

### DISTRICT 9 HIGHWALL MINER GROUND CONTROL PLAN CHECK SHEET

Mine Name: \_\_\_\_\_ ID: \_\_\_\_\_

Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_ MPA No: \_\_\_\_\_

Check plans against surface mine plans where they operate. Anything that has an affect on the highwall miner must be spelled out in the plan....for example pit information. Simply referencing surface ground control plan is not good enough.

Cover sheet (Follow the ground control guidelines dated February 10, 2000)

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List of equipment to be used

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Strata Profile

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Pit and Highwall Information  
(Follow the ground control guidelines dated February 10, 2000 - Item 6)

- a. Slope of Ground to be Mined
- b. Maximum Highwall Height
- c. Highwall Slope
- d. Width of Highwall Benches\*
- e. Spacing of Highwall Benches\*\*
- f. Pit Width
- g. Maximum Height of Deposited Spoil
- h. Maximum Angle of Deposited Spoil
- i. Description of Methods and Equipment Used to Scale and Maintain Highwall

\* Width of Highwall Benches must be 2.5 times the width of the equipment to be used

\*\* Spacing of Highwall Benches to be dictated by the method of mining and the type of equipment available at the mine to scale and maintain the highwall.

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Drawings or map profiles showing sequence of mining in relation to seam locations

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Stability – How determined - Use of ARMPS, etc.  
Must have a minimum overall safety factor of 1.30

**Brook 10d**

Include a drawing showing depth of overburden, height of coal, maximum number of holes between barriers, barrier and web dimensions used to calculate 1.3 stability factor

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- Need to address precautions for any existing auger holes (grouting before entries are established and acceptable stability outside area required to be grouted). See February 10<sup>th</sup> 2000 GC Plan guidelines for grouting information. (900psi minimum grout strength)

Note 1: This may not always apply for HWM if it can be shown that stability can be maintained without grouting auger holes.

Note 2: If there are no existing auger holes then the plan needs to include a statement that no highwall will be developed and no mining will take place where previous underground mining exists.

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- 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, 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. The revision will identify the reason for revising the plan so as to alert MSHA to the conditions.
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- If stability failure or stress cracks occur in the highwall in active work areas where highwall mining or 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.
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- Availability of map showing projections, depth of holes, cover, height of coal, barrier and web dimensions, previous mining in same seam, above, and below, and gas well locations
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- Previous mining same seam, above, & below – IF NONE, include statement that 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).
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- When previous underground mining (including highwall mining or auger mining) exists in the seam being mined or is encountered during mining operations, a 50 ft. barrier needs to be maintained between the end of the holes being mined and the existing previously underground mined areas.
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- Gas wells and lines – IF NONE; include statement that no mining, excavation, or equipment/vehicle operation will occur within 150 feet of gas wells or lines.

OR

- Include precautions to be taken if any type of work, travel, excavation, or blasting will occur within 150 feet of active gas wells or lines.

**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 stipulations will be met:

- 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

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- 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.
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- 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.

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- Provisions to leave holes uncovered in active work areas (this is to make the web pillars easy to observe which is important for recognizing stability hazards)
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- 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).
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- A buffer, berm, or other no less effective means will be provided at the toe of live stacked spoil piles (includes backstack, 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.
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- Methane detection and control, calibration of detecting equipment, explosion-proof enclosures. CH<sub>4</sub> monitor needs to give a warning at 1% and shut down the machine at 2%. The machine also has to be withdrawn at 2%.
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- All electrical components used underground will be housed inside explosion proof enclosures.
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- The push beams will be coupled with a Latching Arm and a Keeper Pin to keep the Latching Arm from coming uncoupled underground. If the Latching Arm or Keeper Pin shows signs of excessive wear the Arm and Pin will be replaced.
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- Recommendations when Mud Seams are encountered**

Stability failure can be expected to occur between the face of the highwall and mud seams that exist near parallel with the face when coal is removed from the toe of such walls by augering or highwall mining. If near vertical mud seams existing in the face of the highwall do not cut into the wall on an angle more than 20 degrees consider the following precautions to help prevent this failure:

- Change orientation of cuts or panels
- Angle drill at least 20 degrees
- Reduce bench spacing and in the case of the highwall miner, set the machine out from the toe of the highwall to the extent that failure of the immediate highwall would not affect the workers and limit workers from the affected area. Because this type of failure is affected by the reduced strength of the coal immediately under the face of the highwall the unstable material can be expected to tip or topple out into the pit instead of sliding down the wall. The toppling material will likely extend farther out into the pit than the distance of the highwall height. Failure in a 100 ft. highwall has been known to result in rock falling out onto the pit floor more than 150 ft. from the toe of the wall.
- Skip these unstable areas. It will be necessary to mark the area to be skipped in the pit and barricade out. Also provide a map and statements with the plan showing that the area(s) will be skipped at locations identified on the map. The locations could be shown on the pit map as long as a statement in the plan provided for this.

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No person shall be permitted to enter a highwall miner hole except with the approval of the District Manager (77.1502)

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Blasting Procedures.

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Recovery Procedure for highwall miner vehicle

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Highwall Inspections (per 77.1501).

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Hole Alignment.

Hole Closure

Hole Surveying

Coal Loading.

Launch Vehicle Repairs

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No Materials stored in Open Holes

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Miner not to remain in hole for extended period