UA1
Facility Information

Mail Application To:		For Department use only:
New Mexico Environment Department Air Quality Bureau Permits Section 525 Camino de los Marquez, Suite 1 Santa Fe, New Mexico, 87505 Phone: (505) 476-4300 Fax: (505) 476-4375 www.env.nm.gov/aqb		AIRS No.:

Universal Air Quality Permit Application

Use this application for NOI, NSR, or Title V sources.

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. Use this application for streamline permits as well. See Section 1-I for submittal instructions for other permits.

This application is submitted as (check all that apply): ☐ Request for a No Permit Required Determination (no fee)
☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☑ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ a NOI 20.2.73 NMAC ☑ 20.2.72 NMAC application or revision ☐ 20.2.72.300 NMAC Streamline application
Title V Source: ☐ Title V (new) ☐ Title V renewal ☐ TV minor mod. ☐ TV significant mod. TV Acid Rain: ☐ New ☐ Renewal
PSD Major Source: ☐ PSD major source (new) ☐ minor modification to a PSD source ☐ a PSD major modification

Acknowledgements:

☑ I acknowledge that a pre-application meeting is available to me upon request. ☐ Title V Operating, Title IV Acid Rain, and NPR applications have no fees.

☑ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).

☐ Check No.: in the amount of

☑ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.

☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance program (SBEAP) and qualifies for 50% of the normal application and permit fees. Enclosed is a check for 50% of the normal application fee which will be verified with the Small Business Certification Form for your company.

☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance Program (SBEAP) but does not qualify for 50% of the normal application and permit fees. To see if you qualify for SBEAP assistance and for the small business certification form go to https://www.env.nm.gov/aqb/sbap/small_business_criteria.html).

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.72.219.D.1.a NMAC**
(e.g. application for a new minor source would be 20.2.72.200.A NMAC, one example for a Technical Permit Revision is 20.2.72.219.B.1.b NMAC, a Title V acid rain application would be: 20.2.70.200.C NMAC)

Section 1 – Facility Information

Section 1-A: Company Information

		AI # if known (see 1st 3 to 5 #s of permit IDEA ID No.): AIRS No. 35-009-0014	Updating Permit/NOI #: 3008-M4-R1
1	Facility Name: Southwest Cheese Company	Plant primary SIC Code (4 digits): 2022, 2023 Plant NAIC code (6 digits): 311513	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): 1411 Curry Road 4, Clovis, NM 88101		
2	Plant Operator Company Name: Southwest Cheese Company LLC	Phone/Fax: 575-742-9251 / 575-769-1494	
a	Plant Operator Address: 1141 Curry Road, Clovis, NM 88101		

b	Plant Operator's New Mexico Corporate ID or Tax ID: 03-003613005	
3	Plant Owner(s) name(s): Southwest Cheese Company LLC	Phone/Fax: 575-742-9200 / 575-769-1494
a	Plant Owner(s) Mailing Address(s): P.O. Box 1509 Clovis, NM 88102	
4	Bill To (Company): SWC Accounts Payable	Phone/Fax: 575-742-9200 / 575-769-1494
a	Mailing Address: P.O. Box 1509, Clovis, NM 88102	E-mail: balair@southwestcheese.com
5	☑ Preparer: Tetra Tech ☑ Consultant: Sara Lubchenco	Phone/Fax: 251-599-0715
a	Mailing Address: 115 Inverness Dr E Ste 300, Englewood, CO 80112	E-mail: sara.lubchenco@tetratech.com
6	Plant Operator Contact: Laura Rufin	Phone/Fax: 251-229-6429
a	Address: 1141 Curry Road, Clovis, NM 88101	E-mail: lrufin@southwestcheese.com
7	Air Permit Contact: Laura Rufin	Title: Environmental Manager
a	E-mail: lrufin@southwestcheese.com	Phone/Fax: 251-229-6429
b	Mailing Address: 1141 Curry Road, Clovis, NM 88101	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? ☑ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ☑ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ☑ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☑ Yes ☐ No
3	Is the facility currently shut down? ☐ Yes ☑ No	If yes, give month and year of shut down (MM/YY):
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ☑ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐Yes ☐No ☐N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☑ Yes ☐ No	If yes, the permit No. is: P-280
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☑ No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☑ No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☑ Yes ☐ No	If yes, the permit No. is: 3008-M4-R1
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ☑ No	If yes, the register No. is:

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly:	Daily: 15MM lb/day milk	Annually:
b	Proposed	Hourly:	Daily:	Annually:
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly:	Daily: N/A	Annually:

b	Proposed	Hourly:	Daily: N/A	Annually:

Section 1-D: Facility Location Information

1	Section: 13	Range: 35N	Township: 1N	County: Curry	Elevation (ft): 4165
2	UTM Zone: ☐ 12 or ☑ 13			Datum: ☐ NAD 27 ☑ NAD 83 ☐ WGS 84	
a	UTM E (in meters, to nearest 10 meters): 663640			UTM N (in meters, to nearest 10 meters): 3798500	
b	**AND** Latitude (deg., min., sec.): 34° 18' 53.5" N			Longitude (deg., min., sec.): 103° 13' 17.5" W	
3	Name and zip code of nearest New Mexico town: Clovis 88101				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From Clovis, South on US 70, then West on Curry Road 4.				
5	The facility is 6.8 (distance) miles south (direction) of Clovis (nearest town).				
6	Status of land at facility (check one): ☑ Private ☐ Indian/Pueblo ☐ Federal BLM ☐ Federal Forest Service ☐ Other (specify)				
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: Curry and Roosevelt Counties, Clovis, Portales, and Texico				
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/aqb/modeling/class1areas.html)? ☐ Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: N/A				
9	Name nearest Class I area: Salt Creek Wilderness Area				
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 130.0				
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: 322 meters south				
12	Method(s) used to delineate the Restricted Area: Fencing "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.				
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes ☑ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.				
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☑ No ☐ Yes If yes, what is the name and permit number (if known) of the other facility?				

Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

1	Facility **maximum** operating ($\frac{hours}{day}$): 24	($\frac{days}{week}$): 7		($\frac{weeks}{year}$): 52	($\frac{hours}{year}$): 8760
2	Facility's maximum daily operating schedule (if less than 24 $\frac{hours}{day}$)? Start:	☐AM ☐PM	End:		☐AM ☐PM
3	Month and year of anticipated start of construction: N/A				
4	Month and year of anticipated construction completion: N/A				
5	Month and year of anticipated startup of new or modified facility: N/A				
6	Will this facility operate at this site for more than one year? ☑ Yes ☐ No				

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes ☑ No If yes, specify:			
a	If yes, NOV date or description of issue:			NOV Tracking No:
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ☑ No If Yes, provide the 1c & 1d info below:			
c	Document Title:	Date:	Requirement # (or page # and paragraph #):	
d	Provide the required text to be inserted in this permit:			
2	Is air quality dispersion modeling or modeling waiver being submitted with this application? ☑ Yes ☐ No			
3	Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes ☑ No			
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☑ Yes ☐ No			
a	If Yes, what type of source? ☐ **Major** (☐ ≥10 tpy of any single HAP **OR** ☐ ≥25 tpy of any combination of HAPS) **OR** ☑ **Minor** (☐ <10 tpy of any single HAP **AND** ☑ <25 tpy of any combination of HAPS)			
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes ☑ No			
a	If yes, include the name of company providing commercial electric power to the facility: ________________________ Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.			

Section 1-G: Streamline Application **(This section applies to 20.2.72.300 NMAC Streamline applications only)**

1	☐ I have filled out Section 18, "Addendum for Streamline Applications."	☑ N/A (This is not a Streamline application.)

Section 1-H: Current Title V Information - Required for all applications from TV Sources

(Title V-source required information for all applications submitted pursuant to 20.2.72 NMAC (Minor Construction Permits), or 20.2.74/20.2.79 NMAC (Major PSD/NNSR applications), and/or 20.2.70 NMAC (Title V))

1	Responsible Official (R.O.) Eric Denton (20.2.70.300.D.2 NMAC):		Phone:575-742-9265
a	R.O. Title: Chief Executive Officer, Southwest Cheese	R.O. e-mail: EDenton@southwestcheese.com	
b	R.O. Address: 1141 Curry Road, Clovis, NM 88101		
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC):		Phone:
a	A. R.O. Title:	A. R.O. e-mail:	
b	A. R. O. Address:		
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship): N/A		
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.): N/A		
a	Address of Parent Company:		
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.): N/A		
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations:		

7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers: The facility is located 15 km west of the New Mexico/Texas state line.

Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package printed double sided ‘head-to-toe’ 2-hole punched** as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required. Please include a copy of the check on a separate page.
2) If the application is for a minor NSR, PSD, NNSR, or Title V application, include one working hard **copy** for Department use. This copy should be printed in book form, 3-hole punched, and **must be double sided**. Note that this is in addition to the head-to-to 2-hole punched copy required in 1) above. Minor NSR Technical Permit revisions (20.2.72.219.B NMAC) only need to fill out Sections 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical permit revision. TV Minor Modifications need only fill out Sections 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.
3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically. Electronic files for applications for NOIs, any type of General Construction Permit (GCP), or technical revisions to NSRs must be submitted with compact disk (CD) or digital versatile disc (DVD). For these permit application submittals, two CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal. Electronic files for other New Source Review (construction) permits/permit modifications or Title V permits/permit modifications can be submitted on CD/DVD or sent through AQB’s secure file transfer service.

Electronic files sent by (check one):

☐ CD/DVD attached to paper application

☐ secure electronic transfer. Air Permit Contact Name____________________________

Email______________________________

Phone number _______________________

a. If the file transfer service is chosen by the applicant, after receipt of the application, the Bureau will email the applicant with instructions for submitting the electronic files through a secure file transfer service. Submission of the electronic files through the file transfer service needs to be completed within 3 business days after the invitation is received, so the applicant should ensure that the files are ready when sending the hard copy of the application. The applicant will not need a password to complete the transfer. **Do not use the file transfer service for NOIs, any type of GCP, or technical revisions to NSR permits.**

4) Optionally, the applicant may submit the files with the application on compact disk (CD) or digital versatile disc (DVD) following the instructions above and the instructions in 5 for applications subject to PSD review.
5) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver** and/or electronic air dispersion modeling report, input, and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau.
6) If the applicant submits the electronic files on CD and the application is subject to PSD review under 20.2.74 NMAC (PSD) or NNSR under 20.2.79 NMC include,
   a. one additional CD copy for US EPA,
   b. one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

   If the application is submitted electronically through the secure file transfer service, these extra CDs do not need to be submitted.

Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted as 2 separate CDs or submitted through the AQB secure file transfer service. Submit a single PDF document of the entire application as submitted and the individual documents comprising the application.
2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible

format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 4 electronic files (3 MSWord docs: Universal Application section 1 [UA1], Universal Application section 3-19 [UA3], and Universal Application 4, the modeling report [UA4]) and 1 Excel file of the tables (Universal Application section 2 [UA2]). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: "A-3423-FacilityName". The "A" distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with "A-". Modifications to existing facilities should use the core permit number (i.e. '3423') the Department assigned to the facility as the next 4 digits. Use 'XXXX' for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: "A-3423-9-description", where "9" stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision number (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. Do not use special symbols (#, @, etc.) in file names. The footer information should not be modified by the applicant.

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UA2

Emissions Information

Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

Unit Number[1]	Source Description	Manufacturer	Model #	Serial #	Maximum or Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture or Reconstruction[2] / Date of Installation /Construction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
BLR1	Steam Heating Boiler	Cleaver-Brooks	CBL700-1200-1500ST	OL103875	50.215 MMBtu/hr	50.215 MMBtu/hr	10/2004 10/2004	- BLR1	3-020-3099	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ✓ To Be Modified ☐ To be Replaced		
BLR2	Steam Heating Boiler	Cleaver-Brooks	CBL700-1200-1500ST	OL103874	50.215 MMBtu/hr	50.215 MMBtu/hr	10/2004 10/2004	- BLR2	3-020-3099	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ✓ To Be Modified ☐ To be Replaced		
BLR3	Steam Heating Boiler	Cleaver-Brooks	CBL700-1200-1500ST	OL103876	50.215 MMBtu/hr	50.215 MMBtu/hr	10/2004 10/2004	- BLR3	3-020-3099	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ✓ To Be Modified ☐ To be Replaced		
DRY1	Whey Drier Heater	CPS	Corbett Whey Dryer Htr.	S-090402	18 MMBtu/hr	18 MMBtu/hr	1/2005 1/2005	DBH1 CYC1 DRY1	3-020-3010	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
BLR4	Biogas Reheat Boiler	Cleaver-Brooks	CBL700-300-30HW	OL103946	12.55 MMBtu/hr	12.55 MMBtu/hr	9/2004 9/2004	- BLR4	3-020-3099	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
FLR1	Flare Pilot Flame	Varec	WG224W S614001	SP78214	25.43 MMBtu/hr	25.43 MMBtu/hr	9/2004 9/2004	FLR1 FLR1	3-020-3099	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
ROAD	Delivery Truck Traffic	N/A	N/A	N/A	464/day 169,360/yr	464/day 169,360/yr	N/A N/A	- -	3-030-0834	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
BLR5	Steam Heating Boiler	Cleaver-Brooks	CBEX 800	T5817-1-1	33.472 MMBtu/hr	33.472 MMBtu/hr	12/2016 5/2017	- BLR5	3-020-3099	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
DRY2	Whey Drier Heater	CFR	Vertical U-Tube	H120DPL162314	14.0 MMBtu/hr	14.0 MMBtu/hr	11/2016 1/2017	DBH2 CYC2 DRY2	3-020-3010	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
WPC1	Whey Powder Conveyor	PPS	VR-18-8-3T	P16129-GA-107	N/A	N/A	11/2016 1/2017	PRBH1 PRBH1	3-020-3010	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
SSH1	Start/Stop Hopper	CFR	36019	19333	N/A	N/A	11/2016 1/2017	SSHBH1 SSHBH1	3-020-3010	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
SDG1	Standby Diesel-Fired Emergency Generator	Caterpillar	3516 BDITA	5SJ00498	2,598 BHP	2,598 BHP	1/1998 9/2005	- -	2-020-0401	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
SDG2	Standby Diesel-Fired Emergency Generator for Waste Treatment	Cummins	VTA-28-G5	25300844	900 BHP	900 BHP	2/2005 9/2005	- -	2-020-0401	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	
FP01	Standby Diesel-Fired Fire Pump	John Deere	6068HFC28	PE6068L277568	183 BHP	183 BHP	8/2015 11/2015	- -	2-020-0401	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	CI	

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.
[2] Specify dates required to determine regulatory applicability.
[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.
[4] "4SLB" means four stroke lean burn engine, "4SRB" means four stroke rich burn engine, "2SLB" means two stroke lean burn engine, "CI" means compression ignition, and "SI" means spark ignition

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at http://www.env.nm.gov/aqb/forms/InsignificantListTitleV.pdf . TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No.	Max Capacity	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)	Date of Manufacture /Reconstruction[2]	For Each Piece of Equipment, Check Onc
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
	660 Gallon Diesel Fuel Tank for Emergency Generator			660		2005	✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				Gallons	IA list Item #1.a	2005	
	280 Gallon Diesel Fuel Tank for Emergency Fire Pump			280			✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				Gallons	IA list Item #1.a, Item 5		
	1,125 Gallon Diesel Fuel Tank for Emergency Generator			1,125			✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				Gallons	IA list Item #1.a		
	57 Fuel Burning Heaters firing Natural Gas < 5 MMBtu/hr			< 5			✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				MMBtu/hr	IA list Item #3		
	500 Gallon Used Oil Bulk Storage Tank			500			✓ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				Gallons	IA list Item #1.a		
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated September 15, 2008. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify date(s) required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions.

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
DBH1	Simatek 70-40 Baghouse	12/15/2004	TSP, PM10, PM2.5	DRY1	99.9%	Manufacturer
CYC1	CPS Cyclone [inline with whey dryer (DRY1) and baghouse (DBH1)]	1/2005	TSP, PM10, PM2.5	DRY1	N/A[2]	Manufacturer
BRBH1	Duralife DCMC1-4-15 Baghouse	1/15/2005	TSP, PM10, PM2.5	Bagging Room Dust Collector, vented inside	99.9%, 100% to outside air	Manufacturer
WRBHI	Nucon DC-PW01-01 Baghouse	12/2004	TSP, PM10, PM2.5	Dry Milk Powder Room Dust Collector, vented inside	99.9%, 100% to outside air	Manufacturer
FLR1	Varec Flare WG224WS614001	9/2004	H2S, CH4	Anaerobic treatment alternate disposal method	98%	Estimate
DBH2	CFR 1816-1 Reverse Pulse-Jet Cleaning Design	1/25/2017	TSP, PM10, PM2.5	DRY2	~99% 0.01 grains/scf	Manufacturer
CYC2	CPS Cyclone [inline with whey dryer (DRY2) and baghouse (DBH2)]	1/25/2017	TSP, PM10, PM2.5	DRY2	N/A[2]	Manufacturer
PRBH1	Powder Receiver Baghouse	1/25/2017	TSP, PM10, PM2.5	Whey Powder Conveyor, WPC1	~99% 0.01 grains/scf	Manufacturer
SSHBH1	Start/Stop Hopper Baghouse	1/25/2017	TSP, PM10, PM2.5	Start/Stop Hopper, SSH1	~99% 0.01 grains/scf	Manufacturer
BLR1	Built-In Lo-NOx Burners and Flue Gas Recirculation	10/13/2004	NOx	BLR1	N/A[2]	N/A
BLR2	Built-In Lo-NOx Burners and Flue Gas Recirculation	10/13/2004	NOx	BLR2	N/A[2]	N/A
BLR3	Built-In Lo-NOx Burners and Flue Gas Recirculation	10/13/2004	NOx	BLR3	N/A[2]	N/A
BLR4	Built-In Lo-NOx Burners	9/27/2004	NOx	BLR4	N/A[2]	N/A
BLR5	Built-In Lo-NOx Burners and Flue Gas Recirculation	5/4/2017	NOx	BLR5	N/A[2]	N/A

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.
[2] The controls are part of the equipment, and therefore there is no specific reduction percentage.

Table 2-D: Maximum Emissions (under normal operating conditions)

☐ **This Table was intentionally left blank because it would be identical to Table 2-E.**

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		TSP[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
BLR2	1.8	7.7	1.9	8.2	0.2	0.8	0.03	0.1	0.4	1.6	0.4	1.6	0.4	1.6	-	-	2.46E-05	1.08E-04
BLR3	1.8	7.7	1.9	8.2	0.2	0.8	0.03	0.1	0.4	1.6	0.4	1.6	0.4	1.6	-	-	2.46E-05	1.08E-04
DRY1	1.93	8.5	8.6	37.5	0.1	0.4	0.02	0.09	0.1	0.6	0.1	0.6	0.14	0.61	-	-	8.80E-06	3.85E-05
BLR1 [2,3]	1.76	7.70	1.88	8.25	0.18	0.79	7.72	33.79	0.38	1.65	0.38	1.65	0.38	1.65	-	-	2.46E-05	1.08E-04
FLR1 [1,2]	1.73	7.58	9.41	41.22	3.56	15.59			0.10	0.44	0.10	0.44	0.10	0.44	4.1	17.9	-	-
BLR4	1.46	6.41	1.88	8.24	0.05	0.20	0.01	0.03	0.31	1.35	0.31	1.35	0.31	1.35	-	-	6.15E-06	2.69E-05
DBH1 [4]	-	-	-	-	-	-	-	-	3000	13300	2100	9200	2100	9200	-	-	-	-
ROAD	-	-	-	-	-	-	-	-	1.7	4.8	0.3	1.0	0.1	0.2	-	-	-	-
BLR5	1.2	5.1	1.3	5.5	0.1	0.5	0.02	0.1	0.3	1.1	0.3	1.1	0.3	1.1	-	-	1.64E-05	7.19E-05
DRY2	0.8	3.7	2.6	11.3	0.1	0.3	0.02	0.1	0.1	0.5	0.1	0.5	0.1	0.5	-	-	2.47E-08	1.08E-07
DBH2 [4]	-	-	-	-	-	-	-	-	160	690	160	690	160	690	-	-	-	-
PRBH1 [4]	-	-	-	-	-	-	-	-	29	128	29	128	29	128	-	-	-	-
SSHBH1 [4]	-	-	-	-	-	-	-	-	3.6	15.8	3.6	15.8	3.6	15.8	-	-	-	-
SDG1	3.3	14.5	0.9	3.9	-	-	0.002	0.008	0.1	0.5	0.1	0.5	0.1	0.5	-	-	-	-
SDG2	1.1	5.0	0.3	1.3			0.001	0.003	0.04	0.2	0.04	0.2	0.04	0.2	-	-	-	-
FP01	0.3	1.5	0.1	0.3	-	-	0.0001	0.001	0.02	0.1	0.02	0.1	0.02	0.1	-	-	-	-
															-	-	-	-
Totals[3]	16	71	29	129	4	19	8	34	3196	14147	2295	10043	2295	10042	4	18	9.05E-05	3.96E-04

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for TSP unless TSP is set equal to PM10 and PM2.5.

Note 2: The source-by-source worst-case scenario emissions were calculated assuming only BLR1 and/or FLR1 could operate on biogas.

Note 3: At the Clovis Plant, only **three** of the four process steam heating boilers, BRL1 ,BLR2, BLR 3 or BLR5 provides steam at any one time. The other boilers are on standby mode operating approximately 10% load. Permit 3008-M4 does not limit fuel consumption but does limit boiler use to two at any one time. Therefore, the pollutant emissions, for facility-wide potential to emit purposes, is limited to the three highest emitting boilers only.

Note 4: Baghouse maximum emissions were estimated based on current permitted limits and manufacturer indicated control efficiencies. Maximum emissions esimtated this way appear to be well in excess of total product captured by these units in reality.

Table 2-E: Requested Allowable Emissions

Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or $1.41E^{-4}$).

Unit No.	NOx		CO		VOC		SOx		TSP[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
BLR2[2,4]	1.76	7.7	1.88	8.2	0.18	0.8	0.03	0.1	0.38	1.6	0.38	1.6	0.38	1.6	-	-	2.46E-05	1.08E-04
BLR3[2,4]	1.76	7.7	1.88	8.2	0.18	0.8	0.03	0.1	0.38	1.6	0.38	1.6	0.38	1.6	-	-	2.46E-05	1.08E-04
DRY1[4]	1.93	8.5	8.56	37.5	0.10	0.4	0.020	0.1	0.14	0.6	0.14	0.6	0.14	0.6	-	-	8.80E-06	3.85E-05
BLR1[2,3,4]	1.76	7.7	1.88	8.2	0.18	0.8	7.72	33.8	0.38	1.6	0.38	1.6	0.38	1.6	-	-	2.46E-05	1.08E-04
FLR1[1,2,4]	1.73	7.6	9.41	41.2	3.56	15.6			0.10	0.4	0.10	0.4	0.10	0.4	0.08	0.4	-	-
BLR4[4]	1.46	6.4	1.88	8.2	0.05	0.2	0.0075	0.0	0.31	1.4	0.31	1.4	0.31	1.4	-	-	6.15E-06	2.69E-05
DBH1[4]	-	-	-	-	-	-	-	-	3.0	13.3	2.10	9.2	2.10	9.2	-	-	-	-
ROAD[5]	-	-	-	-	-	-	-	-	1.65	4.8	0.33	1.0	0.081	0.2	-	-	-	-
BLR5[6]	1.17	5.1	1.26	5.5	0.12	0.5	0.020	0.09	0.25	1.1	0.25	1.1	0.25	1.1	-	-	1.64E-05	7.19E-05
DRY2[7]	0.84	3.7	2.58	11.3	0.078	0.3	0.015	0.067	0.11	0.5	0.11	0.5	0.11	0.5	-	-	2.47E-08	1.08E-07
DBH2[7]	-	-	-	-	-	-	-	-	1.60	6.9	1.60	6.9	1.60	6.9	-	-	-	-
PRBH1[7]	-	-	-	-	-	-	-	-	0.29	1.3	0.29	1.3	0.29	1.3	-	-	-	-
SSHBH1[7]	-	-	-	-	-	-	-	-	0.04	0.2	0.04	0.2	0.04	0.2	-	-	-	-
SDG1	3.32	14.5	0.88	3.9	0.09	0.4	0.002	0.008	0.10	0.5	0.10	0.5	0.10	0.5	-	-	-	-
SDG2	1.14	5.0	0.30	1.3	0.03	0.1	0.0006	0.0027	0.04	0.2	0.04	0.2	0.04	0.2	-	-	-	-
FP01	0.35	1.5	0.07	0.3	0.03	0.1	0.0001	0.001	0.02	0.1	0.02	0.1	0.02	0.1	-	-	-	-
Totals[3]	16.17	70.82	29.46	129.02	4.49	19.67	7.82	34.26	8.55	35.10	6.33	27.15	6.08	26.42	0.082	0.36	9.05E-05	3.96E-04

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for TSP unless TSP is set equal to PM10 and PM2.5.

Note 2: The source-by-source worst-case scenario emissions were calculated assuming BLR1 and FLR1 could operate on biogas.

Note 3: At the Clovis Plant, only **three** of the four process steam heating boilers, BRL1 ,BLR2, BLR 3 or BLR5 provides steam at any one time. The other boilers are on standby mode operating approximately 10% load. Permit 3008-M4 does not limit fuel consumption but does limit boiler use to two at any one time. Therefore, the pollutant emissions, for facility-wide potential to emit purposes, is limited to the three highest emitting boilers only.

Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)

✓ This table is intentionally left blank since all emissions at this facility due to routine or predictable startup, shutdown, or scehduled maintenance are no higher than those listed in Table 2-E and a malfunction emission limit is not already permitted or requested. If you are required to report GHG emissions as described in Section 6a, include any GHG emissions during Startup, Shutdown, and/or Scheduled Maintenance (SSM) in Table 2-P. Provide an explanations of SSM emissions in Section 6 and 6a.

All applications for facilities that have emissions during routine our predictable startup, shutdown or scheduled maintenance (SSM)[1], including NOI applications, must include in this table the Maximum Emissions during routine or predictable startup, shutdown and scheduled maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). In Section 6 and 6a, provide emissions calculations for all SSM emissions reported in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (https://www.env.nm.gov/aqb/permit/aqb_pol.html) for more detailed instructions. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
BLR1																		
BLR2																		
BLR3																		
DRY1																		
BLR4																		
FLR1																		
DBH1																		
ROAD																		
BLR5																		
DRY2																		
DBH2																		
PRBH1																		
SSHBH1																		
SDG1																		
SDG2																		
FP01																		
Totals																		

[1] **For instance**, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in this table. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for TSP unless TSP is set equal to PM10 and PM2.5.

Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

✓ I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		TSP		PM10		PM2.5		☐ H_2S or ☐ Lead	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals:																	

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package. Include the stack exit conditions for each unit that emits from a stack, including blowdown venting parameters and tank emissions. If the facility has multiple operating scenarios, complete a separate Table 2-H for each scenario and, for each, type scenario name here:

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter or L x W (ft)
						(acfs)	(dscfs)			
BLR1	BLR1	V	No	52	240	210	114	10	29.7	3.00
BLR2	BLR2	V	No	52	240	210	114	10	29.7	3.00
BLR3	BLR3	V	No	52	240	210	114	10	29.7	3.00
DRY1	DRY1	H	*No*	95	319	75	36	10	*0.003*	2.00
DBH1	DRY1	V	No	96	137.5	750	540	21	59.7	4.00
BLR4	BLR4	V	No	35	340	61.4	39.90	10	28.1	1.67
FLR1	FLR1	V	No	16	1831	280	52.2	N/A	65.6	2.33 (0.71 mtr)
BLR5	BLR5	V	No	52	*240*	152.6	95.45	10	48.6	2.00
DRY2	DRY2	V	No	102	*318*	56.5	34.0	10	*52.8*	1.17
DBH2	DRY2	V	No	103	190	480.3	305.87	21	67.9	3.00
PRBH1	PRBH1	V	No	102.8	90	71.4	56.7	N/A	66.8	1.17
SSHBH1	SSHBH1	V	No	103	90	8.9	7.00	N/A	16.4	0.83
SDG1	SDG1	V	Yes	14	847	253	89.4	13	328.0	1
SDG2	SDG2	V	Yes	16	700	84	33.4	13	480	0.42
FP01	FP01	H	No	14	770	4	1.5	13	27.9	0.42

Stack temperature, flow rate, and diameter for BLR1 are from April 2006 and October 2008 Kramer and Associates source test reports, and match previous submittals.

Stack temperature, flow rate, and diameter for DRY1 are from April 2006 Kramer and Associates source test report and match previous submittals.

Stack temperature, flow rate, and diameter for DBH1, BLR2, and BLR3 are from November 2005 Kramer and Associates source test report and match previous submittals.

Stack temperature, flow rate, and diameter for DRY2, DBH2, PRBH1, and SSHBH1 are from 2/29/16 "Dryer System Air Emission Source Points" specification sheet from CFR.

Flare hight listed is the actual height of the flare. Flare temperature and flow match previous submittals.
Flow rate for BLR5 was calculated from the maximum rated capacity 33.7 MMBtu/hr and the "F" factors from EPA-450/2-78-042a. Stack Diameter is from Cleaver Brooks "Boiler Book" for the CBEX 800 Model boiler. Stack temperatures for BLR5 and DRY2 are unknown but assumed similar to existing boilers and dryer.

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A “-” symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

Stack No.	Unit No.(s)	Total HAPs		Hexane ✓ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
BLR1	BLR1	0.086	0.38	0.09	0.38														
BLR2	BLR2	0.086	0.38	0.09	0.38														
BLR3	BLR3	0.086	0.38	0.09	0.38														
DRY1	DRY1	0.032	0.14	0.03	0.14														
BLR4	BLR4	0.022	0.10	0.02	0.10														
FLR1	FLR1	0.08	0.20	0.04	0.20														
DBH1	DBH1																		
ROAD	ROAD																		
BLR5	BLR5	0.059	0.26	0.059	0.26														
DRY2	DRY2	0.025	0.11	0.025	0.11														
DBH2	DBH2																		
PRBH1	PRBH1																		
SSHBH1	SSHBH1																		
SDG1	SDG1																		
SDG2	SDG2																		
FP01	FP01																		
Totals:		0.425	1.701	0.388	1.701														

Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

Unit No.	Fuel Type (No. 2 Diesel, Natural Gas, Coal, …)	Specify Units				
		Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
BLR1	Biogas and Natural Gas	600 - 990.5 Btu/scf	22,227 scf/hr biogas and/or 47,941 scf/hr NG	194.7 MMscf/yr biogas and/or 420.0 MMscf/yr NG	≤0.12 scf H_2S per 100 scf biogas or ≤0.25 gr H_2S per100 scf NG	0
BLR2	Natural Gas	990.5 Btu/scf	47,941 scf/hr	420.0 MMscf/yr NG	≤0.25 gr H_2S per100 scf NG	0
BLR3	Natural Gas	990.5 Btu/scf	47,941 scf/hr	420.0 MMscf/yr NG	≤0.25 gr H_2S per 100 scf NG	0
DRY1	Natural Gas	990.5 Btu/scf	17,647 scf/hr	154.6 MMscf/yr NG	≤0.25 gr H_2S per100 scf NG	0
BLR4	Natural Gas	990.5 Btu/scf	20,241 scf/hr biogas or 12,304 scf/hr NG	107.8 MMscf/yr NG	≤0.25 gr H_2S per100 scf NG	0
FLR1	Biogas	600 Btu/scf	38,530 scf/hr	337.5 MMscf/yr	≤0.12 scf H_2S per100 scf biogas	0
BLR5	Natural Gas	990.5 Btu/scf	33,039 scf/hr	289.4 MMscf/yr	≤0.25 gr H_2S per 100 scf NG	0
DRY2	Natural Gas	990.5 Btu/scf	13,725 scf/hr	120.2 MMscf/yr	≤0.25 gr H_2S per100 scf NG	0
SDG1	Diesel	137,000 Btu/gal	132.7 gal/hr	66,372 gal/yr	15ppm ULSD	0
SDG2	Diesel	137,000 Btu/gal	45.7 gal/hr	22,850 gal/yr	15ppm ULSD	0
FP01	Diesel	137,000 Btu/gal	9.4 gal/hr	4,675 gal/yr	15ppm ULSD	0

Hourly fuel consumption rate is estimated from the rated firing capacity of each unit divided by 1020 Btu/scf HHV for natural gas or 620 Btu/scf assumed HHV for biogas. Annual fuel consumption is hourly consumption * 8760 hr/yr. Maxumum BLR1 and FLR1 fuel consumption for biogas are both based on the permit limit of 924,720 scf/day biogas production.

Fuel H_2S content is taken from the permit limits listed in Air Quality Permit No. 3008-M3-R3.

Table 2-P: Greenhouse Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHG as a second separate unit; OR 3) check the following box ☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]									Total GHG Mass Basis ton/yr[4]	Total CO_2e ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**298**	**25**	**22,800**	**footnote 3**										
BLR1	**mass GHG**	25,728	0.0473	0.4868											25,728	
	CO_2e	25,728	14.1	12.2												25,754
BLR2	**mass GHG**	25,728	0.0473	0.4868											25,728	
	CO_2e	25,728	14.1	12.2												25,754
BLR3	**mass GHG**	25,728	0.0473	0.4868											25,728	
	CO_2e	25,728	14.1	12.2												25,754
DRY1	**mass GHG**	9,222	0.0169	0.1745											9,223	
	CO_2e	9,222	5.0	4.4												9,232
BLR4	**mass GHG**	6,430	0.0118	0.1217											6,430	
	CO_2e	6,430	3.5	3.0												6,437
FLR1	**mass GHG**	12,786	0.1548	0.7858											12,787	
	CO_2e	12,786	46.1	19.6												12,852
BLR5	**mass GHG**	17,150	0.0315	0.3245											17,150	
	CO_2e	17,150	9.4	8.1												17,167
DRY2	**mass GHG**	7,173	0.0132	0.136											7,173	
	CO_2e	7,173	3.9	3.4												7,180
SDG1	**mass GHG**	741	0.0060	0.0301											741	
	CO_2e	741	1.8	0.8												744
SDG2	**mass GHG**	255	0.0021	0.010											255	
	CO_2e	255	0.6	0.3												256
FP01	**mass GHG**	52	0.0004	0.0021											52	
	CO_2e	52	0.1	0.1												52
	mass GHG															
	CO_2e															
	mass GHG															
	CO2e															
Total[6]	**mass GHG**	115,559	0.35	2.8											115,562	
	CO_2e	115,559	104.4	68.8												115,732

[1] **GWP** (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For **HFCs** or **PFCs** describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a **mass basis** is the ton per year green house gas emission before adjustment with its GWP.

[5] **CO_2e** means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

[6]Note: At the Clovis Plant, only **three** of the four process steam heating boilers, BRL1 ,BLR2, BLR 3 or BLR5 provides steam at any one time. The other boilers are on standby mode operating approximately 10% load. Permit 3008-M4 does not limit fuel consumption but does limit boiler use to two at any one time. Therefore, the pollutant emissions, for facility-wide potential to emit purposes, is limited to the three highest emitting boilers only.

Fourteen calculation tabs present emission calculations

Emission Source	Calculation Tab Name
BLR1	BLR1 Calcs
BLR2 & BLR3	BLR2, BLR3 Calcs
BLR4	BLR4 Calcs
BLR5	BLR5 Calcs
DRY1 & DBH1	DRY1 Calcs
DRY2 & DBH2	DRY2 Calcs
FLR1	FLR1 Calcs
PRBH1 & SSHBH1	PRBH1, SSHBH1 Calcs
ROAD	Truck Calcs
BLR1, BLR4, FLR1 (SO2 from biogas)	Existing Sc Biogas SO2 Calcs
HAP & GHG	Facility-Wide HAP & GHG
SDG1	SDG1 Calcs
SDG2	SDG2 Calcs
FP01	FP01 Calcs

Southwest Cheese, Boiler #1 (BLR1)

Uncontrolled and Controlled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
BLR1	1.76	7.70	1.88	8.25	0.18	0.79	See biogas SO2 tab		0.38	1.65	0.38	1.65

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr
BLR1	0.38	1.65	2.46E-05	1.08E-04	5880	25754

Emission factors for NOx, CO, VOC, TSP, PM10 and PM2.5 are from Cleaver Brooks.
Emission factors based on maximum PPM values converted to lb/MMBtu.

Boiler Specifications:

Make/Model: Cleaver Brooks CBL-700-1200-150
Fuel: Natural Gas
Heat Input 50.215 MMBtu/hr
Max Fuel Consumption: 431.3 MMScf/yr

Note: BLR1 employs both low NOx burners and flue gas recirculation, which are considered intrinsic to the operation of the unit and are not being considered as add-on control devices.

Criteria Pollutant Emission Factors: Estimated Based on Permitted Emission Factors

NOx lb/MMBtu	CO lb/MMBtu	VOC lb/MMBtu	SO2 lb/MMBtu	TSP lb/MMBtu	PM10 lb/MMBtu	PM2.5 lb/MMBtu
0.0350	0.0375	0.0036	-	0.0075	0.0075	0.0075

Assumed that PM2.5 = PM10 = TSP as was done in previous permit applications.

Greenhouse Gas Emission Factors

EPA Center for Corporate Climate Leadership
Emission Factors for Greenhouse Gas Inventories Accessed 8/2/16
https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

	Heat Cont Btu/scf	CO2 g/scf	CH4 g/scf	N2O g/scf	CO2e g/scf	CO2e lb/MMBtu
Natural Gas	1026	54.44	0.00103	0.0001	54.50	117.10
Non-Landfill BioGas	655	34.106	0.002096	0.000413	34.28	115.38

Where the GWP of gasses is: CO2 =1 CH4 = 25 N2O = 298
and emission factors are converted to units of lb/MMBtu using 453.6 grams/lb and the listed fuel heat contents.

HAP Emission Factors: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
2-Methylnaphthalene	2.40E-05	2.35E-08
3-Methylchloranthrene	1.80E-06	1.76E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08
Acenaphthene	1.80E-06	1.76E-09
Acenaphthylene	1.80E-06	1.76E-09
Anthracene	2.40E-06	2.35E-09
Benz(a)anthracene	1.80E-06	1.76E-09
Benzene	2.10E-03	2.06E-06
Benzo(a)pyrene	1.20E-06	1.18E-09
Benzo(b)fluoranthen	1.80E-06	1.76E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09
Chrysene	1.80E-06	1.76E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09
Dichlorobenzene	1.20E-03	1.18E-06
Fluoranthene	3.00E-06	2.94E-09
Fluorene	2.80E-06	2.75E-09
Formaldehyde	7.50E-02	7.35E-05
Hexane	1.80E+00	1.76E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09
Naphthalene	6.10E-04	5.98E-07
Phenanathrene	1.70E-05	1.67E-08
Pyrene	5.00E-06	4.90E-09
Toluene	3.40E-03	3.33E-06
Total		**1.85E-03**

[1] Where the typical higher heating value of natural gas cited in AP-42 Section 1.4 is 1020 Btu/scf

Lead Emission Factor: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
Lead	5.00E-04	4.90E-07

Southwest Cheese, Boiler #2 and Boiler #3 (BLR2, BLR3)

Uncontrolled and Controlled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
BLR2, BLR3	1.76	7.70	1.88	8.25	0.18	0.79	0.03	0.13	0.38	1.65	0.38	1.65

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr
BLR2, BLR3	0.38	1.65	2.46E-05	1.08E-04	5880	25754

Emission factors for NOx, CO, VOC, TSP, PM10 and PM2.5 are from Cleaver Brooks.
Emission factors based on maximum PPM values converted to lb/MMBtu.

Boiler Specifications:

Make/Model: Cleaver Brooks CBL-700-1200-150
Fuel: Natural Gas
Heat Input 50.215 MMBtu/hr
Max Fuel Consumption: 431.3 MMScf/yr per boiler

Note: BLR2 and BLR3 employ both low NOx burners and flue gas recirculation, which are considered intrinsic to the operation of the units and are not being considered as add-on control devices.

Criteria Pollutant Emission Factors: Estimated Based on Permitted Emission Factors

NOx lb/MMBtu	CO lb/MMBtu	VOC lb/MMBtu	SO2 lb/MMBtu	TSP lb/MMBtu	PM10 lb/MMBtu	PM2.5 lb/MMBtu
0.0350	0.0375	0.0036	0.0006	0.0075	0.0075	0.0075

Assumed that PM2.5 = PM10 = TSP as was done in previous permit applications.

Greenhouse Gas Emission Factors

EPA Center for Corporate Climate Leadership
Emission Factors for Greenhouse Gas Inventories Accessed 8/2/16
https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

	Heat Cont Btu/scf	CO2 g/scf	CH4 g/scf	N2O g/scf	CO2e g/scf	CO2e lb/MMBtu
Natural Gas	1026	54.44	0.00103	0.0001	54.50	117.10
Non-Landfill BioGas	655	34.106	0.002096	0.000413	34.28	115.38

Where the GWP of gasses is: CO_2 =1 CH_4 = 25 N_2O = 298
and emission factors are converted to units of lb/MMBtu using 453.6 grams/lb and the listed fuel heat contents.

HAP Emission Factors: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
2-Methylnaphthalene	2.40E-05	2.35E-08
3-Methylchloranthrene	1.80E-06	1.76E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08
Acenaphthene	1.80E-06	1.76E-09
Acenaphthylene	1.80E-06	1.76E-09
Anthracene	2.40E-06	2.35E-09
Benz(a)anthracene	1.80E-06	1.76E-09
Benzene	2.10E-03	2.06E-06
Benzo(a)pyrene	1.20E-06	1.18E-09
Benzo(b)fluoranthen	1.80E-06	1.76E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09
Chrysene	1.80E-06	1.76E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09
Dichlorobenzene	1.20E-03	1.18E-06
Fluoranthene	3.00E-06	2.94E-09
Fluorene	2.80E-06	2.75E-09
Formaldehyde	7.50E-02	7.35E-05
Hexane	1.80E+00	1.76E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09
Naphthalene	6.10E-04	5.98E-07
Phenanathrene	1.70E-05	1.67E-08
Pyrene	5.00E-06	4.90E-09
Toluene	3.40E-03	3.33E-06
Total		**1.85E-03**

[1] Where the typical higher heating value of natural gas cited in AP-42 Section 1.4 is 1020 Btu/scf

Lead Emission Factor: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
Lead	5.00E-04	4.90E-07

Southwest Cheese, Boiler #4 (BLR4)

Uncontrolled and Controlled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
BLR4	1.46	6.41	1.88	8.24	0.05	0.20	0.0075	0.03	0.31	1.35	0.31	1.35

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr
BLR4	0.31	1.35	6.15E-06	2.69E-05	1470	6437

Emission factors for NOx, CO, VOC, TSP, PM10 and PM2.5 are from Cleaver Brooks.
Emission factors based on maximum PPM values converted to lb/MMBtu.

Boiler Specifications:

Make/Model: Cleaver Brooks CB-700-300-030
Fuel: Natural Gas
Heat Input 12.55 MMBtu/hr
Max Fuel Consumption: 107.8 MMScf/yr

Criteria Pollutant Emission Factors: Estimated Based on Permitted Emission Factors

NOx lb/MMBtu	CO lb/MMBtu	VOC lb/MMBtu	SO2 lb/MMBtu	TSP lb/MMBtu	PM10 lb/MMBtu	PM2.5 lb/MMBtu
0.117	0.150	0.004	0.0006	0.025	0.025	0.025

Assumed that PM2.5 = PM10 = TSP as was done in previous permit applications.

Greenhouse Gas Emission Factors

EPA Center for Corporate Climate Leadership
Emission Factors for Greenhouse Gas Inventories Accessed 8/2/16
https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

	Heat Cont Btu/scf	CO2 g/scf	CH4 g/scf	N2O g/scf	CO2e g/scf	CO2e lb/MMBtu
Natural Gas	1026	54.44	0.00103	0.0001	54.50	117.10
Non-Landfill BioGas	655	34.106	0.002096	0.000413	34.28	115.38

Where the GWP of gasses is: CO_2 =1 CH_4 = 25 N_2O = 298
and emission factors are converted to units of lb/MMBtu using 453.6 grams/lb and the listed fuel heat contents.

HAP Emission Factors: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition
https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
2-Methylnaphthalene	2.40E-05	2.35E-08
3-Methylchloranthrene	1.80E-06	1.76E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08
Acenaphthene	1.80E-06	1.76E-09
Acenaphthylene	1.80E-06	1.76E-09
Anthracene	2.40E-06	2.35E-09
Benz(a)anthracene	1.80E-06	1.76E-09
Benzene	2.10E-03	2.06E-06
Benzo(a)pyrene	1.20E-06	1.18E-09
Benzo(b)fluoranthen	1.80E-06	1.76E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09
Chrysene	1.80E-06	1.76E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09
Dichlorobenzene	1.20E-03	1.18E-06
Fluoranthene	3.00E-06	2.94E-09
Fluorene	2.80E-06	2.75E-09
Formaldehyde	7.50E-02	7.35E-05
Hexane	1.80E+00	1.76E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09
Naphthalene	6.10E-04	5.98E-07
Phenanathrene	1.70E-05	1.67E-08
Pyrene	5.00E-06	4.90E-09
Toluene	3.40E-03	3.33E-06
Total		**1.85E-03**

[1] Where the typical higher heating value of natural gas cited in AP-42 Section 1.4 is 1020 Btu/scf

Lead Emission Factor: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition
https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
Lead	5.00E-04	4.90E-07

Southwest Cheese, Boiler #5 (BLR5)

Uncontrolled and Controlled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
BLR5	1.17	5.13	1.26	5.50	0.12	0.53	0.020	0.088	0.25	1.10	0.25	1.10

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr
BLR5	0.25	1.10	1.64E-05	7.19E-05	3919	17167

Emission factors for NOx, CO, VOC, TSP, PM10 and PM2.5 are from Cleaver Brooks.
Emission factors based on maximum PPM values converted to lb/MMBtu.

Boiler Specifications: Drawing M6.0.3 released for construction on 7/8/16

Make/Model Cleaver Brooks CBEX 800 Firetube Boiler
800 BHP
33000 scf fuel/hr
27 MMBtu/hr output
Assuming 1020 Btu/scf HHV (AP-42 Section 1.4 default), this works out to:
33.472 MMBtu/hr input nameplate rating

Note: BLR5 employs both low NOx burners and flue gas recirculation, which are considered intrinsic to the operation of the unit and are not being considered as add-on control devices.

Criteria Pollutant Emission Factors: Cleaver Brooks Boiler Book Accessed 8/1/16
http://www.cleaverbrooks.com/Products-and-Solutions/Boilers/Firetube/CBEX-Premium/CBEX-Premium-100-800-HP-Boiler-Book.aspx

	NOx lb/MMBtu	CO lb/MMBtu	VOC lb/MMBtu	SO2 lb/MMBtu	TSP lb/MMBtu	PM10 lb/MMBtu	PM2.5 lb/MMBtu
Premium 800 30 ppm	0.035	0.038	0.0036	0.00060	0.0075	0.0075	0.0075

Assumed that PM2.5 = PM10 = TSP as was done in previous permit applications.

Greenhouse Gas Emission Factors

EPA Center for Corporate Climate Leadership
Emission Factors for Greenhouse Gas Inventories Accessed 8/2/16
https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

	Heat Cont Btu/scf	CO2 g/scf	CH4 g/scf	N2O g/scf	CO2e g/scf	CO2e lb/MMBtu
Natural Gas	1026	54.44	0.0010	0.00010	54.50	117.10
Non-Landfill BioGas	655	34.11	0.0021	0.00041	34.28	115.38

Where the GWP of gasses is: CO2 =1 CH4 = 25 N2O = 298
and emission factors are converted to units of lb/MMBtu using 453.6 grams/lb and the listed fuel heat contents.

HAP Emission Factors: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
2-Methylnaphthalene	2.40E-05	2.35E-08
3-Methylchloranthrene	1.80E-06	1.76E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08
Acenaphthene	1.80E-06	1.76E-09
Acenaphthylene	1.80E-06	1.76E-09
Anthracene	2.40E-06	2.35E-09
Benz(a)anthracene	1.80E-06	1.76E-09
Benzene	2.10E-03	2.06E-06
Benzo(a)pyrene	1.20E-06	1.18E-09
Benzo(b)fluoranthen	1.80E-06	1.76E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09
Chrysene	1.80E-06	1.76E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09
Dichlorobenzene	1.20E-03	1.18E-06
Fluoranthene	3.00E-06	2.94E-09
Fluorene	2.80E-06	2.75E-09
Formaldehyde	7.50E-02	7.35E-05
Hexane	1.80E+00	1.76E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09
Naphthalene	6.10E-04	5.98E-07
Phenanathrene	1.70E-05	1.67E-08
Pyrene	5.00E-06	4.90E-09
Toluene	3.40E-03	3.33E-06
Total		**1.85E-03**

[1] Where the typical higher heating value of natural gas cited in AP-42 Section 1.4 is 1020 Btu/scf

Lead Emission Factor: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
Lead	5.00E-04	4.90E-07

Southwest Cheese, Dryer #1 (DRY1) and Dryer System Baghouse (DBH1)

Uncontrolled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
DRY1	1.93	8.45	8.56	37.5	0.10	0.44	0.020	0.088	0.14	0.61	0.14	0.61
DBH1									3000	13300	2100	9200

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr	HAP lb/hr	HAP ton/yr
DRY1	0.14	0.61	8.80E-06	3.85E-05	2108	9232	0.033	0.15
DBH1	2100	9200						

DBH1 Control Rate:
0.999 TSP/PM10/PM2.5

Based on manufacturer's estimation of 99.9% control rate.

Controlled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
DRY1	1.93	8.45	8.56	37.5	0.10	0.44	0.020	0.088	0.14	0.61	0.14	0.61
DBH1									3.0	13.3	2.1	9.2

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr	HAP lb/hr	HAP ton/yr
DRY1	0.14	0.61	8.80E-06	3.85E-05	2108	9232	0.033	0.15
DBH1	2.1	9.2						

DRY1 **Indirect Heater Combustion Exhaust**

Make/Model	CPS Corbett Whey Dryer Heater	
Capacity	18	MMBtu/hr
Flow @ Std Cnd	294.12	scfm

Criteria Pollutant Emission Factors

NOx	0.11	lb/MMBtu	Source: back-calculated from permitted rates.
CO	0.48	lb/MMBtu	
VOC	0.0056	lb/MMBtu	
SOx	0.0011	lb/MMBtu	
PM	0.0078	lb/MMBtu	

Greenhouse Gas Emission Factors

EPA Center for Corporate Climate Leadership
Emission Factors for Greenhouse Gas Inventories Accessed 8/2/16
https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

	Heat Cont. Btu/scf	CO2 g/scf	CH4 g/scf	N2O g/scf	CO2e g/scf	CO2e lb/MMBtu
Natural Gas	1026	54.44	0.00103	0.0001	54.50	117.10
Non-Landfill BioGas	655	34.106	0.002096	0.000413	34.28	115.38

Where the GWP of gasses is: $CO_2 = 1$ $CH_4 = 25$ $N_2O = 298$
and emission factors are converted to units of lb/MMBtu using 453.6 grams/lb and the listed fuel heat contents.

HAP Emission Factors: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition
https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
2-Methylnaphthalene	2.40E-05	2.35E-08
3-Methylchloranthrene	1.80E-06	1.76E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08
Acenaphthene	1.80E-06	1.76E-09
Acenaphthylene	1.80E-06	1.76E-09
Anthracene	2.40E-06	2.35E-09
Benz(a)anthracene	1.80E-06	1.76E-09
Benzene	2.10E-03	2.06E-06
Benzo(a)pyrene	1.20E-06	1.18E-09
Benzo(b)fluoranthen	1.80E-06	1.76E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09
Chrysene	1.80E-06	1.76E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09
Dichlorobenzene	1.20E-03	1.18E-06
Fluoranthene	3.00E-06	2.94E-09
Fluorene	2.80E-06	2.75E-09
Formaldehyde	7.50E-02	7.35E-05
Hexane	1.80E+00	1.76E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09
Naphthalene	6.10E-04	5.98E-07
Phenanathrene	1.70E-05	1.67E-08
Pyrene	5.00E-06	4.90E-09
Toluene	3.40E-03	3.33E-06
Total		**1.85E-03**

Footnote to HAP emission factor table on previous page:

[1] Where lb/MMBtu = lb/MMcf/1020 Btu/cf

1020 Btu is the typical higher heating value of natural gas cited in AP-42 Section 1.4.

Manufacturer particulate loading guaranteed at

Lead Emission Factor: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition
https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
Lead	5.00E-04	4.90E-07

CYC1 **Cyclone** Limits baghouse loading but is not considered in emissions calculations. Primary purpose is to collect product and is not considered an air emissions control device.

DBH1 **Dryer Main Baghouse**

Make/Model	Simatek 70-40 Baghouse
Flow @ Std Cnd	77 scfm

Note: Uncontorlled emissions back-calculated assuming 99.9% control and permitted emissions limits. This value is likely very conservative as the majority of the whey protein is collected via the cyclone units and the uncontrolled PM emissions from this baghouse alone represent 56% of the total whey product produced by both dryers.

Criteria Pollutant Emission Factor

Manufacturer's guaranteed particulate loading rate guaranteed to be
0.01 grains/scf (+/- 0.005) which typically is about 99% control of PM one micron or larger.
Emission rates based on current permit limits.
Baghouse flow determined from maximum flow (given in m3/hr) obtained from simatek website.

Southwest Cheese, Dryer #2 (DRY2) and Dryer System Baghouse (DBH2)

Uncontrolled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
DRY2	0.84	3.68	2.58	11.3	0.08	0.34	0.02	0.067	10.92	47.83	10.92	47.83
DBH2									160.0	690.0	160.0	690.0

DBH2 Control Rate:
0.99 TSP/PM10/PM2.5

Based on manufacturer's estimation of 99% control rate.

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr	HAP lb/hr	HAP ton/yr
DRY2	10.92	47.83	2.47E-08	1.08E-07	1639	7180	0.03	0.11
DBH2	160.0	690.0						

Controlled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
DRY2	0.8	3.7	2.6	11.3	0.08	0.34	0.02	0.07	0.11	0.48	0.11	0.48
DBH2									1.6	6.9	1.6	6.9

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr	HAP lb/hr	HAP ton/yr
DRY2	0.11	0.48	2.47E-08	1.08E-07	1639	7180	0.03	0.11
DBH2	1.6	6.9						

DRY2 **Indirect Heater Combustion Exhaust**

Make/Model	Preheat Inc	Vertical U-Tube Dryer
Capacity	14	MMBtu/hr
Flow Rate Actual		acfm @ 318F
Flow @ Std Cnd	3388	scfm
Stack DIA	14	inch

Criteria Pollutant Emission Factors

NOx	0.06	lb/MMBtu	From Maxon (burner manufacturer) ref: 8/24/16 CFR data sheet for Dryer System
CO	0.184	lb/MMBtu	From Maxon (burner manufacturer) ref: 8/24/16 CFR data sheet for Dryer System
VOC	0.0056	lb/MMBtu	Permit 3008-M3-R3 for DRY1, and similar to factor used for natural gas boiler BLR5
SOx	0.0011	lb/MMBtu	Permit 3008-M3-R3 for DRY1, and similar to factor used for natural gas boiler BLR5
PM	0.0078	lb/MMBtu	Permit 3008-M3-R3 for DRY1, and similar to factor used for natural gas boiler BLR5

Greenhouse Gas Emission Factors

EPA Center for Corporate Climate Leadership
Emission Factors for Greenhouse Gas Inventories Accessed 8/2/16
https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

	Heat Cont. Btu/scf	CO2 g/scf	CH4 g/scf	N2O g/scf	CO2e g/scf	CO2e lb/MMBtu
Natural Gas	1026	54.44	0.00103	0.0001	54.50	117.10
Non-Landfill BioGas	655	34.106	0.002096	0.000413	34.28	115.38

Where the GWP of gasses is: CO_2 =1 CH_4 = 25 N_2O = 298
and emission factors are converted to units of lb/MMBtu using 453.6 grams/lb and the listed fuel heat contents.

HAP Emission Factors: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
2-Methylnaphthalene	2.40E-05	2.35E-08
3-Methylchloranthrene	1.80E-06	1.76E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08
Acenaphthene	1.80E-06	1.76E-09
Acenaphthylene	1.80E-06	1.76E-09
Anthracene	2.40E-06	2.35E-09
Benz(a)anthracene	1.80E-06	1.76E-09
Benzene	2.10E-03	2.06E-06
Benzo(a)pyrene	1.20E-06	1.18E-09
Benzo(b)fluoranthen	1.80E-06	1.76E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09
Chrysene	1.80E-06	1.76E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09
Dichlorobenzene	1.20E-03	1.18E-06
Fluoranthene	3.00E-06	2.94E-09
Fluorene	2.80E-06	2.75E-09
Formaldehyde	7.50E-02	7.35E-05
Hexane	1.80E+00	1.76E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09
Naphthalene	6.10E-04	5.98E-07
Phenanathrene	1.70E-05	1.67E-08
Pyrene	5.00E-06	4.90E-09
Toluene	3.40E-03	3.33E-06
Total		**1.85E-03**

Footnote to HAP emission factor table on previous page:

[1] Where lb/MMBtu = lb/MMcf/1020 Btu/cf

1020 Btu is the typical higher heating value of natural gas cited in AP-42 Section 1.4.

Lead Emission Factor: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
Lead	5.00E-04	4.90E-07

CYC2 **Cyclone** Limits baghouse loading but is not considered in emissions calculations.

DBH2 **Dryer Main Baghouse**

Make/Model	CFR Model 18610-1 Reverse Pulse Jet Baghouse	
Bags	277 Bags, 6" DIA x 13' long, 5664 sq ft cloth, polyester	
Flow Rate Actual	28,817	acfm @ 190F corrected for temperature and Clovis elevation and humidity
Flow @ Std Cnd	18,352	scfm
Stack DIA	36	inch

Criteria Pollutant Emission Factor

Particulate Loading 0.01 grains/scf (+/- 0.005) which typically is about 99% control of PM one micron or larger.

lb/hr = (scf/min) * (60 min/hr) * (0.01 gr/scf) / (7000 gr/lb)

Southwest Cheese, Flare (FLR1)

Uncontrolled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
FLR1	1.73	7.58	9.41	41.22	3.56	15.59	7.71	33.77	0.10	0.44	0.10	0.44

	PM2.5 lb/hr	PM2.5 ton/yr	H2S lb/hr	H2S ton/yr
FLR1	0.10	0.44	4.08	17.88

Controlled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
FLR1	1.73	7.58	9.41	41.2	3.56	15.59	7.71	33.77	0.10	0.44	0.10	0.44

	PM2.5 lb/hr	PM2.5 ton/yr	H2S lb/hr	H2S ton/yr
FLR1	0.10	0.44	8.16E-02	3.57E-01

FLR1 Control Rate:
0.98 H2S

Based on emissions limits and maximum H2S generation from WWTP.

FLR1

Make/Model	Varec WG224WS614001	
Capacity	25.43	MMBtu/hr
Flow @ Std Cnd	415.52	scfm

Criteria Pollutant Emission Factors

NOx	0.068	lb/MMBtu
CO	0.37	lb/MMBtu
VOC	0.14	lb/MMBtu
SOx	0.30	lb/MMBtu
PM	0.0039	lb/MMBtu
H2S	0.0032	lb/MMBtu

Southwest Cheese, Whey Transfer Baghouses (PRBH1, SSHBH1)

PRBH1 & SSHBH1 Control Rate: 0.99 TSP/PM10/PM2.5

Based on manufacturer's estimation of 99% control rate.

Uncontrolled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
PRBH1									29.1	127.6	29.1	127.6
SSHBH1									3.6	15.8	3.6	15.8

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr	HAP lb/hr	HAP ton/yr
PRBH1	29.1	127.6						
SSHBH1	3.6	15.8						

Controlled Emissions:

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr
PRBH1									0.29	1.28	0.29	1.28
SSHBH1									0.04	0.16	0.04	0.16

	PM2.5 lb/hr	PM2.5 ton/yr	Lead lb/hr	Lead ton/yr	CO2e lb/hr	CO2e ton/yr	HAP lb/hr	HAP ton/yr
PRBH1	0.29	1.28						
SSHBH1	0.04	0.16						

Notes: Flow rates and baghouse outlet particulate loading are taken from the 2/29/2016 specification sheet from CFR: " Dryer System Air Emission Source Points". Emissions are estimated from particulate loading and flow rate in scfm. As was done in previous permit applications, all baghouse emissions are conservatively assumed to be PM2.5.

lb/hr = (scf/min) * (60 min/hr) * (0.01 gr/scf) / (7000 gr/lb)

PRBH1 Powder Receiver Baghouse

Make/Model	CFR Model 18610-2 Reverse Pulse-Jet Cleaning Design
Bags	58 Bags, 6" DIA x 12' long, 1099 sq ft cloth, polyester
Flow Rate Actual	4,285 acfm @ 90F corrected for temperature and Clovis elevation and humidity
Flow @ Std Cnd	3,400 scfm
Particulate Loading	0.01 grains/scf (+/- 0.005) which typically is about 99% control of PM one micron or larger.
Stack DIA	14 inch

SSHBH1 Start/Stop Hopper Baghouse

Make/Model	CFR Model 18610-3 Reverse Pulse-Jet Cleaning Design
Bags	13 Bags, 6" DIA x 1 mtr long, 158 sq ft cloth, polyester
Flow Rate Actual	536 acfm @ 90F corrected for temperature and Clovis elevation and humidity
Flow @ Std Cnd	420 scfm
Particulate Loading	0.01 grains/scf (+/- 0.005) which typically is about 99% control of PM one micron or larger.
Stack DIA	10 inch

Southwest Cheese, In-Plant Truck Traffic (ROAD)

Current Permit Limit

464 trucks per day

112,785 trucks per year (309 avg. trucks/day * 365 days/year)

Proposed Truck Emission Estimate

	NOX lb/hr	NOX ton/yr	CO lb/hr	CO ton/yr	VOC lb/hr	VOC ton/yr	SO2 lb/hr	SO2 ton/yr
ROAD								

	TSP lb/hr	TSP ton/yr	PM10 lb/hr	PM10 ton/yr	PM2.5 lb/hr	PM2.5 ton/yr
ROAD	1.65	4.82	0.33	0.96	0.081	0.24

Note: AP-42 Section 13.2.1 has been updated since the previous permit application emissions estimate.

Paved Road Fugitive Dust Estimate for Trucks

Methodology: AP-42 Section 13.2.1 "Paved Roads"
https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf Accessed 7/28/16

This AP-42 Section has been updated since the previous estimate of fugitive emissions from truck traffic at SWC.
The January 2011 version of Equation 2 is: $E_{ext} = [\ k\ (sL)^{0.91} \times (W)^{1.02}\ ]\ (1 - P/4N)$
and the updated k factors are below.

	PM2.5	PM10	PM30	
k	0.00054	0.0022	0.011	Particle Size Multiplier from Table 13.2.1-1
sL	0.6	0.6	0.6	Baseline silt Loading Default Value from Table 13.2.1-2, assumes negligible use of antiskid abrasive.
W	23.96	23.96	23.96	Per-vehicle average weight in tons. Average of loaded/unloaded weights, weighted by VMT/day.
P	70	70	70	NMED Value (# of Precipitation Days over 0.01 inches per year)
N	365	365	365	number of days in the averaging period (e.g., 365 for annual)

lb/VMT	0.0082	0.034	0.17	
Max lb/hr	0.081	0.33	1.65	assuming 464 trucks per day drive a total of 236 VMT in 24 hours
Max tpy	0.24	0.96	4.82	assuming 464 trucks per day drive a total of 236 VMT/day for 365 days
annual lb/hr	0.054	0.22	1.10	assuming 309 trucks per day drive a total of 236 VMT/day for 365 days

Estimate of Maximum Daily Traffic and Maximum Hourly Emissions by Route

Routes	Curr. Avg. Trucks/day	Future Avg. Trucks/day	x 1.5 Prop. Lim.	Average (ton)	Round Trip (mtr)	VMT mi/day	Normalize Weight	VMT Percentag	TSP lb/hr	PM10 lb/hr	PM2.5 lb/hr
Milk (full)	204.3	247.65	371.5	40.0	233.3	53.87	2154.79	23%	0.64	0.13	0.031
Milk (empty)				15.0	408.2	94.24	1413.53	40%	0.41	0.082	0.020
WWTP	4	4	6.0	27.5	2589.4	9.66	265.54	4%	0.078	0.016	0.0038
40 Material	2	2	3.0	22.5	904.8	1.69	37.96	1%	0.011	0.0022	0.00054
RAW	17	17	25.5	22.5	904.8	14.34	322.64	6%	0.094	0.019	0.0046
WPC/I	2.1	2.1	3.2	27.5	1785.6	3.50	96.13	1%	0.028	0.0056	0.0014
Slop	2	2	3.0	27.5	2333.4	4.35	119.64	2%	0.035	0.0070	0.0017
Chemicals	2	2	3.0	27.5	2314.2	4.31	118.66	2%	0.035	0.0070	0.0017
640 Material	4	4	6.0	22.5	1292.7	4.82	108.46	2%	0.032	0.0063	0.0016
Cheese	22.9	28.25	42.4	22.5	1702.2	44.83	1008.65	19%	0.29	0.059	0.014
Total Daily	260	309	**464**			235.60	5646.01	100%	1.65	0.33	0.081

23.96 tons overall weighed average truck
85,993 miles in 365 days per year

Proposed Daily Limit on Trucks 464 Trucks per day

Existing and proposed daily truck permit limits use a 1.5 factor of safety on average truck traffic.
The lb/hr emission estimate is 1/24 the emissions from daily truck limit.
Note that full and empty milk trucks travel by different routes, so emissions are calculated separately for full and empty milk trucks.

Expected Average Annual Trucks and Miles			
	Current Avg	Future Avg.	
Annual	95,010	112,785	Trucks per year
Annual	48,955	57,329	Miles per year

Where expected annual Trucks and expected annual miles is 365 days * average daily

Estimate of Average Truck Weight per Route

Truck Route	Empty Distance (m)	Full Distance (m)	Route Total (m)	Unloaded Weight (ton)	Load Weight (ton)	Weighted Average (ton)
Milk (full)		233.33	233.33	15	25	40.0
Milk (empty)	408.17		408.17	15	25	15.0
WWTP	1294.71	1294.71	2589.42	15	25	27.5
40' Material	452.395	452.395	904.79	15	15	22.5
RAW	452.395	452.395	904.79	15	15	22.5
WPC/I	892.82	892.82	1785.64	15	25	27.5
Slop	1166.71	1166.71	2333.42	15	25	27.5
Chemicals	1157.11	1157.11	2314.22	15	25	27.5
640' Materia	646.35	646.35	1292.7	15	15	22.5
Cheese	851.09	851.09	1702.18	15	15	22.5

Where the weighted average truck weight on each route is calculated as
(unloaded weight)(unloaded distance) + (loaded weight)(loaded distance) / (total distance) = Truck Weight for this route

Southwest Cheese, Revision to SO_2 Representations for Biogas Combustion in FLR1, BLR1 and NG-Only in BLR4

Worst-Case Operating Scenario 1 (BLR1/FLR1)	0.12% H_2S in biogas. All biogas flared (FLR1). Boiler 1 (BLR1) running concurrently on natural gas at full capacity.
Worst-Case Operating Scenario 2 (BLR1/FLR1)	0.12% H_2S in biogas. Biogas use in Boiler 1 (BLR1) maximum 30% of boiler heat input.
BLR4 Operation	No biogas burned in Boiler 4 (BLR4). Natural gas firing only.

Fuel and H_2S Combustion Data

Biogas Production

Parameter		Source
924,720	scf/day	Current permit
0.12%	H_2S by volume	Current permit
660	Btu/ft^3 (HHV basis)	Current permit

Natural Gas

Parameter		Source
0.25	grain H_2S per 100 scf	Current permit
1,020	Btu/ft^3 (HHV basis)	Current permit

Combustion Equation	$2\ H_2S + 3\ O_2 \rightarrow 2\ SO_2 + 2\ H_2O$

H_2S Molecular Weight (lb/lbmol)	34
SO_2 Molecular Weight (lb/lbmol)	64

Gas constant	R	0.73	ft^3 * atm/(R * lbmol)		
Pressure	P	1	atm		
Temperature	T	68	F	528	R
Molar volume	V/n	385.2	ft^3/lbmol		

Boiler 1 heat input capacity:	50.215	MMBtu/hr
Boiler 4 heat input capacity:	12.55	MMBtu/hr

Boiler 4 SO2 Emissions from Natural Gas Only

BLR4 - Natural Gas

Fuel input (ft^3/hr)	12,304
H_2S Input from NG (lb/hr)	0.0044
SO_2 (lb/hr)	0.0083
SO_2 (ton/yr)	0.036

Scenario 1 SO_2 Emissions

FLR1 - Biogas

Fuel input (ft^3/hr)	38,530
H_2S input (ft^3/hr)	46.2
H_2S input (lbmol/hr)	0.120
SO_2 (lb/hr)	7.7
SO_2 (ton/yr)	33.6

BLR1 - Natural Gas

Fuel input (ft^3/hr)	49,230
H_2S input (lb/hr)	0.018
SO_2 (lb/hr)	0.0331
SO_2 (ton/yr)	0.145

Scenario 2 SO_2 Emissions

BLR1 - Biogas/Natural Gas

Biogas heat load capacity (30%) and fuel input rate	15.06 22,825	MMBtu/hr ft^3/hr
Natural gas heat input (70%) and fuel input rate	35.15 34,461	MMBtu/hr ft^3/hr

H_2S Input from NG (lb/hr)	0.0123
H_2S Input from Biogas (ft^3/hr)	27.4
H_2S Input from Biogas (lbmol/hr)	0.071
H_2S Input from Biogas (lb/hr)	2.42
H_2S Input from Both Fuels (lb/hr)	2.43
SO_2 (lb/hr)	4.6
SO_2 (ton/yr)	20.0

FLR1 - Remaining Biogas

38,530	ft^3/hr biogas produced
(22,825)	ft^3/hr biogas routed to BLR1
15,705	ft^3/hr remaining biogas, to route to FLR1

H_2S Input from Biogas (ft^3/hr)	18.8
H_2S Input from Biogas (lbmol/hr)	0.049
SO_2 (lb/hr)	3.13
SO_2 (ton/yr)	13.7

Southwest Cheese, Facility-Wide Greenhouse Gas Emissions

Greenhouse Gas Emission Factors

EPA Center for Corporate Climate Leadership
Emission Factors for Greenhouse Gas Inventories Accessed 7/19/18
https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

	Heat Cont. Btu/scf	CO2 g/scf	CH4 g/scf	N2O g/scf	CO2e g/scf	CO2e lb/MMBtu
Natural Gas	1026	54.44	0.00103	0.0001	54.50	117.10
Non-Landfill BioGas	655	34.106	0.002096	0.000413	34.28	115.38
	Heat Cont. MMBtu/gal	CO2 kg/MMBtu	CH4 g/MMBtu	N2O g/MMBtu	CO2e kg/MMBtu	CO2e lb/MMBtu
Diesel Fuel	0.138	73.96	3.0	0.60	74.21	163.61

Where the GWP of gasses is: CO_2 =1 CH_4 = 25 N_2O = 298
and emission factors are converted to units of lb/MMBtu using 453.6 grams/lb and the listed fuel heat contents.

Facility-Wide GHG Potential Emissions

	MMBtu/hr	CO2 tpy	CH4 tpy	N2O tpy	CO2e tpy
BLR1	50.215	25,728	0.487	0.047	25,754
BLR2	50.215	25,728	0.487	0.047	25,754
BLR3	50.215	25,728	0.487	0.047	25,754
DRY1	18	9,222	0.174	0.017	9,232
BLR4	12.55	6,430	0.122	0.012	6,437
FLR1	25.43	12,786	0.786	0.155	12,852
BLR5	33.472	17,150	0.324	0.032	17,167
DRY2	14	7,173	0.136	0.013	7,180
SDG1	18.19	741	0.030	0.006	744
SDG2	6.26	255	0.010	0.002	256
FP01	1.28	52	0.002	0.000	52
Total	249.7	115,559	2.753	0.350	115,732

Note: At the Clovis Plant, three of the four process steam heating boilers, BRL1 ,BLR2, BLR 3 or BLR5 provides steam at any one time. The other boiler is on standby mode operating approximately 10% load. Permit 3008-M5 is requested to not limit fuel consumption but does limit boiler use to two at any one time. Therefore, the pollutant emissions, for facility-wide potential to emit purposes, is limited based on that.

Southwest Cheese, Facility-Wide HAP Emissions

HAP Emission Factors: AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition

https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf Accessed 8/2/16

	lb/MMscf	lb/MMBtu
2-Methylnaphthalene	2.40E-05	2.35E-08
3-Methylchloranthrene	1.80E-06	1.76E-09
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.57E-08
Acenaphthene	1.80E-06	1.76E-09
Acenaphthylene	1.80E-06	1.76E-09
Anthracene	2.40E-06	2.35E-09
Benz(a)anthracene	1.80E-06	1.76E-09
Benzene	2.10E-03	2.06E-06
Benzo(a)pyrene	1.20E-06	1.18E-09
Benzo(b)fluoranthen	1.80E-06	1.76E-09
Benzo(g,h,i)perylene	1.20E-06	1.18E-09
Benzo(k)fluoranthene	1.80E-06	1.76E-09
Chrysene	1.80E-06	1.76E-09
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09
Dichlorobenzene	1.20E-03	1.18E-06
Fluoranthene	3.00E-06	2.94E-09
Fluorene	2.80E-06	2.75E-09
Formaldehyde	7.50E-02	7.35E-05
Hexane	1.80E+00	1.76E-03
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09
Naphthalene	6.10E-04	5.98E-07
Phenanathrene	1.70E-05	1.67E-08
Pyrene	5.00E-06	4.90E-09
Toluene	3.40E-03	3.33E-06
Total		**1.85E-03**

[1] Where the typical higher heating value of natural gas cited in AP-42 Section 1.4 is 1020 Btu/scf.

HAP Emission Factors: AP-42 Section 3.4 "Large Diesel Engines", 10/96

https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s04.pdf

	lb/MMBtu
Acetaldehyde	2.52E-05
Acrolein	7.88E-06
Benzene	7.76E-04
Formaldehyde	7.89E-05
Naphthalene	1.30E-04
Polycyclic Aromatic Hydrocarbons	2.12E-04
Toluene	2.81E-04
Xylenes	1.93E-04
Total	**1.70E-03**

HAP Emission Factors: AP-42 Section 3.3 "Diesel Engines", 10/96

https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s04.pdf

	lb/MMBtu
Acetaldehyde	7.67E-04
Acrolein	9.25E-05
Benzene	9.33E-04
1,3-Butadiene	3.91E-05
Formaldehyde	1.18E-03
Naphthalene	8.48E-05
Polycyclic Aromatic Hydrocarbons	1.68E-04
Toluene	4.09E-04
Xylenes	2.85E-04
Total	**3.96E-03**

Facility-Wide HAP Emissions

	BLR1	BLR2	BLR3	BLR4	BLR5	DRY1	DRY2	FLR1	SDG1	SDG2	FP01	
Maximum Firing Rate →	48.9 MMBtu/hr	48.9 MMBtu/hr	48.9 MMBtu/hr	12.55 MMBtu/hr	33.7 MMBtu/hr	18 MMBtu/hr	14 MMBtu/hr	25.43 MMBtu/hr	18.19 MMBtu/hr	6.26 MMBtu/hr	1.28 MMBtu/hr	Total
	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
1,3-Butadiene	-	-	-	-	-	-	-	-	-	-	0.0250	0.0250
2-Methylnaphthalene	0.0101	0.0101	0.0101	0.0026	0.0069	0.0037	0.0029	0.0052	-	-	-	0.0346
3-Methylchloranthrene	0.0008	0.0008	0.0008	0.0002	0.0005	0.0003	0.0002	0.0004	-	-	-	0.0026
7,12-Dimethylbenz(a)anthracene	0.0067	0.0067	0.0067	0.0017	0.0046	0.0025	0.0019	0.0035	-	-	-	0.0231
Acenaphthene	0.0008	0.0008	0.0008	0.0002	0.0005	0.0003	0.0002	0.0004	-	-	-	0.0026
Acenaphthylene	0.0008	0.0008	0.0008	0.0002	0.0005	0.0003	0.0002	0.0004	-	-	-	0.0026
Acetaldehyde	-	-	-	-	-	-	-	-	0.2292	0.0789	0.4909	0.7990
Acrolein	-	-	-	-	-	-	-	-	0.0717	0.0247	0.0592	0.1555
Anthracene	0.0010	0.0010	0.0010	0.0003	0.0007	0.0004	0.0003	0.0005	-	-	-	0.0035
Benz(a)anthracene	0.0008	0.0008	0.0008	0.0002	0.0005	0.0003	0.0002	0.0004	-	-	-	0.0026
Benzene	0.8819	0.8819	0.8819	0.2263	0.6078	0.3246	0.2525	0.4586	7.0577	2.4289	0.5971	13.1097
Benzo(a)pyrene	0.0005	0.0005	0.0005	0.0001	0.0003	0.0002	0.0001	0.0003	-	-	-	0.0017
Benzo(b)fluoranthen	0.0008	0.0008	0.0008	0.0002	0.0005	0.0003	0.0002	0.0004	-	-	-	0.0026
Benzo(g,h,i)perylene	0.0005	0.0005	0.0005	0.0001	0.0003	0.0002	0.0001	0.0003	-	-	-	0.0017
Benzo(k)fluoranthene	0.0008	0.0008	0.0008	0.0002	0.0005	0.0003	0.0002	0.0004	-	-	-	0.0026
Chrysene	0.0008	0.0008	0.0008	0.0002	0.0005	0.0003	0.0002	0.0004	-	-	-	0.0026
Dibenzo(a,h)anthracene	0.0005	0.0005	0.0005	0.0001	0.0003	0.0002	0.0001	0.0003	-	-	-	0.0017
Dichlorobenzene	0.5040	0.5040	0.5040	0.1293	0.3473	0.1855	0.1443	0.2621	-	-	-	1.7291
Fluoranthene	0.0013	0.0013	0.0013	0.0003	0.0009	0.0005	0.0004	0.0007	-	-	-	0.0043
Fluorene	0.0012	0.0012	0.0012	0.0003	0.0008	0.0004	0.0003	0.0006	-	-	-	0.0040
Formaldehyde	31.5	31.5	31.5	8.1	21.7	11.6	9.0176	16.3799	0.7176	0.2470	0.7552	109.7898
Hexane	756	756	756	194	521	278	216.4235	393.1179	-	-	-	2,593.6814
Hydrogen Sulfide	-	-	-	-	-	-	-	714.8160	-	-	-	714.8160
Indeno(1,2,3-cd)pyrene	0.0008	0.0008	0.0008	0.0002	0.0005	0.0003	0.0002	0.0004	-	-	-	0.0026
Naphthalene	0.2562	0.2562	0.2562	0.0657	0.1765	0.0943	0.0733	0.1332	1.1824	0.4069	0.0543	2.5225
Phenanathrene	0.0071	0.0071	0.0071	0.0018	0.0049	0.0026	0.0020	0.0037	-	-	-	0.0245
Polycyclic Aromatic Hydrocarbons	-	-	-	-	-	-	-	-	1.9281	0.6636	0.1075	2.6992
Pyrene	0.0021	0.0021	0.0021	0.0005	0.0014	0.0008	0.0006	0.0011	-	-	-	0.0072
Toluene	1.4279	1.4279	1.4279	0.3665	0.9840	0.5256	0.4088	0.7426	2.5557	0.8795	0.2618	8.5962
Xylenes	-	-	-	-	-	-	-	-	1.7553	0.6041	0.1824	2.5418
Total	791	791	791	203	545	291	226	1,126	14	5	2	4,783.4

At the Clovis Plant, only two of the four process steam heating boilers, BRL1 ,BLR2, BLR 3 or BLR5 provides steam at any one time. The other boilers are on standby mode operating approximately 10% load. Permit 3008-M4 does not limit fuel consumption but does limit boiler use to two at any one time. Therefore, the pollutant emissions, for facility-wide potential to emit purposes, is limited to the two highest emitting boilers only.

Southwest Cheese, Generator Emissions (SDG1)

Make:	Caterpillar
Model:	3516
Manufacturer HP:	2598

POLLUTANT NAME	EF (lb/MMBtu)	EF (g/hp-hr)	EF Source[1]	Emissions (tpy)
PM	0.1	0.318	EPA AP-42	0.45
PM_{10}	0.1	0.318	EPA AP-42	0.45
CO	0.85	2.699	EPA AP-42	3.86
SOx	Formula	5.50E-03	EPA AP-42	0.008
NOx	3.2	10.160	EPA AP-42	14.55
HC	0.09	0.286	EPA AP-42	0.41

Calculation Summary

Total hp-hr as Requested =	1,299,000
Annual Fuel Consumption (gal) =	66,372
"Full Standby" fuel consumption (gal/hr) =	132.7
Energy Consumption (MMBtu/hr) =	18.2
Requested Operating Hours =	500
Fuel (Btu/gal) =	137,000
Fuel Sulfur Content (%) =	0.0015%
BSFC (Btu/hp-hr) =	7,000
Total (MMBtu) =	9,093

NOTES:

1.) "EPA AP-42" emission factors are from Vol. 1, 5th Edition, Section 3.4, Table 3.4-1.
AP-42 emission factors are given in units of lbs/MMBtu, which were converted using the following equation:
EF (g/hp-hr) = EF (lb/MMBtu) x 453.6 g/lb x 132.7 gal/hr x 7000 Btu/hp-hr ÷ 2598 hp ÷ 1,000,000 Btu/MMBtu

HAP Emissions Estimates

HAP NAME	HAP EF[1] (lb/MMBtu)	HAP (lb/yr)
Acetaldehyde	2.52E-05	0.23
Acrolein	7.88E-06	0.07
Benzene	7.76E-04	7.06
Formaldehyde	7.89E-05	0.72
Naphthalene	1.30E-04	1.18
Polycyclic Aromatic Hydrocarbon	2.12E-04	1.93
Toluene	2.81E-04	2.56
Xylenes	1.93E-04	1.75
TOTAL HAPs Emissions (lbs.)		**15.5**

NOTES:

1.) HAP emissions factors from Tables 3.4-3 and 3.4-4 of AP-42 for large diesel engines.

Southwest Cheese, Generator Emissions (SDG2)

Make: Cummins
Model: VTA-28-G5
Manufacturer HP: 900

POLLUTANT NAME	EF (lb/MMBtu)	EF (g/hp-hr)	EF Source[1]	Emissions (tpy)
PM	0.1	0.316	EPA AP-42	0.16
PM_{10}	0.1	0.316	EPA AP-42	0.16
CO	0.85	2.682	EPA AP-42	1.33
SOx	Formula	5.50E-03	EPA AP-42	0.003
NOx	3.2	10.097	EPA AP-42	5.01
HC	0.09	0.284	EPA AP-42	0.14

NOTES:

1.) "EPA AP-42" emission factors are from Vol. 1, 5th Edition, Section 3.4, Table 3.4-1.
AP-42 emission factors are given in units of lbs/MMBtu, which were converted using the following equation:
EF (g/hp-hr) = EF (lb/MMBtu) x 453.6 g/lb x 132.7 gal/hr x 7000 Btu/hp-hr ÷ 900 hp ÷ 1,000,000 Btu/MMBtu

Calculation Summary

Total hp-hr as Requested =	450,000
Annual Fuel Consumption (gal) =	22,850
"Full Standby" fuel consumption (gal/hr) =	45.7
Energy Consumption (MMBtu/hr) =	6.3
Requested Operating Hours =	500
Fuel (Btu/gal) =	137,000
Fuel Sulfur Content (%) =	0.0015%
BSFC (Btu/hp-hr) =	6,957
Total (MMBtu) =	3,130

HAP Emissions Estimates

HAP NAME	HAP EF[1] (lb/MMBtu)	HAP (lb/yr)
Acetaldehyde	2.52E-05	0.08
Acrolein	7.88E-06	0.02
Benzene	7.76E-04	2.43
Formaldehyde	7.89E-05	0.25
Naphthalene	1.30E-04	0.41
Polycyclic Aromatic Hydrocarbons	2.12E-04	0.66
Toluene	2.81E-04	0.88
Xylenes	1.93E-04	0.60
TOTAL HAPs Emissions (lbs.)		**5.3**

NOTES:

1.) HAP emissions factors from Tables 3.4-3 and 3.4-4 of AP-42 for large diesel engines.

Southwest Cheese, Generator Emissions (FP01)

Make:	John Deere
Model:	6068HF285
Manufacturer HP:	183

POLLUTANT NAME	EF (lb/MMBtu)	EF (g/hp-hr)	EF Source[1]	Emissions (tpy)
PM	0.31	0.984	EPA AP-42	0.10
PM_{10}	0.31	0.984	EPA AP-42	0.10
CO	0.95	3.016	EPA AP-42	0.30
SOx[2]	1.21E-05	5.50E-03	EPA AP-42	0.0006
NOx+HC	4.77	15.145	EPA AP-42	1.53
HC	0.36	1.143	EPA AP-42	0.12

NOTES:

1.) "EPA AP-42" emission factors are from Vol. 1, 5th Edition, Section 3.3, Table 3.3-1.
AP-42 emission factors are given in units of lbs/MMBtu, which were converted using the following equation:
EF (g/hp-hr) = EF (lb/MMBtu) x 453.6 g/lb x 132.7 gal/hr x 7000 Btu/hp-hr ÷ 183 hp ÷ 1,000,000 Btu/MMBtu

2.) EPA AP-42 Emission factor for SOx from Vol. 1, 5th Edition, Table 3.4-1 and assuming ULSD is consumed in the engine

Calculation Summary	
Total hp-hr as Requested =	91,500
Annual Fuel Consumption (gal) =	4,675
"Full Standby" fuel consumption (gal/hr) =	9.4
Energy Consumption (MMBtu/hr) =	1.3
Requested Operating Hours =	500
Fuel (Btu/gal) =	137,000
Fuel Sulfur Content (%) =	0.0015%
BSFC (Btu/hp-hr) =	7,000
Total (MMBtu) =	641

HAP Emissions Estimates

HAP NAME	HAP EF[1] (lb/MMBtu)	HAP (lb/yr)
Acetaldehyde	7.67E-04	0.49
Acrolein	9.25E-05	0.06
Benzene	9.33E-04	0.60
1,3-Butadiene	3.91E-05	0.03
Formaldehyde	1.18E-03	0.76
Naphthalene	8.48E-05	0.05
Polycyclic Aromatic Hydrocarbon	1.68E-04	0.11
Toluene	4.09E-04	0.26
Xylenes	2.85E-04	0.18
TOTAL HAPs Emissions (lbs.)		**2.54**

NOTES:

1.) HAP emissions factors from Table 3.3-2 of AP-42 for diesel industrial engines.

UA3
Application Details

Section 3

Application Summary

The **Application Summary** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will affect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

Routine or predictable emissions during Startup, Shutdown, and Maintenance (SSM): Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

Southwest Cheese Company (SWC) is applying for a modification to Title V Operating Permit 3008-M3-R3for the Clovis Plant, currently operating under construction Permit 3008-M4, most recently modified on December 9, 2016. SWC has retained Tetra Tech to help prepare the modification application. The facility conducts typical cheese production activities by processing milk, cream, and starter to produce cheese, whey protein concentrate, and whey protein isolate. The current permit 3008M4 authorizes the equipment shown below, from Table 1.a. of the permit. Existing sources are three 49.8 mmBtu/hr steam heating boilers (BLR1, BLR2, and BLR3), a 33.7 mmBtu/hr steam heating boiler (BLR5), an 18 mmBtu/hr natural-gas-fired whey dryer heater (DRY1), a 14 mmBtu/hr natural-gas-fired whey dryer heater (DRY2), a 12.55 mmBtu/hr natural gas wastewater treatment plant reheat boiler (BLR4), a 2,598 BHP Caterpillar 3516B standby emergency generator, a 900 BHP Cummins standby emergency generator, a 180 BHP John Deere standby fire pump, and a biogas flare (FLR1). Particulate emissions from the whey dryer heaters are controlled by two cyclones (CYC1 and CYC2) and two dust collectors (DBH1 and DBH2). Emissions from two whey transfer points will be controlled by a powder receiver baghouse (PRBH1) and a start/stop hopper baghouse (SSHBH1). Truck traffic capacity (ROAD) on-site is limited to 464 trucks per day. Of the permitted emissions sources, two are authorized to combust biogas as fuel: one process boiler (BLR1) and the anaerobic digester biogas flare (FLR1). This modification is to increase facility operations so three of the four boilers can fully operate at the same time instead of the currently permitted two of the four boilers.

Table 3-1 lists the equipment from Table 1.a. "Regulated Equipment List" in SWC Air Quality Permit No. 3008-M-4-R2.

This modification includes increasing facility operations so three of the four boilers can fully operate at the same time instead of the currently permitted two of the four boilers. These updates are being requested to provide additional accuracy to the modeled, predicted impacts which are presented in Section 16. Modeling shows no adverse impacts of any pollutant from SWC.

The site will remain a true minor source for PSD. Title V status is major.

SWC Clovis Plant is located in Township 1N, Range 35E, Section 13, approximately 6.8 miles south of the center of Clovis in Curry County, New Mexico. The Universal Transverse Mercator (UTM) coordinates for the site are UTM E 663,640 meters East and 3,798,500 meters North with NAD83 datum at an elevation of approximately 4,165 feet above mean sea level.

Routine or Predictable Emissions During Startup, Shutdown, and Maintenance (SSM):

No startup, shutdown, or maintenance emissions are predicted for this facility that would be greater than the proposed allowable emissions.

If you have any questions about this permit application, please call Sara Lubchenco-Burson (Tetra Tech, Inc.) at (251) 599-0715 or Laura Rufin of SWC at (251) 229-6429.

Table 3-1 Regulated Equipment List from Permit No. 3008-M3-R4

Unit No.	Source Description	Make Model	Serial No.	Capacity
BLR1	Steam Heating Boiler	Cleaver Brooks CBL700-1200-1500ST	OL103875	50.215 MMBtu/hr
BLR2	Steam Heating Boiler	Cleaver Brooks CBL700-1200-1500ST	OL103874	50.215 MMBtu/hr
BLR3	Steam Heating Boiler	Cleaver Brooks CBL700-1200-1500ST	OL103876	50.215 MMBtu/hr
BLR4	Hot Water Generator	Cleaver Brooks CBL-700-300-30HW	OL103946	12.55 MMBtu/hr
BLR5	Steam Heating Boiler	Cleaver-Brooks CBEX 800	T5817-1-1	33.472 MMBtu/hr
DRY1	Whey Dryer Heater	CPS Corbett Whey Dryer Heater	S-090402	18 MMBtu/hr
DRY2	Whey Dryer Heater	CFR Vertical U-Tube	H120DPL162314	14.0 MMBtu/hr
WPC1	Whey Powder Conveyor	PPS VR-18-8-3T	NA	NA
SSH1	Start/Stop Hopper	CFR	19333-0003	NA
FLR1	Anaerobic Digester Biogas Flare	Varec WG224WS614001	SP78214	25.43 MMBtu/hr
ROAD	Truck Traffic	NA	NA	464 Trucks/day
SDG1	Standby Emergency Generator	Caterpillar 3516 BDITA	5SJ00498	2,598 bhp
SDG2	Standby Emergency Generator	Cummins VTA-28-G5	25300844	900 bhp
FP01	Standby Fire Pump	John Deere 6068HFC28	PE6068L277568	183 bhp

NA: Not Applicable

Section 4

Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.

Figures 4-1 through 4-3 show the proposed process equipment, and Figure 4-4 shows the existing operations. Figure 4-4 is provided for reference; this figure can be found in NMED permit application documents on file.

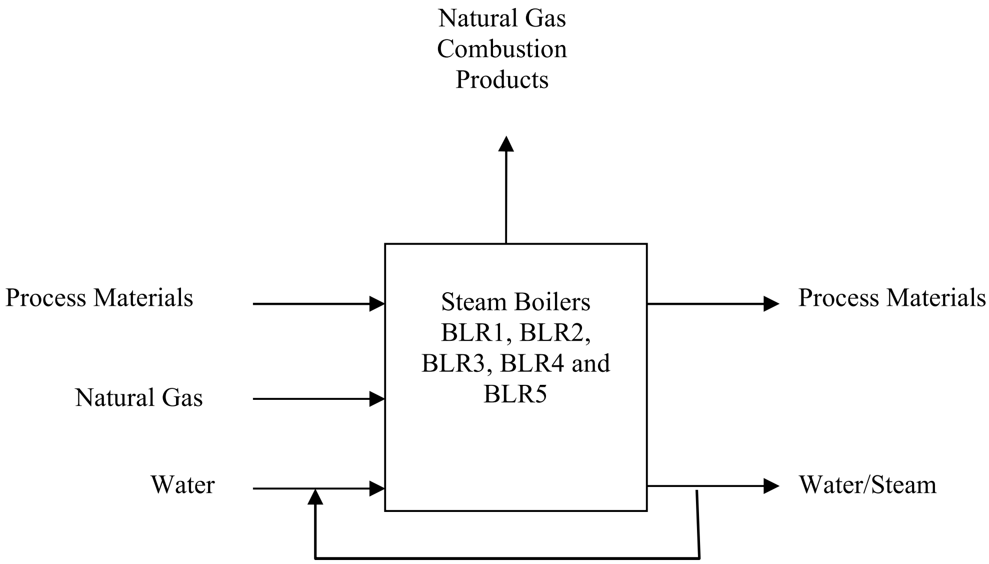

Figure 4-1. Boiler Process

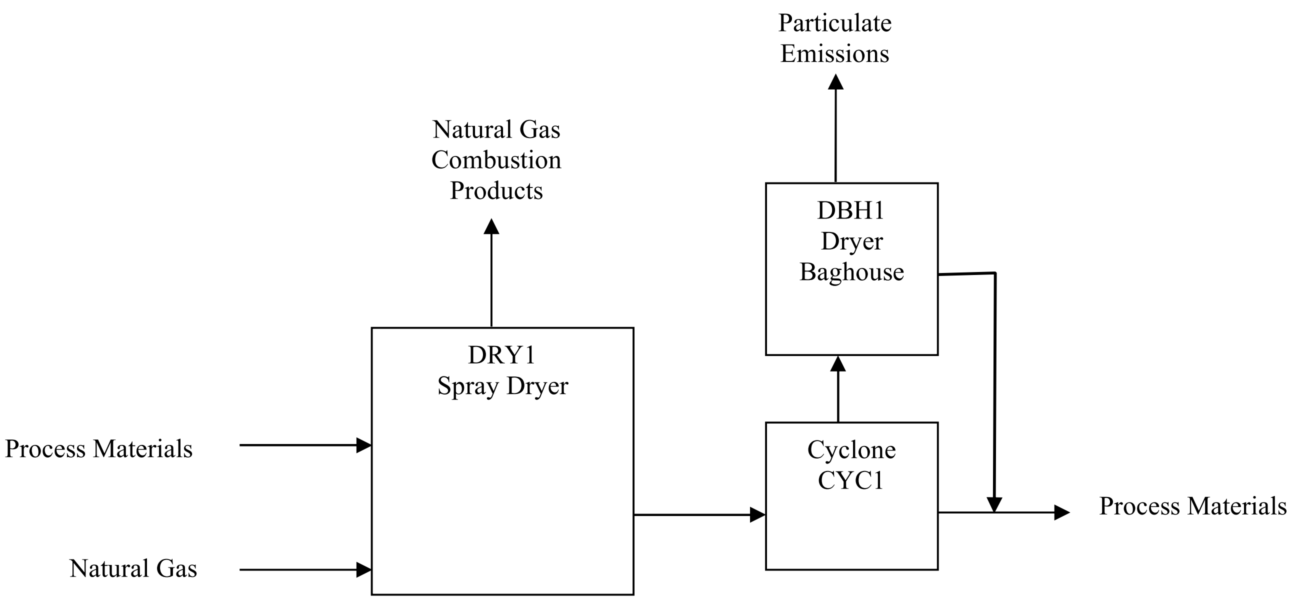

Figure 4-2. Dryer Process

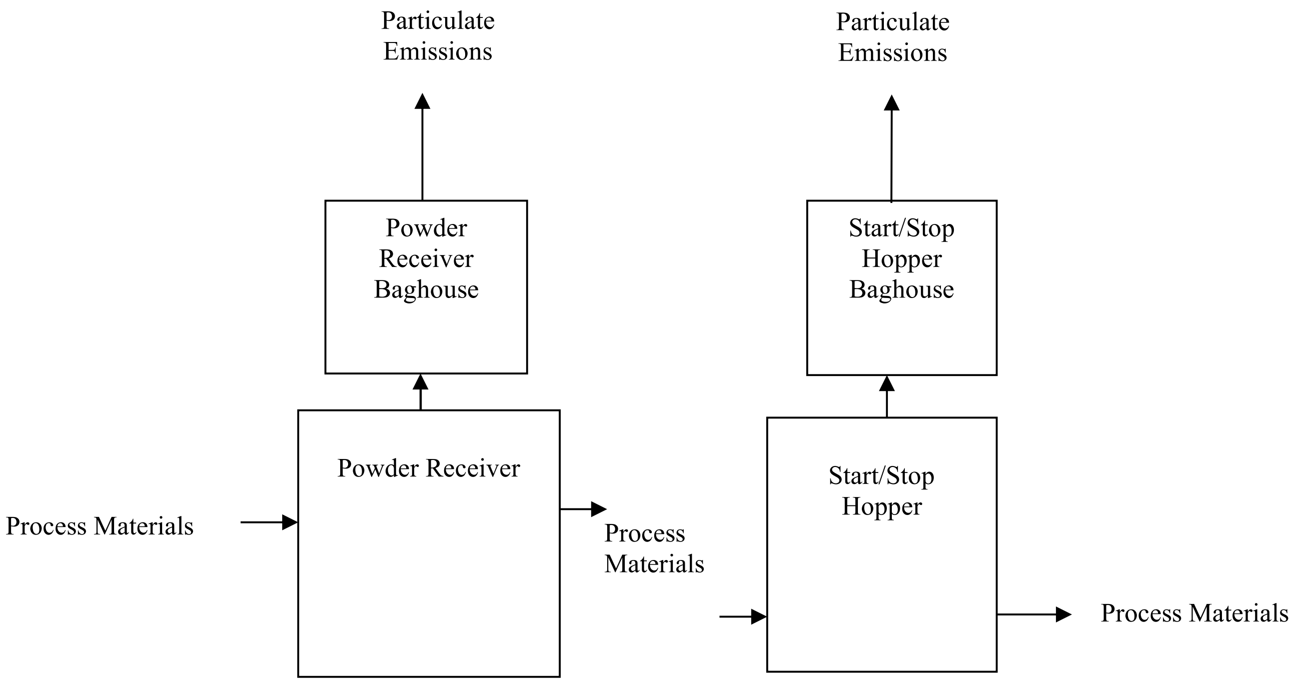

Figure 4-3. Whey Transfer Points Processes

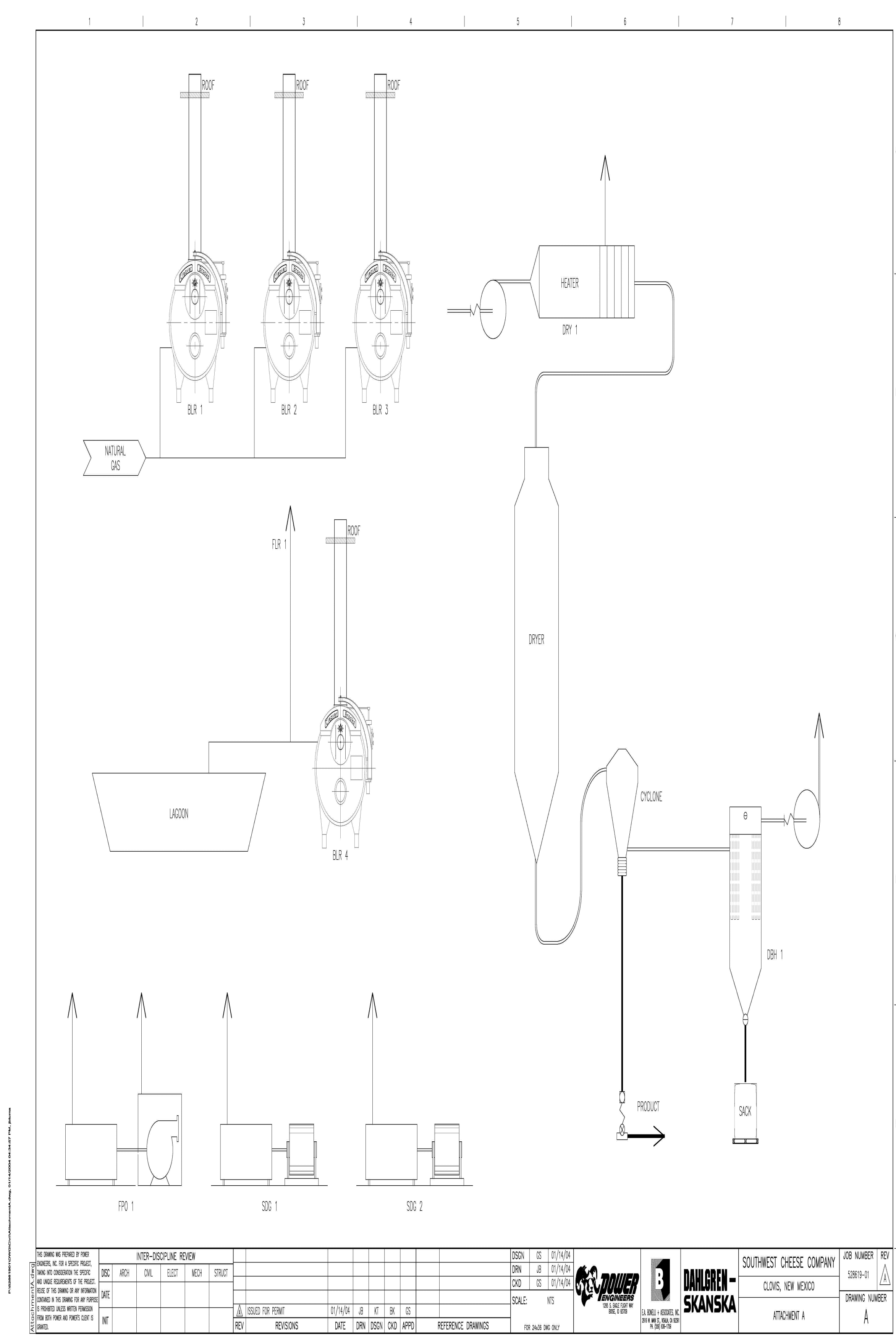

Figure 4-4. Current Permitted Units Process

Section 5

Plot Plan Drawn To Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

Plot plan documents are enclosed in this section in Figures 5-1 and 5-2.

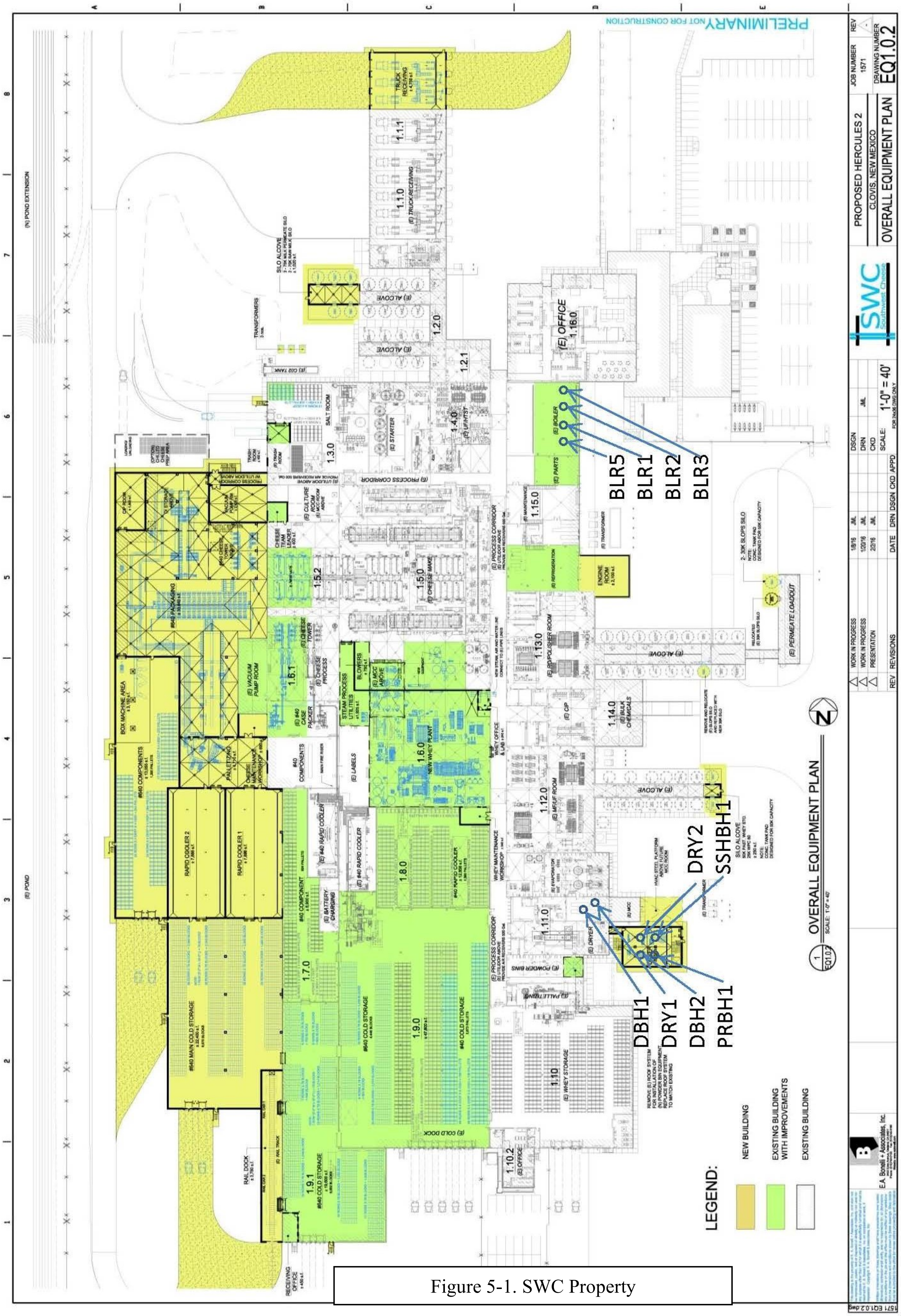

Figure 5-1. SWC Property

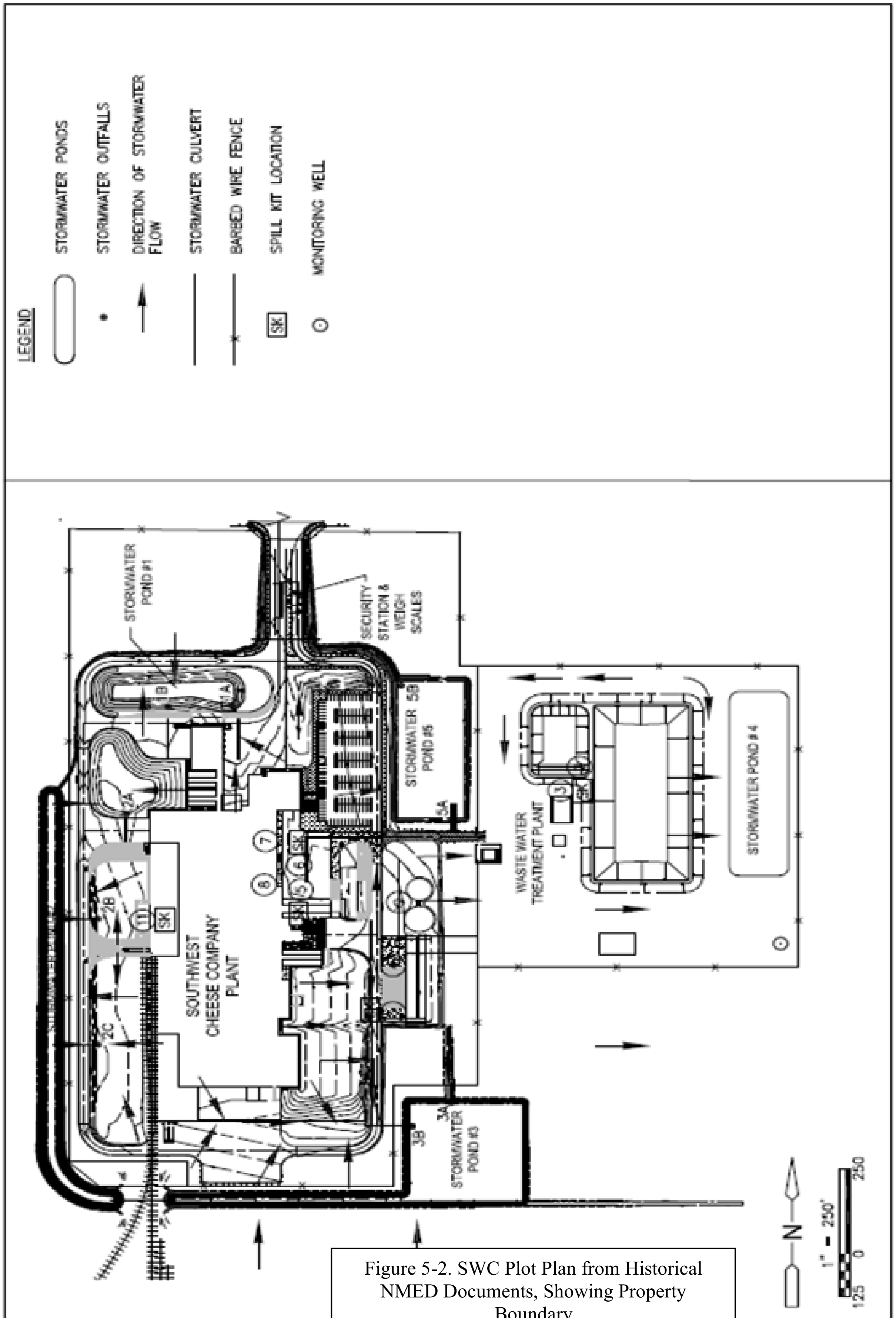

Figure 5-2. SWC Plot Plan from Historical NMED Documents, Showing Property Boundary

Section 6

All Calculations

Show all calculations used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

Tank Flashing Calculations: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

SSM Calculations: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

Glycol Dehydrator Calculations: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

Road Calculations: Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

Significant Figures:

A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.
B. At least 5 significant figures shall be retained in all intermediate calculations.
C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

- **(1)** If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;
- **(2)** If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**
- **(3)** If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.
- **(4)** The final result of the calculation shall be expressed in the units of the standard.

Control Devices: In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

6.1 Boiler Combustion Emissions

The external combustion sources potential emissions were estimated based on natural gas firing, input capacity, and emission factors. One unit will burn biogas. Emission factors were taken from the following sources, as provided in Section 7.

- Criteria pollutants – manufacturer data/Cleaver Brooks.
- Speciated hazardous air pollutants – AP-42 Section 1.4.
- Greenhouse gases – EPA Center for Corporate Climate Leadership, November 2015.

Example calculation methods are shown below for hourly and annual emission estimates.

Emissions (lb/hr):

$$= [\text{rated capacity (Btu/hr)} * \text{emission factor (lb/}10^6 \text{ ft}^3)] / [\text{fuel heating value (Btu/ft}^3) * 10^6 \text{ ft}^3]$$

Emissions (tons/yr):

$$= [\text{emissions (lb/hr)} * 8760 \text{ (hr/yr)}] / 2000 \text{ (lb/ton)}$$

Where applicable, the AP-42 Section 1-4 default natural gas heating value of 1020 Btu/scf HHV for the facility's pipeline quality natural gas was used. This is the value that has historically been used in this permit and amendments for this facility.

Maximum potential emissions are based on this unit operating 8760 hours per year. This operating schedule represents the worst case emissions from the unit. Requested annual emissions are based on worst-case assumptions on how the boilers at the site will operate as a group.

Three of the four boilers can fully operate at the same time instead of the currently permitted two of the four boilers.
The permitted boilers at the site will not run concurrently. See operational statement in Section 7 for details.

6.2 Dryer Combustion Emissions

The external combustion sources potential emissions were also estimated based on input capacity and emission factors. Emission factors were taken from the following sources, as provided in Section 7.

- Criteria pollutants NOx and CO – manufacturer data/from Maxon
- Criteria pollutants VOC, SO_x, and PM – prior permit application (3008-M3-R3, 2012) for similar unit (DRY1). These factors are similar to natural gas boiler (BLR5) emission factors.
- Speciated hazardous air pollutants – AP-42 Section 1.4.
- Greenhouse gases – EPA Center for Corporate Climate Leadership, November 2015

Example calculation methods are shown below for hourly and annual emission estimates.

Emissions (lb/hr):

$$= [\text{rated capacity (Btu/hr)} * \text{emission factor (lb/}10^6 \text{ ft}^3)] / [\text{fuel heating value (Btu/ft}^3) * 10^6 \text{ ft}^3]$$

Emissions (tons/yr):

$$= [\text{emissions (lb/hr)} * 8760 \text{ (hr/yr)}] / 2000 \text{ (lb/ton)}$$

Where applicable, the AP-42 Section 1-4 default natural gas heating value of 1020 Btu/scf HHV for the facility's pipeline quality natural gas was used. This is the value that has historically been used in this permit and amendments for this facility.

Maximum potential emissions are based on this unit operating 8760 hours per year. This operating schedule represents the worst case emissions from the unit.

The dryer combustion stack will not have an add-on control device.

6.3 Dryer Cyclone-Baghouse-System Emissions

As product is sprayed into the dryer (DRY2) for drying, particulates will be generated. Of the particulates that do not fall out by gravity, the larger and heavier of these will be removed by a cyclone (CYC2), before the stream enters the baghouse (DBH2) where smaller particulates are further removed. The cyclone limits the particulate loading in the air flowing to the bag house, helping the baghouse to operate more efficiently, but does not directly effect the air emissions.

The overall control from this cyclone-baghouse system, as provided by the system manufacturer/CFR, is: 0.01 grains per dry standard cubic foot. This corresponds to approximately 99 percent control of particulates of one micron in diameter and larger.

The maximum flow rate of the system in terms of scfm was provided by the manufacturer.

Example calculation methods are shown below for hourly and annual emission estimates.

Emissions (lb/hr):

*= flow rate (scfm) * 60 (min/hr) * emission factor (0.01 grains/scf) / 7000 (grains/lb)*

Emissions (tons/yr):

*= [emissions (lb/hr) * 8760 (hr/yr)] / 2000 (lb/ton)*

Requested allowable emissions are based on this unit operating 8760 hours per year. This operating schedule represents the worst case emissions from the unit.

See operational statement in Section 7 for details on how the proposed and existing dryer are expected to be operated.

Note that the whey particulate emissions from the dryer baghouse (DBH2) are separate from the combustion-product emissions from the dryer combustion stack (DRY2).

6.4 Whey-Transfer-Point Baghouse Emissions

As dried product is conveyed, there will be two transfers which will emit particulates, and which will be controlled by baghouses. These two controlled emission points are at the Powder Receiver Baghouse (PRBH1) and the Start/Stop Hopper Baghouse (SSHBH1).

According to the manufacturer, the control at each baghouse will be 0.01 grains per standard cubic foot. As with the dryer baghouse (DBH2), this corresponds to approximately 99 percent control of particulate greater than 1 micron in size.

Flow rates for each whey transfer point baghouse were provided by the manufacturer, with the higher of the two flow rates being at the powder receiver baghouse (PRBH1).

Example calculation methods are shown below for hourly and annual emission estimates.

Emissions (lb/hr):

*= flow rate (scfm) * 60 (min/hr) * emission factor (0.01 grains/scf) / 7000 (grains/lb)*

Emissions (tons/yr):

*= [emissions (lb/hr) * 8760 (hr/yr)] / 2000 (lb/ton)*

Requested allowable emissions are based on this unit operating 8760 hours per year. This operating schedule represents the worst case emissions from the baghouses. However, the actual operation will be less.

6.5 On-Site On-Road Truck Traffic

Cheese production will result in transfers in and out of materials and product by truck at the facility. This in-plant traffic will generate a small amount of fugitive dust emissions from the road surfaces inside the facility boundary.

The permit limit for trucks is 464 trucks per day.

Milk trucks will come into the plant, empty the contents at the new unloading area, then exit the plant (empty) on a separate road. Therefore, in the case of milk trucks, separate road distances and vehicle weights were used for incoming versus outgoing trucks.

Emission factors from AP-42 Section 12.3.1 were utilized to estimate emissions. This section of AP-42, Paved Roads, has been updated since the original road emissions were estimated for this permit, so all of existing and new proposed truck traffic emissions were estimated/re-estimated.

Emission calculations were done as follows:

$E_{ext}\ (lb/VMT) = [\ k\ (sL)^{0.91}\ x\ (W)^{1.02}\ ]\ (1 - P/4N)$

Where E_{ext} represents emissions in pounds per vehicle mile travelled, and the equation variables are described below. The numerical values utilized in the equation for each particulate size range, is also shown.

	PM2.5	PM10	PM30	
k	0.00054	0.0022	0.011	Particle Size Multiplier from Table 13.2.1-1
sL	0.6	0.6	0.6	Baseline silt Loading Default Value from Table 13.2.1-2, assumes negligible use of antiskid abrasive.
W	23.96	23.96	23.96	Per-vehicle average weight in tons. Average of loaded/unloaded weights, weighted by VMT/day.
P	70	70	70	NMED Value (# of Precipitation Days over 0.01 inches per year)
N	365	365	365	number of days in the averaging period (e.g., 365 for annual)

This table is reiterated in the related emission calculation spreadsheet. The k and sL (grams per square meter) values were taken from AP-42. The W values (same for each particulate size) were calculated based on loaded and unloaded vehicle weights, and are taken from previous permit application estimates. The P values were taken from NMED, and N was assigned 365 to represent an annual averaging period.

The numbers of vehicle types and loads and the distance traveled for each were tabulated for this estimate and can be reviewed in the related emission calculation spreadsheet.

After estimating E_{ext}, the hourly and annual emissions were estimated as follows.

Emissions (lb/hr):

$= E_{ext}\ (lb/VMT) * maximum\ daily\ VMT\ (VMT/day) / 24\ (hours/day)$

Emissions (tons/yr):

$= E_{ext}\ (lb/VMT) * maximum\ annual\ VMT\ (VMT/year) / 2000\ (lb/ton)$

The hourly emissions were based on daily maximum truck throughputs and a 24-hour day. Annual emissions were based on annual maximum truck throughputs. Calculation spreadsheets are enclosed.

6.6 Revisions to Emission Representations for Existing Permitted Equipment

SO_2 from Existing Sources that Burn Biogas

As represented in prior permit application documents, combustion of biogas in Boiler 1, Boiler 4, and/or Flare 1, produces emissions of SO_2/SOx based directly on the amount of hydrogen sulfide (H_2S) in the incoming biogas. The current permit limits H_2S content in the biogas to 0.25 % by volume and requires weekly biogas testing. Based on recent biogas test results at the plant which have not exceeded 0.05% H_2S by volume in over a year, SWC proposes to reduce the maximum allowed H_2S content to

0.12% by volume. This representation will provide a more accurate, while still conservative, estimate of SO_x from sources when burning biogas.

SWC would like to remove biogas fueling representations for Boiler 4 from the permit. It will run, when needed, on natural gas only.

For the burning of biogas in Boiler 1 and Flare 1, two worst-case scenarios were estimated. The first – Scenario 1 - assumes all of the produced biogas being burned in the flare while a full load of natural gas is burned concurrently in Boiler 1. The second – Scenario 2 - assumes biogas being burned at maximum capacity in Boiler 1 (30% of Boiler 1's capacity), with the remainder of Boiler 1's capacity being fueled by natural gas, and the rest of the biogas going to the flare.

The assumption that Boiler 1 can only utilize biogas up to a maximum of 30% of its capacity, is a revision in this permit application. Prior representations were that Boiler 1 could run up to half its capacity on biogas. The new assumption is a more accurate reflection of Boiler 1's maximum biogas load.

Calculation spreadsheets are enclosed which show the revised maximum SO_2 emissions from both of these worst-case scenarios. Both scenarios were utilized in the modeled impacts analyses to predict worst-case impacts of SO_2 in Section 16. Example calculations are below.

Emissions (lb/hr):

= *incoming H_2S in biogas and/or natural gas (lbmol/hr) x 1 lbmol SO_2 /1 lbmol H_2S combusted x 64 lb SO_2/lbmol SO_2*

Emissions (tons/yr):

= *[emissions (lb/hr) * 8760 (hr/yr)] / 2000 (lb/ton)*

$PM_{2.5}$ and PM_{10} from Existing Dryer Baghouse

The existing-dryer baghouse, DBH1, controls particulate matter emissions of whey powder leaving the existing dryer. The current permit and historical permit applications have represented all sizes of particulate matter with the same control efficiency and emission rate. This generally overestimates emissions of smaller particulate matter as compared to total particulate matter.

When the existing-dryer baghouse, DBH1, was tested for TSP and PM_{10} in April 2007, the PM_{10} emissions were measured to be approximately half of the measured TSP emissions.

Based on that test result, a conservative assumption was made in order to more accurately represent maximum emissions of PM_{10} and $PM_{2.5}$ from DBH1. This assumption is that PM_{10}/$PM_{2.5}$ emitted from DBH1 will be equal to or less than 70% by weight of TSP emitted.

The summary table of results from the 2007 stack test report is provided in Section 7 for reference, and the simple ratio that was used to estimate PM_{10} and $PM_{2.5}$ from TSP is shown below.

The reduced DBH1 PM_{10} and $PM_{2.5}$ representations were utilized in the modeled impacts analyses to predict more accurate worst-case impacts of PM_{10} and $PM_{2.5;}$ See Section 16.

Emissions (lb/hr):

= *emissions TSP (lb/hr) x 0.7*

Emissions (tons/yr):

= *emissions (lb/hr) x 8760 (hr/yr) / 2000 (lb/ton)*

See attached calculations.

Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

Title V (20.2.70 NMAC), Minor NSR (20.2.72 NMAC), and PSD (20.2.74 NMAC) applicants must estimate and report greenhouse gas (GHG) emissions to verify the emission rates reported in the public notice, determine applicability to 40 CFR 60 Subparts, and to evaluate Prevention of Significant Deterioration (PSD) applicability. GHG emissions that are subject to air permit regulations consist of the sum of an aggregate group of these six greenhouse gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO_2e emissions from your facility.
2. GHG mass emissions are the sum of the total annual tons of greenhouse gases without adjusting with the global warming potentials (GWPs). GHG CO_2e emissions are the sum of the mass emissions of each individual GHG multiplied by its GWP found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.
3. Emissions from routine or predictable start up, shut down, and maintenance must be included.
4. Report GHG mass and GHG CO_2e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
5. All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
6. For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following ☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

Sources for Calculating GHG Emissions:

- Manufacturer's Data
- AP-42 Compilation of Air Pollutant Emission Factors at http://www.epa.gov/ttn/chief/ap42/index.html
- EPA's Internet emission factor database WebFIRE at http://cfpub.epa.gov/webfire/
- 40 CFR 98 Mandatory Green House Gas Reporting except that tons should be reported in short tons rather than in metric tons for the purpose of PSD applicability.
- API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. August 2009 or most recent version.
- Sources listed on EPA's NSR Resources for Estimating GHG Emissions at http://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases:

Global Warming Potentials (GWP):
Applicants must use the Global Warming Potentials codified in Table A-1 of the most recent version of 40 CFR 98 Mandatory Greenhouse Gas Reporting. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of CO_2 over a specified time period.

"Greenhouse gas" for the purpose of air permit regulations is defined as the aggregate group of the following six gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. **(20.2.70.7 NMAC, 20.2.74.7 NMAC).** You may also find GHGs defined in 40 CFR 86.1818-12(a).

Metric to Short Ton Conversion:
Short tons for GHGs and other regulated pollutants are the standard unit of measure for PSD and title V permitting programs. 40 CFR 98 Mandatory Greenhouse Reporting requires metric tons.

1 metric ton = 1.10231 short tons (per Table A-2 to Subpart A of Part 98 – Units of Measure Conversions)

GHG emissions were estimated for relevant existing and proposed sources. This was not done in prior permit applications, since in earlier applications, criteria pollutant potential emissions may have approached but did not exceed a Title V or other major source threshold. With this application, including representations made in earlier versions of the permit, the carbon monoxide potential emissions may exceed the Title V major source threshold of 100 tons per year. Therefore GHG emissions are included in this document.

GHG from combustion sources were estimated using emission factors from the EPA Center for Corporate Climate Leadership, Emission Factors for Greenhouse Gas Inventories, November 2015. Combustion produces the following GHGs: carbon dioxide (CO_2), methane (CH4), and nitrous oxide (N2O).

For external combustion sources (i.e. boilers, dryers), the emission factors in units of grams per standard cubic foot (g/scf) were divided by the fuel heating values in British Thermal Units per scf (Btu/scf) from the same reference. Then the maximum heater (or dryer) capacity was multiplied by the total to get the emission rates.

Example calculation methods are shown below for hourly and annual emission estimates.

Emissions (lb/hr):

*= emission factor (g/scf) / fuel heat content (Btu/scf) * maximum capacity (MM Btu/hr) / 453.6 (g/lb)*

Emissions (tons/yr):

*= [emissions (lb/hr) * maximum operating hours (8760 hr/yr)] / 2000 (lb/ton)*

To provide emissions in units of carbon dioxide equivalents, CO_2e, the mass emissions of each separate GHG were multiplied by its global warming potential (GWP) , from 40 CFR 98, and summed.

Greenhouse gas emissions from insignificant and exempted equipment as listed in Table 2-B were not included.

The greenhouse gas emissions are estimated in the emission calculations spreadsheets in the previous section (6).

Section 7

Information Used To Determine Emissions

<u>Information Used to Determine Emissions</u> shall include the following:

- ☑ If manufacturer data are used, include specifications for emissions units <u>and</u> control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
- ☑ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
- ☑ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
- ☐ If an older version of AP-42 is used, include a complete copy of the section.
- ☑ If an EPA document or other material is referenced, include a complete copy.
- ☐ Fuel specifications sheet.
- ☐ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

Emission factor references enclosed:

HAP Emission Factors:
AP-42 Section 1.4 "Natural Gas Combustion", 7/98 edition.
https://www3.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf. Accessed 8/2/16.

Paved Road Fugitive Dust Estimate for Trucks
AP-42 Section 13.2.1 "Paved Roads," 1/11 edition.
https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf. Accessed 7/28/16.

Dryer and Baghouse Specifications
"Dryer System Air Emission Source Points," specification sheet prepared by CFR for Southwest Cheese, 2/29/16.

Boiler Specifications
Drawing M6.0.3 Released for Construction 7/8/18 and Cleaver Brooks "Model CBEX 800 Boiler Book."
http://www.cleaverbrooks.com/Products-and-Solutions/Boilers/Firetube/CBEX-Premium/CBEX-Premium-100-800-HP-Boiler-Book.aspx.

Greenhouse Gas Emission Factors
EPA Center for Corporate Climate Leadership Emission Factors for Greenhouse Gas Inventories
https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf. Accessed 8/2/16.

Combined Annual Emission Rates from Boilers
SWC Process Operation of Proposed Boiler Addition, 8/26/16.

Existing Dryer Baghouse, DBH1 Stack Test Results for PM/PM10
Stack Test Results Summary Table, 6/29/07, excerpt from June 2007 SWC Stack Test Report.

See attached references.

Section 8

Map(s)

A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

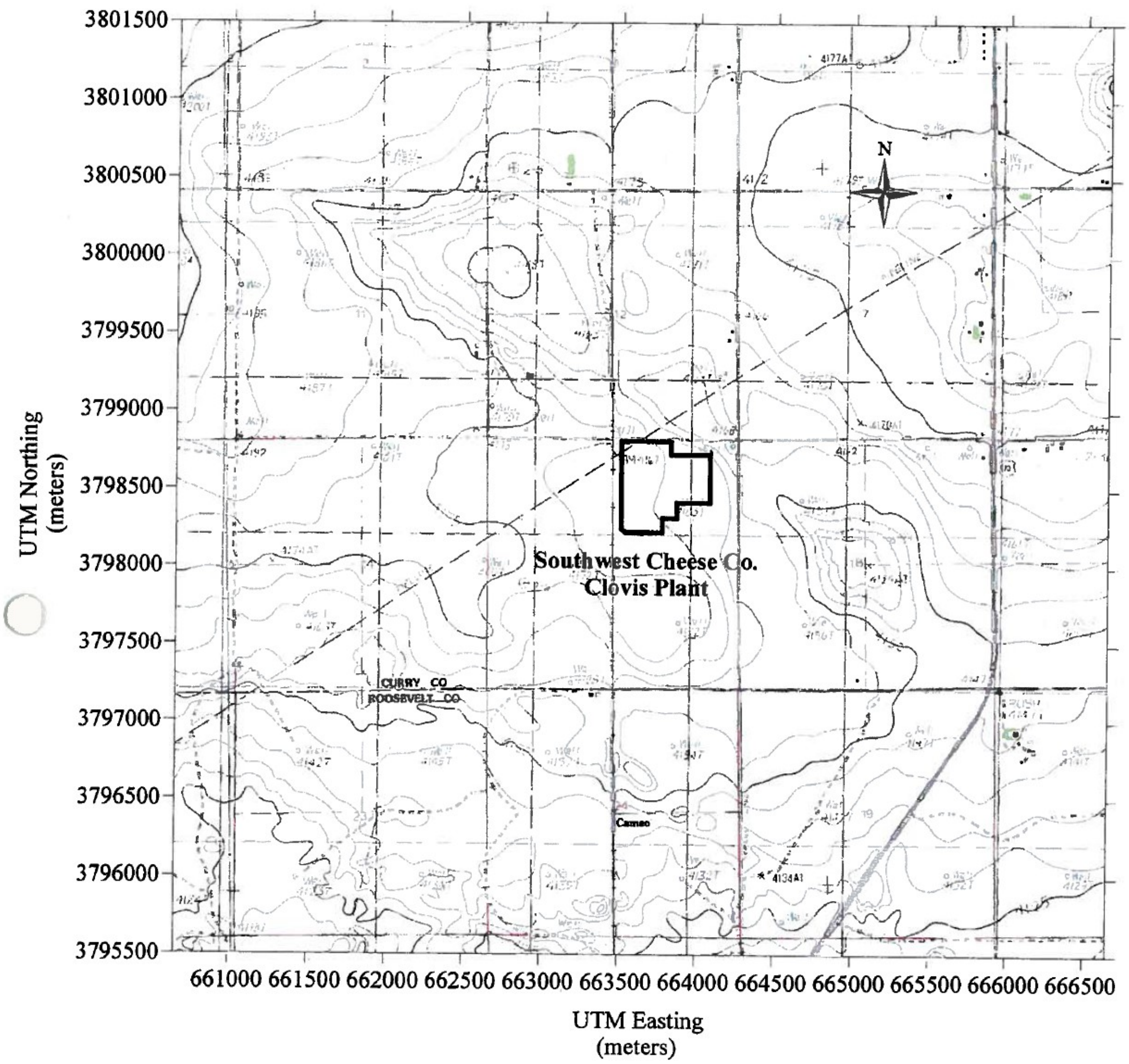

Figure F-1: 7 ½' Topo Map Showing 3 Kilometer Radius around Site Boundaries
7 ½' Quadrangles: Midway, Oasis State Park
NAD 83

Figure 8-1 SWC Area Map from Historical NMED Files

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)
(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

☑ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

New Permit and **Significant Permit Revision** public notices must include all items in this list.

Technical Revision public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1. ☑ A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. ☑ A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. ☐ A copy of the property tax record (20.2.72.203.B NMAC).
4. ☑ A sample of the letters sent to the owners of record.
5. ☑ A sample of the letters sent to counties, municipalities, and Indian tribes.
6. ☑ A sample of the public notice posted and a verification of the local postings.
7. ☑ A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. ☑ A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. ☑ A copy of the <u>classified</u> <u>or</u> <u>legal</u> ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. ☑ A copy of the <u>display</u> ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. ☑ A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.

Proof of public notice is enclosed.
See attached public notice file.

Section 10

Written Description of the Routine Operations of the Facility

A written description of the routine operations of the facility. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

This section contains a description of the routine operations of the facility. There is a brief synopsis of equipment types and an explaining of the function of each piece of equipment. The equipment types are broken down into boilers, dryer heater, control equipment, emergency generators, and diesel-fired pump.

Current Permitted Equipment:

The main devices that are sources of regulated pollutants are the main process steam boilers (BLR1, BLR2, BLR3). These 48.9 mmBtu/hr boilers are manufactured by Cleaver Brooks and are standard boilers used in the cheese process industry. They are cycled for maintenance and operational purposes so that of the three boilers, only two operate at any one time, and the other is on standby. They are automatically controlled and utilize a low NOx burner design to minimize the production of NO_2. It is not expected that these boilers will be at full load at any time to allow for swings and transients. Permit Revision #3008-M3-R1 allowed ducting biogas production from the digester to the main process steam boiler (BLR1). Permit Revision #3008-M3-R3 increased the allowable biogas feed rate to BLR1. The burning of biogas in BLR1 reduced the amount of natural gas burned on site by combusting the biogas in a stable flame of natural gas, and reduced the need for the flaring of biogas. This reduced the amount of facility site emissions and used a source of energy that had been typically being flared.

Whey is dried in a spray dryer which has an 18 mmBtu/hr natural gas-fired heater element (DRY1). The dryer is manufactured by Corbett Industries. The heater element is the only source of combustion emissions and heats the air that is used to dry the whey product. The heater element has no emission control devices. Heated air that is used in the dryer will contain whey products generated during the drying process. The dryer is rated at 3040 pounds of whey an hour. To capture the dried whey that leaves the dryer, a cyclone and baghouse are used. Whey products and heated air enter the top of the dryer. Approximately 95% is of the product remains in the dryer. The 5% of the product not collected from the dryer is discharged into the cyclone unit (CYC1) where 4% of the product is collected and returned to the top of the dryer. The remaining 1 % of the product that is discharged from the cyclone is sent to the baghouse (DBH1) where approximately 0.9% is collected and returned to the top of the dryer unit.

There are two small baghouses that control dust from the bagging room (BRBH1) and the dry milk powder room (WRBH1). These two small baghouses do not vent outside as they are located in positive pressure rooms and vented to an adjoining room. These baghouses are designed to protect personnel working in these two areas. These two baghouses are not sources of air pollution.

Located at the wastewater treatment facility (WWTF) is a reheat boiler (BLR4) that is designed to combust both natural gas and biogas. The boiler is rated at 12.55 mmBtu/hr and is manufactured by Cleaver Brooks. The reheat boiler operates only when there is a demand for heat by the anaerobic digester.

The flare (FLR1) is manufactured by Varec. The flare is presently permitted to burn a maximum of 38,530 cubic feet of biogas in an hour. Biogas produced in the anaerobic digester may contain a maximum of 0.25% by volume of H_2S in the current permit. The conversion of the H_2S in the biogas will be burned with an efficiency of 100% converting it to SO_2. All biogas is combusted as fuel for Unit #1 steam process boiler (BLR1) and/or at the flare pilot flame (FLR1) and/or biogas reheat boiler (BLR4). Unit#1 steam process boiler (BRL1), flare pilot flame (FLR1), and biogas reheat boiler (BLR4) may operate concurrently or independently.

There are two emergency/standby electric diesel fired generators on site. These two generators are exempt under the NMAC 20.2.72 regulations. Caterpillar manufactured these generators. The larger emergency generator is rated at 2000 kW and the smaller is rated at 500 kW. These generators will only operate during power outage or during monthly manufacturer's recommended maintenance periods, but no more 500 hours per year. The larger generator will provide power to the main plant in case of a power outage. The smaller generator provides power to the waste water treatment facility in the case of a power outage. Both generators will only burn low sulfur diesel fuel.

There is a code requirement for an emergency fire pump operated by a diesel-fired engine. The fire pump engine is exempt under the NMAC 20.2.72 regulations. The fire pump engine is a 300bhp John Deere certified pump engine. The engine will only operate during power outage or during monthly manufacturer's recommended maintenance periods, but no more than 500 hours per year. The operation of this diesel engine is for fire scenarios only and then only if there is a power outage, otherwise it will only run in maintenance mode. It is controlled automatically to operate during a power failure and low water header pressure simultaneously. This engine will burn only low sulfur diesel fuel.

On-site, on-road truck traffic (ROAD) is represented in the current permit as well.

Proposed Additions and Revisions to Permit:

With this significant permit revision application, SWC proposes to increase facility operations so three of the four boilers can fully operate at the same time instead of the currently permitted two of the four boilers.

In order to establish that impacts from criteria pollutants to the immediately surrounding areas will not be any cause for concern, SWC is providing some revised emission estimates for existing permitted equipment.

Section 11

Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:**

There are no sources adjacent to the source applying to this permit revision.

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

☑ **Yes** ☐ **No**

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

☑ **Yes** ☐ **No**

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

☑ **Yes** ☐ **No**

C. Make a determination:

☑ The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

Section 12

Section 12.A

PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

A PSD applicability determination for all sources. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. This facility is:

- ☑ **a minor PSD source before and after this modification (if so, delete C and D below).**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☐ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- ☐ **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

B. **This facility is not one of the listed 20.2.74.501 Table I – PSD Source Categories. The "project" emissions** for this modification are **not significant, because the source is not currently major for PSD and because proposed emission increases are beneath the significance levels in 20.2.74.502 NMAC. The "project" emissions listed below do only result from changes described in this permit application, thus no emissions from other revisions to this facility. Also, specifically discuss whether this project results in "de-bottlenecking", or other associated emissions resulting in higher emissions. The project emissions (before netting) for this project are as follows [see Table 2 in 20.2.74.502 NMAC for a complete list of significance levels]:**

a. **NOx: 8.51 TPY**
b. **CO: 13.96 TPY**
c. **VOC: 5.09 TPY**
d. **SOx: 0.07 TPY**
e. **TSP (PM): 1.60 TPY**
f. **PM10: 1.50 TPY**
g. **PM2.5: 0.36 TPY**
h. **Fluorides: 0.0 TPY**
i. **Lead: 0.0 TPY**
j. **Sulfur compounds (listed in Table 2): 0.0 TPY**

E. If this is an existing PSD major source, or any facility with emissions greater than 250 TPY (or 100 TPY for 20.2.74.501 Table 1 – PSD Source Categories), determine whether any permit modifications are related, or could be considered a single project with this action, and provide an explanation for your determination whether a PSD modification is triggered. NA.

Section 13

Discussion Demonstrating Compliance with Each Applicable State & Federal Regulation

Provide a discussion demonstrating compliance with applicable state & federal regulation. If there is a state or federal regulation (other than those listed here) for your facility's source category that does not apply to your facility, but seems on the surface that it should apply, add the regulation to the appropriate table below and provide the analysis. Examples of regulatory requirements that may or may not apply to your facility include 40 CFR 60 Subpart OOO (crushers), 40 CFR 63 Subpart HHH (HAPs), or 20.2.74 NMAC (PSD major sources). We don't want a discussion of every non-applicable regulation, but if there is questionable applicability, explain why it does not apply. All input cells should be filled in, even if the response is 'No' or 'N/A'.

In the "Justification" column, identify the criteria that are critical to the applicability determination, numbering each. For each unit listed in the "Applies to Unit No(s)" column, after each listed unit, include the number(s) of the criteria that made the regulation applicable. For example, TK-1 & TK-2 would be listed as: TK-1 (1, 3, 4), TK-2 (1, 2, 4). Doing so will provide the applicability criteria for each unit, while also minimizing the length of these tables.

As this table will become part of the SOB, please do not change the any formatting in the table, especially the width of the table.

If this application includes any proposed exemptions from otherwise applicable requirements, provide a narrative explanation of these proposed exemptions. These exemptions are from specific applicable requirements, which are spelled out in the requirements themselves, not exemptions from 20.2.70 NMAC or 20.2.72 NMAC.

Table for Applicable STATE REGULATIONS:

STATE REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Federally Enforce-able	Does Not Apply	JUSTIFICATION: Identify the applicability criteria, numbering each (i.e. 1. Post 7/23/84, 2. 75 m^3, 3. VOL)
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes		Yes		20.2.3 NMAC is a SIP approved regulation that limits the maximum allowable concentration of Total Suspended Particulates, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide. Title V applications, see exemption at 20.2.3.9 NMAC
20.2.7 NMAC	Excess Emissions	Yes		Yes		All Title V major sources are subject to Air Quality Control Regulations, as defined in 20.2.7 NMAC, and are thus subject to the requirements of this regulation. Also listed as applicable in NSR Permit 3008-M3-R3.
20.2.61.109 NMAC	Smoke & Visible Emissions		BLR1, BLR2, BLR3, BLR4, BLR5 DRY1, DRY2, FLR1	No		Engines and heaters are Stationary Combustion Equipment.
20.2.70 NMAC	Operating Permits	Yes		Yes		Source may become major for CO.
20.2.71 NMAC	Operating Permit Fees	Yes		Yes		A facility subject to 20.2.70 NMAC is in turn subject to 20.2.71 NMAC.
20.2.72 NMAC	Construction Permits			Yes		This facility is subject to 20.2.72 NMAC and NSR Permit number: 3008-R3-M3.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes		Yes		**Emissions Inventory Reporting:** 20.2.73.300 NMAC applies.

STATE REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Federally Enforce-able	Does Not Apply	JUSTIFICATION: Identify the applicability criteria, numbering each (i.e. 1. Post 7/23/84, 2. 75 m^3, 3. VOL)
20.2.75 NMAC	Construction Permit Fees	Yes		Yes		This facility is subject to 20.2.72 NMAC and is in turn subject to 20.2.75 NMAC. N/A if subject to 20.2.71 NMAC.
20.2.77 NMAC	New Source Performance	Yes	BLR1, BLR2, BLR3, BLR5			This is a stationary source which is subject to the requirements of NSPS 40 CFR60.40c, Subpart Dc.

Table for Applicable FEDERAL REGULATIONS:

FEDERAL REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Federally Enforce-able	Does Not Apply	JUSTIFICATION:
40 CFR 50	NAAQS	Yes		Yes		Defined as applicable at 20.2.70.7.E.11, Any national ambient air quality standard
NSPS 40 CFR 60, Subpart A	General Provisions		BLR1, BLR2, BLR3, BLR5	Yes		Applies if any other NSPS subpart applies.
NSPS 40 CFR60.40 c, Subpart Dc	Standards of Performance for **Small Industrial-Commercial-Institutional Steam Generating Units** the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) or		BLR1, BLR2, BLR3, BLR5			Establishes reporting and recordkeeping requirements for Units BLR 1, BLR2 BLR3, BLR4, and BLR5. Capacities of these units exceed the 10 mmBtu/hr threshold, but are less than 100 mmBtu/hr. Construction after 1989.

FEDERAL REGU-LATIONS CITATION	Title	Applies to Entire Facility	Applies to Unit No(s).	Federally Enforce-able	Does Not Apply	JUSTIFICATION:
	less, but greater than or equal to 2.9 MW (10 MMBtu/hr).					
40 CFR 64	**Compliance Assurance Monitoring**		DRY1, DRY2	Yes		

Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☑ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☐ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

Operational Plan to Mitigate Emissions

Startups and Shutdowns

For material processing equipment at the Southwest Cheese Company's Clovis Plant, Southwest Cheese Company will follow normal industry practices in minimizing emissions during startup and shutdown. All control equipment will be functioning correctly prior to production beginning. Fuel burning equipment will be maintained per plant maintenance schedules to ensure flare and boilers are functioning correctly during normal startups and shutdowns.

Malfunctions Operational Plan

During malfunctions, where excessive emissions are observed, malfunctioning processes will be shut down and repairs to equipment will be made with reasonable effort, including the use of off-shift and overtime labor as needed.

Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Alternative Operating Scenarios: Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

As part of the wastewater treatment process, an anaerobic digester produces biogas. This biogas is combusted as fuel for Unit #1 steam process boiler (BLR1) and/or at the flare (FLR1). These two units may operate concurrently or independently, on biogas or natural gas as provided in this application.

At the Clovis Plant, generally only two of the four boilers, BLR1, BLR2, BLR3, or BLR5, provides steam at any one time. The other boilers are on Standby operating at approximately 10% load.

Of these boilers, only BLR5 is new with this application. The proposed new boiler, BLR5, as stated, will provide backup, and otherwise be on Standby operating at approximately 10% load.

Section 16

Air Dispersion Modeling

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1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

What is the purpose of this application?	Enter an X for each purpose that applies
New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above.	
New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions.	x
Reporting existing pollutants that were not previously reported.	
Reporting existing pollutants where the ambient impact is being addressed for the first time.	
Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above.	
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

- ☐ See attached, approved modeling **waiver for all** pollutants from the facility.
- ☐ See attached, approved modeling **waiver for some** pollutants from the facility.
- ☑ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.
- ☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.
- ☐ No modeling is required.

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

To show compliance with existing NSR permits conditions, you must submit a compliance test history. The table below provides an example.

Compliance Test History Table

Unit No.	Test Description	Test Date
BLR1	Tested in accordance with EPA test methods for NOx, CO and SO2 as required by NSR Permit 3008-M3, Condition permit 6.a.	October 10, 2008
BLR1, BLR2, BLR3	Tested in accordance with EPA test methods for CO as required by NSR Permit 3008-M2. Condition 6.c.	March 25-26, 2008
BLR1, BLR2, BLR3	Tested in accordance with EPA test methods for NOx, CO, SO2,TSP, PM10, and VOC.	June 25-26, 2007
BLR 4	Tested in accordance with EPA test methods for NOx and CO.	June 27, 2007
DRY1	Tested in accordance with EPA test methods for NOx, CO, and SO2.	June 27, 2007
DBH1	Tested in accordance with EPA test methods for TSP and PM10.	June 29,2007
DRY1 and BLR1	Tested in accordance with EPA test methods for NOx and CO as required by NSR permit 3008-M1.	April 25 and 26, 2006
BLR2, BLR3, BLR4, DRY1	Tested in accordance with EPA test methods for NOx and CO as required by NSR permit 3008-M1.	November 8-10 2005
DBH1	Tested in accordance with EPA test methods for TSP and PM10 as required by NSR permit 3008-M1.	November 8-10 2005

Section 20

Other Relevant Information

Other relevant information. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

SWC would appreciate expedited processing of this permit application, in order to meet the production schedule.

NMED application tables 2-K through 2-O were not included since they were not applicable.

Section 13 regulatory applicability was provided for proposed permit sources and not for historical or existing exempt or insignificant sources. It was assumed this information is already on file.

NMED application sections 18, 19 and 21were not included since they were not applicable.

Section 22: Certification

Company Name: Southwest Cheese Company

I, ___________________________________, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this ____ day of ________________, ________, upon my oath or affirmation, before a notary of the State of

__________________________________.

PLEASE SEE ORIGINAL HARD COPY FOR SIGNED CERTIFICATION PAGE

_______________________________________ ________________________
*Signature Date

_______________________________________ ________________________
Printed Name Title

Scribed and sworn before me on this ____ day of _________________________, _________.

My authorization as a notary of the State of _______________________________ expires on the

_________________ day of _______________________, ______________.

_______________________________________ ________________________
Notary's Signature Date

____
Notary's Printed Name

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.

UA4
Air Dispersion Modeling Report

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility:	Clovis Plant
2	Name of company:	Southwest Cheese Company LLC
3	Current Permit number:	P280
4	Name of applicant's modeler:	Sara Woolsey
5	Phone number of modeler:	303.664.4630
6	E-mail of modeler:	sara.woolsey@tetratech.com

16-B: Brief

1	Was a modeling protocol submitted and approved?	Yes☐	No☒
2	Why is the modeling being done?	Other (describe below)	
3	Describe the permit changes relevant to the modeling.		
	Increasing facility operations so three of the four boilers can fully operate at the same time instead of the currently permitted two of the four boilers.		
4	What geodetic datum was used in the modeling?	NAD27	
5	How long will the facility be at this location?	Permanent	
6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☐	No☒
7	Identify the Air Quality Control Region (AQCR) in which the facility is located	155	

8	List the PSD baseline dates for this region (minor or major, as appropriate).			
	NO2	3/16/1988, minor		
	SO2	7/28/1978, minor		
	PM10	2/20/1979, minor		
	PM2.5	11/13/2013, minor		
9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).			
	No Class I areas are within 50 km of the facility. Salt Creek Wilderness Area is the closest Class I area at approximately 128.5 km away.			
10	Is the facility located in a non-attainment area? If so describe below		Yes☐	No☒
11	Describe any special modeling requirements, such as streamline permit requirements.			
	None.			

16-C: Modeling History of Facility

1	Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).			
	Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
	CO	3008M4	12/9/2016	ROI modeling showed 1-hour and 8-hour concentrations below the SILs.
	NO_2	3008M4	12/9/2016	The ROI analysis identified SIL exceedances which required the AAQS and PSD analyses. The surrounding sources were included in the AAQS and PSD Increment Class II modeling.
	SO_2	3008M4	12/9/2016	The ROI analysis identified SIL exceedances which required the AAQS and PSD analyses. The surrounding sources were included in the AAQS and PSD Increment Class II modeling.
	H_2S	N/A	N/A	N/A
	PM2.5	3008M4	12/9/2016	The ROI analysis identified SIL exceedances which required the AAQS and PSD analyses. The surrounding sources were included in the AAQS and PSD Increment Class II modeling.
	PM10	3008M4	12/9/2016	The ROI analysis identified SIL exceedances which required the AAQS and PSD analyses. The surrounding sources were included in the AAQS and PSD Increment Class II modeling. A culpability analysis was performed for the PSD Increment Class II modeling with the produced MaxiFiles demonstrating that the facility was not a major contributor to the exceedances.

	Lead	3008M4	12/9/2016	ROI modeling showed the quarterly averaging period concentrations (modeled as monthly) below the SIL.
	Ozone (PSD only)	N/A	N/A	N/A
	NM Toxic Air Pollutants (20.2.72.402 NMAC)	N/A	N/A	N/A

16-D: Modeling performed for this application

1	For each pollutant, indicate the modeling performed and submitted with this application. Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.					
	Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
	CO	☒	☐	☐	☐	☐
	NO_2	☒	☒	☐	☐	☐
	SO_2	☒	☒	☐	☐	☐
	H_2S	☐	☐	☐	☐	☒
	PM2.5	☒	☒	☐	☐	☐
	PM10	☒	☒	☐	☐	☐
	Lead	☒	☐	☐	☐	☐
	Ozone	☐	☐	☐	☐	☒
	State air toxic(s) (20.2.72.402 NMAC)	☐	☐	☐	☐	☒

16-E: New Mexico toxic air pollutants modeling

1	List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application. None.					
2	List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.					
	Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor

16-F: Modeling options

1	Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☒	No☐

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	Data provided on February 22, 2021.
2	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed.	
	AQB Source ID	Description of Corrections
	16/10016	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	17/10017	Moved the International Ingredient Corporation point source 90 m east to lay on the facility property instead of an open field.
	18/10018	Moved the International Ingredient Corporation point source 90 m east to lay on the facility property instead of an open field.
	19/10019	Moved the International Ingredient Corporation point source 90 m east to lay on the facility property instead of an open field.
	20/10020	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	21/10021	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	22/10022	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	23/10023	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.

	24/10024	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	25/10025	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	26/10026	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	27/10027	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	28/10028	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	29/10029	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	30/10030	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion

		rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	31/10031	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.
	32/10032	Changed the International Ingredient Corporation volume source to a point source. Assigned the same point source stack parameters (stack height, temperature, exit velocity, and stack diameter) as provided in the 2016 surrounding source inventory from AQB for this source. The AQB provided PM_{10} and $PM_{2.5}$ emission rates were the exact same. The $PM_{2.5}$ emission rate was decreased because the IIC air permit does not include $PM_{.5}$ and that bin vents and similar sources should emit less $PM_{2.5}$ than PM_{10}. AP-42 Tables 9.9.1-1 and 9.6.1-2 were reviewed and particulate ratios calculated, and a conservative conversion rate of 1/3 was determined to be appropriate to revise the $PM_{2.5}$ emission rate. Also moved the source 90 m east to lay on the facility property instead of an open field.

16-H: Building and structure downwash

1	How many buildings are present at the facility?	20		
2	How many above ground storage tanks are present at the facility?	2		
3	Was building downwash modeled for all buildings and tanks? If not explain why below.		Yes☒	No☐
4	Building comments	None.		

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area.		
	The facility is surrounded by a six-foot chain link fence with a limited number of access points. These access points are either continuously monitored or secured when not in use.		
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?	Yes☐	No☒
3	Are restricted area boundary coordinates included in the modeling files?	Yes☒	No☐

4	Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.					
	Grid Type	Shape	Spacing	Start distance from restricted area or center of facility	End distance from restricted area or center of facility	Comments
	Cartesian	Fence line	50 m	0 m	0 m	Along fence line only.
	Cartesian	Rectangular	100 m	0 m	1,000 m	From fence line out to 1,000 m from fence line.
	Cartesian	Rectangular	250 m	1,000 m	2,500 m	From 1,000 m to 2,500 m from fence line.
	Cartesian	Rectangular	500 m	2,500 m	5,000 m	From 2,500 m to 5,000 m from fence line.
	Cartesian	Rectangular	1,000 m	5,000 m	10,000 m	From 5,000 m to 10,000 m from fence line.
5	Describe receptor spacing along the fence line.					
	The fence line spacing is 50 m.					
6	Describe the PSD Class I area receptors.					
	N/A.					

16-J: Sensitive areas

1	Are there schools or hospitals or other sensitive areas near the facility? If so describe below. This information is optional (and purposely undefined) but may help determine issues related to public notice.	Yes☐	No☒
3	The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application?	Yes☐	No☒

16-K: Modeling Scenarios

1	Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).
	The facility wants to operate three of the four steam heating boilers (BLR1, BLR2, and BLR3) at full capacity at any one time and the fourth steam heating boiler (BLR5) at a reduced load. The ROI modeling was performed with the BLR5 boiler at 100% load and 13% load. The application lists BLR5 at 10% load. The manufacturer has an emissions data sheet for the boiler which lists source parameters for 13%, 50%, 75%, and 100% load. The source parameters for 13% and 100% loads were used accordingly. The emissions rates at 13% load were calculated using the 13% load heat input (4.037 MMBtu/hr) listed in the manufacturer emissions data report, while the 100% load emission rates were calculated using the nameplate input rating (33.472 MMBtu/hr). The 13% load ROI modeling produced high first high concentrations less than the 100% load ROI modeling high first high concentration; therefore, the 100% load scenario was only used for the AAQS and PSD modeling.

	For the SO_2 modeling, one boiler (BLR1) is equipped to burn biogas and natural gas depending on the operating scenario. Scenario 1 has all biogas sent to the flare (FLR1) and BLR1 only burns natural gas. Scenario 2 has a maximum of 30% biogas used as fuel for BLR1with the rest of the fuel being natural gas and FLR1 burns the remaining biogas.
2	Which scenario produces the highest concentrations? Why?
	The ROI modeling with BLR5 operating at 100% load produces the highest concentrations compared to the modeling with BLR5 at 13% load. Operating all four steam heating boilers at 100% load is the worst-case operating scenario. All AAQS and PSD modeling were performed with the BLR5 100% operating conditions including emissions rates and stack parameters. Scenario 2 produced the highest SO_2 concentrations for the 1-hour and annual averaging periods for the ROI modeling, but Scenario 1 produced the highest SO_2 concentrations for the 3-hour and 24-hour averaging periods for the ROI modeling. Therefore, both Scenarios 1 and 2 were analyzed for the AAQS and PSD modeling.

3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes☐	No☒
4	If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.) Sources:		

Item 5:

Hour of Day	Factor	Hour of Day	Factor								
1		13									
2		14									
3		15									
4		16									
5		17									
6		18									
7		19									
8		20									
9		21									
10		22									
11		23									
12		24									

If hourly, variable emission rates were used that were not described above, describe them below.

6	Were different emission rates used for short-term and annual modeling? If so describe below.	Yes☐	No☒

16-L: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply.	
	☒	ARM2
	☐	100% NO_X to NO_2 conversion
	☐	PVMRM
	☐	OLM

	☐	Other:

2	Describe the NO_2 modeling.		
	The Tier 2, Ambient Ratio Method 2 (ARM2), technique with the default ratios (0.5 minimum and 0.9 maximum) was used for all of the NO_2 modeling.		
3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.	Yes☒	No☐
4	Describe the design value used for each averaging period modeled. Description on the annual average: The high first high from the combined five years of meteorological data was used.		
	1-hour: High eighth high Annual: Other (Describe):		

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.	
	☐	PM2.5
	☐	PM10
	☒	None
2	Describe the particle size distributions used. Include the source of information.	
	None.	

3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.	Yes☒	No☐
4	Was secondary PM modeled for PM2.5?	Yes☐	No☒

5	If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.			
	NO_X (ton/yr)	SO_2 (ton/yr)	$[PM2.5]_{annual}$	$[PM2.5]_{24\text{-hour}}$
	70.82	34.26	0.007442	0.2563

16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	N/A.
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.

	N/A.

16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below.	Yes☒	No☐
	Unit Number in UA-2	Unit Number in Modeling Files	
2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.	Yes☐	No☒
	The only emission rates that doe not match are the emission rates for the BLR5 13% load and the SO_2 emission rates are combined for the FLR1 and BLR1 in the tables. All other emission rates should match.		
3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	Yes☐	No☒
4	Which units consume increment for which pollutants? None.		

Unit ID	NO_2	SO_2	PM10	PM2.5

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).	N/A.	
6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐

16-P: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	FLR1, all scenarios	24.8	668,935	0.71

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☐	No☒

2	Describe the determination of sigma-Y and sigma-Z for fugitive sources.		
	The modeled volume sources are for the haul road emissions from the facility. Sigma Y and sigma Z are based on the road width of 25 feet and an average truck height of 11.5 feet and methodology in AQB Modeling Guidelines Section 5.3.3. Sigma Y is calculated by the equation for adjacent road volume sources (W/2.15), while sigma Z is determined by dividing the plume height by 2.15 (PH/2.15).		
3	Describe how the volume sources are related to unit numbers. Or say they are the same.		
	The haul road routes are represented by a series of adjacent volume sources. Each haul route volume source is equally spaced along the route. All haul routes end 50 m before the intersection with the public road, as identified in AQB Modeling Guidelines Section 5.3.3, and the total emission rate is allocated appropriately along the remaining haul road lengths.		
4	Describe any open pits.		
	None.		
5	Describe emission units included in each open pit.		
	N/A.		

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☒	No☐
	CO: N/A		
	NO_2: Outside Carlsbad (350151005)		
	PM2.5: Hobbs-Jefferson (350450019)		
	PM10: Hobbs-Jefferson (350250008)		
	SO_2: Amarillo (483751025)		
	Other:		
	Comments:		
2	Were background concentrations refined to monthly or hourly values? If so describe below.	Yes☐	No☒

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used. Clovis Clovis 2016-2020 meteorological data.	Yes☒	No☐
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		
	N/A		

16-T: Terrain			
1	Was complex terrain used in the modeling? If not, describe why below.	Yes☒	No☐
2	What was the source of the terrain data?		
	Downloaded the National Elevation Data (NED) from the U.S. Geological Survey Staged Products Directory in ArcGrid format, then converted to GeoTIFF using the Geospatial Data Abstraction Library (GDAL) and running the "Terrain Files Converter" in BEEST.		

16-U: Modeling Files			
1	Describe the modeling files: All modeling input (*.DTA), output (*.LST), and BPIP (*.PIP and associated files) are located in each folder identified below along with the listed BEEST (*.BST and other associated files).		
	File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
	ROI/Gas/SWC_Gas_5MetFiles_ROI.BST	CO	ROI (1-hr and 8-hr) for facility with BLR5 100% Load.
	ROI/Gas/SWC_Gas_5MetFiles_ROI.BST	NO_2	ROI (24-hr and Annual) for facility with BLR5 100% Load.
	ROI/Gas/SWC_Gas_CombinedMetFile_ROI.BST	NO_2	ROI (1-hr) for facility with BLR5 100% Load.
	ROI/Pb/SWC_Pb_ROI.BST	Pb	ROI (Quarterly modeled as monthly) for facility with BLR5 100% Load.
	ROI/PM/SWC_PM_ROI.BST	$PM_{2.5}$	ROI (24-hr and Annual) for facility with BLR5 100% Load.
	ROI/PM/SWC_PM_ROI.BST	PM_{10}	ROI (24-hr and Annual) for facility with BLR5 100% Load.
	ROI/Gas/SWC_Gas_5MetFiles_ROI.BST	SO_2	ROI (3-hr, 24-hr, and Annual) for facility with BLR5 100% Load and for Scenario 1.
	ROI/Gas/SWC_Gas_CombinedMetFile_ROI.BST	SO_2	ROI (1-hr) for facility with BLR5 100% Load and for Scenario 1.
	ROI/Gas/SWC_Scen2SO2_5MetFiles_ROI.BST	SO_2	ROI (3-hr, 24-hr, and Annual) for facility with BLR5 100% Load and for Scenario 2.
	ROI/Gas/SWC_Gas_Scen2SO2_CombinedMetFile_ROI.BST	SO_2	ROI (1-hr) for facility with BLR5 100% Load and for Scenario 2.
	ROI/13percentLoad/Gas/SWC_Gas_5MetFiles_ROI.BST	CO	ROI (1-hr and 8-hr) for facility with BLR5 13% Load.
	ROI/13percentLoad/Gas/SWC_Gas_5MetFiles_ROI.BST	NO_2	ROI (24-hr and Annual) for facility with BLR5 13% Load.
	ROI/13percentLoad/Gas/SWC_Gas_CombinedMetFile_ROI_13.BST	NO_2	ROI (1-hr) for facility with BLR5 13% Load.
	ROI/13percentLoad/Pb/SWC_Pb_ROI_13.BST	Pb	ROI (Quarterly modeled as monthly) for facility with BLR5 13% Load.
	ROI/13percentLoad/PM/SWC_PM_ROI_13.BST	$PM_{2.5}$	ROI (24-hr and Annual) for facility with BLR5 13% Load.
	ROI/13percentLoad/PM/SWC_PM_ROI_13.BST	PM_{10}	ROI (24-hr and Annual) for facility with BLR5 13% Load.

	ROI/13percentLoad/Gas/SWC_Gas_5MetFiles_ROI.BST	SO_2	ROI (3-hr, 24-hr, and Annual) for facility with BLR5 13% Load and for Scenario 1.
	ROI/13percentLoad/Gas/SWC_Gas_CombinedMetFile_ROI_13.BST	SO_2	ROI (1-hr) for facility with BLR5 13% Load and for Scenario 1.
	ROI/13percentLoad/Gas/SWC_Scen2SO2_5MetFiles_ROI_13.BST	SO_2	ROI (3-hr, 24-hr, and Annual) for facility with BLR5 13% Load and for Scenario 2.
	ROI/13percentLoad/Gas/SWC_Gas_Scen2SO2_CombinedMetFile_ROI_13.BST	SO_2	ROI (1-hr) for facility with BLR5 13% Load and for Scenario 2.
	Cumulative/NO2/SWC_NO2_5MetFiles_AAQS.BST	NO_2	Cumulative AAQS (Annual)
	Cumulative/NO2/SWC_NO2_CombinedMetFile_AAQS.BST	NO_2	Cumulative AAQS (1-hr)
	Cumulative/NO2/SWC_NO2_5MetFiles_PSD.BST	NO_2	Cumulative PSD (Annual)
	Cumulative/PM/SWC_PM2.5_AAQS.BST	$PM_{2.5}$	Cumulative AAQS (24-hr and Annual)
	Cumulative/PM/SWC_PM2.5_PSD.BST	$PM_{2.5}$	Cumulative PSD (24-hr and Annual)
	Cumulative/PM/SWC_PM10_AAQS.BST	PM_{10}	Cumulative AAQS (24-hr)
	Cumulative/PM/SWC_PM10_PSD.BST	PM_{10}	Cumulative PSD (24-hr and Annual)
	Cumulative/SO2/SWC_SO2_CombinedMetFile_AAQS.BST	SO_2	Cumulative AAQS (1-hr) for Scenario 1.
	Cumulative/SO2/SWC_Scen2SO2_CombinedMetFile_AAQS.BST	SO_2	Cumulative AAQS (1-hr) for Scenario 2.
	Cumulative/SO2/SWC_SO2_5MetFiles_PSD.BST	SO_2	Cumulative PSD (3-hr, 24-hr, and Annual) for Scenario 1.
	Cumulative/SO2/SWC_Scen2SO2_5MetFiles_PSD.BST	SO_2	Cumulative PSD (3-hr, 24-hr, and Annual) for Scenario 2.

16-V: PSD New or Major Modification Applications N/A

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☐
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☐	No☐
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☐	No☐

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☐	No☒
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (~~ft~~) (m)
CO, 1-hr, SIL	327.30	N/A	N/A	N/A	N/A	2,000*	16.36	663,664.50	3,798,022.10	1,269.43
CO, 8-hr, SIL	140.77	N/A	N/A	N/A	N/A	500*	28.15	663,664.50	3,798,022.10	1,269.43
NO_2, 1-hr, SIL	129.27	N/A	N/A	N/A	N/A	7.52*	1,719	663,664.50	3,798,022.10	1,269.43
NO_2, 24-hr, SIL	45.19	N/A	N/A	N/A	N/A	5*	904	663,546.80	3,798,324.60	1,269.30
NO_2, Annual, SIL	4.87	N/A	N/A	N/A	N/A	1*	487	663,546.80	3,798,324.60	1,269.30
NO_2, 1-hr, AAQS	(1)	133.02	N/A	38.70	171.72	188.03	91.33	661,500.00	3,804,000.00	1,291.32
NO_2, Annual, AAQS	(1)	6.26	N/A	5.00	11.26	99.66 (N) 94.02 (NM)	11.29 (N) 11.97 (NM)	663,664.50	3,798,022.10	1,269.43
NO_2, Annual, PSD	(1)	6.26	N/A	N/A	6.26	25	25.02	663,664.50	3,798,022.10	1,269.43

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (~~ft~~) (m)
$PM_{2.5}$, 24-hr, SIL	14.21	N/A	N/A	N/A	N/A	1.2*	1,184	663,664.50	3,798,022.10	1,269.43
$PM_{2.5}$, Annual, SIL	2.03	N/A	N/A	N/A	N/A	0.2*	1,014	663,903.40	3,798,223.40	1,268.30
$PM_{2.5}$, 24-hr, AAQS	(1)	9.75	0.2563	13.40	23.41	35	66.89	663,619.00	3,798,021.30	1,269.02
$PM_{2.5}$, Annual, AAQS	(1)	3.33	0.007442	5.90	9.24	12	77.02	663,903.40	3,798,223.40	1,268.30
$PM_{2.5}$, 24-hr, PSD	(1)	6.21	0.2563	N/A	6.47	9	26.21	663,664.50	3,798,022.10	1,269.43
$PM_{2.5}$, Annual, PSD	(1)	1.04	0.007442	N/A	1.05	4	71.86	663,546.80	3,798,324.60	1,269.30
PM_{10}, 24-hr, SIL	17.11	N/A	N/A	N/A	N/A	5*	342	663,664.50	3,798,022.10	1,269.43
PM_{10}, Annual, SIL	2.88	N/A	N/A	N/A	N/A	1*	288	663,678.30	3,798,605.60	1,270.18
PM_{10}, 24-hr, AAQS	(1)	19.84	N/A	37.30	57.14	150	38.09	663,600.00	3,797,700.00	1,269.39
PM_{10}, 24-hr, PSD	(1)	25.54	N/A	N/A	25.54	30	85.13	663,600.00	3,797,700.00	1,269.39
PM_{10}, Annual, PSD	(1)	4.55	N/A	N/A	4.55	17	26.79	663,664.50	3,798,022.10	1,269.43

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (~~ft~~) (m)
Pb, Quarterly, SIL	1.4E-4	N/A	N/A	N/A	N/A	0.03	0.47	663,546.80	3,798,324.60	1,269.30
SO_2, 1-hr, SIL (Scenario 1)	103.90	N/A	N/A	N/A	N/A	7.8*	1,332	663,903.40	3,798,223.40	1,268.30
SO_2, 3-hr, SIL (Scenario 1)	97.67	N/A	N/A	N/A	N/A	25*	391	663,903.40	3,798,223.40	1,268.30
SO_2, 24-hr, SIL (Scenario 1)	42.14	N/A	N/A	N/A	N/A	5*	843	663,903.40	3,798,223.40	1,268.30
SO_2, Annual, SIL (Scenario 1)	2.02	N/A	N/A	N/A	N/A	1*	202	664,108.40	3,798,324.50	1,268.23
SO_2, 1-hr, SIL (Scenario 2)	125.46	N/A	N/A	N/A	N/A	7.8*	1,608	663,500.00	3,798,100.00	1,271.15
SO_2, 3-hr, SIL (Scenario 2)	85.61	N/A	N/A	N/A	N/A	25*	342	663,546.80	3,798,324.60	1,269.30
SO_2, 24-hr, SIL (Scenario 2)	37.92	N/A	N/A	N/A	N/A	5*	758	663,546.80	3,798,324.60	1,269.30
SO_2, Annual, SIL (Scenario 2)	3.50	N/A	N/A	N/A	N/A	1*	350	663,546.80	3,798,324.60	1,269.30

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (~~ft~~) (m)
SO_2, 1-hr, AAQS (Scenario 1)	(1)	93.21	N/A	47.00	140.21	196.4	71.39	663,903.40	3,798,223.40	1,268.30
SO_2, 1-hr, AAQS (Scenario 2)	(1)	110.22	N/A	47.00	157.22	196.4	80.05	663,546.80	3,798,324.60	1,269.30
SO_2, 3-hr, PSD (Scenario 1)	(1)	89.34	N/A	N/A	89.34	512	17.45	663,903.40	3,798,223.40	1,268.30
SO_2, 24-hr, PSD (Scenario 1)	(1)	32.98	N/A	N/A	32.98	91	36.24	663,903.40	3,798,223.40	1,268.30
SO_2, Annual, PSD (Scenario 1)	(1)	2.11	N/A	N/A	2.11	20	10.53	664,108.40	3,798,324.50	1,268.23
SO_2, 3-hr, PSD (Scenario 2)	(1)	78.54	N/A	N/A	78.54	512	15.34	663,546.80	3,798,324.60	1,269.30
SO_2, 24-hr, PSD (Scenario 2)	(1)	32.39	N/A	N/A	32.39	91	35.59	663,546.80	3,798,324.60	1,269.30
SO_2, Annual, PSD (Scenario 2)	(1)	3.59	N/A	N/A	3.59	20	17.94	663,546.80	3,798,324.60	1,269.30

Notes:
* SIL concentration
(1) Modeled facility concentration is included in the modeled concentration with surrounding sources.
(N) NAAQS
(NM) NMAAQS

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (~~ft~~) (m)

The SIL results are the high first high for all pollutants and averaging periods.

The NAAQS and NMAAQS standards are compared to the appropriate high concentration for the pollutants and averaging periods as identified in the AQB Modeling Guidelines Section 2.6 and summarized in Table 6C. The 1-hour and annual NO_2 and 1-hour SO_2 total cumulative concentrations include the facility, surrounding sources, and background concentration as a worst-case scenario to compare against the appropriate NAAQS and NMAAQS.

The PSD Increment is compared to the high first highs for the annual averaging periods and high second highs for the short-term averaging periods as directed in the AQB Modeling Guidelines Section 2.6.

16-X: Summary/conclusions	
1	A statement that modeling requirements have been satisfied and that the permit can be issued.
	Modeling requirements have been satisfied and the permit can be issued.

Emissions References

1.4 Natural Gas Combustion

1.4.1 General[1-2]

Natural gas is one of the major combustion fuels used throughout the country. It is mainly used to generate industrial and utility electric power, produce industrial process steam and heat, and heat residential and commercial space. Natural gas consists of a high percentage of methane (generally above 85 percent) and varying amounts of ethane, propane, butane, and inerts (typically nitrogen, carbon dioxide, and helium). The average gross heating value of natural gas is approximately 1,020 British thermal units per standard cubic foot (Btu/scf), usually varying from 950 to 1,050 Btu/scf.

1.4.2 Firing Practices[3-5]

There are three major types of boilers used for natural gas combustion in commercial, industrial, and utility applications: watertube, firetube, and cast iron. Watertube boilers are designed to pass water through the inside of heat transfer tubes while the outside of the tubes is heated by direct contact with the hot combustion gases and through radiant heat transfer. The watertube design is the most common in utility and large industrial boilers. Watertube boilers are used for a variety of applications, ranging from providing large amounts of process steam, to providing hot water or steam for space heating, to generating high-temperature, high-pressure steam for producing electricity. Furthermore, watertube boilers can be distinguished either as field erected units or packaged units.

Field erected boilers are boilers that are constructed on site and comprise the larger sized watertube boilers. Generally, boilers with heat input levels greater than 100 MMBtu/hr, are field erected. Field erected units usually have multiple burners and, given the customized nature of their construction, also have greater operational flexibility and NO_x control options. Field erected units can also be further categorized as wall-fired or tangential-fired. Wall-fired units are characterized by multiple individual burners located on a single wall or on opposing walls of the furnace while tangential units have several rows of air and fuel nozzles located in each of the four corners of the boiler.

Package units are constructed off-site and shipped to the location where they are needed. While the heat input levels of packaged units may range up to 250 MMBtu/hr, the physical size of these units are constrained by shipping considerations and generally have heat input levels less than 100 MMBtu/hr. Packaged units are always wall-fired units with one or more individual burners. Given the size limitations imposed on packaged boilers, they have limited operational flexibility and cannot feasibly incorporate some NO_x control options.

Firetube boilers are designed such that the hot combustion gases flow through tubes, which heat the water circulating outside of the tubes. These boilers are used primarily for space heating systems, industrial process steam, and portable power boilers. Firetube boilers are almost exclusively packaged units. The two major types of firetube units are Scotch Marine boilers and the older firebox boilers. In cast iron boilers, as in firetube boilers, the hot gases are contained inside the tubes and the water being heated circulates outside the tubes. However, the units are constructed of cast iron rather than steel. Virtually all cast iron boilers are constructed as package boilers. These boilers are used to produce either low-pressure steam or hot water, and are most commonly used in small commercial applications.

Natural gas is also combusted in residential boilers and furnaces. Residential boilers and furnaces generally resemble firetube boilers with flue gas traveling through several channels or tubes with water or air circulated outside the channels or tubes.

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6\ m^3$, multiply by 16. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6$ scf$]$ = (3.67) (CON) (C)(D), where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, $4.2x10^4\ lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2.
Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b, c]	2.4E-05	D
56-49-5	3-Methylchloranthrene[b, c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
205-82-3	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION (Continued)

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
74-98-6	Propane	1.6E+00	E
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6\ m^3$, multiply by 16. To convert from $1b/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.

[b] Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.

[c] HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.

[d] The sum of individual organic compounds may exceed the VOC and TOC emission factors due to differences in test methods and the availability of test data for each pollutant.

13.2.1 Paved Roads

13.2.1.1 General

Particulate emissions occur whenever vehicles travel over a paved surface such as a road or parking lot. Particulate emissions from paved roads are due to direct emissions from vehicles in the form of exhaust, brake wear and tire wear emissions and resuspension of loose material on the road surface. In general terms, resuspended particulate emissions from paved roads originate from, and result in the depletion of, the loose material present on the surface (i.e., the surface loading). In turn, that surface loading is continuously replenished by other sources. At industrial sites, surface loading is replenished by spillage of material and trackout from unpaved roads and staging areas. Figure 13.2.1-1 illustrates several transfer processes occurring on public streets.

Various field studies have found that public streets and highways, as well as roadways at industrial facilities, can be major sources of the atmospheric particulate matter within an area.[1-9] Of particular interest in many parts of the United States are the increased levels of emissions from public paved roads when the equilibrium between deposition and removal processes is upset. This situation can occur for various reasons, including application of granular materials for snow and ice control, mud/dirt carryout from construction activities in the area, and deposition from wind and/or water erosion of surrounding unstabilized areas. In the absence of continuous addition of fresh material (through localized track out or application of antiskid material), paved road surface loading should reach an equilibrium value in which the amount of material resuspended matches the amount replenished. The equilibrium surface loading value depends upon numerous factors. It is believed that the most important factors are: mean speed of vehicles traveling the road; the average daily traffic (ADT); the number of lanes and ADT per lane; the fraction of heavy vehicles (buses and trucks); and the presence/absence of curbs, storm sewers and parking lanes.[10]

The particulate emission factors presented in a previous version of this section of AP-42, dated October 2002, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material. EPA included these sources in the emission factor equation for paved roads since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the paved road emission factor equation only estimates particulate emissions from resuspended road surface material[28]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOVES[29] model. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOVES to estimate particulate emissions from vehicle traffic on paved roads. It also incorporates the decrease in exhaust emissions that has occurred since the paved road emission factor equation was developed. Earlier versions of the paved road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.1.2 Emissions And Correction Parameters

Dust emissions from paved roads have been found to vary with what is termed the "silt loading" present on the road surface. In addition, the average weight and speed of vehicles traveling the road influence road dust emissions. The term silt loading (sL) refers to the mass of silt-size material (equal to or less than 75 micrometers [µm] in physical diameter) per unit area of the travel surface. The total road surface dust loading consists of loose material that can be collected by broom sweeping and vacuuming of the traveled portion of the paved road. The silt fraction is determined by measuring the proportion of the loose dry surface dust that passes through a 200-mesh screen, using the ASTM-C-136 method. Silt loading is the product of the silt fraction and the total loading, and is abbreviated "sL". Additional details on the sampling and analysis of such material are provided in AP-42 Appendices C.1 and C.2.

The surface sL provides a reasonable means of characterizing seasonal variability in a paved road emission inventory. In many areas of the country, road surface loadings [11-21] are heaviest during the late winter and early spring months when the residual loading from snow/ice controls is greatest. As noted earlier, once replenishment of fresh material is eliminated, the road surface loading can be expected to reach an equilibrium value, which is substantially lower than the late winter/early spring values.

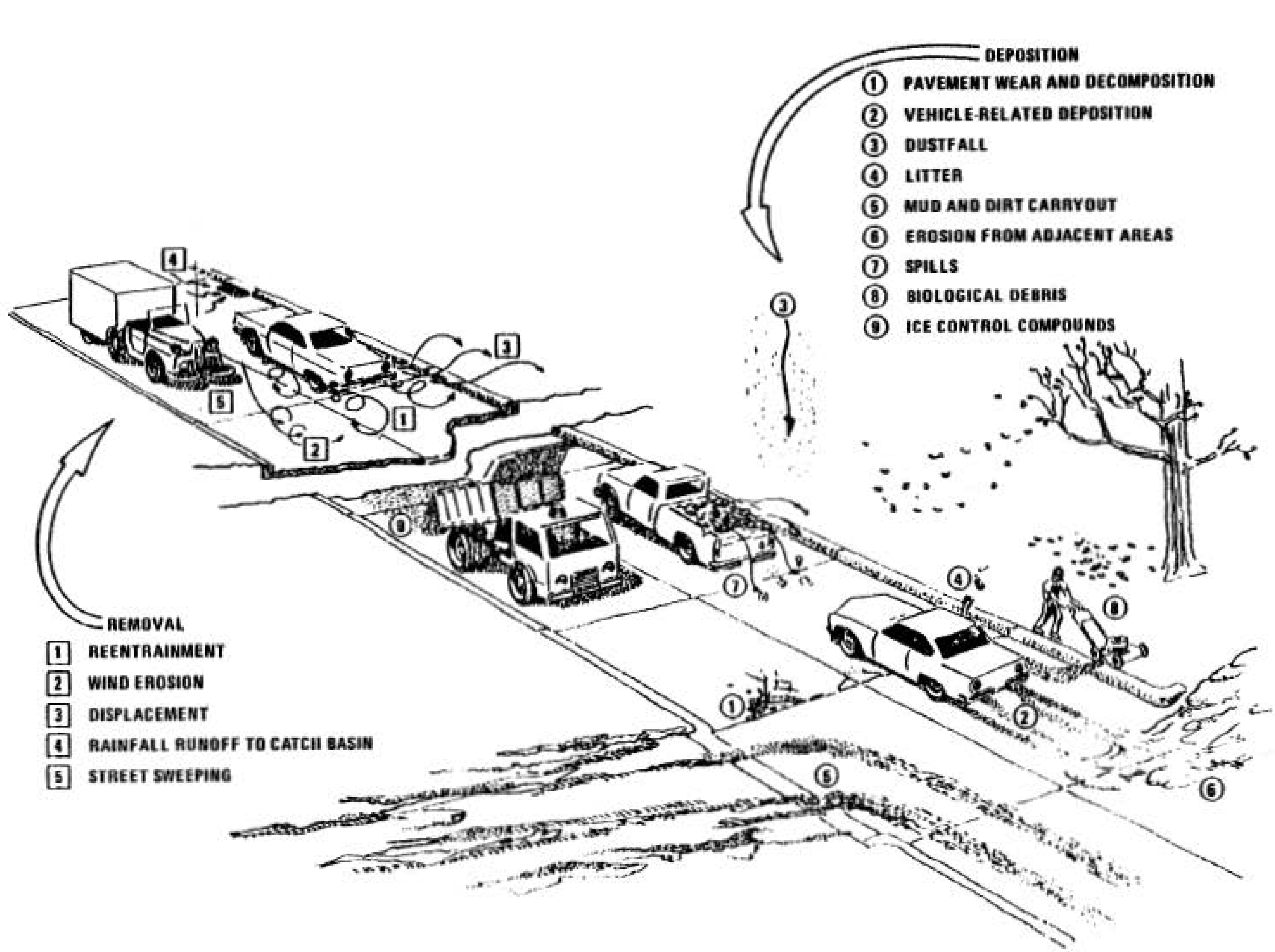

Figure 13.2.1-1. Deposition and removal processes.

13.2.1.3 Predictive Emission Factor Equations[10,29]

The quantity of particulate emissions from resuspension of loose material on the road surface due to vehicle travel on a dry paved road may be estimated using the following empirical expression:

$$E = k\,(sL)^{0.91} \times (W)^{1.02} \qquad (1)$$

where:
- E = particulate emission factor (having units matching the units of k),
- k = particle size multiplier for particle size range and units of interest (see below),
- sL = road surface silt loading (grams per square meter) (g/m^2), and
- W = average weight (tons) of the vehicles traveling the road.

It is important to note that Equation 1 calls for the average weight of all vehicles traveling the road. For example, if 99 percent of traffic on the road are 2 ton cars/trucks while the remaining 1 percent consists of 20 ton trucks, then the mean weight "W" is 2.2 tons. More specifically, Equation 1 is *not* intended to be used to calculate a separate emission factor for each vehicle weight class. Instead, only one emission factor should be calculated to represent the "fleet" average weight of all vehicles traveling the road.

The particle size multiplier (k) above varies with aerodynamic size range as shown in Table 13.2.1-1. To determine particulate emissions for a specific particle size range, use the appropriate value of k shown in Table 13.2.1-1.

To obtain the total emissions factor, the emission factors for the exhaust, brake wear and tire wear obtained from either EPA's MOBILE6.2[27] or MOVES2010[29] model should be added to the emissions factor calculated from the empirical equation.

Table 13.2.1-1. PARTICLE SIZE MULTIPLIERS FOR PAVED ROAD EQUATION

Size range[a]	Particle Size Multiplier k[b]		
	g/VKT	g/VMT	lb/VMT
PM-2.5[c]	0.15	0.25	0.00054
PM-10	0.62	1.00	0.0022
PM-15	0.77	1.23	0.0027
PM-30[d]	3.23	5.24	0.011

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.

[b] Units shown are grams per vehicle kilometer traveled (g/VKT), grams per vehicle mile traveled (g/VMT), and pounds per vehicle mile traveled (lb/VMT). The multiplier k includes unit conversions to produce emission factors in the units shown for the indicated size range from the mixed units required in Equation 1.

[c] The k-factors for $PM_{2.5}$ were based on the average $PM_{2.5}$:PM_{10} ratio of test runs in Reference 30.

[d] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

Equation 1 is based on a regression analysis of 83 tests for PM-10.[3, 5-6, 8, 27-29, 31-36] Sources tested include public paved roads, as well as controlled and uncontrolled industrial paved roads. The majority of tests involved freely flowing vehicles traveling at constant speed on relatively level roads. However, 22 tests of slow moving or "stop-and-go" traffic or vehicles under load were available for inclusion in the data base.[32-36] Engine exhaust, tire wear and break wear were subtracted from the emissions measured in the test programs prior to stepwise regression to determine Equation 1.[37, 39] The equations retain the quality rating of A (D for PM-2.5), if applied within the range of source conditions that were tested in developing the equation as follows:

Silt loading:	0.03 - 400 g/m^2 0.04 - 570 grains/square foot (ft^2)
Mean vehicle weight:	1.8 - 38 megagrams (Mg) 2.0 - 42 tons
Mean vehicle speed:	1 - 88 kilometers per hour (kph) 1 - 55 miles per hour (mph)

The upper and lower 95% confidence levels of equation 1 for PM_{10} is best described with equations using an exponents of 1.14 and 0.677 for silt loading and an exponents of 1.19 and 0.85 for weight. Users are cautioned that application of equation 1 outside of the range of variables and operating conditions specified above, e.g., application to roadways or road networks with speeds above 55 mph and average vehicle weights of 42 tons, will result in emission estimates with a higher level of uncertainty. In these situations, users are encouraged to consider an assessment of the impacts of the influence of extrapolation to the overall emissions and alternative methods that are equally or more plausible in light of local emissions data and/or ambient concentration or compositional data.

To retain the quality rating for the emission factor equation when it is applied to a specific paved road, it is necessary that reliable correction parameter values for the specific road in question be determined. With the exception of limited access roadways, which are difficult to sample, the collection and use of site-specific silt loading (sL) data for public paved road emission inventories are strongly recommended. The field and laboratory procedures for determining surface material silt content and surface dust loading are summarized in Appendices C.1 and C.2. In the event that site-specific values cannot be obtained, an appropriate value for a paved public road may be selected from the values in Table 13.2.1-2, but the quality rating of the equation should be reduced by 2 levels.

Equation 1 may be extrapolated to average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual (or other long-term) average emissions are inversely proportional to the frequency of measurable (> 0.254 mm [0.01 inch]) precipitation by application of a precipitation correction term. The precipitation correction term can be applied on a daily or an hourly basis [26, 38].

For the daily basis, Equation 1 becomes:

$$E_{ext} = [\, k\,(sL)^{0.91} \times (W)^{1.02}\,]\,(1 - P/4N) \qquad (2)$$

where k, sL, W, and S are as defined in Equation 1 and

E_{ext} = annual or other long-term average emission factor in the same units as k,

P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and

N = number of days in the averaging period (e.g., 365 for annual, 91 for seasonal, 30 for monthly).

Note that the assumption leading to Equation 2 is based on analogy with the approach used to develop long-term average unpaved road emission factors in Section 13.2.2. However, Equation 2 above incorporates an additional factor of "4" in the denominator to account for the fact that paved roads dry more quickly than unpaved roads and that the precipitation may not occur over the complete 24-hour day.

For the hourly basis, equation 1 becomes:

$$E_{ext} = [\, k\, (sL)^{0.91} \times (W)^{1.02}\,]\, (1 - 1.2P/N) \qquad (3)$$

where k, sL, W, and S are as defined in Equation 1 and

E_{ext} = annual or other long-term average emission factor in the same units as k,

P = number of hours with at least 0.254 mm (0.01 in) of precipitation during the averaging period, and

N = number of hours in the averaging period (e.g., 8760 for annual, 2124 for season 720 for monthly)

Note: In the hourly moisture correction term (1-1.2P/N) for equation 3, the 1.2 multiplier is applied to account for the residual mitigative effect of moisture. For most applications, this equation will produce satisfactory results. Users should select a time interval to include sufficient "dry" hours such that a reasonable emissions averaging period is evaluated. For the special case where this equation is used to calculate emissions on an hour by hour basis, such as would be done in some emissions modeling situations, the moisture correction term should be modified so that the moisture correction "credit" is applied to the first hours following cessation of precipitation. In this special case, it is suggested that this 20% "credit" be applied on a basis of one hour credit for each hour of precipitation up to a maximum of 12 hours.

Note that the assumption leading to Equation 3 is based on analogy with the approach used to develop long-term average unpaved road emission factors in Section 13.2.2.

Figure 13.2.1-2 presents the geographical distribution of "wet" days on an annual basis for the United States. Maps showing this information on a monthly basis are available in the *Climatic Atlas of the United States*[23] . Alternative sources include other Department of Commerce publications (such as local climatological data summaries). The National Climatic Data Center (NCDC) offers several products that provide hourly precipitation data. In particular, NCDC offers *Solar and Meteorological Surface Observation Network 1961-1990* (SAMSON) CD-ROM, which contains 30 years worth of hourly meteorological data for first-order National Weather Service locations. Whatever meteorological data are used, the source of that data and the averaging period should be clearly specified.

It is emphasized that the simple assumption underlying Equations 2 and 3 has not been verified in any rigorous manner. For that reason, the quality ratings for Equations 2 and 3 should be downgraded one letter from the rating that would be applied to Equation 1.

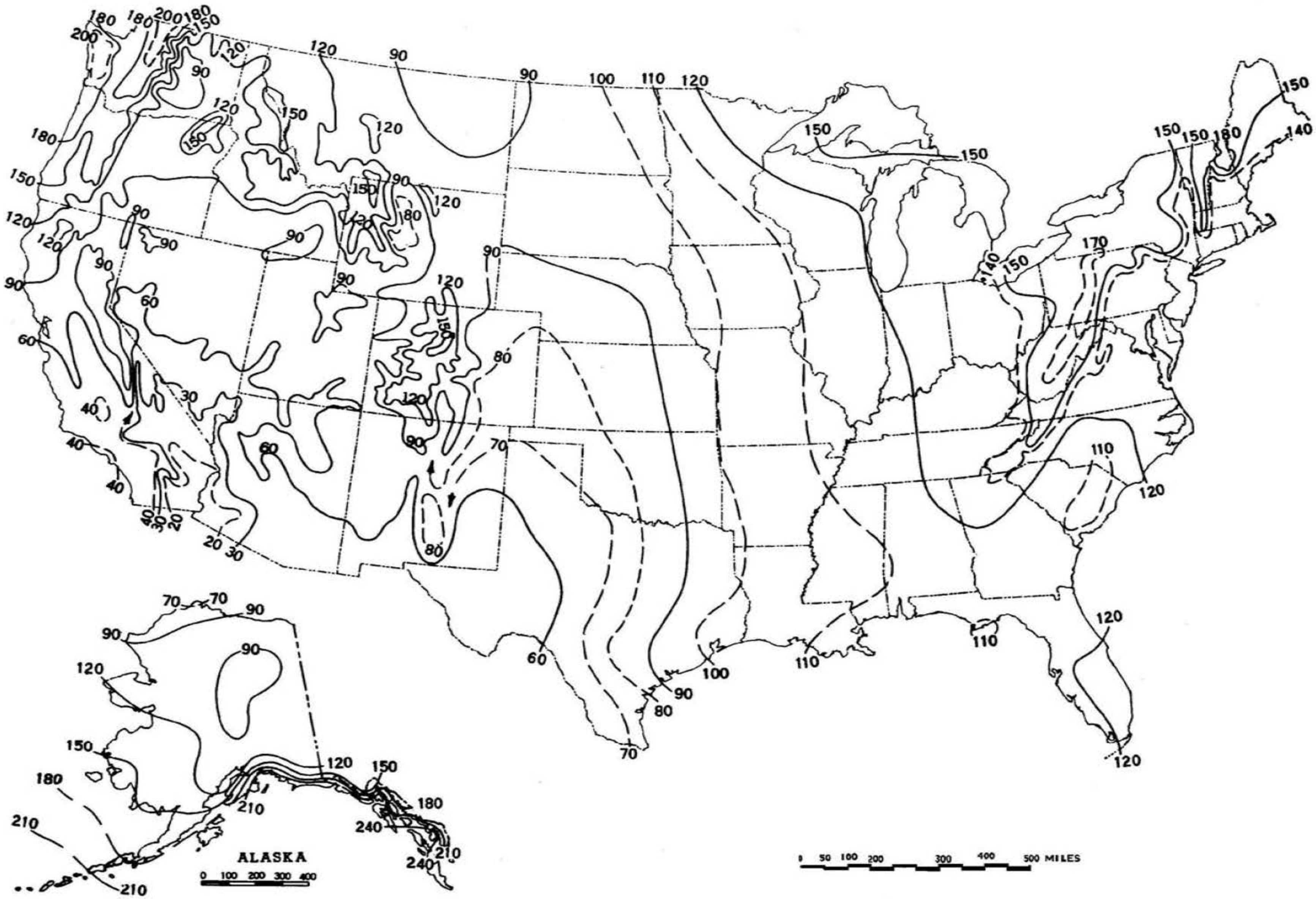

Figure 13.2.1-2. Mean number of days with 0.01 inch or more of precipitation in the United States.

Table 13.2.1-2 presents recommended default silt loadings for normal baseline conditions and for wintertime baseline conditions in areas that experience frozen precipitation with periodic application of antiskid material[24]. The winter baseline is represented as a multiple of the non-winter baseline, depending on the ADT value for the road in question. As shown, a multiplier of 4 is applied for low volume roads (< 500 ADT) to obtain a wintertime baseline silt loading of 4 X 0.6 = 2.4 g/m^2.

Table 13.2.1-2. Ubiquitous Silt Loading Default Values with Hot Spot Contributions from Anti-Skid Abrasives (g/m^2)

ADT Category	< 500	500-5,000	5,000-10,000	> 10,000
Ubiquitous Baseline g/m^2	0.6	0.2	0.06	0.03 0.015 limited access
Ubiquitous Winter Baseline Multiplier during months with frozen precipitation	X4	X3	X2	X1
Initial peak additive contribution from application of antiskid abrasive (g/m^2)	2	2	2	2
Days to return to baseline conditions (assume linear decay)	7	3	1	0.5

It is suggested that an additional (but temporary) silt loading contribution of 2 g/m^2 occurs with each application of antiskid abrasive for snow/ice control. This was determined based on a typical application rate of 500 lb per lane mile and an initial silt content of 1 % silt content. Ordinary rock salt and other chemical deicers add little to the silt loading, because most of the chemical dissolves during the snow/ice melting process.

To adjust the baseline silt loadings for mud/dirt trackout, the number of trackout points is required. It is recommended that in calculating PM_{10} emissions, six additional miles of road be added for each active trackout point from an active construction site, to the paved road mileage of the specified category within the county. In calculating $PM_{2.5}$ emissions, it is recommended that three additional miles of road be added for each trackout point from an active construction site.

It is suggested the number of trackout points for activities other than road and building construction areas be related to land use. For example, in rural farming areas, each mile of paved road would have a specified number of trackout points at intersections with unpaved roads. This value could be estimated from the unpaved road density (mi/sq. mi.).

The use of a default value from Table 13.2.1-2 should be expected to yield only an order-of-magnitude estimate of the emission factor. Public paved road silt loadings are dependent upon: traffic characteristics (speed, ADT, and fraction of heavy vehicles); road characteristics (curbs, number of lanes, parking lanes); local land use (agriculture, new residential construction) and regional/seasonal factors (snow/ice controls, wind blown dust). As a result, the collection and use of site-specific silt loading data is highly recommended. In the event that default silt loading values are used, the quality ratings for the equation should be downgraded 2 levels.

Limited access roadways pose severe logistical difficulties in terms of surface sampling, and few silt loading data are available for such roads. Nevertheless, the available data do not suggest great variation in silt loading for limited access roadways from one part of the country to another. For annual conditions, a default value of 0.015 g/m^2 is recommended for limited access roadways.[9,22] Even fewer of the available data correspond to worst-case situations, and elevated loadings are observed to be quickly depleted because of high traffic speeds and high ADT rates. A default value of 0.2 g/m^2 is recommended for short periods of time following application of snow/ice controls to limited access roads.[22]

The limited data on silt loading values for industrial roads have shown as much variability as public roads. Because of the variations of traffic conditions and the use of preventive mitigative controls, the data probably do not reflect the full extent of the potential variation in silt loading on industrial roads. However, the collection of site specific silt loading data from industrial roads is easier and safer than for public roads. Therefore, the collection and use of site-specific silt loading data is preferred and is highly recommended. In the event that site-specific values cannot be obtained, an appropriate value for an industrial road may be selected from the mean values given in Table 13.2.1-3, but the quality rating of the equation should be reduced by 2 levels.

The predictive accuracy of Equation 1 requires thorough on-site characterization of road silt loading. Road surface sampling is time-consuming and potentially hazardous because of the need to block traffic lanes. In addition, large number of samples is required to represent spatial and temporal variations across roadway networks. Mobile monitoring is a new alternative silt loading or road dust emission characterization method for either paved or unpaved roads. It utilizes a test vehicle that generates and monitors its own dust plume concentration (mass basis) at a fixed sampling probe location. A calibration factor is needed for each mobile monitoring configuration (test vehicle and sampling system), to convert the relative dust emission intensity to an equivalent silt loading or emission factor. Typically, portable continuous particle concentration monitors do not comply with Federal Reference Method (FRM) standards. Therefore, a controlled study must be performed to correlate the portable monitor response to the road silt loading or size specific particle concentration measured with an approved FRM sampling system. In the calibration tests, multiple test conditions should be performed to provide an average correlation with known precision and to accommodate variations in road silt loading, vehicle speed, road dust characteristics and other road conditions that may influence mobile monitoring measurements or emissions characteristics. Because the paved road dust emissions are also dependent on the average vehicle weight for the road segment, it is important that the weight of the test vehicle correspond closely to the average vehicle weight for the road segment or be adjusted using the average vehicle weight relationship in Equation 1. In summary, it is believed that the Mobile Monitoring Method will provide improved capabilities to provide reliable temporally and spatially resolved silt loading or emissions factors with increased coverage, improved safety, reduced traffic interference and decreased cost.[40, 41, 42]

Table 13.2.1-3 (Metric And English Units). TYPICAL SILT CONTENT AND LOADING VALUES FOR PAVED ROADS AT INDUSTRIAL FACILITIES [a]

Industry	No. of Sites	No. Of Samples	Silt Content (%)		No. of Travel Lanes	Total Loading x 10^{-3}			Silt Loading (g/m^2)	
			Range	Mean		Range	Mean	Units[b]	Range	Mean
Copper smelting	1	3	15.4-21.7	19.0	2	12.9 - 19.5	15.9	kg/km	188-400	292
						45.8 - 69.2	55.4	lb/mi		
Iron and steel production	9	48	1.1-35.7	12.5	2	0.006 - 4.77	0.495	kg/km	0.09-79	9.7
						0.020 -16.9	1.75	lb/mi		
Asphalt batching	1	3	2.6 - 4.6	3.3	1	12.1 - 18.0	14.9	kg/km	76-193	120
						43.0 - 64.0	52.8	lb/mi		
Concrete batching	1	3	5.2 - 6.0	5.5	2	1.4 - 1.8	1.7	kg/km	11-12	12
						5.0 - 6.4	5.9	lb/mi		
Sand and gravel processing	1	3	6.4 - 7.9	7.1	1	2.8 - 5.5	3.8	kg/km	53-95	70
						9.9 - 19.4	13.3	lb/mi		
Municipal solid waste landfill	2	7		-	2	-			1.1-32.0	7.4
Quarry	1	6		-	2	-			2.4-14	8.2
Corn wet mills	3	15		-	2	-			0.05 – 2.9	1.1

[a] References 1-2,5-6,11-13. Values represent samples collected from *industrial* roads. Public road silt loading values are presented in Table-13.2.1-2. Dashes indicate information not available.[b] Multiply entries by 1000 to obtain stated units; kilograms per kilometer (kg/km) and pounds per mile (lb/mi).

13.2.1.4 Controls[6,25]

Because of the importance of the silt loading, control techniques for paved roads attempt either to prevent material from being deposited onto the surface (preventive controls) or to remove from the travel lanes any material that has been deposited (mitigative controls). Covering of loads in trucks, and the paving of access areas to unpaved lots or construction sites, are examples of preventive measures. Examples of mitigative controls include vacuum sweeping, water flushing, and broom sweeping and flushing. Actual control efficiencies for any - of these techniques can be highly variable. Locally measured silt loadings before and after the application of controls is the preferred method to evaluate controls. It is particularly important to note that street sweeping of gutters and curb areas may actually increase the silt loading on the traveled portion of the road. Redistribution of loose material onto the travel lanes will actually produce a short-term increase in the emissions.

In general, preventive controls are usually more cost effective than mitigative controls. The cost-effectiveness of mitigative controls falls off dramatically as the size of an area to be treated increases. The cost-effectiveness of mitigative measures is also unfavorable if only a short period of time is required for the road to return to equilibrium silt loading condition. That is to say, the number and length of public roads within most areas of interest preclude any widespread and routine use of mitigative controls. On the other hand, because of the more limited scope of roads at an industrial site, mitigative measures may be used quite successfully (especially in situations where truck spillage occurs). Note, however, that public agencies could make effective use of mitigative controls to remove sand/salt from roads after the winter ends.

Because available controls will affect the silt loading, controlled emission factors may be obtained by substituting controlled silt loading values into the equation. (Emission factors from controlled industrial roads were used in the development of the equation.) The collection of surface loading samples from treated, as well as baseline (untreated), roads provides a means to track effectiveness of the controls over time. The use of Mobile Monitoring Methodologies provide an improved means to track progress in controlling silt loading values.

13.2.1.5 Changes since Fifth Edition

The following changes were made since the publication of the Fifth Edition of AP-42:

October 2002

1) The particle size multiplier for $PM_{2.5}$ was revised to 25% of PM_{10}. The approximately 55% reduction was a result of emission testing using FRM monitors. The monitoring was specifically intended to evaluate the PM-2.5 component of the emissions.

2) Default silt loading values were included in Table 13.2.1-2 replacing the Tables and Figures containing silt loading statistical information.

3) Editorial changes within the text were made indicating the possible causes of variations in the silt loading between roads within and among different locations. The uncertainty of using the default silt loading value was discussed.

2/29/2016

CFR

Customer: **Southwest Cheese**
Location: **Clovis, NM**
Equipment Supplier: **Custom Fabrication & Repair (CFR)**
Equipment: **VERTICAL U-Tube DRYER w/ 1 ea. Med Efficiency Cyclone & 1 Tangential inlet Bag Houses**
Status **REVIEW**

Dryer System Air Emission Source Points

Emission Source **Indirect Heater Combustion Exhaust**
Make: PreHeat, Inc.
Burner Manufacture Maxon
Max. Burner Heat Input Capacity 14 MMBtu /hr. 12-15 PSIG supply pressure
Max. Dryer Natural Gas Flow rate, Cu. Ft./Hr. 16,666 CFH Dryer Design Basis, Net Heat value of NG in Direct Fire Spray Dryers @ 400°F= 840 BTU/Cu. Ft.
GROSS Natural Gas Flow rate, Cu. Ft./Hr. 13,725 CFH Basis, Natural Gas Gross Available Heat Content of 1020 BTU /FT3

Gaseous Emissions

Preliminary per Maxon - Cross Fire Burner in Indirect Heat Application - **NOx** 0.06 lb. / MMBtu | 16.8 lbs./day NOx
Preliminary per Maxon - Cross Fire Burner in Indirect Heat Application - **CO** 0.184 lb. / MMBtu | 51.52 lbs./day CO
Expected Dryer Operating Hours / day 20 hr./day | 7 days/week | 7280 hr./ yr.
Dryer Nominal Indirect heater burner Max. Firing Rate 14 MMBtu /hr.

Indirect Heater Combustion Airflow Exhaust 3,388 SCFM @ 318°F (Per Preheat, Inc., Indirect heater supplier) **14"** Exhaust Stack
NOTE - Dryer equipment has been stated as 20 hr./ day operation at full design rate. Customer will have to state their expected days/year operation

Particulate Emissions

Emission Source **Dryer Main Bag House**
Process Note - Bag house filters dryer exhaust air particulates
Make: CFR
Model # 18610-1 Reverse Pulse-Jet Cleaning Design
Bag Dimensions: 6" nominal dia. X 13 ft. long
ACR: 5.1:1
Bag Qty 277 ea.
Cloth Area: 5664 Sq. Ft.
Expected operating pressure, ΔP "WC: 2-3" WC
Bag Filter Media: Polyester Micro Denier
Main Bag House Exhaust Air Flow Rate 28,817 ACFM @ 190°F (Corrected for Elevation, Temp, Humidity Ratio & duct pressure) **36"** Exhaust Stack
Air Flow at Standard Conditions 18,352 SCFM
Particulate Matter Emissions: When properly operated and maintained, seller can expect bag house collector system to recover 99% of particulates 1.0 micron or larger powder fines entrained in the dryer exhaust steam. Filter efficiencies are effected by many variables such as bag technology, grain loading to bag house, operating pressure and cleaning frequency. **Expected Particulate Emissions .01 (within +/-0.005) grains/SCFM**

0.01 grains/SCFM

Expected **Main Dryer Bag House** Particulate Emission rate, (0.01 grains/SCFM X **18,352 SCFM** X 60 min/hr.) / 1lb. / 7000grains =
Expected Dryer Operating Hours / day 20

1.57	**lb. /hr.**
31.46	**lb. /day**
5.7	**ton/yr.**

Particulate Emissions

Emission Source	**Powder Receiver Bag House**
Process Note -	Powder is conveyed and cooled on the way to Powder Receiver Bag House
Make:	CFR
Model #	18610-2 Reverse Pulse-Jet Cleaning Design
Bag Dimensions:	6" nominal dia. X 12 ft. long
ACR:	3.9:1
Bag Qty	58 ea.
Cloth Area:	1099 Sq. Ft.
Expected operating pressure, ΔP "WC:	2-3" WC
Bag Filter Media:	Polyester Micro Denier
Powder Receiver Exhaust Air Flow Rate	4285 ACFM @ 90°F (Corrected for Elevation, Temp, Humidity Ratio & duct pressure) **14"** Exhaust Stack
Air Flow at Standard Conditions	**3400 SCFM**
Particulate Matter Emissions:	When properly operated and maintained, seller can expect bag house collector system to recover 99% of particulates 1.0 micron or larger powder fines entrained in the dryer exhaust steam. Filter efficiencies are effected by many variables such as bag technology, grain loading to bag house, operating pressure and cleaning frequency. **Expected Particulate Emissions .01 (within +/-0.005) grains/SCFM**
	0.01 grains/SCFM

Expected **Powder Receiver Bag House** Particulate Emission rate (0.01 grains/SCFM X **3,400 SCFM** X 60 min/hr.) / 1lb. / 7000grains =	**0.29**	**lb. /hr.**
Expected Dryer Operating Hours / day: 20	**5.83**	**lb. /day**
	1.1	**ton/yr.**

Particulate Emissions

Emission Source	**Start / Stop Hopper Bag House**
Process Note -	Receives and filters Main Baghouse powder fines
Make:	CFR
Model #	18610-3 Reverse Pulse-Jet Cleaning Design
Bag Dimensions:	6" nominal dia. X 1m long
ACR:	3.4:1
Bag Qty	13 ea.
Cloth Area:	158 Sq. Ft.
Expected operating pressure, ΔP "WC:	1-2" WC
Bag Filter Media:	Polyester Micro Denier
Start / Stop Hopper Bag House Exhaust Air Flow Rate	536 ACFM @ 90°F (Corrected for Elevation, Temp, Humidity Ratio & duct pressure) **10"** Exhaust Stack
Air Flow at Standard Conditions	**420 SCFM**
Particulate Matter Emissions:	When properly operated and maintained, seller can expect bag house collector system to recover 99% of particulates 1.0 micron or larger powder fines entrained in the dryer exhaust steam. Filter efficiencies are effected by many variables such as bag technology, grain loading to bag house, operating pressure and cleaning frequency. **Expected Particulate Emissions .01 (within +/-0.005) grains/SCFM**
	0.01 grains/SCFM

Expected **Start /Stop Hopper Bag House** Particulate Emission rate, (0.01 grains/SCFM X **420 SCFM** X 60 min/hr.) / 1lb. / 7000grains =	**0.04**	**lb. /hr.**
Expected Dryer Operating Hours / day: 20	**0.72**	**lb. /day**
	0.1	**ton/yr.**

STEAM CONDENSATE RETURN PUMP SCHEDULE - ELECTRIC POWERED (1)

MARK	MANUFACTURER, MODEL NUMBER	PERFORMANCE: INLET FLOWRATE (LB/HR) (11)	PERFORMANCE: CONDENSATE TEMPERATURE (OPERATING)	RESERVOIR: VOLUME (GALLON)	RESERVOIR: OPERATING PRESSURE (PSI)	RESERVOIR: MATERIAL	RESERVOIR: INLETS SIZE (IPS)	RESERVOIR: INLETS QTY	RESERVOIR: OVERLOW SIZE (IPS)	PUMPS: QTY	PUMPS: PUMPING FLOWRATE (GPM) (31)	PUMPS: OUTLET PRESSURE (PSI)	PUMPS: MATERIAL	PUMPS: OUTLET (INCH)	PUMPS: MOTOR ENCLOSURE	PUMPS: MOTOR SPEED (RPM)	CONTROL: PANEL LOCATION	CONTROL: ENCLOSURE	CONTROL: FEATURES	ELECTRICAL: V/PH	ELECTRICAL: HP	SIZE	REMARKS
SCRP- 31	STERLING, 43315-JD-SPECIAL	3000	212 F	30	0	SS	2-1/2	1	2	2	22.5	30	CAST IRON	1-1/2	TEFC	3450	INTEGRAL	NEMA 4X	(51) (52) (53) (54)	460/3	1 + 1 (61)	27 X 18 X 16	(71)
SCRP- 41	STERLING, 43450-JD-SPECIAL	20000	212 F	120	0	SS	2-1/2	1	2	2	75	30	CAST IRON	1-1/2	TEFC	3450	INTEGRAL	NEMA 12	(51) (52) (53) (54)	460/3	3 + 3 (61)	40 X 28 X 42	(71)

REMARKS:

(1) SEE GENERAL SCHEDULE NOTES
(11) AVERAGE CONDENSATE FLOW
(31) INTERMITTENT FLOWRATE FROM EACH PUMP AT INDICATED OUTLET PRESSURE.
(51) LEVEL SENSOR ON RESERVOIR, TWO MAGNETIC STARTERS, TWO DISCONNECT SWITCHES, TWO HAND-OFF-AUTO SWITCHES
(52) INCLUDE TRANSFORMER FOR CONTROL VOLTAGE
(53) INCLUDE DRY CONTACT FOR BUILDING AUTOMATION SYSTEM. DRY CONTACT SHALL CHANGED STATE WHEN ABNORMAL OPERATION OCCURS.
(54) INCLUDE PANEL DISCONNECT
(61) ONE MOTOR REDUNDANT, NORMALLY DOES NOT OPERATE
(71) PROVIDE REMOVABLE INSULATION JACKET FOR RESERVOIR.

STEAM BOILER SCHEDULE (1)

MARK	MFR, MODEL NUMBER	TYPE	NOMINAL SIZE (BHP)	FUEL INPUT: PRESS (PSIG)	FUEL INPUT: FLOW (CFH)	OUTPUT: HEAT (MBH)	OUTPUT: FLOW (PPH)	COMBUSTION AIR INPUT (PPH)	INSTALLATION ELEVATION (4)	MIN. EFF. (%)	FUEL	DESIGN OPERATING PRESSURE (PSIG)	ELECTRICAL: (VOLTS/PH)	ELECTRICAL: (HP)	(2) WEIGHT (LBS)	REMARKS
SBLR- 4	CLEAVER-BROOKS, CBEX-800	FIRETUBE	800	5	33,000	27,000	27,000	27,000	4,300	-	NG	150 (3)	460/3	30		

REQUIRED ACCESSORIES/OPTIONS/FEATURES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

1 ADDITIONAL TAPPINGS AS REQUIRED
2 CONTINUOUS AND BOTTOM BLOWDOWN VALVE SETS
3 FEEDWATER VALVES AND REGULATORS
4 FIRING RATE CONTROL (MODULATION)
5 PLC BASED BOILER MANAGEMENT CONTROL
6 FLAME SAFEGUARD CONTROLS
7 TEFC, HIGH EFFICIENCY MOTOR
8 MAIN DISCONNECT
9 ASME SAFETY VALVES
10 LOW WATER CUTOFF AND LEVEL CONTROL
11 LOW NOx EMMISIONS (30 PPM)
12 TOUCH SCREEN HMI
13 AUXILIARY LOW WATER CUTOFF
14 REMOTE ALARMING AND SETPOINT CONTROL
15 ANY OTHER FEATURES REQUIRED TO MEET NEW MEXICO CODES/REQUIREMENTS
16 INSULATED STACK
17 OXYGEN TRIM
18 LINKAGELESS BURNER CONTROLS

REMARKS

(1) SEE GENERAL SCHEDULE NOTES
(3) SET RELIEF VALVE AT 145 PSIG
(4) FT ABOVE SEA LEVEL

OPERATIONS SUPPORT EQUIPMENT SCHEDULE (1)

MARK	EQUIPMENT TYPE	MFR, MODEL NUMBER	DESCRIPTION	ELECTRICAL: V/PH	ELECTRICAL: A	ELECTRICAL: HP	ELECTRICAL: W	REMARKS
EF- 1	EQUIPMENT FOAMER	OFCI	ANTIBACTERIAL FOAM SPRAYER SYSTEM FOR PROCESS EQUIPMENT. WITH LOCAL CHEMICAL SOURCE. PROVIDE 1/2" CAPPED THREADED STUB FOR FUTURE AIR HOSE CONNECTION QD.	120/1	5.0			
FF- 1	FOOT FOAMER	OFCI	ANTIBACTERIAL FOAM SPRAYER SYSTEM FOR SHOES. WITH LOCAL CHEMICAL SOURCE.	120/1	5.0			
HS- 1	HOSE STATION, NON-MIXING	STRAHMAN, M-756 ASSEMBLY	RACK, VALVE, HOSE, AND NOZZLE ASSEMBLY WITH SINGLE NON-MIXING VALVE. STAINLESS STEEL SPRAY NOZZLE WITH SWIVEL CONNECTOR AND WHITE INSULATING COVER. 5/8" ID FDA HOSE WITH WHITE ABRASION-RESISTANT OUTER WRAP, 50 FT LENGTH. STAINLESS STEEL HOSE RACK					
HS- 2	HOSE STATION, NON-MIXING	STRAHMAN, S-70 ASSEMBLY	HOSE AND NOZZLE ASSEMBLY, SUSPENDED FROM CEILING. STAINLESS STEEL SPRAY NOZZLE WITH SWIVEL CONNECTOR AND WHITE INSULATING COVER. 5/8" ID FDA HOSE WITH WHITE ABRASION-RESISTANT OUTER WRAP, APPROX. 30 FT LENGTH. SELECT HOSE LENGTH AND INSTALL SUCH THAT LOWEST PORTION OF SPRAY NOZZLE IS 12" AFF.					
HS- 3	HOSE STATION, NON-MIXING	STRAHMAN, M-756	SAME AS HS-1 EXCEPT SS QUICK DISCONNECT IN PLACE OF HOSE. HOSE AND MATING QUICK DISCONNECT BY OWNER.					
HS- 4	HOSE STATION, NON-MIXING	STRAHMAN, M-756 ASSEMBLY	SAME AS HS-1 EXCEPT135 FT HOSE					

REMARKS:

(1) SEE GENERAL SCHEDULE NOTES

STEAM GENERAL EQUIPMENT SCHEDULE (1)

MARK	EQUIPMENT TYPE	MANUFACTURER, MODEL NUMBER	DESCRIPTION SUMMARY (SEE SPECIFICATIONS)	ELECTRICAL: VOLTS/PH...	ELECTRICAL: AMPS	ELECTRICAL: HP	ELECTRICAL: WATTS	REMARKS
SCFT- 31	CONDENSATE FLASH TANK	PENN, FLASH SEPARATOR	VERTICAL TANK WITH 2" TANGENTIAL INLET AND INTERNAL BAFFLE/WEAR PLATE. 3,000 PPH CONDENSATE CAPACITY, 450 PPH FLASH STEAM CAPACITY. VENTED TO ATMOSPHERE. ASME. 150 PSI MAWP. 10" MINIMUM TANK DIAMETER, 2" MINIMUM VENT DIAMETER. 304 STAINLESS STEEL. PROVIDE REMOVABLE INSULATION JACKET.					
SCFT- 41	CONDENSATE FLASH TANK	PENN, FLASH SEPARATOR	VERTICAL TANK WITH 6" TANGENTIAL INLET AND INTERNAL BAFFLE/WEAR PLATE. 20,000 PPH CONDENSATE CAPACITY, 3000 PPH FLASH STEAM CAPACITY. VENTED TO ATMOSPHERE. ASME. 150 PSI MAWP. 16" MINIMUM TANK DIAMETER, 6" MINIMUM VENT DIAMETER. 304 STAINLESS STEEL. PROVIDE REMOVABLE INSULATION JACKET.					
SDAFW- 21E	DEAERATOR, STORAGE, AND FEEDWATER SYSTEM	CLEAVER-BROOKS, SNP140-2800-3K	MODIFY TO ADD ONE FEEDWATER PUMP. MODIFY LOCAL PIPING AND CONTROLS AS REQUIRED					
SEH- 31	STEAM EXHAUST HEAD	WATSON MCDANIEL, WEH	CAST IRON, SAME SIZE AS STEAM VENT ON SCFT-31	N/A				
SEH- 41	STEAM EXHAUST HEAD	WATSON MCDANIEL, WEH	CAST IRON, SAME SIZE AS STEAM VENT ON SCFT-41	N/A				
SDI- 51	STEAM DIRECT INJECTION HEATER	SPIRAX-SARCO IN40M	1-1/2" STEAM INJECTOR FOR MOUNTING ON TANK WALL FOR WATER HEATING. 316L STAINLESS STEEL CONSTRUCTION WITH BUTT-WELD CONNECTION. 120 PSIG STEAM INJECTION PRESSURE. 2,500 LB/HR STEAM.					

REMARKS

(1) EXTERNAL ELECTRICAL DISCONNECT REQUIRED.
(2) ELECTRICAL RECEPTACLE REQUIRED

STEAM TRAP SCHEDULE (1)

MARK	MANUFACTURER, MODEL NUMBER	TYPE	MAWP	SIZE (IN)	RATED CAPACITY (PPH): AT 100 PSID	RATED CAPACITY (PPH): AT 20 PSID	RATED CAPACITY (PPH): AT 0.25 PSID	REQUIRED CAPACITY: MAX. PRESSURE INLET	REQUIRED CAPACITY: MAX. PRESSURE DIFFERENTIAL	REQUIRED CAPACITY: FLOW (PPH)(11)	BODY MATERIAL	EQUIPMENT SERVED	REMARKS
ST- 1	SPIRAX SARCO, FT-150	F&T	150 PSI AT 350 F	3/4"	1700	1000	170	125	30	200	CI	MAIN DRIP	

TRAP TYPE		BODY MATERIAL	
F&T	FLOAT AND THERMOSTATIC	SS	STAINLESS STEEL
TD	THERMODYNAMIC	CI	CAST IRON

REMARKS:

(1) SEE GENERAL SCHEDULE NOTES
(11) TRAP CAPACITY AT MAXIMUM DIFFERENTIAL PRESSURE. INCLUDES SAFETY FACTOR

E.A. Bonelli + Associates, Inc.
8450 Edes Avenue, Oakland, CA 94621
Phone: (510) 740-0155 Fax: (510) 740-0160

Mead & Hunt
Mead & Hunt, Inc.
2440 Deming Way, Middleton, WI 53562
phone: 608-273-6380
meadhunt.com

DAHLGREN

ROGER F. PORTER
NEW MEXICO
19558
LICENSED PROFESSIONAL ENGINEER
7/8/16

REV	REVISION	DATE	DRN	DSGN	CKD	APPD
1	ISSUED FOR GMP	04/01/16				
2	Issued for Building Permit	06/24/16				
3	Issued for Construction	07/08/16				

DSGN AMT
DRN M&H
CKD RFP
SCALE: AS INDICATED
FOR 24X36 DWG ONLY

SWC Southwest Cheese

HERCULES 2
CLOVIS, NEW MEXICO
MECHANICAL SCHEDULES

JOB NUMBER 1571
REV 3
DRAWING NUMBER M6.0.3

M6.0.3

STEAM BOILER SCHEDULE (1)

MARK	MFR, MODEL NUMBER	TYPE	NOMINAL SIZE (BHP)	FUEL INPUT PRESS (PSIG)	FUEL INPUT FLOW (CFH)	OUTPUT HEAT (MBH)	OUTPUT FLOW (PPH)	COMBUSTION AIR INPUT (PPH)	INSTALLATION ELEVATION (4)	MIN. EFF. (%)
SBLR- 4	CLEAVER-BROOKS, CBEX-800	FIRETUBE	800	5	33,000	27,000	27,000	27,000	4,300	-

REQUIRED ACCESSORIES/OPTIONS/FEATURES INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING

Model CBEX Premium
100-800 HP

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FEATURES AND BENEFITS

The CBEX Premium 100-800 HP Firetube boiler is designed, manufactured, and packaged by Cleaver-Brooks. All units are factory fire tested and shipped as a package, ready for quick connection to utilities. In addition to the features provided on all Cleaver-Brooks Firetube boilers, the following features apply to the CBEX.

Extended Heat Surface Technology:

- EX technology results in increased efficiency and lower emissions with a smaller footprint and 2-pass design
- The packaged boiler offers flexibility, reliability, safety and ease of operation.

Front and Rear Access:

- Davited smoke box doors provide access to front tube sheet.
- Burner housing swings open for service and maintenance.
- Large rear access plug for turnaround and furnace access.

Natural Gas, No. 2 Oil, or Combination Burners Available:

- Combination gas/oil burners provide quick fuel changeover without burner adjustment.

PRODUCT OFFERING

Burners are available to fire natural gas, No. 2 oil, or a combination of oil and gas. Standard product offering for 100-800 HP CBEX boilers is:

- Two pass wetback design.
- 150, 200, or 250 psig steam
- 30 and 125 psig hot water
- Full modulation, all sizes.

Available options include the following (contact your local Cleaver-Brooks authorized representative for option details).

- Boiler Options:

  Low NOx emission levels at 30 PPM.
  Additional screwed or flanged tappings.
  Blowdown valves.
  Non-return valves.
  Feedwater valves and regulators.
  Surface blowdown systems.
  Surge load baffles.
  Seismic design.

- Burner/Control Options:

  Flame safeguard controllers.
  Lead/lag system.
  Special insurance and code requirements (e.g., IRI, FM, NFPA8501).
  Alarm bell/silence switch.
  Special motor requirements (TEFC, high efficiency).
  Special indicating lights.
  Main disconnect.

Elapsed time meter.
NEMA enclosures.
Remote emergency shut-off (115V).
Circuit breakers.
Day/night controls.
Special power requirements.

- Fuel Options:

Gas strainer.
Gas pressure gauge.
Future gas conversion.
Oversized/undersized gas trains.
Optional Oil Pumps.

DIMENSIONS AND RATINGS

Dimensions and ratings are shown in the following tables and illustrations.

NOTE: The following information is subject to change without notice.

Table 1 - CBEX Premium steam boiler ratings

Table 2 - CBEX Premium hot water boiler ratings

Figure 1/Table 3 - CBEX Premium steam boiler dimensions

Figure 2/Table 4 - CBEX Premium hot water boiler dimensions

Table 1. CBEX Premium Steam Boiler Ratings

BOILER H.P.	100	125	150	200	250	300	350	400	500	600	700	800
Burner Model (Standard)	VLG-42	VLG-54	VLG-63	VLG-84	ELG-105	ELG-126	ELG-147	ELG-168	ELG-210	ELG-252	ELG-294-3	ELG-336-3
Burner Model (30 ppm)	LNVLG-42	LNVLG-54	LNVLG-63	LNVLG-84	LNELG-105	LNELG-126	LNELG-147	LNELG-168	LNELG-210	LNELG-252	LNELG-294-3	LNELG-336-3
RATINGS - SEA LEVEL TO 700 FT.												
Rated Capacity (lbs-steam/hr from and at 212 °F)	3450	4313	5175	6900	8625	10350	12075	13800	17250	20700	24150	27600
Btu Output (1000 Btu/hr)	3348	4184	5021	6695	8369	10043	11716	13390	16738	20085	23433	26780
APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY BASED ON NOMINAL 80% EFFICIENCY												
Light Oil gph (140,000 Btu/gal)	29.9	37.4	44.8	59.8	74.7	89.7	104.6	119.6	149.4	179.3	209.2	239.1
Gas CFH (1000 Btu)	4184	5230	6277	8369	10461	12553	14645	16738	20922	25106	29291	33475
Gas (Therm/hr)	41.8	52.3	62.8	83.7	104.6	125.5	146.5	167.4	209.2	251.1	292.9	334.8
POWER REQUIREMENTS - SEA LEVEL TO 700 FT. (60 HZ)												
Blower Motor hp (Standard)[A]	2	3	5	7 1/2	5	7 1/2	10	15	15	15	20	25
Blower Motor hp (30 ppm)[A]	3	5	5	7 1/2	7 1/2	7 1/2	10	15	20	25	30	40
Circulating Oil Pump Motor hp[B]	1/2	3/4	3/4	1	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Oil Metering Pump Motor hp[B]	n/a	n/a	n/a	n/a	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4
Air Compressor Motor hp[B]	**	**	**	**	3	3	5	5	5	7 1/2	7 1/2	7 1/2
BOILER DATA												
Heating Surface sq-ft. (Fireside)	398	423	518	671	737	768	933	1128	1325	1424	1776	1776

NOTES:
A. Blower motor size for boiler operating pressures 125 psig and less, contact your local Cleaver-Brooks authorized representative for higher pressures and altitude.
B. Required for #2 Oil Firing.
C. All fractional hp motors will be single phase voltage except oil metering pump motors which are three phase. Integral hp motors will be three phase voltage.
** Air compressor not required for 100-200hp as these burners are pressure atomized.

Table 2. CBEX Premium Hot Water Ratings

BOILER H.P.	100	125	150	200	250	300	350	400	500	600	700	800
Burner Model (Standard)	VLG-42	VLG-54	VLG-63	VLG-84	ELG-105	ELG-126	ELG-147	ELG-168	ELG-210	ELG-252	ELG-294-3	ELG-336-3
Burner Model (30 ppm)	LNVLG-42	LNVLG-54	LNVLG-63	LNVLG-84	LNELG-105	LNELG-126	LNELG-147	LNELG-168	LNELG-210	LNELG-252	LNELG-294-3	LNELG-336-3
RATINGS - SEA LEVEL TO 700 FT.												
Btu Output (1000 Btu/hr)	3348	4184	5021	6695	8369	10043	11716	13390	16738	20085	23433	26780
APPROXIMATE FUEL CONSUMPTION AT RATED CAPACITY BASED ON NOMINAL 83% EFFICIENCY												
Light Oil gph (140,000 Btu/gal)	28.8	36.0	43.2	57.6	72.0	86.4	100.8	115.2	144.0	172.8	201.7	230.5
Gas CFH (1000 Btu)	4033	5041	6050	8066	10083	12099	14116	16133	20166	24199	28232	32265
Gas (Therm/hr)	40.3	50.4	60.5	80.7	100.8	121.0	141.2	161.3	201.7	242.0	282.3	322.7
POWER REQUIREMENTS - SEA LEVEL TO 700 FT. (60 HZ)												
Blower Motor hp (Standard)	2	3	5	7 1/2	5	7 1/2	10	15	15	15	20	25
Blower Motor hp (30 ppm)	3	5	5	7 1/2	7 1/2	7 1/2	10	15	20	25	30	40
Circulating Oil Pump Motor hp[A]	1/2	3/4	3/4	1	1/2	3/4	3/4	3/4	3/4	3/4	1	1
Oil Metering Pump Motor hp[A]	n/a	n/a	n/a	n/a	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4
Air Compressor Motor hp[A]	**	**	**	**	3	3	5	5	5	7 1/2	7 1/2	7 1/2
BOILER DATA												
Heating Surface sq-ft. (Fireside)	398	423	518	671	737	768	933	1128	1325	1424	1776	1776

NOTES:
A. Required for #2 Oil Firing.
B. All fractional hp motors will be single phase voltage except oil metering pump motors which are three phase. Integral hp motors will be three phase voltage.
** Air compressor not required for 100-200hp as these burners are pressure atomized.

Figure 1. CBEX Premium Steam Boiler Dimensions, 100-800 HP

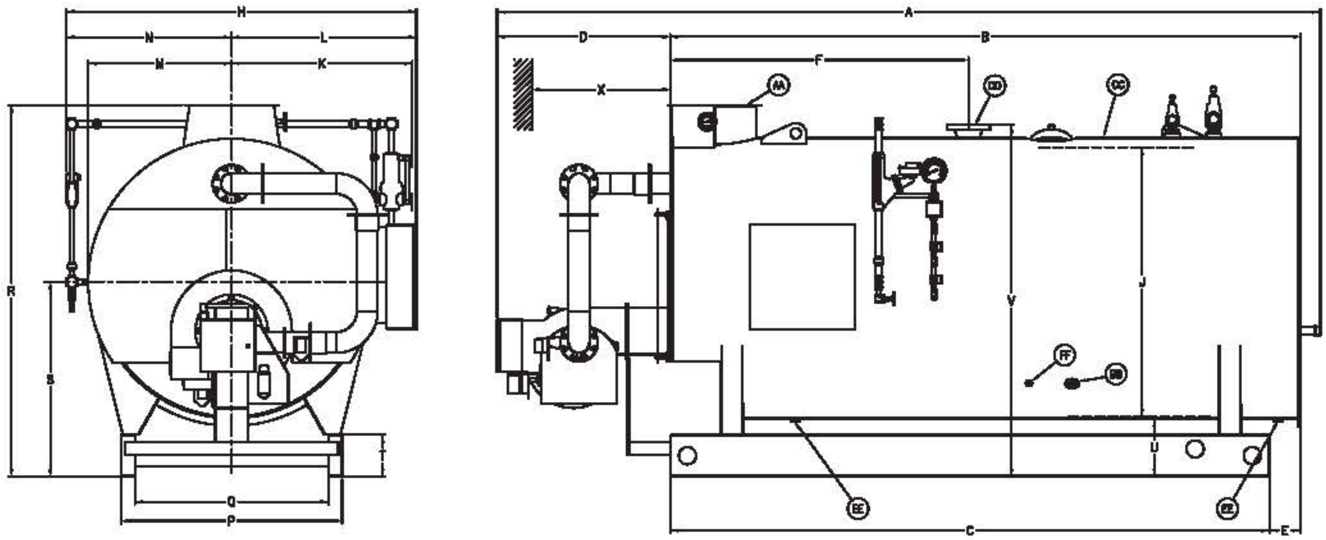

Table 3. CBEX Premium Steam Boiler Dimensions, 100-800 HP

BOILER H.P.	DIM	100	125	150	200	250	300	350	400	500	600	700	800
LENGTHS													
Overall Length	A	179.5	184.5	190	213	232	238	238.5	258.5	261	267	287	287
Shell	B	132.5	137.5	140	163	174	180	182.5	190.5	193	199	207	207
Base Frame	C	125.5	130.5	131	154	164	170	173.5	181.5	183.5	189.5	197.5	197.5
Burner Extension	D	41	41	44	44	52	52	50	62	62	62	74	74
Rear Ring Flange to Base	E	7	7	9	9	10	10	9	9	9.5	9.5	9.5	9.5
Shell Flange to Steam Nozzle	F	60.5	63	64.5	74.5	80.5	83.5	86.5	90.5	110.5	183.5	104.5	104.5
WIDTHS													
Overall Width	H	81	81	86	86	94	94	105	105	112	112	119	119
I.D. Boiler	J	55	55	60	60	67	67	78	78	85	85	92	92
Center to Water Column	K	42.5	42.5	45	45	48.5	48.5	54	54	57.5	57.5	61	61
Center to Panel	L	44.5	44.5	47	47	50.5	50.5	56	56	59.5	59.5	63	63
Center to Lagging	M	30.5	30.5	33	33	36.5	36.5	42	42	45.5	45.5	49	49
Center to Auxiliary LWCO	N	36.5	36.5	39	39	43.5	43.5	49	49	52.5	52.5	56	56
Base Outside	P	47.5	47.5	52.5	52.5	51	51	64	64	60	60	68	68
Base Inside	Q	39.5	39.5	44.5	44.5	43	43	56	56	47	47	55	55
HEIGHTS													
Base to Vent Outlet	R	81	81	87	87	94.5	94.5	108	108	114.5	114.5	122.5	122.5
Base to Boiler Centerline	S	41	41	46	46	50	50	56.5	56.5	61	61	65.5	65.5
Height of Base Frame	T	12	12	12	12	12	12	12	12	12	12	12	12
Base to Bottom of Boiler	U	13	13	15.5	15.5	16	16	17	17	18	18	19	19
Base to Steam Outlet	V	78.5	78.5	82.5	82.5	90	90	102	102	110	110	118	118
BOILER CONNECTIONS													
Feedwater Inlet (Both Sides)	BB	1.25	1.5	1.5	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5
Surface Blowoff	CC	1	1	1	1	1	1	1	1	1	1	1	1
Steam Nozzle (300# ANSI Flange)	DD	4	4	4	4	6	6	6	6	8	8	8	8
Blowdown-Front & Rear	EE	1.25	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2
Chemical Feed	FF	1	1	1	1	1	1	1	1	1	1	1	1
VENT STACK													
Vent Stack Diameter (Flanged)	AA	16	16	16	16	20	20	24	24	24	24	24	24
MINIMUM CLEARANCES													
Tube Removal - Front Only	X	84	89	92	115	120	126	125	133	136	142	150	150
MINIMUM BOILER ROOM LENGTH ALLOWING FOR TUBE REMOVAL:													
Thru Window or Door		208.5	220.5	223	246	274	280	280.5	300.5	303	309	329	329

Table 3. CBEX Premium Steam Boiler Dimensions, 100-800 HP (Continued)

Front of Boiler	252.5	262.5	268	314	330	342	343.5	359.5	365	377	393	393
WEIGHTS IN LBS												
Normal Water Weight	6,260	6,540	7,420	8,830	10,110	10,550	15,820	16,300	16,600	17,110	20,000	20,000
Approx. Shipping Weight - (150psig)	9,710	10,480	11,750	13,250	15,670	16,090	19,650	21,050	24,600	26,000	32,100	32,250

NOTES:

Accompanying dimensions, while sufficiently accurate for layout purposes, must be confirmed for construction by certified dimension diagram/drawing.

All Connections are Threaded Unless Otherwise Indicated:

Figure 2. CBEX Premium Hot Water Boiler Dimensions, 100-800 HP

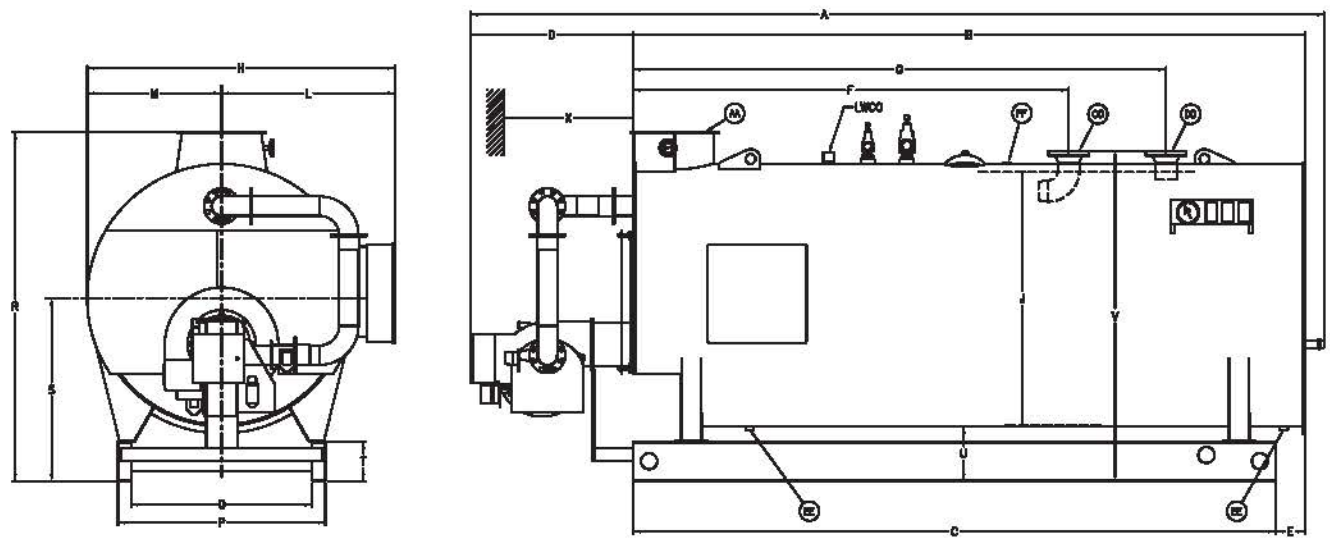

Table 4. CBEX Premium Hot Water Boiler Dimensions, 100-800 HP

BOILER H.P.	DIM	100	125	150	200	250	300	350	400	500	600	700	800
LENGTHS													
Overall Length	A	179.5	184.5	190	213	232	238	238.5	258.5	261	267	287	287
Shell	B	132.5	137.5	140	163	174	180	182.5	190.5	193	199	207	207
Base Frame	C	125.5	130.5	131	154	164	170	173.5	181.5	183.5	189.5	197.5	197.5
Burner Extension	D	41	41	44	44	52	52	50	62	62	62	74	74
Rear Ring Flange to Base	E	7	7	9	9	10	10	9	9	9.5	9.5	9.5	9.5
Shell Flange to Water Return	F	88.5	93.5	96	119	128.5	134.5	137	145	137.5	143.5	151.5	151.5
Shell Flange to Water Outlet	G	113.5	118.5	121	144	154.5	160.5	163	171	173.5	179.5	187.5	187.5
WIDTHS													
Overall Width	H	75	75	80	80	87	87	98	98	105	105	112	112
I.D. Boiler	J	55	55	60	60	67	67	78	78	85	85	92	92
Center to Panel	L	44.5	44.5	47	47	50.5	50.5	56	56	59.5	59.5	63	63
Center to Lagging	M	30.5	30.5	33	33	36.5	36.5	42	42	45.5	45.5	49	49
Base Outside	P	47.5	47.5	52.5	52.5	51	51	64	64	60	60	68	68
Base Inside	Q	39.5	39.5	44.5	44.5	43	43	56	56	47	47	55	55
HEIGHTS													
Base to Vent Outlet	R	81	81	87	87	94.5	94.5	108	108	114.5	114.5	122.5	122.5
Base to Boiler Centerline	S	41	41	46	46	50	50	56.5	56.5	61	61	65.5	65.5
Height of Base Frame	T	12	12	12	12	12	12	12	12	12	12	12	12
Base to Bottom of Boiler	U	13	13	15.5	15.5	16	16	17	17	18	18	19	19
Base to Water Return & Outlet	V	78.5	78.5	82.5	82.5	90	90	102	102	110	110	118	118
BOILER CONNECTIONS													
Water Fill (Both Sides)	BB	1.25	1.5	1.5	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5
Water Return (150# ANSI Flange)	CC	4	6	6	6	8	8	8	10	10	12	12	12
Water Outlet (150# ANSI Flange)	DD	4	6	6	6	8	8	8	10	10	12	12	12
Drain-Front & Rear	EE	1.5	1.5	1.5	2	2	2	2	2	2	2	2	2
Air Vent	FF	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2
VENT STACK													
Vent Stack Diameter (Flanged)	AA	16	16	16	16	20	20	24	24	24	24	24	24
MINIMUM CLEARANCES													
Tube Removal - Front Only	X	84	89	92	115	120	126	125	133	136	142	150	150
MINIMUM BOILER ROOM LENGTH ALLOWING FOR TUBE REMOVAL:													
Thru Window or Door		208.5	220.5	223	246	274	280	280.5	300.5	303	309	329	329
Front of Boiler		252.5	262.5	268	314	330	342	343.5	359.5	365	377	393	393
WEIGHTS IN LBS													
Normal Water Weight		6,960	7,250	8,540	10,140	12,540	13,040	18,870	19,480	21,650	22,300	26,650	26,650

Table 4. CBEX Premium Hot Water Boiler Dimensions, 100-800 HP (Continued)

Approx. Shipping Weight - (30 psig)	8,190	8,430	9,570	10,830	13,100	13,450	16,240	17,640	20,680	21,480	26,500	26,500
Approx. Shipping Weight - (125 psig)	9,050	9,300	11,250	13,000	15,800	16,500	20,650	21,050	25,950	26,900	33,100	33,250

NOTES:

Accompanying dimensions, while sufficiently accurate for layout purposes, must be confirmed for construction by certified dimension diagram/drawing.

All Connections are Threaded Unless Otherwise Indicated:

PERFORMANCE DATA

Efficiency

Tables 5 and 6 show predicted fuel-to-steam efficiencies (including radiation and convection losses) for Cleaver-Brooks CBEX firetube boilers. For specific efficiencies on firetube boiler offerings not listed here, contact your local Cleaver-Brooks authorized representative.

Cleaver-Brooks offers an industry leading fuel-to-steam boiler efficiency guarantee for CBEX Firetube Boilers. The guarantee is based on the fuel-to-steam efficiencies shown in the efficiency tables and the following conditions. The efficiency percent number is only meaningful if the specific conditions of the efficiency calculations are clearly stated in the specification (see Cleaver-Brooks publication CB-7767 for a detailed description of efficiency calculations).

The boiler manufacturer shall guarantee that, at the time of startup, the boiler will achieve fuel-to-steam efficiency (as shown in the tables listed above) at 100% firing rate (add efficiency guarantees at 25%, 50%, and 75% of rating, if required). If the boiler(s) fail to achieve the corresponding guaranteed efficiency as published, the boiler manufacturer will rebate, to the ultimate boiler owner, five thousand dollars ($5,000) for every full efficiency point (1.0%) that the actual efficiency is below the guaranteed level. The specified boiler efficiency is based on the following conditions.

1. Fuel specification used to determine boiler efficiency:

- Natural Gas

Carbon,% (wt) = 69.98
Hydrogen,% (wt) = 22.31
Sulfur,% (wt) = 0.0
Heating value, Btu/lb = 21,830

- No. 2 Oil

Carbon,% (wt) = 85.8
Hydrogen,% (wt) = 12.7
Sulfur,% (wt) = 0.2
Heating value, Btu/lb = 19,420

2. Efficiencies are based on ambient air temperature of 80 °F, relative humidity of 30%, and 15% excess air in the exhaust flue gas.
3. Efficiencies are based on the following radiation and convection losses. Firing rate of 25% - 1.2%, 50% - 0.6%, 75% - 0.4%, and 100% - 0.3%.

Table 5. CBEX fuel-to-steam efficiencies natural gas

BHP	OPERATING PRESSURE = 125 psig			
	% OF LOAD			
	25%	50%	75%	100%
100	82.2	81.9	81.2	80.4
125	82.2	81.9	81.2	80.4
150	82.3	81.9	81.3	80.5
200	82.5	82.5	82.0	81.6
250	82.2	81.8	81.0	80.2
300	82.2	81.8	81.0	80.2
350	82.2	81.9	81.2	80.4
400	82.6	82.1	81.3	80.5
500	82.6	82.0	81.2	80.4
600	82.6	82.0	81.2	80.4
700	82.7	82.2	81.5	80.7
800	82.6	82.0	81.2	80.4

Table 6. CBEX fuel-to-steam efficiencies #2 oil

BHP	OPERATING PRESSURE = 125 psig			
	% OF LOAD			
	25%	50%	75%	100%
100	85.1	84.7	84.0	83.2
125	85.0	84.7	84.0	83.2
150	85.1	84.8	84.1	83.3
200	85.3	85.3	84.9	84.4
250	85.0	84.6	83.8	83.0
300	85.0	84.6	83.8	83.0
350	85.1	84.7	84.0	83.2
400	85.4	84.9	84.1	83.3
500	85.4	84.8	84.0	83.2
600	85.4	84.8	84.0	83.2
700	85.5	85.0	84.3	83.5
800	85.4	84.8	84.0	83.2

Emissions

Table 7. CBEX natural gas estimated emission levels

POLLUTANT	UNITS	UNCONTROLLED	30 PPM SYSTEM
CO	ppm[A]	50	50
	lb/MMBtu	0.037	0.037
NOx	ppm[A]	120	30
	lb/MMBtu	0.1214	0.0364
SOx	ppm[A]	-	-
	lb/MMBtu	0.001	0.001
HC/VOC5	ppm[A]	-	-
	lb/MMBtu	0.0055	0.0055
PM	ppm[A]	-	-
	lb/MMBtu	0.0076	0.0076

A. ppm levels are given on a dry volume basis and corrected to 3% oxygen (15% excess air)

Table 8. CBEX #2 oil estimated emission levels

POLLUTANT	UNITS	UNCONTROLLED	30 PPM SYSTEM
CO	ppm[A]	50	50
	lb/MMBtu	0.039	0.039
NOx	ppm[A]	160	90
	lb/MMBtu	0.2047	0.12
SOx	ppm[A]	55	55
	lb/MMBtu	0.1	0.1
HC/VOC5	ppm[A]	-	-
	lb/MMBtu	0.0021	0.0021
PM	ppm[A]	-	-
	lb/MMBtu	0.0089	0.0089

A. ppm levels are given on a dry volume basis and corrected to 3% oxygen (15% excess air) BASED ON THE FOLLOWING CONSTITUENT LEVELS:
Fuel-bound Nitrogen content = 0.02% by weight.
Sulfur content = 0.1% by weight.
Ash content = 0.01% by weight.

Truncated pages 12 through 19 contain dimensions, safety information, and plumbing details.

https://www.epa.gov/sites/production/files/2015-11/documents/emission-factors_nov_2015.pdf

Emission Factors for Greenhouse Gas Inventories

Last Modified: 19 November 2015

Red text indicates an update from the 2014 version of this document.

Typically, greenhouse gas emissions are reported in units of carbon dioxide equivalent (CO_2e). Gases are converted to CO_2e by multiplying by their global warming potential (GWP). The emission factors listed in this document have not been converted to CO_2e. To do so, multiply the emissions by the corresponding GWP listed in the table below.

Gas	100-Year GWP
CH_4	25
N_2O	298

Source: Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report (AR4), 2007. See the source note to Table 9 for further explanation.

Table 1 Stationary Combustion Emission Factors

Fuel Type	Heating Value	CO_2 Factor	CH_4 Factor	N_2O Factor	CO_2 Factor	CH_4 Factor	N_2O Factor
	mmBtu per short ton	kg CO_2 per mmBtu	g CH_4 per mmBtu	g N_2O per mmBtu	kg CO_2 per short ton	g CH_4 per short ton	g N_2O per short ton
Coal and Coke							
Anthracite Coal	25.09	103.69	11	1.6	2,602	276	40
Bituminous Coal	24.93	93.28	11	1.6	2,325	274	40
Sub-bituminous Coal	17.25	97.17	11	1.6	1,676	190	28
Lignite Coal	14.21	97.72	11	1.6	1,389	156	23
Mixed (Commercial Sector)	21.39	94.27	11	1.6	2,016	235	34
Mixed (Electric Power Sector)	19.73	95.52	11	1.6	1,885	217	32
Mixed (Industrial Coking)	26.28	93.90	11	1.6	2,468	289	42
Mixed (Industrial Sector)	22.35	94.67	11	1.6	2,116	246	36
Coal Coke	24.80	113.67	11	1.6	2,819	273	40
Fossil Fuel-derived Fuels (Solid)							
Municipal Solid Waste	9.95	90.70	32	4.2	902	318	42
Petroleum Coke (Solid)	30.00	102.41	32	4.2	3,072	960	126
Plastics	38.00	75.00	32	4.2	2,850	1,216	160
Tires	28.00	85.97	32	4.2	2,407	896	118
Biomass Fuels (Solid)							
Agricultural Byproducts	8.25	118.17	32	4.2	975	264	35
Peat	8.00	111.84	32	4.2	895	256	34
Solid Byproducts	10.39	105.51	32	4.2	1,096	332	44
Wood and Wood Residuals	17.48	93.80	7.2	3.6	1,640	126	63
	mmBtu per scf	**kg CO_2 per mmBtu**	**g CH_4 per mmBtu**	**g N_2O per mmBtu**	**kg CO_2 per scf**	**g CH_4 per scf**	**g N_2O per scf**
Natural Gas							
Natural Gas	0.001026	53.06	1.0	0.10	0.05444	0.00103	0.00010
Fossil-derived Fuels (Gaseous)							
Blast Furnace Gas	0.000092	274.32	0.022	0.10	0.02524	0.000002	0.000009
Coke Oven Gas	0.000599	46.85	0.48	0.10	0.02806	0.000288	0.000060
Fuel Gas	0.001388	59.00	3.0	0.60	0.08189	0.004164	0.000833
Propane Gas	0.002516	61.46	0.022	0.10	0.15463	0.000055	0.000252
Biomass Fuels (Gaseous)							
Landfill Gas	0.000485	52.07	3.2	0.63	0.025254	0.001552	0.000306
Other Biomass Gases	0.000655	52.07	3.2	0.63	0.034106	0.002096	0.000413
	mmBtu per gallon	**kg CO_2 per mmBtu**	**g CH_4 per mmBtu**	**g N_2O per mmBtu**	**kg CO_2 per gallon**	**g CH_4 per gallon**	**g N_2O per gallon**
Petroleum Products							
Asphalt and Road Oil	0.158	75.36	3.0	0.60	11.91	0.47	0.09
Aviation Gasoline	0.120	69.25	3.0	0.60	8.31	0.36	0.07
Butane	0.103	64.77	3.0	0.60	6.67	0.31	0.06
Butylene	0.105	68.72	3.0	0.60	7.22	0.32	0.06
Crude Oil	0.138	74.54	3.0	0.60	10.29	0.41	0.08
Distillate Fuel Oil No. 1	0.139	73.25	3.0	0.60	10.18	0.42	0.08
Distillate Fuel Oil No. 2	0.138	73.96	3.0	0.60	10.21	0.41	0.08
Distillate Fuel Oil No. 4	0.146	75.04	3.0	0.60	10.96	0.44	0.09
Ethane	0.068	59.60	3.0	0.60	4.05	0.20	0.04
Ethylene	0.058	65.96	3.0	0.60	3.83	0.17	0.03
Heavy Gas Oils	0.148	74.92	3.0	0.60	11.09	0.44	0.09
Isobutane	0.099	64.94	3.0	0.60	6.43	0.30	0.06
Isobutylene	0.103	68.86	3.0	0.60	7.09	0.31	0.06
Kerosene	0.135	75.20	3.0	0.60	10.15	0.41	0.08
Kerosene-Type Jet Fuel	0.135	72.22	3.0	0.60	9.75	0.41	0.08
Liquefied Petroleum Gases (LPG)	0.092	61.71	3.0	0.60	5.68	0.28	0.06
Lubricants	0.144	74.27	3.0	0.60	10.69	0.43	0.09
Motor Gasoline	0.125	70.22	3.0	0.60	8.78	0.38	0.08
Naphtha (<401 deg F)	0.125	68.02	3.0	0.60	8.50	0.38	0.08
Natural Gasoline	0.110	66.88	3.0	0.60	7.36	0.33	0.07
Other Oil (>401 deg F)	0.139	76.22	3.0	0.60	10.59	0.42	0.08
Pentanes Plus	0.110	70.02	3.0	0.60	7.70	0.33	0.07
Petrochemical Feedstocks	0.125	71.02	3.0	0.60	8.88	0.38	0.08
Petroleum Coke	0.143	102.41	3.0	0.60	14.64	0.43	0.09
Propane	0.091	62.87	3.0	0.60	5.72	0.27	0.05
Propylene	0.091	65.95	3.0	0.60	6.00	0.27	0.05
Residual Fuel Oil No. 5	0.140	72.93	3.0	0.60	10.21	0.42	0.08
Residual Fuel Oil No. 6	0.150	75.10	3.0	0.60	11.27	0.45	0.09
Special Naphtha	0.125	72.34	3.0	0.60	9.04	0.38	0.08
Still Gas	0.143	66.72	3.0	0.60	9.54	0.43	0.09
Unfinished Oils	0.139	74.54	3.0	0.60	10.36	0.42	0.08
Used Oil	0.138	74.00	3.0	0.60	10.21	0.41	0.08
Biomass Fuels (Liquid)							
Biodiesel (100%)	0.128	73.84	1.1	0.11	9.45	0.14	0.01
Ethanol (100%)	0.084	68.44	1.1	0.11	5.75	0.09	0.01
Rendered Animal Fat	0.125	71.06	1.1	0.11	8.88	0.14	0.01
Vegetable Oil	0.120	81.55	1.1	0.11	9.79	0.13	0.01
Biomass Fuels (Kraft Pulping Liquor, by Wood Furnish)							
North American Softwood		94.4	1.9	0.42			
North American Hardwood		93.7	1.9	0.42			
Bagasse		95.5	1.9	0.42			
Bamboo		93.7	1.9	0.42			
Straw		95.1	1.9	0.42			

Source:

Solid, gaseous, liquid, and biomass fuels: Federal Register (2009) EPA; 40 CFR Parts 86, 87, 89 et al; Mandatory Reporting of Greenhouse Gases; Final Rule, 30Oct09, 261 pp. Tables C-1 and C-2 at FR pp. 56409-56410. Revised emission factors for selected fuels: Federal Register (2010) EPA; 40 CFR Part 98; Mandatory Reporting of Greenhouse Gases; Final Rule, 17Dec10, 81 pp. With Amendments from Memo: Table of Final 2013 Revisions to the Greenhouse Gas Reporting Rule (PDF) to 40 CFR part 98, subparts C and AA: Table C–1 to Subpart C—Default CO2 Emission Factors and High Heat Values for Various Types of Fuel, Table C–2 to Subpart C—Default CH_4 and N_2O Emission Factors for Various Types of Fuel, and Table AA–1 to Subpart AA of Part 98—Kraft Pulping Liquor Emissions Factors for Biomass-Based CO_2, CH_4, and N_2O.

http://www.epa.gov/ghgreporting/documents/pdf/2013/documents/memo-2013-technical-revisions.pdf
http://www.epa.gov/ghgreporting/reporters/subpart/c.html

Process Operation of Proposed Boiler Addition

Currently SWC have 3 boilers that provide steam for cheese and whey operations. One boiler is equipped with a biogas train. To save energy, this boiler is always the lead boiler unless maintenance or inspection is being done on it. The other two alternate being the lag (or alternative) boilers.

With the current steam demand one boiler is the lead boiler, staying on high fire. Boilers 2 & 3 remain on low fire until the demand requires steam. This demand is usually from 4 am to 11 am daily. The third boiler stays on low fire allowing the alternating lag / backup.

An engineering analysis that was conducted on the future steam demand concluded that a fourth boiler would be needed. With the expansion plan we will be able to spread out the peak demand during normal operations, allowing the need for two boilers to run at all times. It was determined that if there was an operational issue or if one of the boilers were down for maintenance or inspection a negative impact to operations could happen.

The process for the boiler system during normal operations would be as follows:

- Run the biogas boiler as lead (BLR1)
- Alternate the other two boilers in lag (BLR2 & BLR3)
- The fourth boiler would remain off unless maintenance or inspections are occurring on one of the other three. (BLR5)

Note: SWC has a fourth smaller boiler (BLR4) at the wastewater treatment plant that is occasionally used to heat the effluent.

Conor McWilliams
Director Process Engineering

Andrew Logan
Maintenance Plant Manager

Source Emissions Test Report

Boilers #1, #2, #3, Wastewater Plant Boiler
Dryer #1 and Baghouse #1

Southwest Cheese
Clovis, New Mexico

by

Kramer & Associates, Inc.
4501 Bogan NE Suite A-1
Albuquerque, New Mexico 87109
505-881-0243

June, 2007

II. Table 1: Data Summary

Location Data	Boiler #1 BLR1	Boiler #2 BLR2	Boiler #3 BLR3	WW Plt Boiler BLR4	Dryer DRY1	BagHse DBH1
Date of Sampling (2007)	6/26/07	6/25/07	6/26/07	6/27/07	6/27/07	6/29/07
NOx Emissions:						
Test Run #1: (lb/hr)	1.12	1.17	1.62	0.84	0.85	--
Test Run #2: (lb/hr)	1.02	1.15	2.34	0.80	0.74	--
Ave Lb/Hr NOx	**1.07**	**1.16**	**1.98**	**0.82**	**0.79**	--
Permit Max. lb/hr NOx	**1.7**	**1.7**	**1.7**	**0.8**	**1.9**	--
CO Emissions:						
Test Run #1: (lb/hr)	0.29	0.33	0.28	0.81	0.68	--
Test Run #2: (lb/hr)	0.26	0.37	0.25	0.74	1.1	--
Ave Lb/Hr CO	**0.27**	**0.35**	**0.26**	**0.77**	**0.89**	--
Permit Max. CO	**1.8**	**1.8**	**1.8**	**0.7**	**2.6**	--
TSP Emissions:						
Test Run #1, lb/hr	0.102	0.187	0.176	--	0.025	0.506
Test Run #2, lb/hr	0.048	0.077	0.108	--	0.013	0.495
Ave Lb/Hr TSP	**0.075**	**0.132**	**0.142**	--	**0.019**	**0.50**
Permit Max. lb/hr	**0.5**	**0.5**	**0.5**	--	**0.14**	**3.0**
PM-10 Emissions:						
Run #1, lb/hr	0.044	0.077	0.102	--	0.019	0.24
Run #2, lb/hr	0.031	0.041	0.075	--	0.010	0.173
Ave lb/hr PM-10	**0.038**	**0.059**	**0.089**	--	**0.015**	**0.21**
Permit Max. lb/hr	**0.5**	**0.5**	**0.5**	--	**0.14**	**3.0**
VOC Emissions:						
Test Run #1, lb/hr	0.008	0.015	0.01	--	--	--
Test Run #2, lb/hr	0.008	0.015	0.01			
Ave lb/hr VOC	**0.008**	**0.015**	**0.01**			
Permit Max. lb/hr	**0.8**	**0.8**	**0.8**	--	--	--

Note: Additional sampling and analysis data including all field data are in Data & Calculations Section of this report.