DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

Permit Application Analysis
AP-2989

November 9, 2005

NAME OF FIRM:	Arch of Wyoming, LLC
NAME OF FACILITY:	Carbon Basin Mines (Elk Mountain Mine - surface) (Saddleback Hills Mine - underground)
FACILITY LOCATION:	Various Sections of T21N, R80W & T20N, R80W Approximately 3 miles north-northeast of Elk Mountain
TYPE OF OPERATION:	Surface & Underground Coal Mine
RESPONSIBLE OFFICIAL:	Steve Skordas, Mine Manager
MAILING ADDRESS:	P.O. Box 460 Hanna, WY 82327
TELEPHONE NUMBER:	(307) 325-6581 ext. 101
REVIEWING ENGINEER:	Andrew Keyfauver, Air Quality Engineer

PURPOSE OF APPLICATION:

On February 9, 2005, Arch of Wyoming, LLC submitted an application to establish a 2.1 million ton per year surface and underground coal mine known as the Carbon Basin Mines. The Carbon Basin Mines will consist of the Elk Mountain Mine which is a surface mine that uses mobile equipment to remove overburden, mine coal, and backfill mined pits, and the Saddleback Hills mine which is an underground mine that uses continuous mining equipment. Approximately 1.6 million tons per year of coal is expected to come from surface mining operations. Arch of Wyoming, LLC has proposed two options for coal mined from the Carbon Basin Mines; either all run of mine coal will be hauled to the existing Seminoe II processing area for crushing and load-out through rail cars, or a portion (120,000 tons per year) of the mined coal will be run through an in-pit crusher and crushed coal will be loaded out by highway haul trucks. The Seminoe II processing area is located on the northern outskirts of Hanna and Elmo.

The life of the Elk Mountain Mine is projected to be ten (10) years while the life of the Saddleback Hills Mine is projected to be eleven (11) years. Arch of Wyoming, LLC expects that the initial phase of mining at the Carbon Basin Mines will last approximately five (5) years in which the Seminoe II processing area will be used and an in-pit crusher may be installed to allow the loading of highway haul trucks. During the next phase of mining at the Carbon Basin Mines Arch of Wyoming anticipates constructing a new coal handling and load-out facility, including an on-site railroad spur capable of higher throughput. This application will only address the initial phase of mining at the Carbon Basin Mines.

PROCESS DESCRIPTION:

Mine Plan

The Elk Mountain Mine will use front end loaders and highway haul/end-dump trucks to remove coal from surface mining operations. Mining at the Elk Mountain Mine will consist primarily of three pits. Activities would alternate between the pits consisting of top soil removal/replacement, overburden removal/backfilling, and coal removal. Arch of Wyoming, LLC has designated three sites where the pits would be located. Site 1 is located on the west side of the mining area and will progress from north to south. Site 2 is on the south side of the mining area and will progress from west to east. Site 3 is located on the east side and will progress from east to west and then toward the northeast. Underground activities at the Saddleback Hills Mine are expected to coincide with operations at the Elk Mountain Mine.

Coal Handling

Carbon Basin Mines

Coal mined from the underground mine will be transported via a conveyor to a radial stacker where it will be dumped on a stockpile with an estimated size of up to 35,000 tons. An underground tunnel with a conveyor will take coal from the stockpile to load-out bins where highway haul trucks will be loaded for transport to the Seminoe II Processing Area. Surface mined coal will be loaded into highway haul trucks for transport up to the Seminoe II Processing Area.

If highway haul trucks are loaded for sale at the Carbon Basin Mines there will be a crusher located in-pit. This crusher could be fed by either end-dump trucks from surface mined coal or fed by a front-end loader from the underground mine coal stock pile.

Seminoe II Processing Area

The Seminoe II Processing Area will only take run-of-mine coal from the Carbon Basin Mines. Haul trucks would belly dump coal into a primary crushing loading hopper. Once coal has passed the primary crusher it is sent on to a secondary crusher. From the secondary crusher it is conveyed to stacker tubes which create stockpiles around the tubes. Beneath the stacker tubes are reclaim tunnels which collect the coal and send it to a load-out bin for rail-car loadout.

The Seminoe II Processing Area is currently permitted under Air Quality Permit CT-579, which has a limit of 2.1 MMTPY for coal crushing and loadout.

Equipment

The following is the list of mining equipment that will be used at the Carbon Basin Mines:

Table 1: Carbon Basin Mines – Mining Equipment

Equipment	Class/Size	Number of Units
Front End Loader	23 Cubic Yard	1
	15 Cubic Yard	1
	7.5 Cubic Yard	1
Trucks	End Dump Truck/200 ton	3
	Highway Haul Trucks/35 ton	15
	Bottom Dump Truck/200 ton	2
	Fuel Truck	1
	Service Truck	1
	Lowbed Tractor Trailer/85 tons	1
Grader/Dozers/Scrappers	Grader 275 hp	1
	Crawler Tractor 850 hp	1
	Crawler Tractor 570 hp	2
	Scraper 450/490 hp	1
Water Truck	20,000 gallon	1
Drill	Blast Hole Drill	1
Miscellaneous	Light Plant	3
	Hydraulic Crane/15 ton	1
	Utility Backhoe/2 Cubic Yard	1

Disturbed Acreage

Arch of Wyoming, LLC has estimated that there will be 7.3 acres of disturbed area within the Carbon Basin Mines. This is based only on actives during one year. If reclaimed areas and stockpiles are factored in on a two year basis, the disturbed area is estimated to be double that of one year or 14.6 acres.

ESTIMATED EMISSIONS CARBON BASIN MINES:

Particulate emissions (PM_{10}) from the Carbon Basin Mines were estimated using approved Air Quality Division emission calculations developed for coal mines in the Powder River Basin based on mining 2.1 MMTPY of coal. Haul road emissions from the mine to paved surfaces and from paved surfaces to the Seminoe II processing area along with fuel burning equipment were based on AP-42 emission factors.

Table 2: Carbon Basin Mines PM$_{10}$ Fugitive Emissions (tpy)					
Source	Year 1	Year 2	Year 3	Year 4	Year 5
Scraper Operation	2.6	2.6	2.6	2.6	2.6
Overburden Removal	23.6	19.9	22.9	24.7	19.2
Coal Removal	0.5	0.6	0.5	0.5	0.6
Truck Dump	3.1	3.4	3.1	3.1	3.4
Wind Erosion [2]	22.4	22.4	22.4	22.4	22.4
Coal and OB Blasting	0.1	0.1	0.1	0.1	0.1
Dozers	9.8	9.8	9.8	9.8	9.8
In-Mine Coal Haul Roads	6.0	8.3	8.0	8.7	10.2
Overburden Haul Roads	2.9	3.1	4.2	4.6	4.2
Haul Road Repair	3.4	3.4	3.4	3.4	3.4
Haul Road from CBM to Paved Road (Hwy 72)	128.4	128.4	128.4	128.4	128.4
Haul Road from Paved Road (Hwy 30) to Seminoe II	86.8	86.8	86.8	86.8	86.8
Coal Crushing (Optional Crusher)/Conveying	1.4	1.4	1.4	1.4	1.4
Total	**291.0**	**290.2**	**293.6**	**296.5**	**292.5**

[1] Based on the use of the Seminoe II processing area.
[2] Wind erosion based on 14.6 acres or two years.

Table 3: Other Pollutant Emissions Carbon Basin Mines (tpy)					
	NO_x	CO	PM_{10}	VOC	SO_2
Gasoline & Diesel Fired Equipment [1]	238.2	200.4	4.6	10.7	4.1
Blasting	0.5	--	--	--	--
Totals	**238.7**	**200.4**	**4.6**	**10.7**	**4.1**

[1] Each year was assumed to have the same amount of fuel consumption.

Table 4: Seminoe II Processing Area – Crushing/Stockpiling/Loadout	
PM_{10} (tpy) CT-579	74.0

BEST AVAILABLE CONTROL TECHNOLOGY (BACT):

Haul Roads

- Carbon Basin Mines

Arch of Wyoming, LLC has proposed to use water on the roads within the Carbon Basin Mines to minimize fugitive emissions. In addition they have also proposed to use magnesium chloride if it is determined that the application of water isn't sufficient to minimize fugitive emissions. The overall effectiveness of fugitive emission control relies on the assessment of current conditions and the flexibility to react to changing conditions. The Division considers the use of water and chemical dust suppressants as representing BACT for roads within the Carbon Basin Mines.

- Carbon Basin Mines to Highway 72

Arch of Wyoming, LLC has proposed a minimum of two applications of magnesium chloride along the road from the Carbon Basin Mines to Highway 72. In addition water is to supplement the application of chemical dust suppressants as necessary to minimize fugitive dust emissions. The Division considers two applications of chemical dust suppressant along with water as representing BACT for controlling fugitive dust emissions from this road.

- Highway 30 to Seminoe II Processing Area

Arch of Wyoming, LLC addressed two options along this portion of the haul route. They looked at paving a 6,700 ft section of the road that passes near Elmo in addition to their assumed base case of a gravel road along with the application of chemical dust suppressant (at least two applications) and water. The cost of paving the 6,700 foot section of road was estimated at approximately $119,000 with a cost to control of $1,372 per ton of PM_{10} (99% control efficiency). Based on the expected use of the Seminoe II Processing Area for only the first phase of operations of the Carbon Basin Mines (5 years), the Division will consider the use of a gravel road with the use of water and chemical dust suppressant as representing BACT.

Coal Handling

- Carbon Basin Mines

Arch of Wyoming, LLC has proposed to use foggers at the Carbon Basin Mines at each transfer point along the conveyor system. The fogger system uses atomized water to help particulates drop out of the air and also wets the coal to hinder particulates from getting airborne. The fogger system will also use a surfactant with the water which helps as a wetting agent. The Division considers the use of a fogger system as being representative of BACT for this type of operation.

Fugitive dust at the crusher will be minimized with the use of foggers. Use of the fogger systems when the crusher is in operation is considered to be representative of BACT. The feed hopper to the crusher shall be limited to less than 20 percent opacity, per the requirements of Subpart Y. Compliance with the 20 percent opacity limit at the crusher feed hopper will be determined by Method 9 of 40 CFR, Part 60, Appendix A. Arch of Wyoming, LLC shall conduct, at a minimum, quarterly visual observations of the feed hopper using Method 9 to measure the opacity of any fugitive emissions when the crusher is in operation. The Method 9 observations are to be conducted by a qualified observer and shall follow the requirements and procedures of Method 9.

The applicant also addressed BACT regarding the use of an open stockpile versus the use of a coal storage silo. The estimated annualized cost of a storage silo for a period of five (5) years was estimated at approximately $1,060,000. This equates to a cost to control particulate emissions of approximately $93,100 per ton of PM_{10} assuming a 99 percent control efficiency. Based on the cost to control of a storage silo the Division will consider the use of an open stockpile with the use of water and chemical dust suppressants as representing BACT.

Weekly inspections of the fogger systems shall be conducted by Arch of Wyoming to determine any repair measures necessary to minimize fugitive dust emissions and maintain proper operation of the control system. Corrective action and repair measures must be initiated in an expeditious manner when the control device is determined to be improperly maintained or operated.

The dump pad in front of the crusher feed hopper has been identified as sources of fugitive dust as pulverized material that accumulates on pads due to spillage is easily disturbed by traffic. Cleaning practices at the Carbon Basin Mine need to be adequate to control dust problems in this areas.

Conveyors that are above ground are to be partially covered, which is similar to the current conveyor system at the Seminoe II Processing Area.

- Seminoe II Processing Area

Arch of Wyoming, LLC has proposed to use water spray at the Seminoe II Processing Area at each transfer point along the conveyor system. The Seminoe II Processing Area was permitted under CT-579, and Arch of Wyoming, LLC has no changes proposed for the processing area. Therefore, the Division will consider use of water sprays at the Seminoe II Processing Area as representative of BACT for this type of operation.

Miscellaneous

The Division considers acreage within the mine boundary that is subject to wind erosion as disturbed acreage. Contemporaneous reclamation helps minimize wind erosion from mined areas. Reclaimed lands are to be seeded during the first favorable planting conditions. Windrows are to be bladed in pit areas where topsoil has been stripped. Topsoil stockpiles and sediment control structures are to be seeded during the first normal period favorable for planting.

Topsoiled areas shall be stabilized as soon as feasible after topsoil lay-down. When appropriate, topsoiled areas shall be chiseled to roughen the surface. Roughened surfaces have less wind erosion potential because the rougher surface reduces wind shear at the ground level. Backfilled and regraded areas that will not be topsoiled or seeded for an extended period of time and are subject to wind-blown erosion should be ripped to roughen the surface to help reduce wind erosion.

CHAPTER 6, SECTION 3 APPLICABILITY:

The Division determines major source applicability based on point sources and includes fugitive emissions from sources which are subject to new source performance standards. There are no point sources proposed at the Carbon Basin Mines; however, the coal handling systems at the Carbon Basin Mines and the coal handling system at the Seminoe II Processing Area are subject to a new source performance standard (Subpart Y); therefore emissions from the coal handling are counted toward major source applicability. Emissions from the Seminoe II Processing Area are 74 tpy of PM_{10} (Table 4) and emissions from the coal handling system at the Carbon Basin Mines are 3.4 tpy of PM_{10}. Since the Seminoe II and Carbon Basin Mines are considered separate facilities, the emissions from each facility are not aggregated and total emissions from each facility are less than 100 tpy. Therefore, the Seminoe II and Carbon Basin Mines are not considered major sources as defined in Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations (WAQSR).

CHAPTER 5, SECTION 2 – NEW SOURCE PERFORMANCE STNADARDS (NSPS):

All coal preparation facilities, existing and proposed, are subject to Subpart Y of Chapter 5, Section 2, New Source Performance Standards. Subpart Y limits opacity from any coal processing and conveying equipment, including coal crushers and breakers, coal storage systems, and coal transfer and loading systems to less than twenty percent (20%) opacity.

CHAPTER 6, SECTION 4 – PREVENTION OF SIGNIFICANT DETERIORATION (PSD):

Since fugitive emissions are not counted toward applicability under Chapter 6, Section 4 of the WAQSR, the Carbon Basin Mines are not considered a "major emitting facility", and a PSD analysis is not required.

AMBIENT AIR QUALITY:

The Division has typically modeled coal mines of considerably larger size in the Powder River Basin (PRB) for compliance with the WAAQS standards for PM_{10} and NO_x. Based on the size of the Carbon Basin Mines the Division believes that the Carbon Basin Mine will show compliance with the WAAQS standards based on its experience with coal mines in the PRB.

PROPOSED PERMIT CONDITIONS:

The Division proposes to issue an Air Quality Permit to Arch of Wyoming, LLC to establish the Carbon Basin Mines with the following permit conditions:

1. That authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution and for determining compliance or non-compliance with any rules, standards, permits or orders.

2. That all substantive commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit.

3. That a permit to operate, in accordance with Chapter 6, Section 2(a)(iii) of the WAQSR, is required after a 120 day start-up period in order to operate this facility.

4. That all notifications, reports and correspondences associated with this permit shall be submitted to the Stationary Source Compliance Program Manager, Air Quality Division, 122 West 25th Street, Cheyenne, WY 82002 and a copy shall be submitted to the District Engineer, Air Quality Division, 152 North Durbin Street, Suite 100, Casper, WY 82601.

5. That written notification of the anticipated date of initial start-up, in accordance with Chapter 6, Section 2(i) of the WAQSR, is required not more than 60 days or less than 30 days prior to such date. Notification of the actual date of start-up is required 15 days after start-up.

6. That the date of commencement of construction shall be reported to the Administrator within 30 days of commencement. In accordance with Chapter 6, Section 2(h) of the WAQSR, approval to construct or modify shall become invalid if construction is not commenced within 24 months after receipt of such approval or if construction is discontinued for a period of 24 months or more. The Administrator may extend the period based on satisfactory justification of the requested extension.

Carbon Basin Mines

7. That Arch of Wyoming, LLC shall comply with the following requirements for the fogger units at Carbon Basin Mines:

   a) That the opacity from the fogger units shall be limited to a maximum of 20 percent as determined by Method 9 of 40 CFR, Part 60, Appendix A.

   b) That the fogger units shall be operated during all times that the respective coal processing facility is operating including loading of the crusher feed hopper.

   c) Weekly inspections of the fogger systems shall be conducted by Arch of Wyoming to determine any repair measures necessary to minimize fugitive dust emissions and maintain proper operation of the control system. Corrective action and repair measures must be initiated in an expeditious manner when the control device is determined to be improperly maintained or operated.

8. That the crusher feed hopper shall be limited to less than 20 percent opacity, per the requirements of Subpart Y. Compliance with the 20 percent opacity limit at the crusher feed hopper will be determined by Method 9 of 40 CFR, Part 60, Appendix A.

9. Topsoiled areas shall be stabilized as soon as feasible after topsoil laydown. When appropriate, topsoiled areas shall be chiseled to roughen the surface to lessen wind erosion potential. Backfilled and regraded areas that will not be topsoiled or seeded for an extended period of time and are subject to wind-blown erosion shall be ripped to roughen the surface to help reduce wind erosion.

10. That all haul roads and stockpiles within the Carbon Basin Mines shall be treated with suitable chemical dust suppressants and/or water to control fugitive dust emissions. All treated road surfaces shall be maintained on a continuous basis to the extent that the surface treatment remains a viable control measure. Records of the number and size of water trucks, water truck operations, water usage, roads watered, roads treated, length of roads treated, and other operational parameters shall be maintained such that an annual report on dust control measures can be filed with the Division in order to assess compliance with this condition. The report shall include a map showing which roads were treated and what treatments were used on road segments. The annual report shall be submitted to the Division by April 1st of each year.

11. The maximum coal production by year shall not exceed the production rate of 2.1 million tons per year as described in the mine plan contained in the application. Annual coal and overburden production rates shall be reported with the annual report required for dust control measures by Condition 10.

12. That a maximum of 120,000 tons per year of coal may be processed through the in-pit crusher at the Carbon Basin Mines. Annual coal throughput through the in-pit crusher shall be reported with the annual report required for dust control measures by Condition 10.

13. That Arch of Wyoming, LLC will limit public access to the lands defined by the Administrator as necessary to conduct mining operations. All fencing of the Lands Necessary to Conduct Mining boundary shall be equipped with locked gates and signs posted at fixed intervals identifying the enclosed area and prohibiting access.

14. That Arch of Wyoming, LLC shall comply with the requirements of 40 CFR, Part 60, Subpart Y for the coal handling system at the Carbon Basin Mine.

15. That Arch of Wyoming, LLC will adhere to their program to mitigate coal fires that result from spontaneous combustion. All fires are to be extinguished within 24 hours unless operational safety issues are present. A production supervisor will document extinguishing measures utilized when fires are considered significant. All documentation shall be maintained and made available to the Division upon request.

16. That Arch of Wyoming, LLC's shall operate, in accordance with the requirements of 40 CFR, Parts 50 and 58, an approved ambient particulate monitoring program that includes an ambient particulate monitoring network, with wind speed and direction instruments at the Carbon Basin Mines. The data generated by the network shall be submitted in an approved format on a quarterly basis, within 60 days following the end of the quarter. Arch of Wyoming, LLC shall maintain a quality assurance plan for the monitoring network, as required by 40 CFR, Part 58 and shall be approved by the Division.

17. That the ambient monitoring program required in Condition #16 shall be operational prior to starting any mining activities. Arch of Wyoming, LLC shall submit for approval the locations of the ambient monitor(s) prior to start-up of the monitoring program.

18. That Arch of Wyoming, LLC shall maintain a meteorological station at their Carbon Basin Mines acceptable to the Division. Surface air meteorological data measurements shall be collected at the Carbon Basin Mines, as specified in the EPA document: Meteorological Monitoring Guidance for Regulatory Modeling Applications. The meteorological data measurements shall consist of hourly observations of:

    a. Wind speed using an anemometer height of 10 meters
    b. Wind direction
    c. Ambient temperature

19. The meteorological data specified in Condition #18 shall be submitted in an electronic format on a quarterly basis and shall be compiled in a joint frequency distribution (JFD) utilizing the modified sigma theta method for stability.

Seminoe II Processing Area

20. That Arch of Wyoming, LLC may only process run-of-mine coal at the Seminoe II Processing Area.

21. That the water sprays shall be operated during all times that the respective coal processing facility is operating.

22. That all haul roads/stockpiles within the Seminoe II Processing Area shall be treated with suitable chemical dust suppressants and/or water to control fugitive dust emissions. All treated road surfaces shall be maintained on a continuous basis to the extent that the surface treatment remains a viable control measure. Records of water truck operations, water usage, chemical usage, roads watered, roads treated, length of roads treated, and other operational parameters shall be maintained such that an annual report on dust control measures can be filed with the Division in order to assess compliance with this condition. The annual report shall be submitted to the Division by April 1st of each year.

23. That Arch of Wyoming, LLC shall comply with the requirements of 40 CFR, Part 60, Subpart Y for the coal handling system at the Seminoe II Processing Area.

Haul Roads from Carbon Basin Mines to Seminoe II

24. That all unpaved portions of the haul route from the Carbon Basin Mine to Highway 72 utilized during the calendar year shall be treated with suitable chemical dust suppressants and/or water to control fugitive dust emissions. At a minimum, two (2) applications of dust suppressant shall be applied for each calendar year. All treated road surfaces shall be maintained on a continuous basis to the extent that the surface treatment remains a viable control measure. Records of the number and size of water trucks, water truck operations, water usage, roads watered, roads treated, length of roads treated, and other operational parameters shall be maintained such that an annual report on dust control measures can be filed with the Division in order to assess compliance with this condition. The report shall include a map showing which roads were treated and what treatments were used on road segments. The annual report shall be submitted to the Division by April 1st of each year.

25. That all unpaved portions of the haul route from Highway 30 to the Seminoe II Processing Area utilized during the calendar year shall be treated with suitable chemical dust suppressants and/or water to control fugitive dust emissions. At a minimum, two (2) applications of dust suppressant shall be applied for each calendar year. All treated road surfaces shall be maintained on a continuous basis to the extent that the surface treatment remains a viable control measure. Records of the number and size of water trucks, water truck operations, water usage, roads watered, roads treated, length of roads treated, and other operational parameters shall be maintained such that an annual report on dust control measures can be filed with the Division in order to assess compliance with this condition. The report shall include a map showing which roads were treated and what treatments were used on road segments. The annual report shall be submitted to the Division by April 1st of each year.