INITIAL TITLE V AIR PERMIT APPLICATION REVIEW DRAFT

Revised 7/12/99

APPLICANT:	**SITE LOCATION:**		**COUNTY:**
Avoca Incorporated	Merry Hill		Bertie
TECHNICAL CONTACT:	**PHONE:**	**RESPONSIBLE OFFICIAL:**	**TITLE:**
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REGIONAL CONTACT:	**REGIONAL OFFICE:**		**SIC CODE:**
Betsy Huddleston	Washington		2833 (primary) 2087 (secondary)
APPLICATION NUMBER:	**EXISTING PERMIT NUMBER:**		**NEW PERMIT NUMBER:**
080044A5.A	01819R25		**01819T26**

I. Introduction

The U.S. Environmental Protection Agency (EPA) has given final approval to North Carolina's Title V operating permits program effective on October 1, 2001. This EPA approval triggered the requirements for Title V facilities to submit permit applications to the Division of Air Quality. 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 Initial Title V Air Permit application Review intends to convey all pertinent emissions data, rules, policies, and engineering assumptions used to construct the DRAFT Title V operating permit. The primary source of information used to construct the DRAFT permit is the above referenced air permit application.

II. Background Information

The DRAFT Title V operating permit replaces an existing Air Quality Construction and Operation Permit No. 01819R25 which was issued on November 7, 2002 and is currently scheduled to expire on October 31, 2004.

Pursuant to 15A NCAC 2Q .0506 Avoca Incorporated (formerly R.J. Reynolds Tobacco Company-Avoca Division) submitted its initial Title V application to the Division of Air Quality on February 13, 1996. The application was considered complete for processing. The DRAFT permit is required to go to public notice pursuant to 15A NCAC 2Q .0521.

III. Facility Description

Avoca Incorporated operates a plant extract and flavor producing facility at this Merry Hill site. The facility grows and harvests plant materials for extraction of necessary ingredient to produce flavorings used in the tobacco and foods industry, as well as material used in fragrances. Operations include boilers, generators, reaction vessels, and several processing tanks.

IV. Statement of Compliance

The DAQ has reviewed the compliance status of this facility. The applicant has certified that the facility will be in compliance with all applicable requirements. The applicant has also certified that the facility will be in compliance with any applicable requirements taking effect during the term of the permit and will meet such requirements on a timely basis.

V. Summary of Emission Sources and Control Devices

The following table identifies all emission sources and associated control devices for which the Initial Title V Operating Permit is being issued.

Emission Source ID No.	**Emission Source Description**	**Control Device ID No.**	**Control Device Description**
H-101, H-102 and H-103	Three No. 2 fuel oil-fired boilers (20.3, 20.3, and 25.2 million Btu per hour heat input, respectively, **Building No. 1001-4**)	NA	NA
E101, E102 and E103	Three No. 2 fuel oil-fired emergency generators [maximum permitted heat inputs (generator capacity) of 4.1 (400kW), 5.2 (500kW), and 4.5 (400kW) million Btu per hour, respectively]	NA	NA
TK-9228, M-2, M-17, M-17A, M-124A, M -124B, and M-20	Six solvent storage tanks and one acetic acid storage tank associated with the Sclareolide Operation	NA	NA
M-10, M-10A, D-1231A and D-1231B	Sclareolide Operation (batch flavorant/fragrant process, **Building No. 1001-1**) consisting of four reaction vessels	M-34	One jet ejector venturi-type wet ccrubber (10 gallons per minute total liquid injection rate)

ES-1001-2	Rotating counter current extractor and associated equipment consisting of: Eighteen cells	 CD-S-1	 One packed tower mineral oil scrubber installed on condenser vent with associated separation and recovery equipment including three tanks (M-25, M-124A and M -124B, Recovery Operation {**Building 1001-1**}, 20 gallons per minute organic solution processing rate) and one distillation tower (Distillation Operation {**Building 1001-1**}, 3.5 feet in diameter, six gallons per minute maximum processing rate, ID No. A-1)
ES-1001-11 Z-1001, Z-1002, TK-90024, EX-1012, and EX-1013 MHZ-1002	Botanical Extraction Operation (equipment for extraction of organics from plant materials) consisting of: One immersion extractor (918 pounds of botanical material per hour), a de-solventizer (five tray, indirect steam heated), a day tank (6000 gallons, first stage falling film evaporator (322 square feet of surface area), and second stage film evaporator (21 square feet of surface area){**Building No. 1001-11**} One plant material grinder (1011 pounds of feed per hour){**Building No. 1003-4**}	 CD-1001-11EX1002 CD-1003-4-1	 One condenser (84 square feet of shell surface area, 516 gallons of coolant per hour, 35°F outlet vapor stream) Bagfilter (244 square feet of filter area)
TK-9003, TK-9004, TK-9005, TK-9007 and TK9009	Five processing tanks (maximum permitted process rates of three batches per day; 2950, 2850, 2586, 264, and 264 gallons per batch, respectively) for dissolution of plant extract concentrate ("concrete" dissolution with hexane) prior to extraction in the Recovery Operation	CD-1001-1-2	One condenser

EVG D-2202, D-1215, D-1218 and D-1201	EVG Operation (batch flavorant process, **Building No. 1003-2**) consisting of: three reaction vessels and one dryer	CD-Z-9215 and CD-Z-9216	One water spray fume scrubber and one caustic solution fume scrubber (50 gallons per minute total liquid injection rate each)
Z-90005	One bulk lime storage silo	CD-90001	One bagfilter (225 square feet of filter area)
T-3001, T-3002, T-3004 and T-3005, T-3006 C-3001, D-3001, and D-3001d	Sclareol Recrystallization Process (**Building No. 1003-10**) consisting of: Five hexane storage tanks (6700, 2500, 2500, 2500, and 50 gallons capacity, respectively) One centrifuge, one reactor (1000 gallons), and one heat exchanger/dryer	CD-3001	One condenser
HB-1, HB-2, HB-3 and HB-4	Four hot boxes (**Building No. 1001-1**) for heating of concrete or mother liquor prior to extraction in the Recovery Operation	NA	NA
D1214 TK1204, 1205, 1206 and 1208 C-1203 D1211	Plant Nutrient Extraction (PNE) Process (**Building No. 1003-2**) consisting of: product extract reaction vessel four processing tanks one centrifuge waste solids separator vessel	EX2003 and D1213 EX2205 and D1212	One chilled water condenser with associated collector tank One chilled water condenser with associated collector tank
M-4, M-44, M-11, M-14, M-15, M-16, TK-1007, TK-1202, TK-1202A, TK 1205, TK-1208, and TK 9231, G-17 and D1202	Equipment for purification of sclareolide consisting of: Twelve tanks, one centrifuge and one dryer, respectively	NA	NA

VI. Emission Source-by-Source Evaluation

A. Three No. 2 fuel oil-fired boilers (ID Nos. H-101, H-102 and H-103)

1. Description

These boilers provide process steam used in the plant.

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	0.37 pounds per million Btu heat input	15A NCAC 2D .0503
sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
visible emissions	20 percent opacity	15A NCAC 2D .0521
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100

a. 2D .0503 "Particulates from Fuel Burning Indirect Heat Exchangers"

i.) Regulatory Analysis

These boilers are subject to 2D .0503 since No. 2 fuel oil can be burned for the primary purpose of producing heat by indirect heat transfer. The allowable emission rate is a function of maximum, plant-wide, indirect-fired heat exchanger heat input from non-wood fuels and is calculated by the following equation:

$$E = 1.090 (Q^{-0.2594}$$

where, E = allowable particulate emission rate in pounds per million Btu, and
Q = maximum heat input rate in million Btu per hour

These boilers were established before to the effective date of the regulation (February 1, 1983). The maximum heat input of all indirect-fired heat exchangers at the site (Q = 65.8 million Btu per hour) is used to calculated the allowable emission limit (E = 0.37 pounds per million Btu) for these boilers.

ii.) Monitoring Requirements

Since potential emissions are less than allowables, no monitoring is required.

iii.) Recordkeeping/Reporting Requirements

Since potential emissions are less than allowables, no recordkeeping or reporting is required.

b. 2D .0516 "Sulfur Dioxide Emissions from Combustion Sources"

i.) Regulation Requirements

The boilers are a source of emissions from combustion which discharges through a stack and therefore is subject to 2D .0516(a). Allowable emissions from this source while firing No.2 fuel oil shall not exceed 2.3 pounds per million Btu heat input.

The maximum sulfur content of No. 2 generally does not exceed 0.5 percent by weight. The worst case sulfur dioxide emissions based on diesel fuel with a sulfur content of 0.5 percent, and a heat content of 140,000 Btu per gallon are 0.1 pounds per million Btu heat input. Compliance with this regulation is indicated since the estimated emissions are less than the allowable.

ii.) Monitoring/Recordkeeping Requirements

Since potential emissions are less than allowables, no monitoring is required.

iii.) Reporting Requirements

Since potential emissions are less than allowables, no reporting is required.

c. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

These boilers were established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is demonstrated with this regulation because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring Requirements

There are no monitoring requirements when the source is burning No. 2 fuel oil.

iii.) Recordkeeping Requirements

There are no monitoring requirements when the source is burning No. 2 fuel oil.

iv.) Reporting Requirements

There are no monitoring requirements when the source is burning No. 2 fuel oil.

B. Three No. 2 Fuel Oil Fired Generators- 400, 500 and 400 KW (ID No. E101, E102 & E103)

1. Description

These No. 2 fuel oil fired generators are used to provide backup electricity to serve the utilities at the plant.

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
sulfur dioxide	2.3 pounds per million Btu heat input	15A NCAC 2D .0516
visible emissions	20 percent opacity	15A NCAC 2D .0521

a. 2D .0516 "Sulfur Dioxide Emissions from Combustion Sources"

i.) Regulation Requirements

The generators are a source of emissions from combustion which discharges through a stack and therefore is subject to 2D .0516(a). Allowable emissions from this source while firing No. 2 fuel oil shall not exceed 2.3 pounds per million Btu heat input.

The maximum sulfur content of No. 2 generally does not exceed 0.5% The worst case sulfur dioxide emissions based on diesel fuel with a sulfur content of 0.5%, and a heat content of 140,000 Btu per gallon are 0.1 pounds per million Btu heat input. Compliance with this regulation is indicated since the estimated emissions are less than the allowable.

ii.) Monitoring/Recordkeeping Requirements

Since potential emissions are less than allowables, no monitoring is required.

iii.) Reporting Requirements

Since potential emissions are less than allowables, no reporting is required.

d. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

This process was established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period.

Compliance is demonstrated with this regulation because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring/Recordkeeping/Reporting Requirements

There are no monitoring, recordkeeping, or reporting requirements for these generators.

C. Six Solvent Storage Tanks (ID Nos. TK-9228, M-2, M-17, M-17A, M-124A, and M-124B)

1. Description

These storage tanks are used in the batch processes for the sclareolide conversion.

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**
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year- See Section VII	avoidance of 15A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100

D. Acetic Acid Storage Tank (ID No. M-20)

1. Description

This tank is used in the sclareolide conversion process.

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**
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958

volatile organic compounds	less than 225 tons per year- See Section VII	avoidance of 15A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100

E. Sclareolide Operation (Bldg. 1001-2) consisting of Four Reaction Vessels (ID No. M-10, M10A, D-1231A, D-1231B) with associated jet ejector venturi type wet scrubber (ID No. CD-M-34)

1. Description

   This sclareolide process is a batch process operation for producing flavorant/fragrant products from sclareol.

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**
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year - See Section VII	avoidance of 15A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100

F. One Rotocel Operation (ID No. ES-1001-2-1) and associated packed tower with associated separation and recovery equipment (M-25, M-124A and M -124B) and distillation tower (ID No. A-1)

1. Description

   The rotocel is an 18 compartment rotating extractor used for processing the plant material. Hexane carrying the extracted solution is drained to a tank for separation of water. The wax laden solution is further concentrated by evaporation of hexane and recovery of vapors with a condenser.

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
visible emissions	20 percent opacity	15A NCAC 2D .0521
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year- See Section VII	avoidance of 15A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100
toxic air pollutants	**State-enforceable only** -See Section VII	15A NCAC 2Q .0711

a. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

This process was established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is demonstrated with this regulation because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring Requirements

The Permittee shall observe this process once a month for any visible emissions above normal.

iii.) Recordkeeping Requirements

The Permittee shall record the results of the observations along with any corrective actions taken to reduce visible emissions to normal.

iv.) Reporting Requirements

Reporting requirements include a summary report of the records by January 30 and July 30 of each year.

G. One Botanical Extraction Operation (ID No. ES-1001-11) which consists of One Immersion Extractor (ID No. Z-1001), One De-Solventizer (ID No. Z-1002), One Day Tank (ID No. TK-90024), One First Stage Falling Film Evaporator (ID No. EX-1012) and One Second Stage Thin Film Evaporator (EX-1013) with associated Condenser (CD-1001-11EX1002)

1. Description

   This process extracts organics from plant materials.

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**
visible emissions	20 percent opacity	15A NCAC 2D .0521
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year - See Section VII	avoidance of 15A NCAC 2D .0530
n-hexane	Emissions must be less than 10 tons per consecutive twelve (12) month period	avoidance of 15A NCAC 2D .1112
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100
toxic air pollutants	**State-enforceable only** -See Section VII	15A NCAC 2Q .0711

a. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

This process was established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is demonstrated with this regulation because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring Requirements

The Permittee shall observe this process once a month for any visible emissions above normal.

iii.) Recordkeeping Requirements

The Permittee shall record the results of the observations along with any corrective actions taken to reduce visible emissions to normal.

iv.) Reporting Requirements

Reporting requirements include a summary report of the records by January 30 and July 30 of each year.

b. 112(g) Case by Case MACT

i.) Regulation Analysis

In order to avoid 112(g) of the Clean Air Act this process must emit less than 10 tons per year of n-hexane per consecutive twelve month period. To comply with his limit the Operation is limited to use n-hexane containing solvent no more than 497 hours per year.

ii.) Monitoring Requirements

Calculation of n-hexane emissions per month shall be made at the end of each quarter. n-Hexane emissions shall be determined by multiplying the total amount of each type of n-hexane containing material consumed during the quarter by the n-hexane content of the material.

iii.) Recordkeeping Requirements

The Permittee shall record the results of these calculation and the total amount of n-hexane emissions in an emissions log.

iv.) Reporting Requirements

Reporting requirements include a summary report within thirty (30) days after each calendar year quarter, the quarterly VOC emissions for the previous twelve (12) months.

H. One Plant Material Grinder (ID No. MHZ-1002) with associated fabric filter (ID No. CD-1001-1-2)

1. Description

This grinder processes the plant material so it can be processed in the rotocel operation.

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	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds per hour P = process weight in tons per hour	15A NCAC 2D .0515

visible emissions	20 percent opacity	15A NCAC 2D .0521

a. 2D .0515 "Particulates from Miscellaneous Industrial Processes"

i.) Regulatory Analysis

This process is subject to 2D .0515 since no other emission control standards are applicable for the particulate emissions from this industrial process. Allowable emissions of particulate matter from this source shall be calculated as follows:

$$E = 4.10 (P^{0.67}$$

where E = allowable particulate emission rate (pounds per hour), and
P = process weight rate (tons per hour)

The reported throughput of plant material is P= 1011 pounds per hour or P= 0.5055 ton/hr. This is used to calculate the allowable emission limit (E = 2.6 pounds per hour).

ii.) Monitoring/Recordkeeping Requirements

Particulate matter emissions from the **plant material grinder** shall be controlled by the fabric filter. To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer's inspection and maintenance recommendations, or if there is no manufacturer's inspection and maintenance recommendations, as a minimum, the inspection and maintenance requirement shall include the following:

a. a monthly visual inspection of the system ductwork and material collection unit for leaks, and
b. an annual internal inspection of the fabric filter's structural integrity.
c. the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515 if the ductwork and fabric filters are not inspected and maintained.

The results of inspection and maintenance shall be maintained in a log (written or electronic format) on-site and made available to an authorized representative upon request. The log shall record the following:

a. the date and time of each recorded action;
b. the results of each inspection;
c. the results of any maintenance performed on the fabric filter; and
d. any variance from manufacturer's recommendations, if any, and corrections made.

iii). Reporting

The Permittee shall submit the results of any maintenance performed on the fabric filters within 30 days of a written request by the DAQ.

The Permittee shall submit a summary report of monitoring and recordkeeping activities by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

b. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

This process was established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is demonstrated with this regulation because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring Requirements

The Permittee shall observe this process once a month for any visible emissions above normal.

iii.) Recordkeeping Requirements

The Permittee shall record the results of the observations along with any corrective actions taken to reduce visible emissions to normal.

iv.) Reporting Requirements

Reporting requirements include a summary report of the records by January 30 and July 30 of each year.

I. Five Processing Tanks (ID No. TK-9003, TK-9004, TK-9005, TK-9007 and TK-9009) with associated condenser (ID No. CD-1001-1-2)

1. Description

These tanks are processing tanks used for dissolution of plant extract concentrate before going to extraction the Recovery Operation. The plant extract solution is also called "concrete".

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

volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year- See Section VII	avoidance of 15A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100
toxic air pollutants	**State-enforceable only** -See Section VII	15A NCAC 2Q .0711

J. EVG Operation (Building No. 1003-2) which consists of three reaction vessels (ID Nos. D-2202, D-1215, and D-1218) with associated water spray fume scrubber (IDNo. Z-9215) and one caustic solution fume scrubber (ID No. Z-9216)

1. Description

   These reaction vessels are used as a batch operation to develop ethyl vanillyl glucoside.

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**
visible emissions	20 percent opacity	15A NCAC 2D .0521
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year- See Section VII	avoidance of 15A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100
toxic air pollutants	**State-enforceable only** -See Section VII	15A NCAC 2Q .0711

a. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

This process was established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is demonstrated with this regulation because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring Requirements

The Permittee shall observe this process once a month for any visible emissions above normal.

iii.) Recordkeeping Requirements

The Permittee shall record the results of the observations along with any corrective actions taken to reduce visible emissions to normal.

iv.) Reporting Requirements

Reporting requirements include a summary report of the records by January 30 and July 30 of each year.

L. One bulk lime storage silo (ID No. Z90005) with associated fabric filter (ID No. 90001)

1. Description

This 3,400 ft^3 bulk lime silo is filled by a truck and is sent to a process tank where it is used for manganese neutralization. The silo is equipped with a fabric filter.

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	$E=4.10P^{0.67}$ where E = allowable emission rate in pounds per hour P = process weight in tons per hour	15A NCAC 2D .0515
visible emissions	20 percent opacity	15A NCAC 2D .0521

a. 2D .0515 "Particulates from Miscellaneous Industrial Processes"

i.) Regulatory Analysis

This process is subject to 2D .0515 since no other emission control standards are applicable for the particulate emissions from this industrial process. Allowable emissions of particulate matter from this source shall be calculated as follows:

$$E = 4.10 (P^{0.67}$$

where E = allowable particulate emission rate (pounds per hour), and
P = process weight rate (tons per hour)

The reported throughput of lime (P= 25 ton/hr) is used to calculate the allowable emission limit (E = 35.4 pounds per hour) for this silo.

The applicant estimates the worst case particulate matter emissions to be 0.135 pounds per hour. Compliance is demonstrated since the emissions are less than the allowable.

ii.) Monitoring/Recordkeeping Requirements

Particulate matter emissions from the **bulk lime silo** shall be controlled by the fabric filter. To assure compliance, the Permittee shall perform inspections and maintenance as recommended by the manufacturer. In addition to the manufacturer's inspection and maintenance recommendations, or if there is no manufacturer's inspection and maintenance recommendations, as a minimum, the inspection and maintenance requirement shall include the following:

a. a monthly visual inspection of the system ductwork and material collection unit for leaks; and
b. an annual internal inspection of the fabric filter's structural integrity.
c. the Permittee shall be deemed in noncompliance with 15A NCAC 2D .0515 if the ductwork and fabric filter are not inspected and maintained.

The results of inspection and maintenance shall be maintained in a log (written or electronic format) on-site and made available to an authorized representative upon request. The log shall record the following:

a. the date and time of each recorded action;
b. the results of each inspection;
c. the results of any maintenance performed on the fabric filter; and
d. any variance from manufacturer's recommendations, if any, and corrections made.

iii). Reporting

The Permittee shall submit the results of any maintenance performed on the fabric filters within 30 days of a written request by the DAQ.

The Permittee shall submit a summary report of monitoring and recordkeeping activities by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be

clearly identified.

b. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

This process was established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is demonstrated with this regulation because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring Requirements

The Permittee shall observe this process once a month for any visible emissions above normal.

iii.) Recordkeeping Requirements

The Permittee shall record the results of the observations along with any corrective actions taken to reduce visible emissions to normal.

iv.) Reporting Requirements

Reporting requirements include a summary report of the records by January 30 and July 30 of each year.

M. Scareol Recrystallization Process which consists of five storage tanks (ID Nos. T-3001, T-3002, T-3004, T-3005), one reactor (IDNo. D-3001), and a condenser (ID No. CD-3001) installed on one centrifuge (ID No. C-3001) and on one heat exchanger/dryer (ID D-3001)

1. Description

This process consists of storage tanks, a reactor and a condenser installed on a centrifuge and heat exchanger. These process recrystallized the scaerol.

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**
visible emissions	20 percent opacity	15A NCAC 2D .0521

volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year- See Section VII	avoidance of 15A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100
toxic air pollutants	**State-enforceable only** -See Section VII	15A NCAC 2Q .0711

a. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

This process was established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance with this regulation is indicated because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring Requirements

The Permittee shall observe this process once a month for any visible emissions above normal.

iii.) Recordkeeping Requirements

The Permittee shall record the results of the observations along with any corrective actions taken to reduce visible emissions to normal.

iv.) Reporting Requirements

Reporting requirements include a summary report of the records by January 30 and July 30 of each year.

N. Four Hot Boxes (ID Nos. HB-1,2,3 & 4)

1. Description

The hot boxes are used for heating the "concrete" or mother liquor solution prior to the extraction process in the Recovery Operation.

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
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100
toxic air pollutants	**State-enforceable only** -See Section VII	15A NCAC 2Q .0711

P. Plant nutrient extraction process which consist of one condenser (EX2203) with associated collection tank (D 1213), one product extract reaction vessel (D1214), four processing tanks (TK1204, TK1205, Tk 1206 and TK1208), one centrifuge (C-1203), and one condenser (EX 2005) installed on one waste solids separator (D1211)

1. Description

   These reaction vessels are used as a batch operation for the plant nutrient extraction process.

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
visible emissions	20 percent opacity	15A NCAC 2D .0521
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year- See Section VII	avoidance of 15A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100
toxic air pollutants	**State-enforceable only** -See Section VII	15A NCAC 2Q .0711

a. 2D .0521 "Control of Visible Emissions"

i.) Regulation Analysis

This process was established after July 1, 1971 and therefore is subject to 2D .0521(d). Per this regulation, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period except that six-minute period averaging not more than 87 percent opacity may occur not more than once in any hour nor more than four times in any 24-hour period. Compliance is demonstrated with this regulation because the latest inspection report did not cite any opacity exceedances.

ii.) Monitoring Requirements

The Permittee shall observe this process once a month for any visible emissions above normal.

iii.) Recordkeeping Requirements

The Permittee shall record the results of the observations along with any corrective actions taken to reduce visible emissions to normal.

iv.) Reporting Requirements

Reporting requirements include a summary report of the records by January 30 and July 30 of each year.

b. Operational Requirements for PNE Process in Bldg. 1003-2

The source may be operated for the production of concentrated plant extracts during which operation the water spray to the scrubbers (water spray fume scrubber and caustic solution fume scrubber is not required). However, the dryer may not be used during the concentrated plant extracts production.

During the production of concentrated plant extracts, solvents will be limited to water and those alcohols for which 1)the constituents of the alcohol as purchased have no required toxic permit emissions rate (TPER) pursuant to 15A NCAC 2Q .0711, 2) comply with 15A NCAC 2D .0518(d), and 3) have a vapor pressure less than or equal to methanol. Denatured ethyl alcohol which as purchased contains ethyl acetate is an acceptable solvent as the ethyl acetate emissions have been evaluated pursuant to 2Q .0711.

The permittee shall maintain record specifying the particular product produced (eg. EVG flavorants, Kava Kava, Saint Johnswort etc.) And the quantity and type of solvent used.

Q. Equipment for purification of scalareolide consisting of 12 tanks (ID No. M-4, M-44,M-11, M-14, M-15, M-16, TK-1202, TK-1202A, TK -1205, TK-1208, and TK 9231) , one centrifuge (G-17) and one dryer (D1202)

1. Description

This equipment is used for the purification of the sclareolide produced.

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
volatile organic compounds	work practice standards - See Section VII	15A NCAC 2D .0958
volatile organic compounds	less than 225 tons per year- See Section VII	avoidance of 5A NCAC 2D .0530
toxic air pollutants	**State-enforceable only** - See Section VII	15A NCAC 2D .1100

VII. Multiple Emissions Source Evaluation

A. <u>2D .0958"Work Practices for sources of Volatile Organic Compounds"</u>

i.) Regulatory Analysis

The Permittee shall:

(1) store all material, including waste material, containing volatile organic compounds in tanks or in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use,
(2) clean up spills of volatile organic compounds as soon as possible following proper safety procedures,
(3) store wipe rags containing volatile organic compounds in closed containers,
(4) not clean sponges, fabric, wood, paper products, and other absorbent materials with volatile organic compounds,
(5) transfer solvents containing volatile organic compounds used to clean supply lines and other coating equipment into closable containers and close such containers immediately after each use, or transfer such solvents to closed tanks, or to a treatment facility regulated under section 402 of the Clean Water Act,
(6) clean mixing, blending, and manufacturing vats and containers containing volatile organic compounds by adding cleaning solvent and close the vat or container before agitating the cleaning solvent. The spent cleaning solvent shall then be transferred into a closed container, a closed tank or a treatment facility regulated under section 402 of the Clean Water Act

b. When cleaning parts with a solvent containing a volatile organic compound, the Permittee shall:
(1) flush parts in the freeboard area,
(2) take precautions to reduce the pooling of solvent on and in the parts,
(3) tilt or rotate parts to drain solvent and allow a minimum of 15 seconds for drying or until all dripping has stopped, whichever is longer,
(4) not fill cleaning machines above the fill line,
(5) not agitate solvent to the point of causing splashing

ii. Monitoring

To assure compliance with paragraphs (a) and (b) above, the Permittee shall, at a minimum, perform a visual inspection once per month of all operations and processes utilizing volatile organic compounds. The inspections shall be conducted during normal operations. If the required inspections are not conducted the permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0958.

iii. Recordkeeping

The results of the inspections shall be maintained in a log (written or electronic format) on-site and made available to an authorized representative upon request. The log shall record the following:
i. the date and time of each inspection; and
ii. the results of each inspection noting whether or not noncompliant conditions were observed.
If the required records are not maintained the permittee shall be deemed to be in noncompliance with 15A NCAC 2D .0958.

iv. Reporting

The Permittee shall submit a summary report of the observations by January 30 of each calendar year for the preceding six-month period between July and December and July 30 of each calendar year for the preceding six-month period between January and June. All instances of deviations from the requirements of this permit must be clearly identified.

B. Avoidance of 15A NCAC 2D. 0530: Prevention of Significant Deterioration

i.) Regulatory Analysis

This is a major stationary source. The applicant has requested the VOC emissions from the above sources shall discharge into the atmosphere less than 225 tons of VOCs per consecutive 12-month period in order to avoid PSD review.

ii.) Monitoring, Recordkeeping Requirements

To ensure enforceablilty of this limit, the following restrictions shall apply:

VOC emissions calculations from the facility shall be made at the end of each month. VOC emissions shall be determined by multiplying the total amount of each type of VOC-containing material used during the month by the VOC content of the material and excluding material reclaimed or shipped offsite. This calculation and the total amount of VOC emissions must be recorded in an emissions log. In addition, the Permittee must make available to officials of the Division of Air Quality, upon request, copies of the emissions log. The Permittee must keep each entry in the log and all required records on file for a minimum of five years.

iv.) Reporting Requirements

For compliance purposes, within thirty (30) days after each calender year quarter, the following shall be reported to the Regional supervisor, DAQ:

A. the monthly VOC emissions for the previous twelve (12) months.

v). CONDENSER REQUIREMENTS

A. Inspection and Maintenance Requirements- To comply with the provisions of this permit and ensure that emissions do not exceed the regulatory limits, the Permittee shall perform periodic inspections and maintenance as recommended b the equipment manufacturer. In addition, the Permittee shall perform an annual inspection of the condenser system, including the following:

1. The Permittee shall inspect and maintain the structural integrity of the condenser, including inspection for leakage of coolant and, if the system is under positive gauge pressure, leakage of the contaminated gas stream. In order to indicate leakage of the coolant, the condensate shall be inspected for the presence of coolant; and
2. The Permittee shall inspect and maintain the structural integrity of ductwork and piping leading to and coming from the condenser.

B. Record keeping Requirements-The results of all inspections and any variance from manufacturers recommendations or from those given in this permit (when applicable) shall be investigated with corrections made and dates of actions recorded in a log. Records of all maintenance and monitoring activities shall be recorded in the log. The log (in written or electronic form shall be kept on-site and made available to DAQ personnel upon request.

vi). PACKED TOWER GAS ABSORBER REQUIREMENTS

A. Inspection and Maintenance Requirements- To comply with the provisions of this permit and ensure that emissions do not exceed the regulatory limits, the Permittee shall perform periodic inspections and maintenance as recommended by the equipment manufacturer. In addition, the Permittee shall perform an annual inspection of the scrubber system.

As a minimum, the annual internal inspection will include inspection of spray nozzles, packing material, chemical feed system (if so equipped), and the cleaning/calibration of all associated instrumentation annually. Additionally, two weeks following start-up of the scrubber whenever the packing is replaced, the Permittee shall shut down the system and inspect for nozzle plugging and settling of the packing.

B. Record keeping Requirements-The results of all inspections and any variance from manufacturers recommendations or from those given in this permit (when applicable) shall be investigated with corrections made and dates of actions recorded in a log Records of all maintenance and monitoring activities shall be recorded in the log. The log (in written or electronic form shall be kept on-site and made available to DAQ personnel upon request.

C. Monitoring Requirements The Permittee shall ensure the proper performance of the scrubber by monitoring the following operational parameters:
i. The permittee shall record the liquid make-up flow rate; and
ii. The permittee shall record the pH of the recirculation tank scrubber solution (range above 3)

C. **15A NCAC 2D .1100 Toxic Air Pollutant Emissions Limitation and Reporting Requirement**

i. Regulatory Analysis

This regulation applies to the following sources Sclareolide Operation (Bldg. No. 1001-1); Rotocel Operation (ID No. ES-1001-2-1); One Botanical Extraction Operation (ID No. ES-1001-11);Aphios Process (ID No. Aphios-1); EVG Operation(Building No. 1003-2); Scareol Recrystallization Process (Bldg. 1003-10); Four Hot Boxes (ID Nos. HB-1,2,3 & 4); Boilers (ID No. H-101, H-102 and H-103); Waste Water Treatment Plant (ID No. WWTP); Equipment for purification of scalareolide consisting of

12 tanks (ID No. M-4, M-44, M-11, M-14, M-15, M-16, TK-1202, TK-1202A, TK -1205, TK-1208, and TK 9231) , one centrifuge (G-17) and one dryer (D1202).

The above sources shall exceeded the following limits:

EMISSION SOURCE(S)	POLLUTANT(S)	ROTOCEL OPERATION DURING MAY-AUG	NON-ROTOCEL OPERATION (Concrete)	NON-ROTOCEL OPERATION (Aphios)	ANNUAL
Sclareolide Operation (Building No. 1001-1)	n-hexane	158 lb/day	296 lb/day	270 lb/day	
Rotocel Operation (Building No. 1001-2)	n-hexane	Combined Limit for Rotocel & Recovery Operations: 1968 lb/day	no allowable		
Recovery Operation (Building No. 1001-1)	n-hexane	See Above	275 lb/day	306 lb/day	
Distillation Operation (ID No. A-2)	n-hexane	21.2 lb/day	39.8 lb/day	36.2 lb/day	
Recrystallization Operation (Building No. 1003-10)	n-hexane	192 lb/day	361 lb/day	328 lb/day	
Botanical Extraction Operation (Building No. 1001-11)	n-hexane hexane isomers except n-hexane	no allowable no allowable	481 lb/day 20.1 lb/hr	481 lb/day 20.1 lb/hr	
Sclareolide, Rotocel, Recovery, Distillation, Recrystallization Operations and Hot Boxes	hexane isomers except n-hexane	1143 lb/hr	1143 lb/hr	1143 lb/hr	
Hot boxes	n-hexane	20.6 lb/day	38.7 lb/day	56.8 lb/day	
Sclareolide Operation (Building No. 1001-1)	acetic acid	8.0 lb/hr	8.0 lb/hr		
EVG operation (Building No. 1003-2)	chloroform	NA	NA		19,195 lb/yr
Boilers (ID No. H-101, H-102 and H-103)	nickel metal	1.98 lb/day	1.98 lb/day		
	arsenic and inorganic arsenic compounds	NA	NA		0.656 lb/yr

	beryllium	NA	NA	0.76 lb/yr
	cadmium	NA	NA	2.83 lb/yr
	chromium (VI)	NA	NA	0.02 lb/yr
WWTP stripping	acetic acid	31.1 lb/hr	31.1 lb/hr	

(a) To ensure compliance with the above limits, the following restrictions shall apply:

(i) The arsenic emissions from the combustion of No. 2 and No. 6 fuel oil in the three oil-fired boilers (ID Nos. H-101, H-102 and H-103) shall be calculated by the following formula:

(gal No. 2)(5.92E-04 lb/1,000 gal[1]) + (gal No. 6)(1.32E-03 lb/1,000 gal)

(ii) The exhaust stacks for the three boilers (ID Nos. H-101, H-102 and H-103) shall be maintained at a height of 45 feet from the ground-level elevation from the base of the stack.

(iii) The Rotocel process shall operate only during the months of May through August.

(iv) No more than two (2) batches per day shall be run in the Recrystallization Operation.

(vii) The n-hexane solvent used in the Botanical Extraction Operation shall contain no more than 50 percent n-hexane by weight.

(viii) The n-hexane solvent used in the Botanical Extraction Operation shall contain no more than 50 percent n-hexane by weight.

(ix) The Botanical Extraction Operation shall not use n-hexane solvent unless its condenser (ID No. 1001-11EX2) is properly operating.

(x) For the above processes that have n-hexane limits, the facility will use production throughput emissions factors to ensure that each process stays within the appropriate n-hexane limit of the three available. (e.g., a hypothetical operation emits 10 pounds of n-hexane for each 100 pounds of production. Therefore, if the limit during Rotocel operation is 7 pounds of n-hexane per day, this operation may only process 70 pounds per day.) The facility will keep records of the following for the above processes that have n-hexane limits: production records, records of which scenario (three available) the sources are operating under, and the production limits based on the emissions factors. These records will be kept on site and made available to the Division of Air Quality upon request.

(ii)Reporting Requirements

For compliance purposes, within thirty (30) days after each calendar year quarter the following shall be reported to the Regional Supervisor, Division of Air Quality:

(a)the monthly No. 2 and No. 6 fuel oil consumption and arsenic emissions from the three oil-fired boilers (ID Nos. H-101, H-102 and H-103) for the previous fourteen (14) months and used to determine compliance with specific condition 11. a. (I), (ii), and (iii).

D. **15A NCAC 2Q .0711 Emission Rates Requiring a Permit**

i.) Regulatory Analysis

All sources at the facility should not exceed the following limits.

Emission Source	Toxic Air Pollutant	TPERS
Facility Wide	Ethyl Acetate	36 lb/hr
	Toluene	98 lb/day 14.4 lb/hr

E. **15A NCAC 2D .1806: Control and Prohibition of Odorous Emissions**

i.) Regulatory Analysis

This regulation applies to all emission sources

The Permittee not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary.

VIII. MACT Applicability and Requirements

Based on a review of the facility's current operations and emission sources, the facility is not subject to any MACT standard.

IX. Permit Shield (including non-applicable requirements)

In accordance with 2Q .0512 the permit will contain a provision stating that compliance with the terms, conditions, and limitations of the Title V permit shall be deemed in compliance with applicable requirements specifically identified in the permit, as of the date of permit issuance. The permit did not expressly state that a permit shield exists then it shall be presumed not to provide such a shield.

X. General Conditions

The "General Conditions" section of the Title V Operating Permits lists additional applicable rule requirements that the permittee must adhere to, as with any other permit condition. These requirements in general are common to all Title V facilities. The general conditions include provisions such as annual fee payment, permit renewal and expiration, transfer of ownership or operation, property rights, submission of documents, inspections and entry procedures, reopen for cause, and severability.

XI. Insignificant Activities

The insignificant activities listed in the application have been reviewed and modified to reflect the new NC regulations. Because an emission source or activity is insignificant does not mean that the emission source or activity is exempted from any applicable requirement or that the owner or operator of the source is exempted from demonstrating compliance with any applicable requirement.

XII. Public Notice

Pursuant to 15A NCAC 2Q .0521, a notice of the draft Title V Operating Permit shall 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 shall be sent to persons on the Title V mailing list and EPA.

XIII. Recommendations

The initial Title V application for Avoca Incorporated has been reviewed by the DAQ to determine compliance with all procedures and requirements under 15A NCAC 2Q .0500 and 40 CFR Part 70. The DAQ has made a preliminary determination that the facility is complying or will achieve compliance as specified in the draft permit with all applicable requirements. Therefore, the DAQ is proposing to issue the Title V Operating Permit upon completion of the public comment period and the EPA review.