



Air Quality Permitting Technical Memorandum

Tier II Operating Permit and Permit to Construct No. 083-00086

DAIRY FEED SUPPLY, INC.
TWIN FALLS, IDAHO

Prepared By: Kent Berry
Environmental Quality Management

Project No. T2-010416

August 22, 2002

FINAL PERMIT

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	Environmental Protection Agency
gr	grain (1 lb = 7,000 grains)
HAPS	hazardous air pollutants
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pound per hour
MACT	Maximum Available Control Technology
MMBtu/hr	million British thermal units per hour
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards For Hazardous Air Pollutants
NO _x	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
SIP	State Implementation Plan
SO ₂	sulfur dioxide
T/hr	tons per hour
T/yr	tons per year
VOC	volatile organic compound

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 400 through 470, *Rules for the Control of Air Pollution in Idaho* for Tier II Operating Permits and Sections 200 through 228 for Permits to Construct.

PROJECT DESCRIPTION

Dairy Feed Supply submitted a PTC application for their animal feed facility which was constructed without first obtaining a PTC. A combined PTC and Tier II operating permit is being issued instead.

The emissions sources at the facility are as follows:

Table 1. EMISSIONS SOURCES

Permit Section	Source Description	Emissions Control(s)
2	Natural gas-fired boiler, Superior model 4-X-1024-S150, 7.5 MMBtu/hr Grain bins (2), 500,000 bushels each Product storage bins Truck loadout	None
3	Steam roller mills (2), Panhandle machine shop, rated at 12.7 tons per hour (T/hr) Electric dryer/coolers (2)	Cyclones

FACILITY DESCRIPTION

Corn and barley are brought in by railcar and unloaded into two 500,000 bushel grain bins. From the bins the grain is fed into a drum cleaner, a long cylindrical unit that rotates internally and has a capacity to clean 4,000 bushels per hour. There are two large wooden boxes underneath the cleaner that collect dust and debris removed during cleaning.

After cleaning, the grain is elevated into a storage bin unit until it is fed into one of two steam roller mills. The gas-fired boiler that provides the steam has a rated capacity of 7.5 MMBtu/hr. As the product leaves the steamer/roller process, it drops into one of two electric dryer/cooler units. This inhibits fermentation of the product during storage and brings it to the correct moisture content. The exhaust from the dryer/coolers goes to one of two Feed Systems International cyclone air cleaners.

After the product leaves the dryer/coolers, it is elevated to one of several storage bins located over the truck load-out area. The product is still "wet" (13-15% moisture) as it is stored in the load-out bins and is loaded into the trucks, which deliver the product for local use. The load-out area is open (i.e., no sides or enclosure).

SUMMARY OF EVENTS

- August 23, 2001 DEQ received a PTC application from Dairy Feed Supply.
- February 8, 2002 The application was determined to be incomplete.
- March 18, 2002 DEQ received a revised application, dated March 11, 2002, from Dairy Feed Supply.
- May 7, 2002 DEQ issued a facility draft permit to Dairy Feed. No comments were received.
- June 5, 2002 DEQ issued a proposed permit for public comment.
- July 15, 2002 The public comment period closed. No comments were received.

DISCUSSION

1. Emissions Estimates

Potential criteria pollutant emissions from the gas-fired boiler are all less than 10% of the significant emission rates in IDAPA 58.01.01.006.92. The applicant estimated PM emissions from each of the cyclones as 1.4 lb/hr and 4.4 T/yr using AP-42, Table 9.9-1 for a grain column dryer with no control. Based on the flow rate provided, this is equivalent to approximately 0.02 gr/acfm and seems reasonable.

2. Modeling

The applicant provided SCREEN3 results for the cyclones and the boiler. The criteria pollutant concentrations, including background, were below the respective NAAQS. Emissions of cadmium and formaldehyde exceeded the emissions screening levels in IDAPA 58.01.01.585 and 586, but did not exceed the respective acceptable ambient concentrations. The SCREEN3 outputs are shown in the appendix.

3. Area Classification

Dairy Feed Supply is located in Twin Falls County, Idaho, in Air Quality Control Region 63. The area is classified attainment or unclassifiable for all federal and state criteria air pollutants.

4. Facility Classification

The facility is not a designated facility as defined in IDAPA 58.01.01.006.27. The AFS classification for this facility is "B" source because actual and potential emissions of all criteria pollutants are less than 100 T/yr.

5. Regulatory Review

This OP and PTC is subject to the following permitting requirements:

- | | | |
|----|----------------------------------|---|
| a. | <u>IDAPA 58.01.01.401</u> | Tier II Operating Permit |
| b. | <u>IDAPA 58.01.01.403</u> | Permit Requirements for Tier II Sources |
| c. | <u>IDAPA 58.01.01.404.01(c)</u> | Opportunity for Public Comment |
| d. | <u>IDAPA 58.01.01.404.04</u> | Authority to Revise or Renew Operating Permits |
| e. | <u>IDAPA 58.01.01.406</u> | Obligation to Comply |
| f. | <u>IDAPA 58.01.01.470</u> | Permit Application Fees for Tier II Permits |
| g. | <u>IDAPA 58.01.01.625</u> | Visible Emission Limitation |
| h. | <u>IDAPA 58.01.01.650</u> | General Rules for the Control of Fugitive Dust |
| i. | <u>IDAPA 58.01.01.677</u> | Particulate Matter from Minor and Existing Fuel-burning Equipment |
| j. | <u>IDAPA 58.01.01.200 et seq</u> | Requirements for Permits to Construct |

6. Permit Conditions

a. Emission Limits - Steam Roller Mills and Dryer/Coolers

Because PM emissions exceed 10% of the significant emission rates in IDAPA 58.01.01.006.92, the permit includes PM emission limits from the cyclones controlling these units.

b. Emission Limits - Natural Gas-fired Boiler

The boiler is subject to the 20% opacity limit in IDAPA 58.08.01.01.625 and 0.015 gr/dscf in IDAPA 58.01.01.677. These requirements are covered in the facility-wide conditions of the permit. No monitoring, recordkeeping, or reporting conditions are included for these requirements because of the extremely small likelihood of a violation for this minor combustion source.

7. AIRS

AIRS/AFS FACILITY-WIDE CLASSIFICATION^a DATA ENTRY FORM

AIR PROGRAM	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION
POLLUTANT							A - Attainment U - Unclassifiable N - Nonattainment
SO ₂	B						A
NO _x	B						A
CO	B						U
PM ₁₀	B						U
PT (Particulate)	B						A
VOC	B						U
THAP (Total HAPs)							
			APPLICABLE SUBPART				

^a AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.470. The facility is subject to Tier II permit application fees of \$500 and has paid the amount in full.

RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends DEQ issue a final Tier II operating permit and permit to construct to Dairy Feed Supply. An opportunity for public comment on the air quality aspects of the proposed operating permit was provided in accordance with IDAPA 58.01.01.404.01.c.

KB/MS:sm

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cc: Steve VanZandt, Twin Falls Regional Office
Kent Berry, EQM
Joan Lechtenberg, Air Quality Division

Dairy Feed Supply
Inc.

APPENDIX
SCREEN3 OUTPUT FILES

02/14/02
15:42:25

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

dairy Feed supply Boiler

SIMPLE TERRAIN INPUTS:

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SOURCE TYPE           = POINT
EMISSION RATE (G/S)  = .126000
STACK HEIGHT (M)     = 6.0960
STK INSIDE DIAM (M)  = .5600
STK EXIT VELOCITY (M/S) = .6600
STK GAS EXIT TEMP (K) = 477.0000
AMBIENT AIR TEMP (K) = 293.0000
RECEPTOR HEIGHT (M) = .0000
URBAN/RURAL OPTION   = RURAL
BUILDING HEIGHT (M)  = .0000
MIN HORIZ BLDG DIM (M) = .0000
MAX HORIZ BLDG DIM (M) = .0000

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THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .196 M**4/S**3; MOM. FLUX = .021 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	1	1.0	1.0	320.0	11.46	.49	.32	NO
100.	136.4	3	1.5	1.5	480.0	9.11	12.52	7.54	NO
200.	123.5	4	1.0	1.0	320.0	11.46	15.67	8.69	NO
300.	93.21	4	1.0	1.0	320.0	11.46	22.68	12.23	NO
400.	66.96	4	1.0	1.0	320.0	11.46	29.51	15.38	NO
500.	49.63	4	1.0	1.0	320.0	11.46	36.19	18.39	NO
600.	38.12	4	1.0	1.0	320.0	11.46	42.76	21.29	NO
700.	34.44	6	1.0	1.0	10000.0	19.48	24.80	11.67	NO
800.	34.72	6	1.0	1.0	10000.0	19.48	27.94	12.66	NO
900.	34.10	6	1.0	1.0	10000.0	19.48	31.05	13.61	NO
1000.	32.96	6	1.0	1.0	10000.0	19.48	34.13	14.54	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
83. 143.4 3 1.5 1.5 480.0 9.11 10.67 6.46 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** SUMMARY OF SCREEN MODEL RESULTS ***

02/14/02
16:08:18

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Dairy Feed Supply Cyclone (2 Cyclones Combined as 1)

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT
EMISSION RATE (G/S) = .126000
STACK HEIGHT (M) = 6.3754
STK INSIDE DIAM (M) = .3683
STK EXIT VELOCITY (M/S) = 33.2247
STK GAS EXIT TEMP (K) = 293.0000
AMBIENT AIR TEMP (K) = 293.0000
RECEPTOR HEIGHT (M) = .0000
URBAN/RURAL OPTION = RURAL
BUILDING HEIGHT (M) = .0000
MIN HORIZ BLDG DIM (M) = .0000
MAX HORIZ BLDG DIM (M) = .0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

STACK EXIT VELOCITY WAS CALCULATED FROM
VOLUME FLOW RATE = 7500.0000 (ACFM)

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = 37.434 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN AUTOMATED DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.4144E-10	6	1.0	1.0	10000.0	21.83	2.71	2.71	NO
100.	18.48	3	8.0	8.0	2560.0	10.96	12.53	7.56	NO
200.	17.09	4	5.0	5.0	1600.0	13.72	15.70	8.75	NO
300.	16.26	5	5.0	5.0	10000.0	13.72	17.02	8.95	NO
400.	21.58	5	1.0	1.0	10000.0	23.34	22.54	11.85	NO
500.	24.95	5	1.0	1.0	10000.0	23.34	27.45	13.69	NO
600.	25.73	5	1.0	1.0	10000.0	23.34	32.30	15.47	NO
700.	25.05	5	1.0	1.0	10000.0	23.34	37.09	17.21	NO
800.	26.01	6	1.0	1.0	10000.0	21.83	27.99	12.76	NO
900.	26.49	6	1.0	1.0	10000.0	21.83	31.09	13.71	NO
1000.	26.36	6	1.0	1.0	10000.0	21.83	34.17	14.64	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:
924. 26.51 6 1.0 1.0 10000.0 21.83 31.86 13.95 NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED

DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	26.51	924.	0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

Emission factor from AP-42, Table 9.9.1-1, grain drying, column dryer no control. This emission factor most closely represents the cyclones used in Dairy Feed's process; it is a conservative estimate because the AP-42 emission factor assumes no control, whereas cyclones are used in Dairy Feed's process.

Emission factor for PM-10 = 0.22 lb/ton.
Maximum production = 12.7 ton/hour, based on 7,000 ton/month capacity for January, 2002, @ 23 weekdays in January and 24 hours per day. Potential to emit = 2.8 lb/hr for 2 cyclones combined (or 1.4 lb/hr per cyclone).

At 2.8 lb/hr, PM-10, hourly impact = 74.23 ug/m3.
24-hour = 29.7 ug/m³ Background = 86 Total impact = 115.7 ug/m³
Annual = 5.9 ug/m³ Background = 32.7 ug/m³ Total impact = 38.6 ug/m³

Both the 24-hour impact and the annual impact meet the NAAQS for PM-10 of 150 ug/m³ and 50 ug/m³, respectively.

APR. 11. 2002 7:33AM

EQM DURHAM

SCREEN Gas Boiler

11/11/02

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	143.4	83.	0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
