining to be done in the vicinity of abandoned or active underground mines?  Yes  No If yes, give a brief narrative and provide underground mapping. \_\_\_\_\_

### *Information For Seams To Be Auger Mined*

	Coalbed Name	Elevation (feet)	Seam Height (inches)
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____

- Maximum cover above auger holes: \_\_\_\_\_ feet
- The minimum web (stump) width between each hole/cut and/or set of holes/cuts, shall be increased as necessary to maintain highwall stability.

## HIGHWALL MINING OPERATIONS

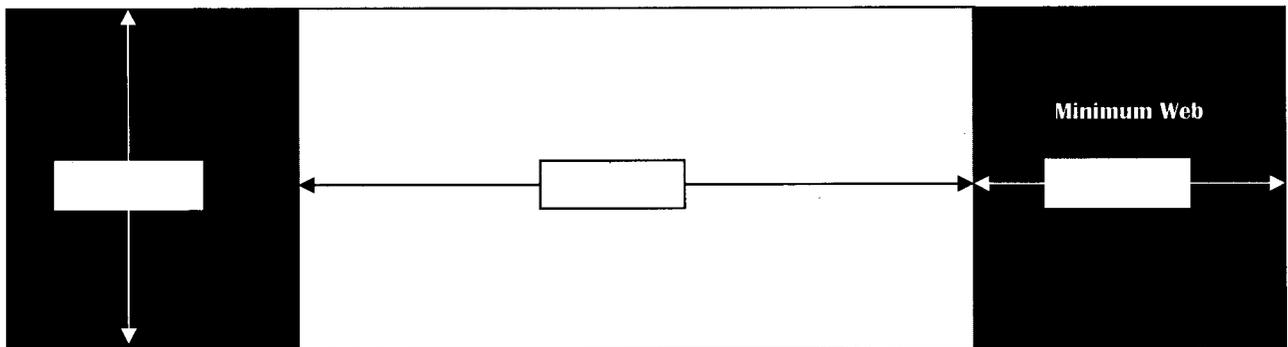
- Type of Highwall Miner: \_\_\_\_\_
- Serial Number: \_\_\_\_\_
- Maximum penetration depth: \_\_\_\_\_ feet
- Will any highwall mining be in the vicinity of abandoned or active underground mines?  Yes  No If yes, give a brief narrative and provide underground mapping. \_\_\_\_\_

### *Information For Seams To Be Mined By Highwall Miner*

	Coalbed Name	Elevation (feet)	Seam Height (inches)
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____

- Distance between Highwall Miner entries (web thickness): \_\_\_\_\_ feet
- Maximum width of Highwall Miner entries: \_\_\_\_\_ feet
- As a minimum, a "skip barrier" of \_\_\_\_\_ feet will be utilized after every \_\_\_\_\_ highwall miner entries.
- Maximum cover above Highwall Miner entries: \_\_\_\_\_ feet
- The minimum web (stump) width between each hole/cut and/or set of holes/cuts, shall be increased as necessary to maintain highwall stability.

### Diagram of Highwall Miner Entries and Web



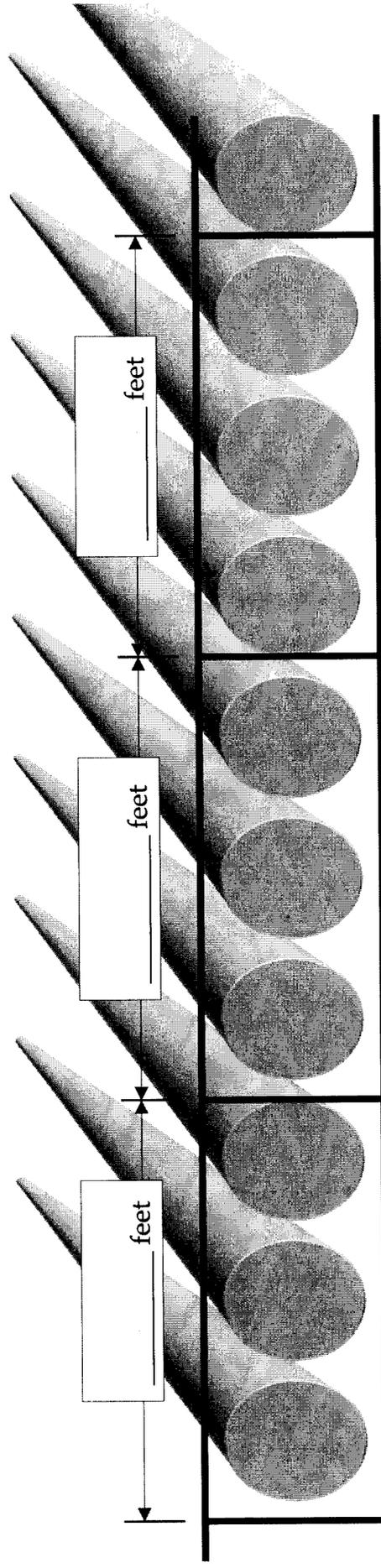
## HIGHWALL MINING OPERATIONS THROUGH EXISTING AUGER HOLES

- Type of Highwall Miner: \_\_\_\_\_
- Serial Number: \_\_\_\_\_
- Maximum penetration depth: \_\_\_\_\_ feet
- Will any highwall mining be in the vicinity of abandoned or active underground mines?  Yes  No If yes, give a brief narrative and provide underground mapping. \_\_\_\_\_

### Information For Seams To Be Mined By Highwall Miner

	Coalbed Name	Elevation (feet)	Seam Height (inches)
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____

- Distance between Highwall Miner entries (web thickness): \_\_\_\_\_ feet
- Maximum width of Highwall Miner entries: \_\_\_\_\_ feet
- As a minimum, a "skip barrier" of \_\_\_\_\_ feet will be utilized after every \_\_\_\_\_ highwall miner entries.
- Maximum cover above auger holes to be Highwall Mined: \_\_\_\_\_ feet
- The minimum web (stump) width between each hole/cut and/or set of holes/cuts, shall be increased as necessary to maintain highwall stability.
- Auger Hole Diameter: \_\_\_\_\_
- Minimum distance between Auger Holes (web thickness): \_\_\_\_\_ inches
- Maximum Cover over Auger Holes: \_\_\_\_\_ feet



Highwall Miner Web (Must contain at a minimum 3 Auger Hole Webs)

Highwall Miner Opening

Highwall Miner Web (Must contain at a minimum 3 Auger Hole Webs)

## **BLASTING SAFETY PRECAUTIONS**

- 1. The horn or siren used to give an audible warning of the blast to be detonated will be of sufficient decibel level to be heard by all employees that are within the affected blast area.**
- 2. All employees, including highwall miner crews, auger crews, or any other person within the affected blast area(s), shall be removed before the blast is detonated.**
- 3. When remote firing devices are used, the manufacturer's safety precautions shall be followed.**
- 4. Before drilling, the blaster and/or foreman will make a visual inspection of the area to be drilled.**
- 5. The row of holes on free faces of production shots will have burden as measured from the powder column of the hole equal to a minimum of 20 times the hole diameter in feet (e.g. for a 6<sup>3</sup>/<sub>4</sub>-inch diameter hole, burden=20 x 6.75/12=11.25 feet minimum)**
- 6. All holes within 150 feet of the outcrop will be drilled with a 6<sup>3</sup>/<sub>4</sub>-inch diameter drill bit, or smaller.**
- 7. Drill operators will keep a written drill log identifying each drill hole and will promptly provide the blaster information about the strata and any abnormalities encountered. The written drill log will contain a sketch identifying the location of each "problem" drill hole. This will enable the blaster to adequately load the holes. This log will be attached to the blast record.**
- 8. For outcrop shots, a safety bench will be maintained on the outslope of the shot. This safety bench will be cleaned out after each shot.**
- 9. If a cracked hole is to be loaded, the cracked region of the hole will be decked-through. If the hole is not to be loaded, it will be filled with stemming.**
- 10. If it is necessary to drill the first two or three holes of a pattern with the drill angled toward the wall, an examination of the highwall will be made by a competent person immediately before drilling the first holes of the pattern near the highwall and any hazards found will be corrected before work is done. All other holes will be drilled with the cab away from the highwall.**

## **PRECAUTIONS NEEDED FOR WORKING OR TRAVELING NEAR GAS LINES AND/OR WELLS**

Before performing any type of work, travel, excavation, or blasting within 150 feet of active gas lines or wells existing where highwalls, spoil banks, or pits will be developed, the following precautions will be taken:

- Any gas line will be considered as being active unless the line has been cut, purged, and capped on each end. Any gas well will be considered active unless the well has been adequately plugged below the elevation of the work area. Documentation will be provided to show that the condition of the gas lines and/or wells is as described.
- Notify the gas company or other entity owning the lines or wells and have them locate and mark the lines or wells according to their operating procedures.
- A pipe line locator of the type used by gas companies (there are different manufacturers) will be used to locate metal gas lines.
- Older plastic lines will be located by survey records if they exist. Recent plastic line installations may have a tracer wire buried with them
- The location of all gas lines will be marked in a distinct color on a certified map with legend identifying color and the map provided with the ground control plan.
- After gas lines are located they will be identified with markers.
- The markers will be no less than 36 inches in height above the ground level and will be identified with a distinct, consistent, reflective marking at the top of the marker.
- The markers will be placed perpendicular (upright) to the location of the gas line, 5 feet from the location of the gas line, and on both sides of the gas line at each marker location.
- The markers will be spaced at no more than 75 feet intervals along the gas line and have a guaranteed line of sight between markers.
- The markers will be made of a weather resistant material.

- **The markers will be visible to persons on foot or in equipment from outside the defined zone. The defined zone is the area on both sides of and within 50 feet of the gas line.**
- **When there is a curve in a gas line, additional markers will be installed 5 feet from each side of the gas line and directly across from each other at any location where any part of a gas line is located more than 5 feet from a straight line extending along the gas line between the center of the gas line at one marked location and the center of the gas line at the next adjacent marked location.**
- **In areas where equipment/vehicles cross gas lines, the gas line will be encased with a steel pipe (conductor) of a minimum wall thickness of ¼ inch or protected from damage by equivalent means and will be buried a minimum depth of 6 feet where equipment weighing more than 150,000 lbs. cross the lines and will be buried a minimum depth of 3 feet where equipment weighing less than 150,000 lbs. cross the lines. Pickup trucks, six wheel mechanic trucks, and track mounted equipment weighing less than 30,000 lbs. will be allowed to cross low pressure gas lines in areas outside the encased zones only if the depth of the gas line is known to be at least 3 feet and the ground surface is not disturbed.**
- **In all areas where equipment/vehicles are allowed to cross, the gas lines will be marked by signs designating the crossing area and identifying the presence of the gas line.**
- **In areas where tree cutting and/or clearing operations is to be performed the markers will be inspected after the operation is completed and any markers found to be missing or damaged will be replaced as needed.**
- **When tree removal activities must be conducted within 50 feet of the gas line, a grapple type excavator will be used to pick the fallen trees from the marked area. This work can not be conducted unless the gas line is buried more than two feet below the surface of the ground and at no time can the ground be disturbed below the surface.**
- **At no time will mining, excavation, or equipment/vehicle operation occur within 50 feet of a gas line or well except that equipment/vehicles will be allowed to cross at designated crossings. Markers will be established around gas wells to identify this 50 ft. zone.**
- **The location of all oil and gas wells and active gas lines will be distinctly marked on the mine map required to be maintained by the operator by 30 CFR 77.1200.**

## SAFETY PRECAUTIONS FOR AUGER MINING OPERATIONS

### GROUND MAN

When the ground man is required to perform duties near the highwall, such as lining up the auger to start a new entry, servicing the auger, changing steel, directing the movement of the machine, etc. , he will first observe the highwall for hazardous conditions. Any hazardous conditions observed will be immediately reported to the foreman and corrected before any person enters an area of exposure. If no hazardous conditions are observed, work can continue in a normal manner with the ground man positioned as far as practical from the highwall.

### HIGHWALLS WHERE HILLSEAMS EXIST

An auger entry will not be started in a location where a hillseam enters the highwall face. In areas where a hillseam runs in a direction parallel to the highwall face (i.e., a hillseam can be observed running into the highwall and then back out), the area between the hillseam entry and exit points will be skipped.

### MONITORING PREVIOUSLY MINED ENTRIES

All auger openings within 150 feet of the current opening shall be left open for monitoring for adverse conditions (i.e., webs taking weight, etc.)

### MULTIPLE SEAMS

Where multiple seams are to be augered in a common highwall, the lowest coal seam will be augered first and the upper coal seam(s) will be augered as the highwall is backfilled.

### PENETRATION OF UNDERGROUND MINE OPENINGS

Should an auger entry penetrate an abandoned area of an underground mine, tests for methane concentration and oxygen deficiency will be made at the collar of the hole. The test will be made by a qualified person using an approved device to determine if dangerous quantities of methane or oxygen deficient air are present or being emitted. If an explosive mixture of methane and/or irrespirable atmosphere is encountered, all miners will be withdrawn from the area and corrective actions will be immediately initiated. Additionally, mining will be discontinued and shall not commence until the atmosphere is made safe.

### INTERCONNECTED AUGER HOLES

Care will be taken to avoid interconnecting auger holes or narrowing the web. If this should occur, mining will be discontinued and the auger will be moved to the next projected entry.

### BLAST SHIELD

A blast shield will be maintained and used at all times when the auger is mining coal.

### **BARRIER BETWEEN AUGER MINING AND PREVIOUS MINE WORKS**

If previous underground mining is determined to exist during augering operations, a minimum 100-foot barrier will be maintained between the deepest penetration of the auger holes and the underground mine works. (A 100-foot barrier will be maintained between the developed auger holes and the underground mine workings as mapped.)

Augering operations will not occur where highwalls are developed directly above or directly adjacent to any previously underground mined areas (including highwall mining and auger mining). Other means may be used to address this if necessary, for example: a statement can be included in the plan which states that auger mining will not occur above or beneath highwall miner web pillars or barrier pillars.

### **WORKING NEAR A HIGHWALL**

Before persons on foot work near the highwall a competent person will make an examination of the highwall immediately before working near the wall and will have any unsafe conditions corrected before exposure occurs. Persons traveling on foot in close proximity to a highwall must have a spotter stationed to watch the highwall.

### **UNSAFE HIGHWALL; BARRICADING AND PLAN REVISION**

If failure to control the highwall occurs such as the existence of overhangs, loose material, unconsolidated rocks, material falling into the pit, movement in the wall, blasting practices fail to result in a clean and stable highwall, or the highwall can not be observed while flights are changed, and corrective action can not be taken to eliminate the existence of these conditions; the affected area will be barricaded to prevent persons from being exposed to the conditions and the plan will be revised to safely control the highwall and provide for safe conditions. The revision will identify the reason for revising the plan so as to alert MSHA to the conditions.

If stability failure or stress cracks occur in the highwall in active work areas where augering has occurred, mining operations will be immediately stopped, the affected area will be barricaded, and the ground control plan will be revised. The revision will include adequate procedures for maintaining highwall stability and will identify the reason for revising the plan to alert MSHA to the conditions.

### **SOLARIS DETECTORS**

Solaris detectors will be maintained and used at all times when auger mining. Miners will be trained in the proper use of all instruments and such instruments will be maintained and calibrated/checked daily in accordance with manufacturers' recommendations.

## **SAFETY PRECAUTIONS FOR HIGHWALL MINING OPERATIONS**

### **GROUND MAN**

When the ground man is required to perform duties near the highwall, such as lining up the continuous miner head to start a new entry, servicing the continuous miner, changing bits, directing the movement of the machine, etc. , he will first observe the highwall for hazardous conditions. Any hazardous conditions observed will be immediately reported to the foreman and corrected before any person enters an area of exposure. If no hazardous conditions are observed, work can continue in a normal manner with the ground man positioned as far as practical from the highwall.

### **HIGHWALLS WHERE HILLSEAMS EXIST**

A highwall miner entry will not be started in a location where a hillseam enters the highwall face. In areas where a hillseam runs in a direction parallel to the highwall face (i.e., a hillseam can be observed running into the highwall and then back out), the area between the hillseam entry and exit points will be skipped.

### **MONITORING PREVIOUSLY MINED ENTRIES**

All highwall miner openings within 150 feet of the current opening shall be left open for monitoring for adverse conditions (i.e., webs taking weight, etc.)

### **MULTIPLE SEAMS**

Where multiple seams are to be highwall-mined in a common highwall, the lowest coal seam will be mined first and the upper coal seam(s) will be mined as the highwall is backfilled.

### **PENETRATION OF UNDERGROUND MINE OPENINGS**

Should a highwall miner penetrate an abandoned area of an underground mine, tests for methane concentration and oxygen deficiency will be made at the collar of the hole. The test will be made by a qualified person using an approved device to determine if dangerous quantities of methane or oxygen deficient air are present or being emitted. If an explosive mixture of methane and/or irrespirable atmosphere is encountered, all miners will be withdrawn from the area and corrective actions will be immediately initiated. Additionally, mining will be discontinued and shall not commence until the atmosphere is made safe.

### **HIGHWALL MINING THROUGH EXISTING AUGER HOLES**

No highwall mining will be conducted through existing auger holes without prior acknowledgement in a submitted Ground Control Plan.

Care will be taken to avoid interconnecting cuts or narrowing the web. If this should occur, mining will be discontinued and the miner will be moved to the next projected opening.

### **BARRIER BETWEEN HIGHWALL MINING AND PREVIOUS MINE WORKS**

If previous underground mining exists, a minimum 100-foot barrier will be maintained between the developed highwall miner entries and the previous underground mining (including highwall mining or auger mining) as shown on a certified mine map.

Highwall mining operations will not occur where highwalls are developed directly above or directly adjacent to any previously underground mined areas (including highwall mining and auger mining). Other means may be used to address this if necessary, for example: a statement can be included in the plan which states that auger mining will not occur above or beneath highwall miner web pillars or barrier pillars.

### **WORKING NEAR A HIGHWALL**

Before persons on foot work near the highwall a competent person will make an examination of the highwall immediately before working near the wall and will have any unsafe conditions corrected before exposure occurs. Persons traveling on foot in close proximity to a highwall must have a spotter stationed to watch the highwall.

### **UNSAFE HIGHWALL; BARRICADING AND PLAN REVISION**

If failure to control the highwall occurs such as the existence of overhangs, loose material, unconsolidated rocks, material falling into the pit, movement in the wall, blasting practices fail to result in a clean and stable highwall, or the highwall can not be observed while flights are changed, and corrective action can not be taken to eliminate the existence of these conditions; the affected area will be barricaded to prevent persons from being exposed to the conditions and the plan will be revised to safely control the highwall and provide for safe conditions. The revision will identify the reason for revising the plan so as to alert MSHA to the conditions.

If stability failure or stress cracks occur in the highwall in active work areas where highwall mining has occurred mining operations will be immediately stopped, the affected area will be barricaded, and the ground control plan will be revised. The revision will include adequate procedures for maintaining highwall stability and will identify the reason for revising the plan to alert MSHA to the conditions.

### **SOLARIS DETECTORS**

Solaris detectors will be maintained and used at all times when highwall mining. Miners will be trained in the proper use of all instruments and such instruments will be maintained and calibrated/checked daily in accordance with manufacturers' recommendations.

## **PROCEDURES RELATING TO POTENTIAL METHANE ACCUMULATIONS**

The highwall miner has a methane monitoring system which indicates the percentage of methane/air mixture at the operator's station. Methane concentrations are continually displayed on a monitor in the operator's compartment. The system is designed to give a warning at 1% methane concentration and automatically de-energizes the miner when a methane concentration of 2% or greater is detected.

### **Methane Monitor Procedure**

- 1. If the methane monitor indicates a methane concentration of 1%, the cutter head will be lowered to the center of the coal seam and the machine shut down. All ground men will be removed from the immediate area and a methane examination will be conducted at the collar of the hole.**
- 2. Methane levels will be observed on the operator's monitor in the operating compartment. When monitor readouts indicate that methane accumulations have dispersed, another methane examination will be made at the collar of the opening. If no significant levels of methane are detected, work may resume.**
- 3. All methane examinations will be recorded in the examination book maintained by the supervisor, along with necessary explanations. Methane monitors will be visually inspected prior to the start of each production shift and when the cutter head is removed from the highwall miner opening being mined. Cutter bits will also be inspected and replaced (as necessary) prior to mining a new highwall miner opening. Methane monitors will be tested once each month using manufacturer's test apparatus and the results recorded and kept for examination.**

## **PROCEDURE FOR DUMPING SPOIL MATERIAL**

Section 77.1713 requires, in part, that: (a) at least once during each working shift, and more often if necessary for safety, each active work area be examined by a certified person for hazardous conditions, and any hazardous conditions be reported to the operator and corrected; (b) the operator withdraw persons from any area where a hazardous condition creates an imminent danger; (c) a written report be made of the conditions found; and (d) a report be made of the action taken to abate any hazardous conditions.

The below listed procedures will be followed when dumping spoil material from elevated dump locations:

1. The mine operator will provide training to dump-point workers on recognizing dump-point hazards, taking appropriate corrective measures and using safe dumping procedures.
2. The mine operator's certified foreman/superintendent will observe dumping operations regularly to ensure that unsafe conditions are being corrected and safe practices are being followed.
3. Trucks will be routed to the dump area in a way that provides the drivers with the best opportunity to routinely observe and examine the dump area before they begin to back toward the dump point.
4. Before dumping begins, and throughout the shift, equipment operators and their supervisors will routinely check the dump area for unsafe conditions, such as cracks, inadequate berms, unstable material on the slope below the dump point, or a loaded outslope below the dump point. Such conditions will be promptly reported and corrected. Berms need to be at least mid-axle height of the largest piece of equipment that will use the dump area. While the adequacy of a berm is normally judged based on the mid-axle-height criterion, it will be recognized that it only sets a *minimum* value for berm height. It is good practice to provide as large a berm as is practical, and operators will realize that the effectiveness of a berm depends not just on its height but also on its thickness and firmness.
5. The top of the dump will be sloped so that while backing up to dump point, the trucks will be going up a slight grade. When a small amount of slope cannot be maintained, the material will be short dumped and pushed.
6. Water will not be allowed to pond near the outer edge of the fill.
7. The top of the dump will be kept level—from side-to-side—so that trucks do not tend to tip on their side whenever the bed is raised.

8. Drivers will stay back a minimum of one truck length from the edge during their approach and in making their turn at the dump point.
9. Drivers will back-up perpendicular to the edge.
10. Trucks will back slowly and come to a gradual stop at the dump point. Use the berm as a visual guide only. The berm will not be used to help stop the truck. Avoid running the rear tires up on the berm.
11. Once trucks have backed into the proper position, set the parking brake and move the gear selector to the neutral position before raising the truck bed.
12. Adequate illumination will be provided for nighttime operations.
13. Trucks will be spaced out when more than one truck is dumping at the same time.
14. Dumping will be conducted a safe distance back from the edge anytime there is uncertainty about the safety of the dump area.

