

NORTH CAROLINA DIVISION OF AIR QUALITY <p style="text-align: center;">Air Permit Review</p>		Region: Mooresville Regional Office County: Cabarrus NC Facility ID: 1300051 Inspector's Name: Bill Bass Date of Last Inspection: 05/23/2005 Compliance Code: 4/In Compliance - Certification	
Permit Issue Date:			
Facility Data Applicant (Facility's Name): S & D Coffee, Inc. Facility Address: S & D Coffee, Inc. 300 Concord Parkway South Concord, NC 28026 SIC: 2096 / Potato Chips And Similar Snacks NAICS: 311919 / Other Snack Food Manufacturing Facility Classification: Before: Synthetic Minor After: Title V Fee Classification: Before: Synthetic Minor After: Title V		Permit Applicability (this application only) SIP: 2D .0515, .0516, .0521, .0531, .1806, .1100, 2Q .0500, and 2Q .0711 NSPS: NESHAP: PSD: PSD Avoidance: 100 TPY VOC NC Toxics: 2D .1100 112(r): Other: 100 TPY VOC limit due to non-attainment.	
Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	Application Number: 1300051.05B Date Received: 08/18/2005 Application Type: Modification Application Schedule: 1 st time Title V Existing Permit Data Existing Permit Number: 05029/R09 Existing Permit Issue Date: 10/19/2004 Existing Permit Expiration Date: 09/30/2005
Carl Teten Engineering Manager (704) 782-3121 P O Box 1628 Concord NC, 28026	Jerry Collier Vice President of Operations (704) 782-3121 P. O. Box 1628 Concord NC, 28026	Harold Blackerby Plant Eng (704) 782-3121 P O Box 1628 Concord NC, 28026	
Review Engineer: Mike Benson Review Engineer's Signature: Date:		Comments / Recommendations: Issue 05029/T10 Permit Issue Date: Permit Expiration Date:	

I. Introduction:

The U.S. Environmental Protection Agency (EPA) has given interim approval to North Carolina's Title V operating permits program effective on December 15, 1995. Final approval for the Title V program was received October 1, 2001. Title V facilities are required to obtain an operating permit which addresses all applicable regulations under the State Implementation Plan, Federal Implementation Plan, and other provisions of the Clean Air Act (CAA). The Title V Operating Permit will define all of the facility's obligations under the CAA.

This First Time Title V Air Permit application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the Title V operating permit. The primary source of information used to construct the permit is the above referenced air permit application. This facility currently has a Synthetic Minor Air Quality Permit. The facility has asked that its synthetic minor limitations be removed for 10/25 Federal HAPs. However, the facility has also asked that the original 100 TPY limit for VOC emissions associated with the synthetic minor permit be retained so as to remain a minor source, avoiding non-attainment area and PSD New Source Review. The proposed production increase will result in the HAP acetaldehyde emission increase, therefore, the facility will become a Part 70 major source. Applicability of 2D .0530 avoidance was examined for PM10 because the previously issued synthetic minor permit had a 100 TPY limit due to potential uncontrolled PM10 emission. It was determined that

no PSD avoidance limit for PM10 (250 TPY) would be needed because potential with limits/control PM10 emissions are less than the 250 TPY threshold.

II. Background Information:

Pursuant to 15A NCAC 2Q .0506 S&D Coffee, Inc. submitted its initial Title V application to the Division of Air Quality on August 19, 2005. The application was considered complete for processing on August 19, 2005. The permit is required to go to public notice pursuant to 15A NCAC 2Q .0521.

III. Facility Description:

S&D Coffee, Inc. roasts green coffee beans to make dry coffee beans. S&D Coffee, Inc. will be considered major for Title V purposes due to HAP emissions exceeding the 10/25 TPY threshold.

IV. Statement of Compliance:

This facility was inspected by DAQ on May 23, 2004. However, Form E5, "Title V Compliance Certification" was submitted to DAQ indicating that the Company is in compliance with all Air Quality regulations.

V. Summary of Emission Sources and Control Devices:

The following table contains a summary of all permitted emission sources and associated air pollution control devices and appurtenances:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Roaster 1 ES-R1	natural gas-fired coffee bean roasting operation (4.0 million Btu per hour maximum rated input; 4,400 pounds per hour maximum process rate)	EP-R1-RVC, ES-R1-TO	receiving cyclone (ID No. EP-R1-RVC; 40 inches in diameter) and natural gas-fired thermal oxidizer (ID No. ES-R1-TO; 3.5 million Btu per hour maximum rated input) installed in series
ES-R1C	cooling system (4,400 lbs/hr maximum process rate)	EP-R1-C/DC	cooling/destoning cyclone (21.5 inches in diameter)
Roaster 2 ES-R2	natural gas-fired coffee bean roasting operation (8.0 million Btu per hour maximum rated input and 7,400 lbs/hr maximum process rate)	EP-R2-RVC, ES-R2-CO	receiving cyclone (ID No. EP-R2-RVC; 40 inches in diameter) and natural gas-fired catalytic oxidizer (ID No. ES-R2-CO; 4 million Btu per hour maximum rated input) installed in series
ES-R2C	cooling and destoning system (7,400 lbs/hr maximum process rate)	EP-R2-CC, ES-R2-DC	cooling cyclone (EP-R2-CC; 60 inches in diameter) and destoning cyclone (ID No. ES-R2-DC; 36 inches in diameter) installed in series

Roaster 3			
ES-R3	natural gas-fired coffee bean roasting operation (7.0 million Btu per hour maximum rated input and 8800 lbs/hr maximum process rate)	EP-R3-RVC, ES-R3-CO	receiving cyclone (ID No. EP-R3-RVC; 40 inches in diameter) and natural gas-fired catalytic oxidizer (ID No. ES-R3-CO; 2.6 million Btu per hour maximum rated input) installed in series
ES-R3C	cooling and destoning system (8,800 lbs/hr maximum process rate)	EP-R3-CC, ES-R3-DC	cooling cyclone (ID No. EP-R3-CC; 88 inches in diameter) and destoning cyclone (ID No. ES-R3-DC; 60 inches in diameter) installed in series
Roaster 4			
ES-R4	natural gas-fired specialty coffee bean roasting operation (0.4 million Btu per hour maximum heat input; 405 pounds per hour maximum process rate)	ES-R4-TO	natural gas-fired thermal oxidizer (1.4 million Btu per hour maximum rated input)
Roaster 5			
ES-R5	natural gas-fired coffee bean roasting operation (7.0 million Btu per hour maximum rated input; 8,800 pounds per hour maximum process rate)	CD-R5-CO, CD-R5-RVC	receiving cyclone (ID No. CD-R5-RVC; 88 inches in diameter) and natural gas-fired catalytic oxidizer (ID No. CD-R5-CO; 2.6 million Btu per hour maximum rated input) installed in series
ES-R5C	cooling and destoning system (8,800 lbs/hr maximum process rate)	CD-R5-DC, CD-R5-CC	cooling cyclone (ID No. CD-R5-CC; 88 inches in diameter) and destoning cyclone (ID No. CD-R5-DC; 88 inches in diameter) installed in series
Green Bean Handling			
ES-BH1	bean handling system (5.70 tons/hr maximum process rate)	BH1-BF	bagfilter (2,398 square feet of filter area)
ES-BH2	bean handling system (22.8 tons/hr maximum process rate)	CD-BF-1, CD-BF-2	bagfilter (ID No. CD-BF-1; 2,400 square feet of filter area) and bagfilter (ID No. CD-BF-2; 4,800 square feet of filter area) installed in parallel

VI. Emission Source-by-Source Evaluation:

A. Coffee bean roasting operations consisting of the following:

Roaster 1 – 8.0 million Btu per hour natural gas-fired coffee bean roasting operation with a maximum process throughput of 7,400 pounds per hour (ID No. ES-R2), with associated receiving cyclone (ID No. EP-R1-RVC; 40 inches in diameter), controlled by a natural gas-fired thermal oxidizer (ID No. ES-R1-TO; 3.5 million BTU per hour maximum heat input) in series with a cooling system (ID No. ES-R1C; 4,400 pounds per hour maximum process throughput rate) controlled by a cooling/destoning cyclone (ID No. EP-R1-C/DC; 21.5 inches in diameter),

Roaster 2 – 4.0 million Btu per hour natural gas-fired coffee bean roasting operation with a maximum process throughput of 7,400 pounds per hour (ID No. ES-R1), with associated receiving cyclone (ID No. EP-R2-RVC; 40 inches in diameter), controlled by a natural gas-fired catalytic oxidizer (ID No. ES-R2-CO; 4.0 million BTU per hour maximum heat input) in series with a cooling and destoning system (ID No. ES-R2C; 7,400 pounds per hour maximum process throughput rate) controlled by a cooling cyclone (ID No. EP-R2-CC; 60 inches in diameter) in series with a destoning cyclone (ID No. ES-R2-DC; 36 inches in diameter),

Roaster 3 – 7.0 million Btu per hour natural gas-fired coffee bean roasting operation with a maximum process throughput of 8,800 pounds per hour (ID No. ES-R3), with associated receiving cyclone (ID No. EP-R3-RVC; 40 inches in diameter), controlled by a natural gas-fired catalytic oxidizer (ID No. ES-R2-CO; 2.6 million BTU per hour maximum heat input) in series with a cooling and destoning system (ID No. ES-R3C; 8,800 pounds per hour maximum process throughput rate) controlled by a cooling cyclone (ID No. EP-R3-CC; 88 inches in diameter) in series with a destoning cyclone (ID No. ES-R3-DC; 60 inches in diameter),

Roaster 4 – 0.4 million Btu per hour natural gas-fired specialty coffee bean roasting operation with a maximum process throughput of 405 pounds per hour (ID No. ES-R4) controlled by a natural gas-fired thermal oxidizer (ID No. ES-R4-TO; 1.4 million BTU per hour maximum heat input), and

Roaster 5 – 7.0 million Btu per hour natural gas-fired coffee bean roasting operation with a maximum process throughput of 8,800 pounds per hour (ID No. ES-R5), with associated receiving cyclone (ID No. EP-R5-RVC; 88 inches in diameter), controlled by a natural gas-fired catalytic oxidizer (ID No. ES-R5-CO; 2.6 million BTU per hour maximum heat input) in series with a cooling and destoning system (ID No. ES-R5C; 8,800 pounds per hour maximum process throughput rate) controlled by a cooling cyclone (ID No. CD-R5-CC; 88 inches in diameter) in series with a destoning cyclone (ID No. CD-R5-DC; 88 inches in diameter)

1. Description:

Coffee bean roasters (batch type).

2. Applicable Regulatory Requirements:

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	$E=4.10(P^{0.67})$ where P=process weight in tons per hour	15A NCAC 2D .0515
sulfur dioxide	2.3 pounds SO ₂ per million Btu heat input	15A NCAC 2D .0516

visible emissions	20 percent opacity	15A NCAC 2D .0521
odorous emissions	State-enforceable only - odorous emissions must be controlled	15A NCAC 2D .1806
toxic air pollutants	State-enforceable only - See Section	15A NCAC 2D .1100
volatile organic compounds	VOC emissions less than 100 tons per year	15A NCAC 2Q .0317 (avoidance of 2D .0531)
particulate matter PM-10	PM-10 emissions less than 250 tons per year	15A NCAC 2Q .0317 (avoidance of 2D .0530)

a. 15A NCAC 2D .0515: “Particulates from Miscellaneous Industrial Process”.

Allowable particulate emissions are calculated using the formula $E = 4.10(P)^{0.67}$, where P is the process rate in tons per hour, and E is the allowable particulate emissions rate, in pounds per hour. The table below summarizes rates, allowable emissions, and expected particulate emissions.

Process	Maximum Process Rate, TPH	Allowable Emissions Rate, lb/hr	Expected Actual Emissions, lb/hr (after controls) ¹	Potential Emissions, lb/hr (before controls)	Potential Emissions, lb/hr (after controls) ²
Bean Handling #1	5.70	13.16	0.18	3400	0.34
Bean Handling #2	22.8	33.31	0.41	13500	1.35
Roaster #1	2.20	6.95	0.46	2.34	0.60
Roaster #2	3.70	9.85	0.64	3.93	1.00
Roaster #3	4.40	11.06	0.83	4.75	1.21
Roaster #4	0.203	1.41	0.00016	0.13	0.038
Roaster #5	4.40	11.06	0.82	4.75	1.21

¹Based on 6,000 hours per year.

²Based on 8,760 hours per year.

Estimated actual emissions are less than the respective estimated actual emissions, and all processes are considered to be in compliance with 2D .0515.

b. 15A NCAC 2D .0516: “Sulfur Dioxide Emissions from Combustion Sources”.

Emissions from the combustion sources at this facility are limited to 2.3 pounds of sulfur dioxide per million Btu heat input. The below table summarizes estimated SO₂ emissions for those processes with fuel input.

Process	Maximum Heat Input, MBtu/hr	Estimated SO ₂ Emissions, lb/hr	Estimated SO ₂ Emissions, lb/MBtu	Allowable SO ₂ Emissions, lb/MBtu
Roaster #1	3.5	0.02	0.006	2.3
Roaster #2	4.0	0.004	0.001	2.3
Roaster #3	2.6	0.004	0.002	2.3
Roaster #4	1.4	0.004	0.003	2.3
Roaster #5	2.6	0.004	0.002	2.3

Estimated actual SO₂ emissions are in all cases less than allowable SO₂ emissions, and therefore, all fuel burning processes are considered to be in compliance with 2D .0516.

- c. 15A NCAC 2D .0521: “Control of Visible Emissions”.
All sources are limited to 20 percent visible opacity emissions.

This facility was inspected on May 23, 2004, by Bill Blass of MRO. Roasters 1, 2 and 3 were in operation with no visible opacity emissions. Bean handling systems 1 and 2 were observed in operation with no opacity visible emissions. It is expected that roasters 4 and 5, when operating, will operate with no visible opacity emissions. This facility is considered/expected to be in compliance with 2D .0521.

- d. 15A NCAC 2D .1806: “Control and Prohibition of Odorous Emissions”.

This rule requires the owner or operator of a facility to prevent objectionable odors beyond the facility’s boundary. Based on past DAQ inspections, coffee odors have been reported off-site. However, the last inspection report has indicated that this has not been a recurring problem. This equipment is considered to be in compliance with 2D .1806.

- e. 15A NCAC 2D .1100: “Control of Toxic Air Pollutants”.

This facility has conducted point-source Toxics modeling for acetic acid, acrolein, and formaldehyde. Each Roaster (ES-R1 through ES-R5) demonstrated compliance with the AAL. The modeling protocol was reviewed and approved by Charles Buckler, AQAB on September 16, 2004. The results are as follows:

EMISSION SOURCE	TOXIC AIR POLLUTANT(S)	EMISSION LIMIT(S)
ES-R1	acetic acid acrolein formaldehyde	1.24 lb/hr 0.108 lb/hr 0.619 lb/hr
ES-R2	acetic acid acrolein formaldehyde	7.715 lb/hr 0.126 lb/hr 0.874 lb/r
ES-R3	acetic acid acrolein formaldehyde	9.174 lb/hr 0.150 lb/hr 1.039 lb/hr
ES-R4	acetic acid acrolein formaldehyde	0.114 lb/hr 0.010 lb/hr 0.057 lb/hr
ES-R5	acetic acid acrolein formaldehyde	9.174 lb/hr 0.150 lb/hr 1.039 lb/hr

This facility is considered to be in compliance with 2D .1100.

f. 15A NCAC 2Q .0317: “Avoidance Conditions”.

This facility is subject to 2D .0531 Prevention of Significant Deterioration avoidance (avoidance for sources in non-attainment areas) because Cabarrus County is non-attainment for ozone, and is not part of the Early Action Compact.

1. Sources in Nonattainment Areas.

As noted above, Cabarrus County is non-attainment for ozone. This means the facility will be limited to 100 tons per year of VOC emissions to avoid PSD/NSR review. The facility’s uncontrolled potential VOC emissions are 2,740 TPY. The facility’s potential controlled VOC emissions are 137 TPY. A specific stipulation is included in the permit limiting the facility’s VOC emissions to less than 100 TPY. The facility will be required to keep monthly records and submit quarterly reports to demonstrate compliance.

It is important to note that the facility’s expected actual VOC emissions are 63 TPY. The facility has been contacted in regards to this issue (accidentally exceeding the 100 TPY limit). The Permittee indicated that for the foreseeable future, they do not expect to have more than 65 TPY VOC emissions. This is based on expected 120 million pounds of beans processed. The reason the facility has requested to become Title V is not expected VOC emissions exceeding the 100 TPY threshold for Title V applicability, but that they expect to exceed the 10 TPY Federal HAP threshold for acetaldehyde.

Volatile Organic Compounds emissions are expected to be less than 100 tons per year, and therefore, the facility is expected to be in compliance with 2D .0532 avoidance.

g. 15A NCAC 2Q .0711: “Emission Rates Requiring a Permit”.

In addition to the modeled pollutants listed above for 2D .1100, the facility will be subject to 2Q .0711 limits. The table below summarizes the TAPs that did not need a modeling review.

Pollutant	Allowable Emissions	Estimated Emissions
Acetaldehyde	6.8 lb/hr	5.90
Phenol	0.24 lb/hr	1.8E-8
Hexane	23 lb/day	2.96

Expected actual emissions are less than allowable, and the facility is considered to be in compliance with 2Q .0711.

B. Green bean handling operations consisting of the following:

Bean handling system 1 (ID No. ES-BH1; 5.70 tons per hour maximum process rate) controlled by a bagfilter (ID No. BH1-BF; 2,398 square feet of filter area), and

Bean handling system 2 (ID No. ES-BH1; 22.8 tons per hour maximum process rate) controlled by a bagfilter (ID No. CD-BF-1; 2,400 square feet of filter area) in parallel with a bagfilter (ID No. CD-BF-2; 4,800 square feet of filter area)

1. Description:

Transfer system for coffee beans.

2. Applicable Regulatory Requirements:

The following provides a summary of limits and/or standards for the emission source(s) described above. A review of the information in the application was performed to ensure the appropriate limits and associated calculations used to show compliance were correct.

Regulated Pollutant	Limits/Standards	Applicable Regulation
particulate matter	$E=4.10(P^{0.67})$ where P=process weight in tons per hour	15A NCAC 2D .0515
visible emissions	20 percent opacity	15A NCAC 2D .0521

- a. 15A NCAC 2D .0515: "Particulates from Miscellaneous Industrial Process".

Compliance indicated in VI.A.a above.

- b. 15A NCAC 2D .0521: "Control of Visible Emissions".

Compliance indicated in VI.A.c above.

- c. 15A NCAC 2Q .0317: "Avoidance Conditions".

Compliance indicated in VI.A.f.1 above.

VII. Other Applicable Requirements:

A. NAA/PSD Issues:

Cabarrus County has been triggered for PSD increment tracking for PM10 and SO2. This modification will increase PM10 and SO2 emissions. It is believed that this increase is less than the 1.0 pound per hour threshold for PSD increment tracking based on the following:

Total SO2 emissions are 0.10 TPY for 6,000 hours of operation (0.03 lb/hr). The total SO2 emission rate is less than the threshold level, thus the increase by definition is less than the threshold level.

Total PM10 emissions are 10.0 TPY for 6,000 hours of operation (3.3 lb/hr). Previously, the facility was limited to 86,500,000 pounds of coffee processed. The facility now expects to process a maximum of 120,000,000 pounds of coffee. The approximate increase in PM10 emissions are:

$$((120,000,000 - 86,500,000) / 86,500,000) \times 100 = \sim 39\% \text{ (increase)}. \quad 3.3 \text{ lb/hr} \times .39 = 1.28 \text{ lb/hr.}$$

This is more than the threshold level (1.0 lb/hr) and PSD increment tracking does apply. A copy of the permit will be forwarded to Connie Horne, DAQ.

NAA does apply. Cabarrus County is non-attainment for ozone. Therefore, for this increase, VOC emissions will be limited to 100 TPY.

B. NSPS Issues:

This facility is not subject to NSPS.

C. MACT Issues:

This facility is not subject to MACT.

D. 112(r) Issues:

This facility is not subject to 112(r).

E. CAM Issues:

CAM should be evaluated at permit renewal. It is expected that CAM will apply to Roasters 1-5 and bean handling systems 1 and 2.

F. NC Air Toxics:

The facility is subject to both 2D .1100 and 2Q .0711.

VIII. Facility-wide Emissions Summary:

Emissions are summarized from the current First Time Title V application.

Pollutant	Actual Emissions (TPY, after controls)	Potential Emissions (TPY, before controls)	Potential Emissions (TPY, after controls)
PM	10.0	74092*	25.1
PM10	10.0	74092*	25.1
PM2.5	10.0	74092*	25.1
SO2	0.10	0.10	0.10
NOx	16.10	16.10	16.10
CO	2.94	1958	6.40
VOC	63.15	2740	137

*It is important to note that this estimate, 74,000 TPY, is more than the total expected throughput, 60,000 TPY. The reason is that this is a back-calculation using an efficiency of 99.99% from the bagfilter, which in this case, is over-estimating PM emissions. The 25 TPY after-controls estimate was based on EPA AP-42 emission factors for controlled coffee bean processes. No known emission factors exist for uncontrolled factors. As noted in VI.A.a above, the facility demonstrates compliance with 2D .0515 easily, and the calculated 74,000 TPY pre-control emission rate does not effect compliance in any way.

The facility is considered to be Title V for expected acetaldehyde emissions of 11.8 TPY, which is greater than the 10 TPY threshold for any one HAP.

IX. Facility Compliance Status/Compliance History:

A review of IMPAQ as well as the physical file history located in the Central Files indicated that this facility is currently in compliance with applicable Air Quality regulations. A statement of compliance (Form E5) was received on August 19, 2005, indicating that the facility is in compliance with all applicable regulations.

X. Public Notice / EPA and Affected State Review:

Pursuant to 2Q. 0521, a notice of the draft Title V Permit will be placed in a newspaper of general circulation in the area where the facility is located. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice will be sent to persons on the Title V mailing list and EPA. Pursuant to 2Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant was provided to EPA. Also pursuant to 2Q .0522, a notice of the draft Title V Permit was provided to each affected State at or before the time notice provided to the public under 2Q .0521 above. South Carolina is an affected state for this facility. No comments from EPA or the public were received. or insert comments here

XI. Miscellaneous:

A settling box to trap burlap string before entering the bagfilter (ID No. BH1-BF) has been installed. This device is technically an additional control device and was added to the permit as ID No. BH1-SB. This device was not installed to increase the PM/PM10 efficiency of the current bagfilter, and calculations were not changed for PM/PM10 emissions.

Insignificant activities were added to the permit.

XII. Conclusions, Comments, and Recommendations:

A PE seal was not needed for this application.

Form E5, "Title V Compliance Certification", was submitted for this application.

MRO recommends issuance of Permit No. 05029T10.

Recommend issuance of Permit No. 05029T10.