FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

NORTHEAST DISTRICT
8800 BAYMEADOWS WAY WEST, SUITE 100
JACKSONVILLE, FLORIDA 32256

RICK SCOTT
GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

Sent by Electronic Mail – Received Receipt Requested

PERMITTEE

SiVance, LLC
P.O. Box 1466
Gainesville, Florida 32602

Authorized Representative:
Dr. Paul Kremer, Site Director

Air Permit No. 0010049-014-AC
Permit Expires: xx/xx/xxxx

SiVance, LLC
Minor Source Air Construction Permit
New Reactor (R-20)

This is the final air construction permit, which authorizes the facility to convert the Intermediate Tank (No. T-3126) in Prosil Manufacturing Building No 26 into a new Reactor (R-20) EP24. This reactor will be dedicated to blending, neutralization, and simple synthesis processes associated with the production of products currently manufactured at the site. The tank conversion will involve adding an agitator to the tank, a condenser above the tank, piping, valves and etc. Emissions from the new reactor (R-20) EP24 will be directed through existing wet scrubbers (WS 26-5 or WS 26-6) and to (EPs 20 and 21) and will not result in the creation of additional emission points.

The proposed work will be conducted at the SiVance, LLC. This facility is a Specialty Organic Chemical Manufacturing facility – (Standard Industrial Classification Code No. 2869). The facility is located in Alachua County at 5002 N.E. 54th Place, Gainesville, Alachua County, Florida. The UTM coordinates are Zone 17, 377.6 km East, and 3286.7 km North.

This final permit is organized by the following sections.

Section 1. General Information

Section 2. Administrative Requirements

Section 3. Emissions Unit Specific Conditions

Section 4. Appendices

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of Section 4 of this permit.

This air pollution construction permit is issued under the provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and is not subject to the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Jacksonville, Florida

(DRAFT)

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Richard S. Rachal III, P.G.
Program Administrator
Waste and Air Resource Management Program

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Final Air Permit package (including the Final Determination and Final Permit) was sent by electronic mail (or a link to these documents made available electronically on a publicly accessible server) with received receipt requested before the close of business on (DRAFT) to the persons listed below.

Dr. Paul Kremer, Site Director- SiVance, LLC (paul.kremer@sivancellc.com)
Roland Roberts, ETTS Manager- SiVance, LLC (roland.roberts@sivancellc.com)
Dave Buff, P.E.- Golder and Associates (dbuff@golder.com)

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.

(DRAFT)

_____ _____
(Clerk) (Date)

FACILITY AND PROJECT DESCRIPTION

Existing Facility

SiVance, LLC operates a Specialty Organic Chemical Manufacturing facility (EU 005) which manufactures customized chemical products, primarily organofunctional silanes and organofluorine intermediates on laboratory and larger scale.

Manufacturing areas consist of:
1) Building 5 (Pilot plant) process area
2) Building 18 process area;
3) Building 20 (Autoclave) process area
4) Building 21 (Uracil) process area
5) Buildings 25/26 (Prosil) Process Areas;
6) Building 32 Process Water and Storm Water Treatment area;
7) Building 39 Manufacturing/ammoniation Process Area
8) Building 43 **(**Norbornadiene) Process Area

The air pollutant emissions from the facility are Hazardous Air Pollutants (HAP) Volatile Organic Compounds (VOC) and Ammonia(NH_3). Significant emissions are controlled by a series of control devices as described below.

Control Devices:

Vertical venturi/packed-bed fume scrubbers with demister (WS 18-1, WS 18-2): Vanaire Model VT-550 control emissions from Building No. 18 EP 08 – EP 10 and EP 34. Caustic is used as the scrubbing media to remove chlorosilanes and hydrochloric acids emissions from alkoxysilanes production, or sulfuric acid is used as the scrubbing media to remove ammonia or allylamine emissions. Nominal scrubber flow rate is 17-28 gallons per minute through the venture and 25-55 gallons per minute through the packed bed. The design airflow rate is 2000 acfm. Exhaust gases exit at approximately 100° F from an 11" diameter stack that is 80' tall.

Vertical venturi scrubber/vertical packed-bed fume scrubbers (WS 39- 1, WS 39- 2): Met-Pro Corp Duall Division contol emissions from Building No. 39 from EP 28 and EP 30 Ammoniation processes. Caustic and water is used as the scrubbing media to remove ammonia or allylamine emissions emissions. Nominal scrubber flow rate is 80 gallons per minute. The design airflow rate is 4600 acfm 60' tall stack height and a 14"stack diameter.

Carbon bed absorber (CA 18-4) used only during Tetramethyl (TMT) production controls emissions from Building No. 18 EP 11. Carbon is used as the scrubbing media with a flow rate of 100-900 acfm.

Caustic vertical pack bed fume scrubber (WS 26-5): Met-Pro Corp Duall Division contol emissions from Building No. 26, EP 21. EP 16 through EP 20, EP 22 intermediate device controlled emissions are also vented to this emission unit (WS 26-5). Caustic is used as the scrubbing media to remove chlorosilanes and hydrochloric acids emissions from alkoxysilanes production. Nominal scrubber flow rate is 80 gallons per minute with a design airflow rate is 80 – 200 acfm 76' tall stack height and a 10"stack diameter.

Flare for Norbornadiene Process Building 43: Manufactured by Zeeco with an air flow rate of 1,985 acfm, 60' stack and 10" in diameter.

Ammonia emissions from the HMDS process are captured by an ammonia absorber followed by a scrubber. Aqueous ammonium chloride waste is sent offsite for disposal.

This facility is considered a synthetic Non-Title V source base on federally enforceable facility-wide emissions limits of less than 100 tons per year of VOC, less than 100 tons per year NH_3 less than 10 tons per year of individual HAPs, and less than 25 tons per year of total HAPs emissions.

The existing facility consists of the following emissions units.

Facility ID No. 0010049			
EU 005 Batch Organic Chemical Manufacturing			
Building No.	Building Name	EP No.	Description
2	R & D Labs	01	Lab fume hood emissions vented to atmosphere or to vertical packed-bed fume scrubbers (west end to WS 2-1 and east end to WS 35-1)
3	Analytical Wet Lab		Laboratory
5	Pilot Plant	03	< 50 gallon glass-lined reactors vented to vertical packed bed fume scrubber (WS 5-1)
5	Pilot Plant	02	Reactor emissions vented to vertical packed bed fume scrubber (WS 5-1)
5	Pilot Plant	03	Reactor emissions vented to aspirator/venturi scrubber (WS 5-1)
6	Analytical Lab	N/A	Fume hood emissions vented to atmosphere
7	R & D Lab	04	Fume hood emissions vented to atmosphere
13	Oil heater	N/A	30 HP Hot Oil Heater
15	Material control	N/A	Shipping/receiving, bottling operations, lab chemical storage
18	Drum wash	N/A	Pressurized H_2O cleaning of empty drums
18	Manufacturing	N/A	Non-contact H_2O chiller
18	Manufacturing	06	Aspirator (A-1 East) emissions vented to atmosphere
18	Manufacturing	08	Various reactors and NH_3 absorber emissions vented to vertical pack bed fume scrubber w/ demister (WS18-1)
18	Manufacturing	09	Various reactors emissions vented to vertical pack bed fume scrubber w/ demister (WS 18-2)

Building No.	Building Name	EP No.	Description
18	Manufacturing	10	Various reactors emissions vented to vertical pack bed fume scrubber w/ demister (WS18-1 or WS 18-2)
18	Manufacturing	11	Carbon bed absorber (used only during TMT production) (CA-18-4)
18	Commercial Reactor	34	vertical pack bed fume scrubber vents through WS 18-1(WS 18-5)
19	Haz waste staging area	N/A	Secondary containment drum storage pad
20 South	R & D	12	1 to 20 gal high pressure autoclaves vented to scrubber(WS 20-1)
20a East	Manufacturing	13	200-500 gal high pressure autoclaves vented to scrubber(WS 20-1or WS 20-2)
21	Building 21	14	Sulfuric acid mist eliminator (WS 21-1)
21	Building 21	15a	Aspirator
23, 26,33	Mechanical chiller	N/A	Non-contact H_2O cooling with ethyl glycol & H_2O
24	Material storage	N/A	Exterior storage building
25	Prosil Manufacturing	16	Distillation columns: S-4 emissions vented to EP 5 or 15a, S-5, & S-6 emissions vented to EP 5 (ammoniation process) or EP 21 or EP 22(non ammoniation process)
26	Prosil Manufacturing	05	NH_3 process vents for Blding 25 & 26
26	Prosil Manufacturing	31	R-14 Ammonia process vent
26	Prosil Manufacturing	17	Silane absorber (WS 26-1) emissions vented to EP 21 or EP 22
26	Prosil Manufacturing	18	Venturi vertical pack bed fume scrubber (WS 26-2) vented to EP 21 or EP 22
26	Prosil Manufacturing	19	R 8 HCL absorber (WS 26-4) vented to EP 21 or EP 22
26	Prosil Manufacturing	20	R 14 HCL absorber (WS 26-7) vented to EP 21 or EP 22

Building No.	Building Name	EP No.	Description
26	Prosil Manufacturing	21	Caustic vertical pack bed fume scrubber (WS 26-5)
26	Prosil Manufacturing	22	Caustic vertical pack bed fume scrubber (WS 26-6)
26	Prosil Manufacturing	24	Reactor (R-20) vented to Caustic vertical pack bed fume scrubber (WS 26-5) or (WS 26-6)
28	Maintenance West	N/A	Batch cold cleaner for cleaning mechanical parts
32	Process H_2O treatment	N/A	Tank & aeration pond for final pH control
32	Process H_2O treatment	23	Above ground NaOH & HCl storage tanks, HCl storage tank venturi eductor
32	Process H_2O treatment	N/A	Bulk pH control tanks
32	Process H_2O treatment	26	VOC Stripper for process H_2O treatment
33	Research chemical manufacturing	N/A	Manufacture of small quantities of chemicals, counter top & walk in fume hoods vented to atmosphere or vertical packed bed scrubber (WS 33-1)
35	manufacturing	27	Manufacture of small quantities of catalog chemicals, vented to vertical packed bed scrubber (WS 35-1)
37	Material control	N/A	Warehouse of drummed & bottled material
38	Material control	N/A	Drummed material storage pad (raw mat, intermediates & haz waste)
39	Manufacturing R-10 R-12 process	28	Venturi scrubber (WS 39-1) followed by a vertical packed-bed fume scrubber (WS 39-2)
39	Manufacturing R-10 R-12 Ammoniation process	30	Ammoniation process vented to EP 28 or atmosphere
40	Material control	N/A	Drummed material storage pad (East)
41	Material control	N/A	Drummed material storage pad (West)
43	Norbornadiene (NBD)	29	Flare for Norbornadiene
27	Steam Generation	33	Exempt Boilers

Proposed Project

This is an air construction permit, which authorizes the facility to convert the Intermediate Tank (No. T-3126) in Prosil Manufacturing Building No 26 into a new Reactor (R-20) EP24. This reactor will be dedicated to blending, neutralization, and simple synthesis processes associated with the production of products currently manufactured at the site. The tank conversion will involve adding an agitator to the tank, a condenser above the tank, piping, valves and etc. Emissions from the new reactor (R-20) EP24 will be directed through existing wet scrubbers (WS 26-5 or WS 26-6) and to (EPs 20 and 21) and will not result in the creation of additional emission points.

This project will modify the following emissions units.

Facility ID No. 0010049	
ID No.	**Emission Unit Description**
005	Batch Organic Chemical Manufacturing

FACILITY REGULATORY CLASSIFICATION

- The facility **is not** a major source of hazardous air pollutants (HAP).
- The facility **has no** units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility **is not** a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility **is not** a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.

1. Permitting Authority: The permitting authority for this project is the Northeast District, Waste and Air Resource Management, Florida Department of Environmental Protection (Department). The Northeast District's mailing address is 8800 Baymeadows Way West, Suite 100, Jacksonville, Florida 32256, (904) 256-1700. All documents related to applications for permits to operate an emissions unit shall be submitted to the Northeast District Office.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Northeast District's Air Compliance Assurance at 8800 Baymeadows Way West, Suite 100, Jacksonville, Florida 32256, (904) 256-1700.

3. Appendices: The following Appendices are attached as part of this permit:

a. Appendix A. Citation Formats and Glossary of Common Terms;

b. Appendix B. General Conditions;

c. Appendix C. Common Conditions; and

d. Appendix D. Common Testing Requirements.

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No new emissions unit shall be constructed and no existing emissions unit shall be modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

[Rule 62-212.400(12), F.A.C.]

7. Application for Non-Title V Permit: This permit authorizes construction of the permitted emissions unit and initial operation to determine compliance with Department rules. A completed Application for Air Permit - Non Title V Source (DEP Form No. 62-210.900(3), F.A.C.), shall be submitted to the Department at least 90 days prior to the expiration date of this construction permit. To properly apply for a construction permit, the permittee shall submit the appropriate application form, processing fee, and compliance test reports as required by this permit. [Rules 62-4.050 and 62-4.220, F.A.C.]

B. EU005 Batch Organic Chemical Manufacturing

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
005	Batch Organic Chemical Manufacturing

1. **Relation to Other Permits.** The conditions of this permit supplements all other previously issued air construction and operation permits for these emissions units. These conditions are in addition to all other applicable permit conditions and regulatory requirements. The Permittee shall continue to comply with the conditions of those permits, which include restrictions and standards regarding capacities, production, operation, fuels, emissions, monitoring, recordkeeping, reporting, and the like.

[Rules 62-4.210, 62-4.030, and 62-210.300(1)(b), F.A.C.]

EQUIPMENT

2. **Equipment Name**. The permittee is authorized to convert the Intermediate Tank (No. T-3126) in the Prosil Manufacturing Building No. 26 into a product Reactor (R-20) EP24. This tank conversion will involve adding an agitator to the tank, a condenser above the tank, piping, valves and etc. Emissions from the new reactor (R-20) will be directed through existing wet scrubbers (WS 26-5 or WS 26-6) which are vented to (EPs 20 and 21).

   [Application No. 0010049-014-AC and Additional information received on 01/06/2014]

ESSENTIAL POTENTIAL TO EMIT (PTE) PARAMETERS

3. **Hours of Operation**. The hours of operation are not restricted.

   [Rules 62-4.160(2), 62-210.200(PTE), F.A.C.]

EMISSION LIMITATIONS AND PERFORMANCE STANDARDS

4. **Maximum Allowable Emissions Rate (Facility-wide)**. This permit does not change any or establish any new permitting emissions limits for this EU. The permitted maximum allowable emission rate for each pollutant is as follows:

Pollutant	Location	Emissions Rate	FAC Rule
Total Volatile Organic Compounds	Facility-wide	Less than 100 tons per year **NOTE (1)**	62-210.200(PTE)
Individual Hazardous Air Pollutants **NOTES (2)**	Facility-wide	Less than 10 tons per year **NOTE (1) (3)**	62-210.200(PTE)
Total Combined Hazardous Air Pollutants **NOTES (2)**	Facility-wide	Less than 25 tons per year **NOTE (1)**	62-210.200(PTE)
Ammonia	Facility-wide	Less than 100 tons per year **NOTE (1)**	62-210.200(PTE)

Specific Condition No. 4. Continued:

NOTE (1) Limit established to escape Title V classification.
NOTE (2) Hazardous Air Pollutants (HAPs), as defined in Section 112(g) of the Clean Air Act. Emissions are not to exceed the limits specified above.
NOTE (3) Limit established to escape Title III classification.

[Permit No. 0010049-009-AF]

5. **General Visible Emissions**. No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20% opacity. This regulation does not impose a specific testing requirement.

[Rule 62-296.320(4)(b)1, F.A.C.]

6. **Unconfined Particulate Matter -Fugitive Emissions (UCPM).** Precautions shall be taken to prevent UCPM, such as:

1. All bulk solids are delivered to the facility in bags, and are manually loaded into the process equipment;
2. Solid materials are handled in enclosed areas, where possible;
3. Products in solid form are stored and shipped in fiber drums;
4. No outdoor storage piles are located on site; and
5. General housekeeping measures are performed throughout the plant site, including sweeping, washing and collection of spilled materials.

[Application No. 0010049-014-AC]

COMPLIANCE MONITORING AND TESTING REQUIREMENTS

7. **Initial Compliance Test for Reactor (R-20) EP24.** Reactor R-(20) EP24 shall be tested to determine actual VOC emissions. The initial test shall be conducted prior to applying for an operating permit and in accordance with **Specific Condition No. 8**.

[Rules 62-4.070(3) and 62-297.310(7)(a)1, F.A.C.]

8. **Initial Testing Requirements**. The tests shall be conducted no later than 180 days after the initial startup of the new Reactor (R-20) EP24. Notify the Department 15 days prior to testing [FAC Rule 297.310(7)(a)9], and submit the test report documentation to the Department 45 days after completion of the testing. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit.

POLLUTANT	LOCATION IDENTIFICATION	TEST METHOD
VOC	EP20/21	Method 25 or 25A

[Rule 297.310(8)(b), F. A.C.]

9. **Subsequent Testing.** Thereafter, a compliance test shall be conducted for VOC upon Permit Renewal (Every 5 Years).

[Rules 62-4.070(3), 62-297.310(7)(a)1., F.A.C.]

10. **Applicable Test Procedures**. Required Sampling Time: Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes.

Minimum Sample Volume: Unless otherwise specified in the applicable rule, the minimum sample volume per run shall be 25 dry standard cubic feet.

Calibration of Sampling Equipment: Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C.

[Rule 62-297.310(4)(a),(b), and (d), F.A.C.]

11. **Method of Operation Control Equipment**. This permit does not change any or establish any new requirements. The air pollution control equipments specified in this permit shall be operated at all times during which the process equipment associated with the control equipment is operated under conditions where there is a potential to emit HAPs, VOCs, or any regulated air pollutant, except during periods of malfunctions or emergencies when operation of such equipment is not feasible.

[Rule 62-4.070(3), F.A.C.]

REPORTING AND RECORDKEEPING REQUIREMENTS

12.a. **Initial Record Keeping Reactor (R-20).** During the construction process and prior to applying for an operating permit, the facility shall calculate the emissions of VOC, each HAP and Ammonia, on a monthly basis **for Reactor (R-20),** to facilitate the emissions tracking needed to document compliance with **Specific Condition 4**. **The facility must submit these records/calculations along with the application for the operating permit.** The calculations will be based on the following method:

a. A roster of all processes run in each piece of equipment will be prepared and kept current. The roster will include a traceable identification code and title for each process, the nominal product amount (in pounds), for each process, and factors for determining the emissions of each listed pollutant emitted by the process each time it is run.

b. The factors for determining the emissions of each air pollutant emitted by the process each time it is run will be based on scientifically sound engineering calculations or estimates and will be expressed in terms of the pounds of pollutant emitted each time the process is run.

Specific Condition No. 12.a. continued:

c. A traceable record of all production batches run in each piece of equipment will be documented in a production summary for the purpose of calculating the month rolling average emissions of each pollutant.

d. The cumulative months rolling average emissions of each pollutant will be calculated using the process emission factors and the production summary.

e. A monthly summation of the cumulative months rolling average emissions of each pollutant emitted by the facility will be maintained.

f. Air emissions associated with small scale laboratory productions (i.e., batches less than 50 gallons), can be estimated through a conservative, simplified approach based on sound engineering estimates as an alternative to the procedure specified in **Specific Conditions 12.a.**

[Application No. 0010049-014-AC]

12.b. <u>Thereafter- Record Keeping (Cumulative 12-month rolling average)</u>. This permit does not change any or establish any new Record Keeping and Reporting for this EU. The Permittee will calculate the cumulative 12-month rolling average emissions of VOC, each HAP and Ammonia, on a monthly basis to facilitate the emissions tracking needed to document compliance with **Specific Condition 4**. The calculations will be based on the following method:

a. A roster of all processes run in each piece of equipment will be prepared and kept current. The roster will include a traceable identification code and title for each process, the nominal product amount (in pounds), for each process, and factors for determining the emissions of each listed pollutant emitted by the process each time it is run.

b. The factors for determining the emissions of each air pollutant emitted by the process each time it is run will be based on scientifically sound engineering calculations or estimates and will be expressed in terms of the pounds of pollutant emitted each time the process is run.

c. A traceable record of all production batches run in each piece of equipment will be documented in a production summary for the purpose of calculating the cumulative 12-month rolling average emissions of each pollutant.

d. The cumulative 12-month rolling average emissions of each pollutant will be calculated using the process emission factors and the production summary.

Specific Condition No. 12.b. continued:

e. A monthly summation of the cumulative 12-month rolling average emissions of each pollutant emitted by the facility will be maintained.

f. Air emissions associated with small scale laboratory productions (i.e., batches less than 50 gallons), can be estimated through a conservative, simplified approach based on sound engineering estimates as an alternative to the procedure specified in **Specific Condition 12.b.**

[Air Operation Permit No. 0010049-009-AF]

13. **Commencement of Construction/Operation.** The permittee shall submit to the Air Compliance Authority of this Office written notification of the date of commencement of construction and operation of the new Reactor (R-20). This notification shall be submitted or postmarked within as many days prior to the date of construction/operation commencement as practical, but no later than one (1) business day following commencement of construction/operation.

[Rule 62-4.070(3), F.A.C.]

14. This Facility is subject to SECTION 2. Administrative Requirements of this permit and also, the attached Combined Appendices.