In the Matter of the Appeal)
And Petition for Hearing of:)
Croell Redi-Mix, DEQ AQD Permit) Docket No. 10-2803
Application No. AP-9645)
And DEQ AQD Permit No. MD-9645)
Dated March 17, 2010)

DEQ'S MOTION FOR SUMMARY JUDGMENT

EXHIBIT 5

Application Analysis

DEQ Bates Nos. 000026-36

DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

Permit Application Analysis
AP-9645

September 8, 2009

NAME OF FIRM:	Croell Redi-Mix
NAME OF MINE:	Rogers Rock Pit
LOCATION OF MINE:	NW¼NE¼ of Section 25, T52N, R62W Crook County, Wyoming
TYPE OF OPERATION:	Limestone
RESPONSIBLE OFFICIAL:	Julie Ewing, Safety Director
MAILING ADDRESS:	PO Box 1352 Sundance, WY 82729
TELEPHONE:	(307) 283-2221
REVIEWING ENGINEER:	Nick Meeker, Air Quality Engineer

PURPOSE OF APPLICATION:

On July 6, 2009, the Division of Air Quality received an application from Croell Redi-Mix to modify the Rogers Rock Pit, which will include limestone crushing, screening, blasting, exposed acreage, stockpiling, haul activity, a hot mix asphalt plant and a concrete batch plant, located in the NW¼NE¼ of Section 25, T52N, R62W, approximately five (5) miles northeast of Sundance, in Crook County, Wyoming. The applicant estimates an annual production rate of 500,000 tons.

A facility location map is included in Appendix A.

REPORTED MINE INFORMATION:

Annual Production Rate:	500,000 tons
Material Mined:	Limestone
Size of Mine:	600.07 acres
# of Blasts per Year:	12
Crushing and Screening Proposed:	Yes
Distance to Nearest Residence:	1.0 mile
Number of Residences within 1 miles radius:	1
Distance Material Hauled Until Reaching Pavement:	1.0 mile
Proper Land Use Documentation Submitted:	Yes

PERMIT HISTORY:

Air Quality Permit CT-4526 was issued to Croell Redi-Mix on February 13, 2007 to establish the Rogers Rock Pit as a limestone mine. Croell Redi-Mix initially permitted the Rogers Rock Pit with the maximum annual production of 100,000 tons per year and as a ten (10) acre mine.

ESTIMATED EMISSIONS:

The pollutant of main concern at the Rogers Rock Pit will be fugitive particulate matter emitted primarily from limestone crushing, screening, blasting, exposed acreage, stockpiling and haul truck activity. The Division estimated emission based on EPA document, AP-42, Compilation of Emission Factors. Application of water during stockpiling operations is credited for 50% control efficiency. Table 1 lists the estimated emissions for crushing, screening, blasting, exposed acreage and stockpiling based on a maximum production rate of 500,000 TPY of mined material, 500,000 TPY of stockpiled material, 135,000 TPY of topsoil and 20,000 TPY of overburden. Exposed acreage is based on five (5) acres. Table 2 lists emissions from haul road activities based on a haul road length of two (2) miles (total miles to and from the pit). Emission calculations are detailed in Appendix B.

Table 1: Estimated Emissions, TPY [1]					
Source	NO_x	CO	SO_2	TSP	PM_{10}
Crushing	--	--	--	0.7	0.3
Screening	--	--	--	3.1	1.1
Blasting	0.8	3.0	0.1	18.9	--
Exposed Acreage	--	--	--	1.0	0.3
Truck Loading & Stockpiling	--	--	--	16.6	7.8
Total Emissions	0.8	3.0	0.1	40.3	9.5

[1] Emissions estimated to nearest 0.1

Table 2: Haul Road Emissions, TPY [1]		
Source	TSP	PM_{10}
Haul Road	103.8	29.4

[1] Emissions estimated to nearest 0.1

BEST AVAILABLE CONTROL TECHNOLOGY (BACT):

The Division considers the use of two (2) applications of chemical dust suppressant to be applied annually in accordance with the manufacturer's recommendations on the work areas, access roads and haul roads to represent BACT for this type of operation.

BACT for crushing/screening operations shall consist of a wet suppression system to control fugitive emissions from the crushing/screening equipment and shall be operated to the extent necessary to limit visible emissions to twenty percent (20%) opacity, or limits set to comply with 40 CFR part 60, subpart OOO.

CHAPTER 6, SECTION 3 APPLICABILITY:

The Rogers Rock Pit is not a "major source" as defined by Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations (WAQSR). Point source emissions do not exceed the 100 tpy threshold of any regulated pollutant.

PREVENTION OF SIGNIFICANT DETERIORATION (PSD):

The Rogers Rock Pit is not a "major emitting facility" as defined by Chapter 6, Section 4 of the Wyoming Air Quality Standards and Regulations. Therefore, further analysis is not required under this section.

AMBIENT AIR QUALITY:

It is the Division's experience that ambient air quality standards will be maintained with the utilization of the control measures recognized as BACT for pit operations.

PROPOSED PERMIT CONDITIONS:

The Division is proposing to issue an Air Quality Permit to Croell Redi-Mix to modify the Rogers Rock Pit subject to the following 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 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, 1866 S. Sheridan Avenue, Sheridan, WY 82801.

4. The owner or operator shall furnish the Administrator written notification of: (i) the anticipated date of initial startup not more than sixty (60) days or less than thirty (30) days prior to such date, and; (ii) the actual date of initial start-up within fifteen (15) days after such date in accordance with Chapter 6, Section 2(i) of the WAQSR.

5. The date of commencement of construction shall be reported to the Administrator within thirty (30) days of such date. The permit shall become invalid if construction or modification is not commenced within twenty-four (24) months of the date of permit issuance or if construction is discontinued for a period of twenty-four (24) months or more in accordance with Chapter 6, Section 2(h) of the WAQSR. The Administrator may extend such time period(s) upon a satisfactory showing that an extension is justified.

6.   Any crushing/screening equipment, hot mix asphalt plant and concrete batch plant shall have separate valid air quality permit(s) prior to locating/operating at this site.

7.   That all work areas, disturbed areas and stockpiles shall be treated with water and/or chemical dust suppressants on a schedule sufficient to control fugitive dust.

8.   All unpaved haul roads shall be treated with water and/or chemical dust suppressants on a schedule sufficient to control fugitive dust from vehicular traffic and wind erosion. At a minimum, two (2) applications of chemical dust suppressant shall be applied annually in accordance with the manufacturer's recommendations. The chemical dust suppressant shall be maintained continuously to the extent that it remains a viable control measure, which may require additional applications. All unpaved portions of haul roads shall receive an initial treatment of chemical dust suppressant prior to any hauling activities at the beginning of each construction season.

9.   Croell Redi-Mix shall maintain a log book listing the dates, amount of dust suppressant applied, areas treated, water usage and operating hours of the water truck. The log shall be maintained on site for a period of at least five (5) years and shall be made available to the Division upon request.

10.   This permit shall supersede Air Quality Permit CT-4526 for the Rogers Rock Pit.

APPENDIX A
Facility Location Map
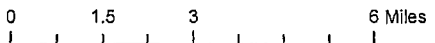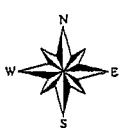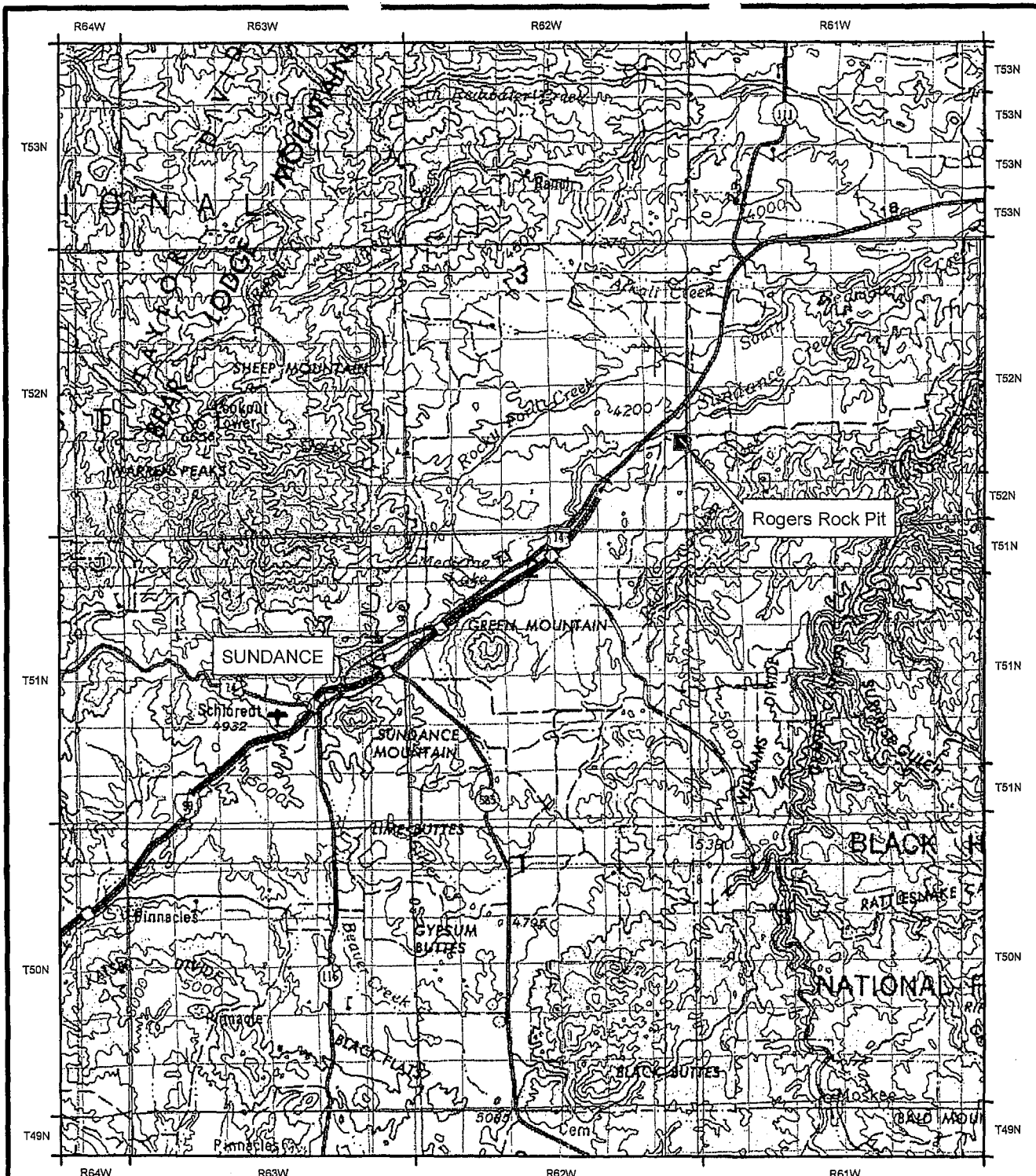
Croell Redi-Mix
Rogers Rock Pit
NW1/4NE1/4 of Section 25, T52N, R62W
Crook County

0   1.5   3   6 Miles
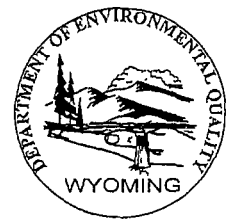
APPENDIX B
Emission Estimates

CRUSHING EMISSIONS:

Based on 500,000 TPY production rate, TSP and PM_{10} emissions associated with crushing operations were estimated as follows:

Crushing: 0.0054 lb/ton TSP, 0.0024 lb/ton PM_{10}
AP-42 Table 11.19.2-2 8/04

$$\text{TSP Emissions} = \frac{500,000\frac{ton}{year} \times 0.0054\frac{lb}{ton} \times (1-0.50)}{2,000\frac{lb}{ton}} = 0.68\frac{ton}{year} \text{ (50\% control)}$$

$$PM_{10} \text{ Emissions} = \frac{500,000\frac{ton}{year} \times 0.0024\frac{lb}{ton} \times (1-0.50)}{2,000\frac{lb}{ton}} = 0.30\frac{ton}{year} \text{ (50\% control)}$$

SCREENING EMISSIONS:

Based on 500,000 tpy maximum production rate, TSP and PM_{10} emissions associated with screening operations were estimated as follows:

Screening: 0.025 lb/ton TSP, 0.0087 lb/ton PM_{10}
AP-42 Table 11.19.2-2 8/04

$$\text{TSP Emissions} = \frac{500,000\frac{ton}{year} \times 0.025\frac{lb}{ton} \times (1-0.50)}{2,000\frac{lb}{ton}} = 3.13\frac{ton}{year} \text{ (50\% control)}$$

$$PM_{10} \text{ Emissions} = \frac{500,000\frac{ton}{year} \times 0.0087\frac{lb}{ton} \times (1-0.50)}{2,000\frac{lb}{ton}} = 1.09\frac{ton}{year} \text{ (50\% control)}$$

BLASTING EMISSIONS:

Emissions from blasting operations were calculated using AP-42 Table 13.3-1 and Table 11.9-1.

Emission Factors:

NO_x: 17 lb/ton
CO: 67 lb/ton
SO_2: 2 lb/ton
TSP: 0.000014 (A) $^{1.5}$ lb/blast
A = Horizontal area (ft^2) = 369,460 ft^2

Amount of Blasting Agent used:
180,000 lb/year = 90 TPY

$$NO_x \text{ Emissions} = 17\frac{lb}{ton}x90\frac{ton}{year} = 1,530\frac{lb}{year}x\frac{ton}{2,000lb} = 0.77\frac{ton}{year}$$

$$CO \text{ Emissions} = 67\frac{lb}{ton}x90\frac{ton}{year} = 6,030\frac{lb}{year}x\frac{ton}{2,000lb} = 3.02\frac{ton}{year}$$

$$SO_2 \text{ Emissions} = 2\frac{lb}{ton}x90\frac{ton}{year} = 180\frac{lb}{year}x\frac{ton}{2,000lb} = 0.09\frac{ton}{year}$$

TSP Emissions:

$$0.000014(A)^{1.5} \text{ lb/blast} = 0.000014(369,460)^{1.5} \text{ lb/blast} = 3,144 \text{ lb/blast}$$

$$TSP \text{ Emissions} = 3,144\frac{lb}{blast}x12\frac{blasts}{year} = 37,728\frac{lb}{year}x\frac{ton}{2,000lb} = 18.86\frac{ton}{year}$$

ESPOSED ACREAGE:

Based on 5 acres exposed to wind erosion annually, TSP and PM_{10} emissions were estimated as follows:

Exposed Acreage: TSP: 0.38 tons/acre/year, PM_{10}: 0.11 tons/acre/year
AP-42 Table 11.9-4, PM_{10} = TSP x 0.3

TSP Emissions = 5 acres x 0.38 tons/acre/year x (1-0.50) = 0.95 TPY (50% control)

PM_{10} Emissions = 5 acres x 0.11 tons/acre/year x (1-0.50) = 0.28 TPY (50% control)

TRUCK LOADING AND STOCKPILING EMISSIONS:

Based on 500,000 TPY of mined material, 500,000 TPY of stockpiled material, 135,000 TPY of topsoil and 20,000 TPY of overburden, TSP and PM_{10} emissions associated with stockpiling operations were estimated as follows, using AP-42 13.2.4 Equation 1:

$$E = k(0.0032)\frac{\left(\dfrac{U}{5}\right)^{1.3}}{\left(\dfrac{M}{2}\right)^{1.4}}$$

Where:
k=particle size multiplier
U=average wind speed, mph
M=material moisture content, %

TSP:

k=0.74
U= 11.0 mph (average wind speed for Sundance, WY)
M=0.7%

$$E = 0.74(0.0032)\frac{\left(\dfrac{11.0}{5}\right)^{1.3}}{\left(\dfrac{0.7}{2}\right)^{1.4}} = 0.0287\frac{lb}{ton}$$

$$\text{TSP Emissions} = \frac{1{,}155{,}000\dfrac{ton}{year}\, x0.0287\dfrac{lb}{ton}\, x(1-0.50)}{2{,}000\dfrac{lb}{ton}} = 8.3\frac{ton}{year}\, x2\frac{drops}{trip} = 16.6\frac{ton}{year} \text{ (50\% control)}$$

PM_{10}:

k=0.35
U= 11.0 mph (average wind speed for Sundance, WY)
M=0.7%

$$E = 0.35(0.0032)\frac{\left(\dfrac{11.0}{5}\right)^{1.3}}{\left(\dfrac{0.7}{2}\right)^{1.4}} = 0.0136\frac{lb}{ton}$$

$$PM_{10}\text{ Emissions} = \frac{1{,}155{,}000\dfrac{ton}{year}\, x0.0136\dfrac{lb}{ton}\, x(1-0.50)}{2{,}000\dfrac{lb}{ton}} = 3.9\frac{ton}{year}\, x2\frac{drops}{trip} = 7.8\frac{ton}{year} \text{ (50\% control)}$$

HAUL ROAD ACTIVITY EMISSIONS:

Fugitive TSP and PM$_{10}$ emissions per Vehicle Mile Traveled (VMT) associated with haul roads are estimated using AP-42 Chapter 13.2.2, equation (1a) as follows:

$$E = k\left(\frac{s}{12}\right)^a \left(\frac{W}{3}\right)^b$$

Where:

k=empirical constant
s=surface material silt content, %
a=empirical constant
W=mean vehicular weight
b=empirical constant

TSP:

k=4.9
s=8.3
a=0.7
W=80.0 tons
b=0.45

$$E = 4.9\left(\frac{8.3}{12}\right)^{0.7} \left(\frac{80.0}{3}\right)^{0.45} = 16.6\frac{lb}{VMT}$$

$$\text{Amount of trips per year} = 500{,}000\frac{ton}{year} \, x \, \frac{1}{40}\frac{trip}{ton} = 12{,}500\frac{trip}{year}$$

$$\text{TSP Emissions} = 12{,}500\frac{trip}{year} \, x2.0\frac{mile}{trip} \, x16.6\frac{lb}{VMT} \, x\frac{ton}{2{,}000lb} \, x(1-0.50) = 103.8\frac{ton}{year} \text{ (50\% control)}$$

PM$_{10}$:

k=1.5
s=8.3
a=0.9
W=40 tons
b=0.45

$$E = 1.5\left(\frac{8.3}{12}\right)^{0.9} \left(\frac{80.0}{3}\right)^{0.45} = 4.7\frac{lb}{VMT}$$

$$\text{Amount of trips per year} = 500{,}000\frac{ton}{year} \, x \, \frac{1}{40}\frac{trip}{ton} = 12{,}500\frac{trip}{year}$$

$$\text{PM}_{10} \text{ Emissions} = 12{,}500\frac{trip}{year} \, x2.0\frac{mile}{trip} \, x4.7\frac{lb}{VMT} \, x\frac{ton}{2{,}000lb} \, x(1-0.50) = 29.4\frac{ton}{year} \text{ (50\% control)}$$