OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

MEMORANDUM **November 17, 2015**

TO: Phillip Fielder, P.E., Permits and Engineering Group Manager

THROUGH: Phil Martin, P.E., Engineering Manager, Existing Source Permits Section

THROUGH: Peer Review

FROM: Ellis Fischer, P.E., Existing Source Permits Section

SUBJECT: Evaluation of Permit Application No. **2009-394-C (M-4) (PSD)**
Tinker Air Force Base
KC-46A Project
Facility ID: 1518
KC-46A Program
Tinker AFB, Oklahoma County

SECTION I. INTRODUCTION

Introduction This Permit No. 2009-394-C (M-4) PSD

This permit application: the applicant requests an increase in emissions associated with facilities needed to support the KC-46A program. The applicant discovered discrepancies in the stripper materials initially proposed in Permit No. 2009-394-C (M-2) PSD. As a result the applicant is requesting a re-opening of the prior permit and relaxation of the existing VOC emission limits from the previous PSD permit. The emission relaxation will only affect the VOC emissions from the chemical depainting operations. The analysis in this permit involves only the chemical depainting VOC emissions. All other emissions remain the same.

This permit addresses an increase in expected VOC emissions from chemical depainting activities of 204 TPY which was determined to be necessary subsequent to issuance of Permit Number 2009-394-C (M-2) (PSD). The emissions increase is necessary to account for updated information regarding the anticipated volume of non-HAP containing stripper materials to be used in the chemical depainting activities. The new total emissions from chemical depainting activities is 319 TPY of VOC which is used in the PSD analysis.

The application has been prepared in accordance with requirements set forth in Oklahoma Administrative Code (OAC) 252:100-8 and is considered a Tier II application. Because the program will result in a major modification of an existing major stationary source located in an attainment area, the permit will be subject to the prevention of significant deterioration (PSD) preconstruction permitting program.

This permit provides updated emissions estimates for a portion of the new workload previously authorized via a PSD permit application submitted in March 2014, which resulted in issuance of Construction Permit Number 2009-394-C (M-2) (PSD) on January 8, 2015 (the January 2015 Permit). This additional permit application is necessary because subsequent analysis of available data concerning chemical stripping (depainting) operations indicate that the VOC emissions projected for depainting activities had been underestimated in the original permit application. Specifically, this current permit application documents a total projected VOC emission from chemical depainting activities 204 TPY higher than the VOC emissions (115 TPY) documented in the January 2015 Permit. Note that these additional emissions arise solely from use of chemical strippers that do not contain HAPs, thus HAP emissions remain as currently permitted. All other emissions projected and described in the January 2015 Permit also remain the same.

Introduction Permit No. 2009-394-C (M-2) PSD (issued January 8, 2015)

Tinker Air Force Base (AFB), located in Oklahoma County, Oklahoma, is an existing major facility (Standard Industrial Classification Code 9711) with permitted emissions of nitrogen oxides (NO_X), carbon monoxide (CO), and volatile organic compounds (VOCs) exceeding 250 tons per year (TPY) each. Facility-wide operations at Tinker AFB are currently authorized by Permit Number 2009-394-TVR, issued by the Oklahoma Department of Environmental Quality (ODEQ) on September 2, 2010.

In February 2011, the U.S. Air Force (USAF) selected the Boeing KC-767 to replace its aging KC-135 tankers and assigned the new aircraft the designation KC-46A. Tinker AFB was selected to perform the programmed depot-level maintenance of the KC-46A aircraft. In order to accommodate this new workload, Tinker AFB will construct new facilities at the former Burlington Northern Santa Fe (BNSF) rail yard. The BNSF rail yard was off base at the time of permit application, but adjacent to Tinker AFB property immediately north of Building 9001.

SECTION II. PROCESS DESCRIPTION

There is no change in the process description from previous permit. Activities to be performed at the proposed new KC-46A facilities will be similar to activities currently occurring at Tinker AFB and addressed by Tinker's existing Title V permit. The new facilities will include the following new emission sources: natural gas-fired boilers and heaters associated with the new aircraft hangars, a 10-meter jet engine test cell, aircraft painting and depainting operations, aerospace cleaning, diesel-fueled fire pump engines, and additional above ground aircraft fuel storage tanks.

SECTION III. EQUIPMENT

Equipment This Permit No. 2009-394-C (M-4)PSD

The processes or operations associated with the project that are expected to be significant sources of air emissions have been identified but the actual equipment to be used is not yet determined and remains as described in Permit Number 2009-394-C (M-2) (PSD).

Equipment Permit No. 2009-394-C (M-2) PSD

The processes or operations associated with the project that are expected to be significant sources of air emissions have been identified but the actual equipment to be used is not yet determined. When the actual equipment is installed on Tinker AFB, an Emission Unit (EU) number will be assigned to each air emission source. These EU numbers will be categorized in accordance with Emission Unit Groups (EUGs) defined in Tinker AFB's existing Title V permit; the applicable EUGs are listed below.

Significant Air Emission Source Categories

Emission Unit Group (EUG) Code	EUG Name	Emission Category
EC6/8	ExtComb-6/8	Boilers and Heaters
ET1	EngTest-1	Jet Engine Test Cell
IC1	IntComb-1	Diesel-Fueled Fire Pump Engines
SC1/2/3	SrfCoat-1/2/3	Painting
CD1/2/3	ChemDpnt-1/2/3	Depainting Operations
CH1/2	ClnHWipe11/2	Clean Handwipe Operations
CF1	ClnFlush-1	Flush Cleaning Operations
CS1	ClnSpray-1	Spray Gun Cleaning Operations

Boilers and Heaters

The KC-46A Program will use boilers and heaters to provide heat and steam to the new hangars, buildings, and processes, all of which will be fired exclusively with pipeline-quality natural gas. Design specifications for the boilers and heaters have been determined but the manufacturers have not yet been selected. The total design heat input capacity for the boilers and heaters category (EC6/8 plus insignificant units) is approximately 300 million British thermal units per hour (MMBTUH). The hangars have been designed to include redundant units with a total design heat input capacity of approximately 96.7 MMBTUH. To maintain operational readiness, these redundant boilers and heaters will be operated only as backup units during periods when the primary unit is not functional. The preliminary facility design will require the following units: 28 hot water boilers (19 operational, 9 redundant), 8 steam boilers (6 operational, 2 redundant), 18 water heaters (all operational), and 8 gas-fired radiant-unit heaters (all operational). Fuel-burning equipment with rated input capacities of less than 5 MMBTUH are considered insignificant for the purposes of Title V permitting and are not usually subject to specific permit conditions. Combustion will contribute emissions of NO_x, CO, VOCs, sulfur dioxide (SO_2), particulate matter of less than 10 micron diameter (PM_{10}), particulate matter of

less than 2.5 micron diameter ($PM_{2.5}$), and carbon dioxide equivalent (CO_{2e}).

Boilers and Heaters

Type of Unit (Building)	EUG	# of Operating Units	# of Redundant Units	Unit Heat Input Capacity (MMBTUH)	Total Operating Capacity (MMBTUH)	Total Redundant Capacity[1] (MMBTUH)	Estimated Const. Date
Hot Water Boiler	EC-8	3	1	17.3	51.9	17.3	
Steam Boiler	EC-8	1	1	14.5	14.5	14.5	
Steam Boiler	EC-8	2		13.5	27	n/a	
Water Heater	Insig.	2		1.0	2	n/a	
(Two-Bay Multipurpose Hangar)				**TOTAL**	**95.4**	**31.8**	
Hot Water Boiler	EC-8	3	1	17.3	51.9	17.3	
Steam Boiler	EC-8	1	1	14.5	14.5	14.5	
Steam Boiler	EC-8	2		13.5	27	n/a	
Water Heater	Insig.	2		1.0	2	n/a	
(Corrosion Control Hangar)				**TOTAL**	**95.4**	**31.8**	
Hot Water Boiler	Insig.	2	1	3.5	7.0	3.5	
Water Heater	Insig.	2		0.8	1.6	n/a	
Gas-Fired Heater	Insig.	1		2.9	2.9	n/a	
(Single-Bay PDM Hangar 1)				**TOTAL**	**11.5**	**3.5**	
Hot Water Boiler	Insig.	2	1	3.5	7.0	3.5	
Water Heater	Insig.	2		0.8	1.6	n/a	
Gas-Fired Heater	Insig.	1		2.9	2.9	n/a	
(Single-Bay PDM Hangar 2)				**TOTAL**	**11.5**	**3.5**	
Hot Water Boiler	EC-6	2	1	5.8	11.6	5.8	
Water Heater	Insig.	2		1.0	2.0	n/a	
Gas-Fired Heater	EC-6	1		5.6	5.6	n/a	
(Double-Bay PDM Hangar 1)				**TOTAL**	**19.2**	**5.8**	
Hot Water Boiler	EC-6	2	1	5.8	11.6	5.8	
Water Heater	Insig.	2		1.0	2.0	n/a	
Gas-Fired Heater	EC-6	1		5.6	5.6	n/a	
(Double-Bay PDM Hangar 2)				**TOTAL**	**19.2**	**5.8**	
Hot Water Boiler	EC-6	2	1	5.8	11.6	5.8	
Water Heater	Insig.	2		1.0	2.0	n/a	
Gas-Fired Heater	EC-6	1		5.6	5.6	n/a	
(Double-Bay PDM Hangar 3)				**TOTAL**	**19.2**	**5.8**	
Hot Water Boiler	EC-6	2	1	5.8	11.6	5.8	
Water Heater	Insig.	2		1.0	2.0	n/a	
Gas-Fired Heater	EC-6	1		5.6	5.6	n/a	
(Fuel Cell Maintenance Hangar)				**TOTAL**	**19.2**	**5.8**	
Hot Water Boiler	Insig.	1	1	2.9	2.9	2.9	
Water Heater	Insig.	2		1.0	2.0	n/a	
(Kitting Facility)				**TOTAL**	**4.9**	**2.9**	
Gas-Fired Heater	Insig.	1		0.5	0.5	n/a	
(Fire Pump House)				**TOTAL**	**0.5**	**0.0**	
Gas-Fired Heater	Insig.	1		3.7	3.7	n/a	
(Chiller Building)				**TOTAL**	**3.7**	**0.0**	
TOTAL HEAT INPUT CAPACITY FOR THE KC-46A PROGRAM					**299.7**	**96.7**	

[1] Redundant boilers will not be operated at the same time as the primary boilers.

Jet Engine Test Cell (ET1)
A new 10-meter stationary jet engine test cell will be constructed as part of the proposed project. The new engine test cell will function in much the same manner as the existing jet engine test cells at Tinker AFB, whereby a software system cycles the engine through its operational run modes at various power settings (such as idle, approach, military, takeoff, and afterburn) to monitor engine performance throughout the entire test period.

Diesel-Fueled Fire Pump Engines (IC1)
Three 300-brake-horsepower (bhp) diesel-fueled fire pump engines are planned to provide fire protection water for the new hangars. Non-emergency use of the fire pump engines will be limited to monthly testing not to exceed 100 hours per year per engine. These engines will use only ultra-low-sulfur diesel fuel.

Painting/Depainting Operations (SC1/2/3 and CD1/2/3)
Tinker AFB will perform surface coating and depainting/stripping for the KC-46A aircraft. The chemical strippers used to remove the residual paint from the surface of the aircraft as well as the new paint applied to the aircraft will be formulations that meet Aerospace Manufacturing and Rework Facilities (Aerospace) National Emission Standards for Hazardous Air Pollutants (NESHAP) VOC limits. No VOC controls will be installed at the new paint hangars.

Clean Hand Wipe Operations (CH1/2)
Tinker AFB will remove contaminants such as dirt, grease, oil, and coatings from aerospace components by physically rubbing the items with material such as a rag, paper, or cotton swab that has been moistened with a cleaning solution; this activity is known as hand wipe cleaning. Hand wipe cleaning operations using solvents are expected to result in evaporative losses of VOCs. Aerospace NESHAP guidelines will be followed for this operation.

Flush Cleaning Operations (CF1)
The flush cleaning performed at Tinker AFB will remove contaminants such as dirt, grease, oil, and coatings from aerospace components by passing solvent over, into, or through the items being cleaned. The solvent may simply be poured into the part being cleaned and then drained, or the solvent application can be assisted by air or hydraulic pressure, or by pumping. Flush cleaning operations are expected to result in evaporative losses of VOCs. Aerospace NESHAP guidelines will be followed for this operation.

Spray Gun Cleaning Operations (CS1)
Tinker AFB will use paint spray guns during the painting process and the spray guns will be cleaned in accordance with the Aerospace NESHAP guidelines. Some evaporative losses of VOCs are expected during spray gun cleaning operations.

Storage Tanks
Two new aboveground storage tanks are proposed as part of the KC-46A Program. These tanks will store Jet-A fuel used for jet engine testing and will be manifolded with Tinker AFB's existing Jet-A storage tanks. This is a closed-loop hydrant system in which fuel is delivered to the tanks by pipeline. These tanks and associated pipeline and headers are considered

insignificant sources for the purposes of the Tinker AFB Title V permit.

SECTION IV. POTENTIAL EMISSIONS

Combustion Sources

The new combustion sources that will be constructed and operated to support the new KC-46A workload include boilers and heaters, jet engine test cells, and emergency fire pumps. The total potential to emit (PTE) for these emission sources is summarized below; the methods used to calculate the PTE values are in subsequent discussions.

Emission Increases from Combustion Sources

Emission Source	NOx		CO		VOC		SO_2	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Boilers & Heaters	4.50	19.69	19.48	85.32	1.62	7.08	0.18	0.77
Jet Engine Testing	4.08	17.86	1.57	6.88	0.39	1.70	0.25	1.09
Diesel Fire Pumps	6.00	0.30	5.40	0.27	2.40	0.12	0.02	<0.01
Totals	**---**	**37.85**	**---**	**92.47**	**---**	**8.90**	**---**	**1.87**

Emission Increases from Combustion Sources (continued)

Emission Source	PM_{10}		$PM_{2.5}$		CO2e		HAPs	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Boilers & Heaters	2.23	9.78	2.23	9.78	35,094	153,713	0.55	2.42
Jet Engine Testing	0.007	0.03	0.007	0.03	566.5	2,481	0.39	1.70
Diesel Fire Pumps	0.40	0.02	0.40	0.02	900	45	0.06	<0.01
Totals	**---**	**9.83**	**---**	**9.83**	**---**	**156,239**	**---**	**4.13**

The types and manufacturers for the boilers and heaters to be installed at Tinker AFB have not yet been determined. However, design specifications for all boilers and heaters installed as part of the KC-46A Program will have low-NOx burners and be manufacturer-guaranteed not to exceed the following emission factors: 0.015 pound NO_X per million British thermal units (lb/MMBTU) input and 0.065 lb/MMBTU for CO.

PTE estimates for VOCs, SO_2, PM, and hazardous air pollutants (HAPs) for all boilers and heaters were performed using the emissions factors from AP-42 (7/98). Greenhouse gas (GHG) emissions calculations used global warming potentials (GWPs) and emission factors for natural gas provided in Table A-1 and Tables C-1 and C-2 of Title 40 of the Code of Federal Regulations (CFR) Part 98 (40 CFR 98), Subparts A and C, respectively. PTE for each natural gas-fired boiler and heater has been estimated assuming 8,760 hours of operation per year.

A 10-meter jet engine test cell will be constructed to test F-139 engines and will contribute to air emissions from combustion sources. The following assumptions and data sources were used to estimate jet engine testing emissions:

- Fifty-two PW4062 (F139) engines used on the KC-46A aircraft will be tested annually. This is a conservative estimate based on KC-46A Program annual approximations using a safety factor to allow for flexibility.
- Two tests will be performed per engine.
- Time-in-mode for each test was provided by USAF personnel based on the expected testing protocol for the F139 jet engine.
- Pollutant emission factors for NO_X, CO, and hydrocarbons (HC) as well as fuel flows were obtained from ICAO Engine Exhaust Emissions Data Bank, PW4062 - unique ID 12PW102 - Test dates 30 Nov 2012 through 12 Mar 2013.

ICAO Engine Exhaust Emissions Data (Engine PW4062 of F-139)

Mode	Power Setting (%Rated Output)	Time (minutes)	Fuel Flow (kg/s)	Emissions Indices (g/kg)			Smoke Number
				HC	CO	NOx	
Take-off	100	0.7	2.725	0.08	0.61	34.36	8.5
Climb Out	85	2.2	2.125	0.07	0.5	25.98	6
Approach	30	4	0.718	0.09	1.93	12.17	0.5
Idle	7	26	0.21	10.86	42.61	3.78	0.1

- Pollutant emission factor for VOCs was assumed to be equal to HC emissions from ICAO data.
- SO_2 emissions were calculated from fuel flows and fuel sulfur content assuming a 100 percent conversion factor, as described in *AFCEE AEI Guidance for Stationary Sources, Chapter 3: Aircraft Engine Testing*, December 2009.
- PM PTE was estimated using smoke number data provided in the ICAO Engine Exhaust Emission Data Bank. ICAO data provide information on the smoke number for the F139 jet engine, which is a quantification of the visible smoke rather than particulates of a given aerodynamic equivalent diameter (PM). Several correlations have been developed between PM measurements and smoke number for various jet engine operating conditions. The PM factors for the F139 were calculated from "Smoke Number Correlation by Deutsches Zentrum für Luft- und Raumfahrt," reported by A. Kugele in *Aircraft Particulate Matter Emission Estimation through all Phases of Flight*, p. 69-70. All PM emissions were assumed to be $PM_{2.5}$; therefore, pollutant emission factors for PM_{10} and $PM_{2.5}$ were assumed to be the same.
- GHG emission estimates are based on 40 CFR 98 default emission factors for kerosene-type jet fuel from Subpart C, Tables C-1 and C-2, and GWP from Subpart A, Table A-1.

Additional combustion sources include three diesel-fueled fire pump engines. These will be rated at approximately 300-bhp. NO_X, CO, PM_{10}, and $PM_{2.5}$ emission estimates from the fire pump engines were calculated using New Source Performance Standards (NSPS), Subpart IIII emission limits and 100 hours of operation. VOC, PM, and SO_2 emissions were estimated using AP-42 (10/96) and 100 hours of operation. SO_2 emission estimates are based on a fuel sulfur content of 15 parts per million by weight (ppmw). CO_{2e} emission estimates are based on 40 CFR 98 default emission factors for diesel from Subpart C, Tables C-1 and C-2 and GWP from Subpart A, Table A-1.

NSPS Emission Limits for Fire Pump Engines[1]

	NMHC + NO_X	CO	PM
Max Engine Power	**g/kW-hr (g/hp-hr)**	**g/kW-hr (g/hp-hr)**	**g/kW-hr (g/hp-hr)**
300 ≤ hp < 600	4.0 (3.0)	3.5 (2.6)	0.2 (0.15)

[1] – For model year 2009 and later.

Emissions for Painting and Depainting Operations Permit No. 2009-394-C (M-2) PSD

Painting and Depainting Operations

Emission estimates associated with the Tinker AFB KC-46A Program painting/depainting operations include emissions from strippers, primers, topcoats, and conversion or pretreatment coatings. The USAF is purchasing 179 KC-46A aircraft. Based on the depot-level maintenance program schedule, each KC-46A will come to Tinker AFB approximately once every 4 years, meaning that approximately 40 KC-46A aircraft will be subject to depot-level maintenance at Tinker AFB each year.

Assumptions about material usage for painting and depainting operations are:

- PTE estimates for painting/depainting are based on a maximum of 40 KC-46A aircraft subject to annual depot-level maintenance that results in complete painting/depainting.
- *HAP-containing stripping operations*: PTE calculations for HAP-containing stripping operations on the KC-46A aircraft were estimated based on a maximum annual stripper usage of 50 gallons per aircraft, which is the limit provided in the Aerospace Manufacturing and Rework Facilities NESHAP [40 CFR 63.746(b)(3)] for military aircraft.
- *Non-HAP-containing stripping operations*: Because the KC-46A is new to the USAF inventory, no data are available to Tinker AFB regarding the usage of non-HAP strippers on this aircraft. As a result, existing data on stripper usage for the KC-135, which undergoes stripping operations similar to those expected to be used on the KC-46A, were employed for PTE estimates. Although the KC-46A has a surface area more akin to the KC-10 than the KC-135, it is expected to undergo non-HAP-containing stripping operations similar to those performed on the KC-135, whereas KC-10 non-HAP-containing stripping operations use only a fraction of the non-HAP stripper used for the KC-135. The stripper usage for the KC-46A was calculated by multiplying average KC-135 stripper usage by the ratio of the surface areas of the KC-46A to the KC-135. Specifically, 2013 Tinker AFB data indicate that KC-135 stripping operations used 620 gallons of non-HAP stripper per KC-135 aircraft, which has a surface area of 11,440 square feet. The KC-46A has a surface area of 15,506 square feet, which is 1.35 times greater than the KC-135. Using a 20 percent factor for a conservative estimate, the correction factor used for the non-HAP stripper usage for the KC-46A aircraft was 1.6.
  - The non-HAP stripper use assumed for the KC-46A aircraft was 1,000 gallons/aircraft/year (620 gallons/KC-135 x 1.35 x 1.2)
- *Primer, topcoat, and conversion or pretreatment coating operations:* Actual usage of primer, topcoat, and pretreatment coating materials for the KC-46A is currently not available. The KC-10 aircraft, which has a surface area approximately equivalent to the KC-46A, was used

as a surrogate for KC-46A primer, topcoat, and conversion coating operations. The following quantities, based on 2013 Tinker AFB data for KC-10 aircraft, were used for KC-46A PTE estimates:

- 65 gallons/KC-46A primer
- 110 gallons/KC-46A topcoat
- 80 gallons/KC-46A conversion coating (pretreatment coating)

- Information provided in material safety data sheets (MSDS) for the materials expected to be used in painting and depainting operations for the KC-46A aircraft, or materials currently approved for use at Tinker AFB for similar operations, were utilized to determine the VOC and total HAP content of those materials for PTE calculations. When more than one material was available for the same type of operation, the material with the highest VOC content was selected.
- PTE estimates assume the following:
  - That all VOCs and organic HAPs are emitted to the air.
  - Non-HAP-Containing Stripper:
    - Stripper designed to contain Non-HAPs, therefore, HAPs are zero.
  - HAP-Containing Stripper:
    - Inorganic HAPs emissions from stripper usage are assumed to be zero because the application method does not atomize the material.
  - Primer and Topcoat:
    - Inorganic HAPs emissions from primer and topcoat application are attenuated by the 65 percent transfer efficiency that may be assumed for high-volume, low-pressure (HVLP) coating application and by the 95 percent removal efficiency required of Aerospace NESHAP dry paint exhaust filters.
  - The conversion coating (pretreatment coating) does contain an inorganic HAP, but the method of application does not atomize the coating and, thus, precludes emissions of this inorganic HAP.

Emissions for Painting and Depainting Operations Permit No. 2009-394-C (M-4) PSD

Assumptions about and projected emissions from painting (topcoat and primer) operations remain as described in the January 2015 permit.

Assumptions about and projected emissions from usage of HAP-containing chemical strippers also remain as described in the January 2015 permit.

VOC emissions from depainting operations will increase, due to a necessary increase in the amount of non-HAP stripper needed to achieve acceptable results. The performance of non-HAP strippers used in 2014 and expected to be used in future compared to the non-HAP strippers used in previous years indicates that future usage of non-HAP stripper per aircraft will be considerably higher than the usage documented in the 2013 data, by a factor of 2.9975:

- The non-HAP stripper usage assumed for the KC-46A aircraft was 2,997.5 gallons/aircraft/year (620 gallons/KC-135 x 1.35 x 1.2 x 2.9975)

Based on these assumptions, the additional annual emission of VOCs [over that currently authorized by Permit Number 2009-394-C (M-2) (PSD)] is 407,969 lb/yr or 204 TPY.

No other emission estimates have changed from the currently permitted emissions.

The table below summarizes the emission increases projected (as PTE calculations) for the emissions described in this section.

VOC and Total HAP Emissions from Painting and Depainting Operations

Materials	VOC Content	HAP Content	Material Throughput	Annual VOC Emissions		Total HAP Emissions	
	(lb/gal)	(lb/gal)	(gal/yr)	lb/yr	TPY	lb/yr	TPY
Permit No. 2009-394-C (M-2) PSD							
Pre-Modification							
Non-HAP -Containing Stripper	5.1	0.0	40,000	204,000	102.1	0.00	0.00
HAP-Containing Stripper	1.4	6.1	2,000	2,781	1.4	11,926	5.96
Primer	2.9	4.0	2,600	7,540	3.8	4,761	2.38
Topcoat	3.5	0.8	4,400	15,379	7.7	3,351	1.68
Pretreatment Coating	0.00	0.0	3,200	0	0.0	0.00	0.00
Pre-Modification Totals				**229,940**	**115.0**	**20,038**	**10.0**
Permit No. 2009-394-C (M-4) PSD							
Post-Modification							
Non-HAP -Containing Stripper	5.1	0.0	119,900	611,490	306.1	0.00	0.00
HAP-Containing Stripper	1.4	6.1	2,000	2,781	1.4	11,926	5.96
Primer	2.9	4.0	2,600	7,540	3.8	4,761	2.38
Topcoat	3.5	0.8	4,400	15,379	7.7	3,351	1.68
Pretreatment Coating	0.00	0.0	3,200	0	0.0	0.00	0.00
Post-Modification Totals				**637,190**	**319.0**	**20,038**	**10.0**
Increase (Decrease)					**204**		**0.0**

Emission Limits for PSD Analysis
This Permit No. 2009-394-C (M-4) PSD

Emission Source Category	EUG	NO_X	CO	VOC	SO_2	$PM_{10}/PM_{2.5}$	CO_{2e}
Painting/Depainting	CD1/2/3	-	-	319	-	-	-
Totals (PTE)		-	-	319	-	-	-
SER		**40**	**100**	**40**	**40**	**15/10**	**75,000**
>SER		**NO**	**NO**	**YES**	**NO**	**NO**	**NO**

Since this permit relaxes the VOC emissions from a previous limit in the prior PSD permit, the total depainting emissions (319 TPY) are used instead of the increase in emissions.

Aerospace Cleaning operations

Cleaning operations included in this category of PTE emissions comprise Clean Handwipe Operations (CH1), Flush Cleaning Operations (CF1), and Spray Gun Cleaning Operations (CS1). Because the KC-46A is a new aircraft and no cleaning-related emissions data are currently available, VOC and HAP emissions expected to be emitted from these sources due to evaporative losses were estimated using the following assumptions:

- The VOC PTE estimates assumed the VOCs will be emitted from these cleaning sources at the same ratio between cleaning operations and the surface coating operations [which includes EUGs SC1 and SC2 (Primers and Topcoats)] reported in the 2012 Tinker AFB Air Emissions Inventory (AEI), from 76th Aircraft Maintenance Group (76 AMXG). The 76 AMXG comprises the Aircraft portion of Oklahoma City-Air Logistics Complex (OC-ALC) Maintenance Wing. These data include surface coating emissions from all aircraft types undergoing depot-level maintenance operations. Surface coating operations from the 2012 AEI for the 76 AMXG were approximately 26.981 TPY.
- The corresponding cleaning operations, as provided in the 2012 AEI data for the 76 AMXG, included the following VOCs emissions:
  - Flush Cleaning (CF1): 0.555 tons VOC
  - Hand Wipe Cleaning (CH1): 7.885 tons VOC
  - Paint Spray Gun Cleaning (CS1): 4.511 tons VOC
- Based on the 2012 AEI emissions shown above, the ratios used to calculate the VOC emissions from cleaning operations related to the KC-46A Program were as follows:
  - CF1: 0.021 tons of VOCs from flush cleaning emissions per ton of VOCs from surface coating emissions;
  - CH1: 0.292 tons of VOCs from hand wipe cleaning emissions per ton of VOCs form surface coating emissions; and
  - CS1: 0.167 tons of VOCs from paint spray gun cleaning emissions per ton of VOCs from surface coating emissions.
- The ratios shown above were multiplied by the KC-46A PTE emissions estimated for painting operations (primers and topcoats only) to obtain the total VOC PTE for cleaning operations related to the KC-46A aircraft.
- HAPs PTE for cleaning operations were estimated using a similar approach. The specific cleaning materials that will be used during KC-46A overhaul and maintenance are currently unknown, so HAP emissions were estimated based on an assumption that certain representative cleaning materials, currently used within the 76 AMXG, will be used for KC-46A work.
  - Representative cleaning solvents currently used for CH1 and CF1 operations are zero-HAP, leading to estimated zero-HAP emissions in each of these categories.
  - The solvent most commonly used for paint gun cleaning (CS1) in the 76 AMXG at this time does contain organic HAPs, leading to estimated HAP emissions from CS1 operations of 0.57 TPY.

VOC and Total HAP Emissions for Cleaning Operations (CH1, CF1, CS1)

Cleaning Operation Type (EUG)	Cleaning to Surface Coating VOC AEI Emissions Ratio	KC-46A VOC Emissions (TPY)	HAPs to VOCs in representative solvent	KC-46A HAPs Emissions (TPY)
Flush Cleaning (CF1)	0.021	0.24	0	0.00
Hand Wipe Cleaning (CH1)	0.292	3.35	0	0.00
Paint Spray Gun Cleaning (CS1)	0.167	1.92	0.30	0.57
Totals (TPY)	**VOCs**	**5.5**	**HAPs**	**0.6**

Paved surface driving activities

Increased emissions of PM (TSP)/PM_{10}/$PM_{2.5}$ will result from the following paved surface driving activities at and associated with the KC-46A facility:

1) Privately-owned vehicles (POVs) of new personnel driving between the Tinker AFB entrance and the new employee POV parking lots.
2) Government-owned vehicles (GOVs) specifically trucks driving on the paved airfield and roadways
3) Tugs moving aircraft around facility
4) Tugs moving engines between the maintenance facility and the new jet engine test cell
5) Sweeping of the aircraft taxiway and apron areas
6) Sanding of POV roads during a winter storm event
7) Sweeping of POV roads after winter storm event

Emissions were estimated based on U.S. Environmental Protection Agency's (EPA) AP 42 section 13.2.1: Paved Roads, for these various dust generating activities. To develop the emissions reported below, the following assumptions and approaches were used:

- For emissions associated with POVs, the following was assumed:
  - An estimated 255 new vehicles (for 255 new personnel) as stated in the draft Environmental Assessment (EA) for the proposed KC-46A mission
  - POVs enter the base 5 days/week, 50 weeks/yr. for a total of 250 days/yr.
  - The distance from the Tinker AFB entrance on Midwest Blvd. to the new parking lots is 0.5 miles round trip
  - The average weight of the POV's is 1.5 tons
- For GOVs – Pickup trucks assumptions include the following.
  - The new hangar area will utilize 8 GOV - Pickups
  - GOV- Pickup truck usage is based on operating 5 days/week, 50 weeks/yr for a total of 250 days/yr./pickup
  - The distance a GOV-pickup truck drives in a day around the airfield is assumed to be 3 miles
  - The average weight of the GOV-pickup is 2 tons
- For tugs moving aircraft, assumptions were:
  - Each of the 40 aircraft estimated to be serviced each year will be moved approximately 4 times.
  - The tugs will move each aircraft on average 0.5 miles per roundtrip
  - Aircraft weight is based on an empty KC-46A at 181,610 lbs or approximately 91 tons. Category 2 tugs will be used to move the empty planes, each Category 2 tug

weighing 26,455 lbs or approximately 13 tons.

- For tugs that will move engines to be tested, the following assumptions were used:
  - A single tug will be dedicated to moving engines to be tested between maintenance hangars and the engine test facilities
  - Tinker will test up to 52 engines each year. This equates to 52 trips out and back.
  - The distance between maintenance facility and engine test facility is 0.5 miles roundtrip
  - The tug plus engine weight is 7 tons
- Assumptions for sweeping aircraft area:
  - Sweeping of the aircraft area will be done by one vehicle one day/week or 50 days/yr.
  - Sweeping of the entire aircraft area will be 10 miles total travel distance
  - The weight of a street sweeping vehicle is approximately 4 tons
- Assumptions for sanding/sweeping POV roads:
  - Sanding and sweeping of the POV roads will be done by one sand spreading vehicle and one sweeping vehicle
  - Sanding/sweeping of POV roads based on two one-day winter storm events during the year
  - Sanding/sweeping of POV roads would be 0.5 miles roundtrip
  - The weight of a sander/street sweeping vehicle is approximately 4 tons each

Based on the assumptions and emission estimate methodology described above, estimated paved road particulate emissions are summarized in the table below. Note that the sweeping operations for the aircraft and POV travel areas will be done to reduce particulate accumulation on the paved surface. Particulate emissions released by the sweeping activities were estimated. However, since no reliable emissions control factor could be found for sweeping of a paved surface, no emission reduction credit is claimed for the sweeping activities. Thus the emission estimates reported here are conservative (high).

Tinker AFB Fugitive Source Emission Summary

Uncontrolled Emissions	**PM (TSP) (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
Paved Road Activities	2.42	0.48	0.12

The table below summarizes the emission increases projected (as PTE calculations) for the emission categories described in this section.

Emission Increases

Emission Source Category	EUG	NO_X	CO	VOC	SO_2	$PM_{10}/PM_{2.5}$	CO_{2e}
		TPY	**TPY**	**TPY**	**TPY**	**TPY**	**TPY**
Permit No. 2009-394-C (M-2) PSD							
Pre-Modification							
Boilers & Heaters	EC6/8	19.7	85.3	7.1	0.8	9.78/9.78	153,713
Jet Engine Testing	ET1	17.9	6.9	1.7	1.1	0.03/0.03	2481
Diesel Fire Pumps	IC1	0.3	0.3	0.1	0.0	0.02/0.02	45
Painting/Depainting	SC1/2/3 CD1/2/3	-	-	114.97	-	-	-
Clean Hand Wipe Operations	CH1	-	-	0.24	-	-	-
Flush Cleaning Operations	CF1	-	-	3.35	-	-	-
Spray Gun Cleaning Operations	CS1	-	-	1.92	-	-	-
Paved Surface Driving Activities	--	-	-	-	-	0.48/0.12	-
Pre Modification Totals (PTE)		**37.8**	**92.5**	**129.4**	**1.9**	**10.31/9.95**	**156,239**
Permit No. 2009-394-C (M-4) PSD							
Post-Modification							
Painting/Depainting	SC1/2/3 CD1/2/3	-	-	318.97	-	-	-
Post-Modification Total		**37.8**	**92.5**	**333.38**	**1.9**	**10.31/9.95**	**156,239**
SER		**40**	**100**	**40**	**40**	**15/10**	**75,000**
Post-Modification >SER		**NO**	**NO**	**YES[(1)]**	**NO**	**NO**	**YES[(2)]**

Notes: (1) VOC emissions are the only emissions addressed in PSD review.
(2) PSD review for GHG was addressed in Permit No. 2009-394-C (M-2) PSD and no changes are made under this permit. And are therefore, not addressed in this Permit No. 2009-394-(M-3) PSD.

SECTION V. PSD REVIEW

The PTE calculations for the air emission sources, which are the subject of this permitting action, will result in facility-wide PTE emission increases exceeding the significant emission rates (SERs) for VOCs (major source threshold of 40 TPY) and GHGs (prevention of significant deterioration [PSD] major source threshold of 75,000 TPY of CO_{2e}). Because the facility will be a PSD major source, this permitting action must include a PSD review.

A. Project Emission Increases

The project will be a major modification to an existing major stationary source due to the exceedance of the PSD significance levels. This project must undergo best available control technology (BACT) analysis and modeling for each regulated pollutant that exceeds the facility's projected PTE significance level. PTE means the maximum capacity of a source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or

processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is enforceable. Secondary emissions do not count in determining the potential to emit of a source.

The Emission Increases table above summarizes the PTE for each of the relevant pollutants and compared those emission rates to the SERs.

Because the project results in significant emissions of VOC and CO_{2e}, this project is subject to PSD and the applicant is required to apply BACT to each emission unit at which a net increase in the pollutant would occur, to conduct a facility air quality impact analysis for each regulated pollutant that exceeds the significant emission increase threshold, and to perform monitoring, if applicable. There is currently no applicable modeling or monitoring requirements for CO_{2e}.

B. BACT

BACT results in a specific emission limitation based on the maximum degree of reduction for each pollutant and emission unit, on a case-by-case basis, taking into account technical feasibility, energy, environmental, and economic impacts. The case-by-case BACT determination results from an analysis referred to as a "top-down" analysis.

The top-down analysis required for BACT involves the identification of all applicable control technologies in order of effectiveness. The review is then conducted beginning with the "top," or most effective emission control and/or reduction technology to determine if the technology is technologically, environmentally, and economically feasible. If the analysis reveals that a technology is not feasible based on any of these criteria, the next most effective control technology is then evaluated in the same manner. This is continued until the control technology under consideration cannot be eliminated based on technological feasibility, environmental impacts, or economics. This control technology is then proposed as BACT.

The top-down BACT approach must not only look at the most stringent emission limits previously approved, but it also must evaluate all demonstrated and potentially applicable technologies, including innovative controls, lower polluting processes, etc. These technologies and emission limits are generally identified through a review of the EPA RACT/BACT/LAER Clearinghouse (RBLC). If the proposed BACT is equivalent to the most stringent emission limit (top), no further analysis is necessary. However, if the most stringent emission limit is not selected, additional analyses are required. Any decision to require a lesser degree of emissions reduction must be justified by an objective analysis of "energy, environmental, and economic" impacts, as described previously.

The determination of what constitutes BACT is left to ODEQ, and allows that agency to consider the weight or emphasis to be placed on the energy, environmental, and economic impacts of control. This allows ODEQ to consider, on a case-by-case basis, the size of the facility, the increment of air quality that will be absorbed by any particular major-emitting facility, anticipated and desired economic growth for the area, and other concerns that may impact the agency's decision-making process. In no event can the application of BACT be less stringent than any applicable NSPS or NESHAP standard. BACT should be established as a numerical

emission limit or standard in the permit.

The five basic steps involved in the top-down BACT analysis are listed below:

Step 1. Identify Available Control Technologies
Step 2. Eliminate Technically Infeasible Options
Step 3. Rank Remaining Control Technologies by Control Effectiveness
Step 4. Evaluate Most Effective Controls Based on Energy, Environmental, and Economic Impacts
Step 5. Select BACT and Document the Selection as BACT

If due to technological or economic limitations to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice, or operation, and shall provide for compliance by means that achieve equivalent results.

For the purpose of the BACT analysis, GHG is assumed to be composed primarily of CO_2, with much smaller quantities of CH_4 and N_2O. Under U.S. Environmental Protection Agency (EPA) guidelines for GHG BACT, the typical top-down analysis approach is to be followed.

Furthermore, the GHG BACT analysis for the project is also based on the following concepts:

- Emission limits are defined on a "case-by-case" basis that considers site-specific factors.
- Emission limits must be "achievable" on a long-term, day-in and day-out, basis.
- The technology must be available and feasible for a specific project.
- BACT does not redefine the facility as proposed (including fuels).

The first step in the top-down BACT process is the identification of potentially available control technologies. One of the methods used to identify available control technologies for the GHG BACT analysis was to review previous BACT determinations for similar sources using EPA's RBLC database. This database is maintained on EPA's Technology Transfer Network website at www.epa.gov/ttn/catc. Advanced queries of the database were conducted to identify control technology determinations from January 2004 to January 2014 for sources similar to the proposed combustion sources identified in this permit application: jet engine test cells, boilers and heaters, and diesel-fueled fire pump engines. Final and draft determinations were included in the search. In addition, the research included EPA's white papers on available and emerging technologies for reducing GHG emissions from various relevant sources.

The technologies identified in Step 1 of the GHG BACT were separated into the following three categories, in accordance with EPA's *PSD and Title V Permitting Guidance for Greenhouse Gases* (EPA, 2011):

- Inherently Lower-Emitting Processes/Practices/Designs

- Add-On Controls
- Combinations of Inherently Lower Emitting Processes/Practices/Designs and Add-On Controls

1. Heaters/Boilers

Tinker is proposing to install various hot water boilers, steam boilers, radiant heaters and water heaters at the facility. The BACT analysis for the heaters/boilers is for VOC and GHGs. Eight 17.3-MMBTUH hot water boilers, four 14.5-MMBTUH and four 13.5-MMBTUH steam boilers will be subject to 40 CFR 60, NSPS, Subpart Dc, and 40 CFR 63 Subpart DDDDD. Because the proposed heaters and boilers will burn natural gas as fuel, they will not be subject to any emission standards under this subpart.

Step 1 - Identify Available Control Technologies

A review of previous BACT analyses was conducted to identify available control technologies for consideration. The search was conducted for heaters and boilers similar to the units being proposed. The applicant queried the database for commercial/institutional-size (<100 MMBTUH) boilers/furnaces permitted from January 2004 to January 2014. The technologies identified for evaluation are summarized below.

Control Technologies Identified for BACT Analysis for Boilers and Heaters

Pollutant	Control Technologies Identified
VOC	Good Combustion Practices
GHG	Tune-Ups
	Oxygen Trim Control
	Energy Capture from Boiler Blowdown
	Condensate Return System
	Carbon Capture and Sequestration (CCS)

Step 2 – Eliminate Technically Infeasible Options

Good combustion practices are technically feasible to control VOC emissions from boilers and heaters.

Analysis of GHG control technologies indicated that all technologies identified in step 1 are technically feasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Based on the Step 2 analysis, good combustion practice and use of pipeline-quality natural gas are the only technologies for this application for VOC control.

For GHG control, the technologies were ranked according to their control efficiencies measured as percent CO_2 reduction. In order of greatest to lowest percent CO_2 reduction potentially achieved, the technologies were ranked as follows:

1. Condensate return system
2. Energy capture from boiler blowdown
3. Oxygen trim control

4. Tune-ups

The CO_2 control efficiency for carbon capture and sequestration (CCS) has not been determined because there are no projects applying this technology at a commercial or pilot scale that can be used for reference. It is expected that the CO_2 reduction efficiency of CCS would be case specific and, as such, it has not been ranked.

Step 4 – Evaluate Most Effective Controls and Document Results

VOCs

According to RBLC, the proposed heaters have the lowest emissions of VOCs. The search results for VOC emissions for heaters/boiler rated between 0.75 and 19 MMBTUH are summarized below.

RBLC Search Results for VOC

RBLC ID	Process	Emission Rate (lb/MMBTU)
		VOC
WI-0228	0.75-MMBTUH Station Heater	0.0053
NV-0046	3.85-MMBTUH Boiler	0.0052
WI-0207	11.0-MMBTUH Boilers	0.0054
AR-0090	12.6-MMBTUH Boiler	0.0055
LA-0192	19.0-MMBTUH Fuel Gas Heaters	0.005

The proposed BACT for VOC is the burning of natural gas and good combustion with emissions based on AP-42 (7/1998), Section 1.4 for boilers and heaters. BACT for VOC is selected as good combustion practices with an emission rate limit of 0.005 lb/MMBTU.

GHGs

The search results for GHG emissions for heaters/boilers rated between 1.0 and 19 MMBTUH are summarized below.

RBLC Search Results for GHG

RBLC ID	Process Code	Process	Emission Rate TPY
			GHG
IA-0107	13.31	13.32-MMBTUH Heater	6,860
NE-0058	13.31	19.80-MMBTUH Generating Package	14,634
IA-0107	13.31	60.1-MMBTUH Boiler	17,313
IN-0158	13.31	80.0-MMBTUH Boiler	81,996
OH-0352	13.31	99.0-MMBTUH Boiler	11,671
PA-0291	13.31	40.0-MMBTUH Boiler	13,696
PA-0296	13.31	40.0-MMBTUH Boiler	12,346
GA-0147	19.60	9.8-MMBTUH Boiler	5,809
IN-0167	19.60	1.0-MMBTUH Space Heater	3,587

RBLC ID	Process Code	Process	Emission Rate TPY
			GHG
IN-0167	19.60	1.70-MMBTUH System Air Heater	871
IN-0167	19.60	19.0-MMBTUH Heater	9,737
PA-0296	19.60	8.5-MMBTUH PreHeater	4,996
SC-0142	19.60	5.0-MMBTUH Heater	3,093
SC-0142	19.60	12.0-MMBTUH Heater	7,424
SC-0142	19.60	18.0-MMBTUH Furnace	0.005
IA-0107	13.31	13.32-MMBTUH Heater	6,860

Tinker AFB will be implementing tune-ups as a GHG control measure as part of compliance with the Major Source Boiler NESHAP, which will constitute the baseline for BACT. Because the tune-up costs will already be incurred by Tinker AFB, selection of other measures that might be slightly more effective at controlling GHGs would be an additional cost beyond the cost of the tune-ups. For example, the control technology that would result in the highest overall CO_2 reductions for this category would be implementation of oxygen trim controls. The cost of implementing this alternative is also the highest, at approximately $500,000, and it can be implemented in only half of the affected units to achieve an additional 2 to 3 percent reduction of CO_2e. Furthermore, part of the tune-ups to be conducted will include calibration of the system controlling the air-to-fuel ratio for the boilers, which is one of the functions of the oxygen trim system. The next effective technology is condensate return systems. This alternative is only applicable to steam boilers that constitute just 12 percent of the affected units. The cost for implementing this alternative is more than $250,000 for six boilers to achieve an overall CO_2e reduction of less than 3 percent for the category. The remaining technically feasible alternative includes energy capture from boiler blowdown, which is also only applicable to steam boilers. The overall CO_2e reductions resulting from implementation of this technology would be less than the reductions obtained from the tune-ups, which are the baseline BACT. This alternative is less efficient for CO_2e reductions for the boilers and heaters than the baseline BACT. The costs associated with the technically feasible alternatives are not considered economically feasible for the low CO_2e reductions expected to be achieved.

The only post-combustion alternative identified for GHG control was CCS. Page 42 of EPA's PSD and Title V Permitting Guidance suggests that detailed cost estimates and vendor quotes should not be required where it can be qualitatively determined that a control strategy would not be cost effective. A rough estimate of the pipeline cost (one of the components of CCS for which some data/correlations are available) was calculated using the MIT correlation for CO_2 pipeline transport costs. The MIT correlation estimates that the cost to transport CO_2 by pipeline is roughly $33,853/inch of pipeline diameter/mile. Based on that estimate, the cost for a 4-inch-diameter, 100-mile CO_2 pipeline is approximately $13.5 million. The distance of the pipeline for this project is expected to be greater than 100 miles, which is roughly the straight line distance from Tinker AFB to the nearest active enhanced oil recovery (EOR) site. The cost of the pipeline alone, even without considering the CO_2 capture or injection costs, would make this alternative economically infeasible.

Step 5 - Select BACT and Document the Selection as BACT (VOC)
As previously indicated, BACT for VOC is selected as good combustion practices with an emission rate limit of 0.005 lb/MMBTU. No further analysis for VOC BACT was conducted.

CCS, oxygen trim control, energy capture from boiler blowdown, and condensate return systems for the boilers and heaters category are not cost-effective GHG control measures and, therefore, these alternatives were removed from consideration.

The selected BACT measures for VOCs and GHGs for this category are identified as follows:

Summary of Selected BACT for Boilers and Heaters

Pollutant	Control Technology	Emission Limits
VOC	Good Combustion Practices	0.005 lb/MMBTU [1]
GHG	Use of Pipeline-Quality Natural Gas	153,716 TPY
	Good Combustion Practices	
	Tune-Ups for Applicable Boilers/Heaters per 40 CFR 63, Subpart DDDDD	

1. Based on AP-42 (7/1998), Section 1.4.

The selected GHG BACT limit for the Tinker AFB KC-46A project is 153,713 TPY as CO_2e for the boilers and heaters category. No further analysis was conducted for GHG.

2. <u>Jet Engine Testing</u>
The facility is proposing to install a new 10-meter engine test cell. A review of previous BACT analyses was conducted to identify available control technologies for consideration. The search was conducted for Standard Industrial Classification (SIC) codes 3724 and 4581. The applicant queried the database for determinations between January 2004 and January 2014. No technologies were identified in the RBLC search and, therefore, BACT for jet engine testing was no control.

Step 1 - Identify Available Control Technologies
A search of the available literature did not identify any technologies for controlling VOC emissions from jet engine test cells. However, the Non-Thermal Plasma technology indicates that NOx removal along with VOC reductions occur during free radical interactions.

The RLBC database search for jet engine controls for GHGs did not yield any GHG emissions control technology currently being implemented in jet engine test cells. Typical GHG controls to consider include inherently lower emitting processes and add-on controls. For the case of GHGs, the only add-on control identified was CCS.

Step 2: Eliminate Technically Infeasible Options
Neither inherently lower-emitting processes nor CCS is considered technically feasible for jet engine test cells.

Inherently lower emitting processes are not considered further for jet engine test cells because

Tinker AFB only tests those engines in the U.S. Department of Defense (DoD) inventory. Therefore, the installation cannot alter either the combustor or the combustion characteristics of the engine. The F139 engine is a very efficient engine, consuming less fuel compared to older jet engines. Thus, testing F139s as compared to F135s would result in lower GHG emissions because a more efficient engine design is being utilized.

Capturing CO_2 emissions from the jet engine test cell would alter the test procedures. Gas turbine engines move significant amounts of air, some as much as 1,000 lbs per second, and the exhaust is extremely hot (approximately 2,000 degrees Fahrenheit (^oF) for non-afterburning and 3,000 ^oF for afterburning mode). The engines require the same or lower pressure on the exhaust as the inlet to operate properly, otherwise stalls and permanent damage may occur. The engines also need airflow around them to keep them cool. In order to capture CO_2 emissions from the exhaust air stream, the air-handling portion of the capture system would need to draw a very large portion of air to keep from back-pressuring the engine, which would require significant power and cost. Additionally, the air handling system for the capture of CO_2 would require handling extremely large changes in airflow in less than a second (if not fast enough, problems may occur). The capture system would need to handle a very large flow and be able to accommodate for a wide range of airflow temperatures, having the capacity to cool the airflow when the engine is at high power and heat it when the engine is at low power. The highly variable range of airflows, temperatures, and pressures that the CO_2 capture system would need to handle, in addition to the potential risks related to stalling of the engines if the capture system allows any back-pressure to occur that could result in significant overpressure of flaming gas out of both ends of the engine, would certainly make this add-on control technology technically infeasible for jet engine test cells.

Step 3: Rank Remaining Control Technologies by Control Effectiveness
Based on the analyses in steps 1 and 2, no control technologies are technically feasible for implementation on the jet engine test cells.

Step 4: Evaluate Most Effective Controls and Document Results
Because none of the identified technologies was considered technically feasible, an economic analysis was not performed for any of those technologies identified in Step 1.

Step 5 - Select BACT and Document the Selection as BACT (VOC)
The selected BACTs for VOCs and GHGs are summarized below and no further analysis was conducted.

Summary of Selected BACT for Jet Engine Testing

Pollutant	Control Technology	Emission Limits
VOC	No Control	1.7 TPY
GHG	No Control	2,481 TPY

The selected GHG BACT limit for the Tinker AFB KC-46A project is 2,481 TPY as CO_2e for the jet engine test cells category.

3. Diesel-Fueled Fire Pump Engines

The facility is proposing to install three 300-bhp diesel-fueled fire pump engines, each of which will utilize ultra-low sulfur distillate fuel oil and operate for a maximum of 100 hours annually for readiness testing purposes. The BACT analysis for the diesel-fueled fire pump engines is for VOCs and GHGs. The proposed fire pumps will be subject to 40 CFR 60, NSPS, Subpart IIII, and 40 CFR 63, NESHAP, Subpart ZZZZ. The standards for diesel-fueled fire pumps manufactured after 2009 with a maximum horsepower (hp) rating between 300 and 600-hp are 3.0 g/hp-hr NO_X + NMHC, 2.6 g/hp-hr CO, and 0.15 g/hp-hr for VOC.

Step 1 - Identify Available Control Technologies

A review of previous BACT analyses was conducted to identify available control technologies for consideration. The search was conducted for Small Internal Combustion Engines < 500-hp. The applicant queried the database for determinations between January 2004 and January 2014. The technologies identified for evaluation are summarized below.

Control Technologies Identified for BACT Analysis for Fire Pump Engines

Pollutant	Control Technologies Identified
VOC	Good Combustion Practices
GHG	Good Combustion Practices
	Efficient Design
	CCS

Step 2 – Eliminate Technically Infeasible Options

Good combustion practices are technically feasible to control VOC and GHG emissions from the diesel-fueled fire pump engines. Efficient design is also technically feasible.

Stand-alone CO_2 capture systems for the small sources are not feasible, either technically or economically. Therefore, CCS is eliminated from further consideration for fire pump engines for GHG reduction.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Based on the Step 2 analysis, good combustion practice is the only technology feasible for VOCs.

Good combustion practices and efficient design are the only technologies feasible for GHGs. Both technologies are equally important in minimizing GHG emissions.

Step 4 – Evaluate Most Effective Controls and Document Results

According to RBLC, the proposed diesel-fueled fire pump engines have the lowest emissions of VOC. The search results for VOC are summarized below.

RBLC Search Results for VOC BACT Emissions from Fire Pumps

RBLC ID	VOC Emission Rate (g/hp-hr)
IA-0105	0.34
OH-0352	0.38

RBLC ID	VOC Emission Rate (g/hp-hr)
OH-0317	0.39
LA-0254	1.0
OK-0129	1.1
LA-0274	1.1

Because the fire pump engines are for emergency use only, they have no GHG minimization options. However, the proposed engines will be the most efficient units offered by the manufacturer in this horsepower range and service class to achieve the emission standards under 40 CFR 60, NSPS Subpart IIII. Accordingly, BACT is accepted as proper operation of the proposed diesel-fueled fire pump engines, and compliance with Table 4 of 40 CFR 60 Subpart IIII emissions standards, is BACT.

Step 5 - Select BACT and Document the Selection as BACT (VOC)

BACT for the diesel-fueled fire pump engines is proper operation and compliance with NSPS, Subpart IIII, Tier III emissions standards.

The selected BACT is summarized below and no further analysis was conducted.

Summary of Selected BACT for Diesel Fire Pumps

Pollutant	Control Technology	Emission Limits
VOC	Good Combustion Practices	0.15 g/hp-hr
GHGs	Good Combustion Practices	44 TPY
	Efficient Designed	

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The GHG BACT limit for the Tinker AFB KC-46A Program is 44 TPY as CO_2e for the diesel-fueled fire pump engines category.

PSD Review Permit No. 2009-394-C (M-2) PSD Aircraft Painting/Depainting

4 (a). Aircraft Painting/Depainting

The facility is proposing to perform surface coating and depainting/stripping for the KC-46A aircraft. The stripper used to remove the residual paint from the surface of the aircraft as well as the new paint applied to the aircraft will be formulations that meet Aerospace NESHAP VOC limits. No VOC controls will be installed at the new paint hangars.

Step 1 - Identify Available Control Technologies

A review of previous BACT analyses, the California Air Resources Board (CARB) and South Coast Air Quality Management District (SCAQMD) were reviewed for possible control technologies that are available on the market and proven practice in the aerospace or other industries with similar requirements for coating very large objects.

Control Technologies Identified for BACT Analysis

Pollutant	Control Technologies Identified
VOC	Regenerative Thermal Oxidizer
	Carbon Adsorption
	Thermal Oxidizer
	Regenerative Thermal Oxidizer with concentrator
	Low-VOC Coatings, HLVP Coating Gun, Best Management Practices

Step 2 - Eliminate Technically Infeasible Options

The control technologies in Step 1 have been demonstrated and achieved in practice and, therefore, could be feasible technologies for implementation at Tinker AFB for the KC-46A Program. The use of low-VOC coating, high-transfer-efficiency spray equipment, and good work practices to minimize VOC emissions is the base case for BACT.

Step 3 - Rank Control Technologies by Control Effectiveness

The potential control options provided above have been ranked based on the control efficiencies documented as being achieved in practice.

Ranking of VOC Control Technologies by Effectiveness

Pollutant	Control Technologies	Approximate Control Efficiency
VOC	Regenerative Thermal Oxidizer	99.3
	Carbon Adsorption	99.3
	Thermal Oxidizer	98.9
	Regenerative Thermal Oxidizer with concentrator	93.2
	Low-VOC Coatings, HLVP Coating Gun, Best Management Practices	N/A

Step 4 - Evaluate Most Effective Controls Based on Impacts

An economic evaluation was performed on the technologies ranked in Step 3. Cost effectiveness of the various VOC control technologies for the KC-46A painting and depainting operations is summarized below.

Aircraft Painting/Depainting Emissions Control Cost Comparison

Type of Control Technology	Vendor Name	Capital Cost ($)	O&M Costs ($)	Cost Effectiveness ($/ ton of VOC Removed)
Regenerative thermal oxidizer	Epcon	$12,460,676	$2,730,890	$31,813
Carbon adsorption	Thermal Recovery Systems	$508,617	$12,346,588	$114,691
Thermal oxidizer	Callidus	$5,191,948	$15,142,895	$138,350
Thermal oxidizer with preheater	Callidus	$10,383,896	$7,365,323	$71,971
Thermal oxidizer with preheater	John Zink	$16,614,234	$11,162,464	$108,491
Regenerative thermal oxidizer with concentrator	Anguil	$8,307,117	$922,906	$13,607

Step 5 - Select BACT and Document the Selection as BACT
The table above shows the technology options are not economically feasible.

The selected BACT for painting/depainting operations is summarized below.

Summary of Selected BACT for Painting/Depainting Operations

Pollutant	Control Technology
VOC	Use of low VOC coatings
	High transfer efficiency coating equipment
	Good work practices in compliance with Aerospace NESHAP (40 CFR 63, Subpart GG)

PSD Review Permit No. 2009-394-C (M-4) PSD Aircraft Painting/Depainting

Note that a new BACT analysis for control of VOCs from aircraft depainting (and painting) activities was required as part of the analysis for the emission increase related to usage of non-HAP strippers. The BACT analysis described below is very similar to the analysis performed in 2014 because no significant changes in the available control technologies have occurred in the intervening time.

4 (b). Aircraft Painting/Depainting

The PTE calculations for the air emission sources, which are the subject of this permitting action, will result in facility-wide PTE emission increases exceeding the significant emission rates (SERs) for VOCs (major source threshold of 40 TPY). Because the facility will be a PSD major source, this permitting action must include a PSD review.

A. Project Emission Increases

The project will be a major modification to an existing major stationary source due to the exceedance of the PSD significance levels. This project must undergo BACT analysis and modeling for each regulated pollutant that exceeds the facility's projected PTE significance level. PTE means the maximum capacity of a source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is enforceable. Secondary emissions do not count in determining the potential to emit of a source.

The Emission Increases table on page 14 summarizes the PTE for each of the relevant pollutants and compared those emission rates to the SERs.

Because the project results in significant emissions of VOC, this project is subject to PSD and the applicant is required to apply BACT to each emission unit at which a net increase in the pollutant would occur, to conduct a facility air quality impact analysis for each regulated pollutant that exceeds the significant emission increase threshold, and to perform monitoring, if

applicable.

B. BACT

BACT results in a specific emission limitation based on the maximum degree of reduction for each pollutant and emission unit, on a case-by-case basis, taking into account technical feasibility, energy, environmental, and economic impacts. The case-by-case BACT determination results from an analysis referred to as a "top-down" analysis.

The top-down analysis required for BACT involves the identification of all applicable control technologies in order of effectiveness. The review is then conducted beginning with the "top," or most effective emission control and/or reduction technology to determine if the technology is technologically, environmentally, and economically feasible. If the analysis reveals that a technology is not feasible based on any of these criteria, the next most effective control technology is then evaluated in the same manner. This is continued until the control technology under consideration cannot be eliminated based on technological feasibility, environmental impacts, or economics. This control technology is then proposed as BACT.

The top-down BACT approach must not only look at the most stringent emission limits previously approved, but it also must evaluate all demonstrated and potentially applicable technologies, including innovative controls, lower polluting processes, etc. These technologies and emission limits are generally identified through a review of the EPA RACT/BACT/LAER Clearinghouse (RBLC). If the proposed BACT is equivalent to the most stringent emission limit (top), no further analysis is necessary. However, if the most stringent emission limit is not selected, additional analyses are required. Any decision to require a lesser degree of emissions reduction must be justified by an objective analysis of "energy, environmental, and economic" impacts, as described previously.

The determination of what constitutes BACT is left to ODEQ, and allows that agency to consider the weight or emphasis to be placed on the energy, environmental, and economic impacts of control. This allows ODEQ to consider, on a case-by-case basis, the size of the facility, the increment of air quality that will be absorbed by any particular major-emitting facility, anticipated and desired economic growth for the area, and other concerns that may impact the agency's decision-making process. In no event can the application of BACT be less stringent than any applicable NSPS or NESHAP standard. BACT should be established as a numerical emission limit or standard in the permit.

The five basic steps involved in the top-down BACT analysis are listed below:

Step 1. Identify Available Control Technologies
Step 2. Eliminate Technically Infeasible Options
Step 3. Rank Remaining Control Technologies by Control Effectiveness
Step 4. Evaluate Most Effective Controls Based on Energy, Environmental, and Economic Impacts
Step 5. Select BACT and Document the Selection as BACT

If due to technological or economic limitations to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice, or operation, and shall provide for compliance by means that achieve equivalent results.

The facility is proposing to perform surface depainting/stripping for the KC-46A aircraft. The stripper used to remove the residual paint from the surface of the aircraft will be formulations that meet Aerospace NESHAP VOC limits. No VOC controls will be installed at the new hangars.

Step 1 - Identify Available Control Technologies
A review of previous BACT analyses, the California Air Resources Board (CARB) and South Coast Air Quality Management District (SCAQMD) were reviewed for possible control technologies that are available on the market and proven practice in the aerospace or other industries with similar requirements for coating very large objects.

Control Technologies Identified for BACT Analysis

Pollutant	Control Technologies Identified
VOC	Regenerative Thermal Oxidizer
	Carbon Adsorption
	Thermal Oxidizer
	Regenerative Thermal Oxidizer with concentrator
	Best Management Practices

Step 2 - Eliminate Technically Infeasible Options
The control technologies in Step 1 have been demonstrated and achieved in practice and, therefore, could be feasible technologies for implementation at Tinker AFB for the KC-46A Program. Good work practices to minimize VOC emissions is the base case for BACT.

Step 3 - Rank Control Technologies by Control Effectiveness
The potential control options provided above have been ranked based on the control efficiencies documented as being achieved in practice.

Although the increase in depainting VOC emissions are 204 TPY, the BACT review is based on the total increase in the depainting of 319 TPY.

Ranking of VOC Control Technologies by Effectiveness

Pollutant	Control Technologies	Approximate Control Efficiency
VOC	Regenerative Thermal Oxidizer	99.3
	Carbon Adsorption	99.3
	Thermal Oxidizer	98.9
	Regenerative Thermal Oxidizer with concentrator	93.2
	Best Management Practices	N/A

Step 4 - Evaluate Most Effective Controls Based on Impacts

An economic evaluation was performed on the technologies ranked in Step 3. Cost effectiveness of the various VOC control technologies for the KC-46A depainting operations is summarized below.

Aircraft Painting/Depainting Emissions Control Cost Comparison

Type of Control Technology	Vendor Name	Capital Cost ($)	O&M Costs ($)	Total Annualized Costs	VOC Removed (TPY)	Cost Effectiveness ($/ ton of VOC Removed)
Regenerative thermal oxidizer	Epcon	$39,269,477	$8,423,071	11,041,036	317	$34,855
Carbon adsorption	Thermal Recovery Systems	$1,602,893	$11,070,075	11,390,654	317	$35,959
Thermal oxidizer	Callidus	$16,362,283	$47,539,164	48,629,983	315	$154,141
Thermal oxidizer w/preheater	Callidus	$32,724,564	$23,028,360	25,209,997	315	$79,907
Thermal oxidizer w/preheater	John Zink	$52,359,302	$34,994,945.94	38,485,565	315	$121,986
Regenerative thermal oxidizer w/concentrator	Anguil	$26,179,651	$2,725,258	4,470,568	297	$15,036

Note: VOC removed is based on control efficiencies in previous table and 319 TPY VOC from the depainting process.

Step 5 - Select BACT and Document the Selection as BACT

The table above shows the technology options are not economically feasible.

As BACT for VOC depainting operations, Tinker AFB will use good work practices to minimize VOC emissions in compliance with the Aerospace NESHAP VOC emission standards in 40 CFR 63, Subpart GG, as summarized in the following table.

Summary of Selected BACT for Painting/Depainting Operations

Pollutant	Production Activity	Control Technology
VOC	Low-VOC vapor-pressure cleaning solvents and strippers.	Less than 45 mm Hg at 20°C or as specified in Table 1 of 40 CFR 63, Subpart GG.
	Low-VOC vapor-pressure cleaning solvents and strippers.	Use of low VOC coatings (VOC content not to exceed lb/gal show in table above)
	Solvents and stripper application	High transfer efficiency coating equipment (High Volume Low Pressure: HVLP) or manual application.
	Work practice	Good work practices in compliance with Aerospace NESHAP (40 CFR 63, Subpart GG)

5. Hand Wipe Cleaning Operations

Step 1 – Identify All Control Technologies
One control technology for the hand wipe cleaning operations has been identified for VOC control:

Control Technologies Identified for BACT Analysis for Handwipe Cleaning

Pollutant	Control Technologies Identified
VOC	Bagging used solvent hand wipe cleaning rags

Step 2 – Eliminate Technically Infeasible Options
Bagging used solvent hand wipe cleaning rags is technically feasible for use in limiting VOC emissions and is a requirement of the Aerospace NESHAP.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
Based on the Step 2 analysis, bagging used solvent hand wipe cleaning rags is the only applicable VOC control technology for handwipe cleaning operations.

Step 4 – Evaluate Most Effective Controls and Document Results
No environmental or energy costs are associated with bagging solvent hand wipe cleaning rags from hand wipe cleaning operations.

Step 5 – Select BACT
The selected BACT is summarized below and no further analysis was conducted.

Summary of Selected BACT for Handwipe Cleaning Operations

Pollutant	Control Technology
VOC	Bagging solvent hand wipe cleaning rags

6. Flush Cleaning Operations

Step 1 – Identify All Control Technologies
One control technology for the flush cleaning operations has been identified for VOC control:

Control Technologies Identified for BACT Analysis

Pollutant	Control Technologies Identified
VOC	Capturing and containing solvent used for aircraft part flush cleaning operations

Step 2 – Eliminate Technically Infeasible Options
This option is technically feasible for use in limiting VOC emissions from flush cleaning operations and is a requirement of the Aerospace NESHAP.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
Based on the Step 2 analysis, capturing and containing solvent used for aircraft part flush cleaning operations is the only applicable VOC control technology.

Step 4 – Evaluate Most Effective Controls and Document Results
No environmental or energy costs are associated with capturing and containing solvent used for aircraft part flush cleaning operations.

Step 5 – Select BACT
The selected BACT is summarized below and no further analysis was conducted.

Summary of Selected BACT for Flush Cleaning Operations

Pollutant	Control Technology
VOC	Capturing and containing solvent used for aircraft part flush cleaning operations

7. <u>Spray Gun Cleaning Operations</u>

Step 1 – Identify All Control Technologies
One control technology for the spray gun cleaning operations has been identified for VOC control:

Control Technologies Identified for BACT Analysis

Pollutant	Control Technologies Identified
VOC	Enclosed container for spray gun cleaning

Step 2 – Eliminate Technically Infeasible Options
This option is technically feasible for use in limiting VOC emissions from spray gun cleaning operations and is a requirement of the Aerospace NESHAP.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness
Based on the Step 2 analysis, cleaning the spray gun in an enclosed container is the only applicable VOC control technology for spray gun cleaning operations.

Step 4 – Evaluate Most Effective Controls and Document Results
No environmental or energy costs are associated with use of an enclosed container for spray gun

cleaning operations.

Step 5 – Select BACT
The selected BACT is summarized below and no further analysis was conducted.

Summary of Selected BACT for Spray Gun Cleaning Operations

Pollutant	Control Technology
VOC	Enclosed container for spray gun cleaning

8. Fuel Storage Tank
Two new aboveground storage tanks are proposed as part of the KC-46A Program. Both are proposed fixed-roof tanks, which will be manifolded with Tinker AFB's existing Jet-A storage tank and connected to a closed-loop hydrant system. The closed loop system is considered BACT for the tanks because no air emissions are expected to be released from these tanks. No further analysis has been completed.

C. Air Quality Impacts
Tinker AFB is located in Oklahoma County, Oklahoma, which has been designated as attainment or unclassifiable for all criteria pollutants. In accordance with Oklahoma Administrative Code (OAC) 252:100-8-35, one of the requirements to obtain a PSD permit is the performance of an air quality impact evaluation for all pollutants with proposed emissions in excess of their respective PSD SER. The proposed PTE of GHGs and VOCs from this project exceed the PSD SER. The air quality impact evaluation consists of an air quality modeling analysis and additional impact analysis to determine air quality impacts on local soils, vegetation, and visibility.

Air Quality Impact Modeling

Permit No. 2009-394-C (M-2) PSD Air Quality Impact Modeling

Projected emissions are 129.4 tons per year of VOC and 37.8 tons per year of NOx. Barring the likelihood of ozone scavenging, any resultant ozone concentration increases are likely to be near the facility and nominal. The existing regional monitors are adequate to establish existing ozone concentration for the facility and its impact area. Given emission levels from the project and the fact that current models would be inadequate to provide reasonably accurate assessments of the impact of such a small increase, no further analyses are warranted.

Permit No. 2009-394-C (M-4) PSD Air Quality Impact Modeling

Ozone Monitoring

Pre-construction monitoring for ozone is required for any new source or modified existing source located in an unclassified or attainment area with greater than 100 tons per year of VOC emissions. Continuous ozone monitoring data must be used to establish existing air quality concentrations in the vicinity of the proposed source or modification.

Site	Distance	Average 4th High 2013-2015*	Average 4th High 2012-2014	Standard
40-109-0033	7.28 miles NW	0.069ppm	0.073ppm	0.075ppm
40-109-0096	6.33 miles NE	0.067ppm	0.071ppm	0.075ppm

*The average of the 4th high monitored 8-hour ozone values from 2013 through September 21 of 2015.

Ozone Modeling

OAC 252:100-8-35 requires an air quality impact evaluation for each regulated pollutant for which a major modification would result in a significant net emissions increase. No de minimis air quality level is provided for ozone. However, any net increase of 100 tons per year or more of volatile organic compounds subject to PSD is required to perform an ambient impact analysis. Methods for evaluating single source impacts on ozone concentrations are not consistent, due to the lack of availability of data at a refined level, readily available tools and EPA guidance. TAFB has evaluated the impact of the proposed modification to the facility using an existing air quality database generated for a SIP evaluation and the CAMx photochemical modeling system.

Episode Selection

For the state of Oklahoma, 2011 and 2012 are the most recent years with existing summer ozone photochemical grid modeling databases. The currently available ozone modeling databases were reviewed, and the Texas Commission on Environmental Quality (TCEQ) modeling database for the June 2012 period was selected. EPA's 2011 modeling platform was considered due to the fact that it is aligned with the 2011 National Emissions Inventory (NEI2). However 2011 had anomalous meteorological and other conditions in the Oklahoma region. 2011 was the hottest summer in a 117-year record. 2012 was hotter than normal but not the single hottest summer during the period of record. 2011 was the worst drought in Texas since detailed records have been kept with the drought extending into Oklahoma. The summer of 2011 had unusually low precipitation with the lowest on record in Texas and third lowest on record in Oklahoma. Although precipitation in summer of 2012 was below normal, it was not an outlier like 2011. There were numerous severe wildfires in Texas and Oklahoma during 2011 that likely contributed to elevated ozone concentrations in the region. During summer 2011, a wildfire occurred which caused an evacuation of portions of OKC. Therefore, it was determined that the period for 2012 represents a more typical year.

Model Selection

The TCEQ used the Comprehensive Air quality Model with extensions (CAMx; Ramboll Environ, 2015) version 6.11 with the Carbon Bond 6 revisions 2 (CB6r2; Yarwood et al., 2010) chemical mechanism for their June 2012 PGM modeling database. The CAMx model satisfies EPA's selection criteria for ozone modeling and is explicitly mentioned as appropriate for ozone modeling in EPA's latest air quality guidelines (EPA, 2015) and guidance (EPA, 2014d). Thus, CAMx was selected for the new TAFB emissions ozone sensitivity modeling.

Domain

For the new TAFB emissions ozone sensitivity modeling, the TCEQ 36 km CONUS and 12 km TXOK domains were retained, and a new 4 km OKC-TAFB-Tulsa modeling domain was added. The 4 km domain is a rectangle which extends west through Caddo County, south through Stephens County, east through Tulsa County and north through three quarters of Garfield County. CAMx was run with the 36/12/4 km domains using two-way grid nesting. The 4 km TAFB domain was defined using the CAMx flexi-nest feature where the 4 km meteorological and emission inputs are interpolated from the 12 km TXOK domain inputs.

Meteorological and Emission Modeling

Meteorological and emissions modeling for the June 2012 modeling database was conducted by the TCEQ. The meteorological inputs were based on the Weather Research Forecast (WRF4; Skamarock et al., 2004; 2005; 2006) model, and emissions inputs were prepared using version 3 of the Emissions Processing System (EPS35). The TCEQ's CAMx meteorological and emission inputs for the 36/12 km domains and the June 2012 period were used without alteration.

Model Performance

The individual site ozone model performance metrics are compared against the EPA ozone performance goals. However, this is a particularly stringent test because the ozone performance goals were designed for comparison of ozone performance across a region with multiple sites. Thus, there are opportunities for a site with ozone overestimations to offset a site with ozone underestimations that does not occur when examining performance at an individual site. Therefore, a site failing to achieve the ozone performance goals may not be a cause for concern, particularly if it is close to achieving the ozone performance goal.

The Daily Maximum 8-hour (DMAX8) ozone Normalized Mean Bias (NMB) and Fractional Bias (FB) are 12.8% and 13.0%, respectively, which achieves the ≤±15% ozone performance goal. The DMAX8 ozone Normalized Mean Error (NME) and Fractional Error (FE) are both 14.1%, which is lower than the ozone error performance goal (≤35%) by over a factor of two. The hourly ozone bias (11.4% and 12.8%) and error (24.0% and 26.9%) metrics also achieve the ozone model performance goals. The DMAX8 and hourly ozone from the model are highly correlated with the observed values with correlation coefficients of 0.87 and 0.71, respectively.

At the 11 individual ozone monitoring sites in the 4 km domain, the ozone performance goal was achieved 86% of the time for DMAX8 ozone and 73% of the time for hourly ozone. When the ozone performance goals were not achieved, it was due to an overestimation bias that usually was slightly above the upper bound of the ozone bias performance goal (≤±15%). The CAMx Base Case reasonably performed in tracking the day-to-day variations of the observed DMAX8 ozone concentrations; thus, the model is capturing many of the processes and phenomena that lead to elevated ozone concentrations in Oklahoma.

New TAFB Emissions Ozone Modeling

Emissions associated with the new VOC, NO_x and CO emissions at TAFB were added to the 2012 Base Case emissions. There are two PSD projects at TAFB, each with total VOC emissions that exceed the PSD significance threshold. The NO_x and CO emissions associated with the two

projects do not exceed the PSD significance threshold; however, they were included in the PGM ozone modeling analysis.

In the new TAFB project inventory, some of the VOC emissions were provided as explicit VOC species (for example, methyl isobutyl ketone), and the remaining were provided as unspeciated VOC. EPS3 uses speciation profiles to convert explicit and unspeciated VOC emissions into CB6 model species. Preprocessed VOC emissions were modeled at 608 TPY. This emission rate reflects the cumulative projected increase above existing emissions for permit 2009-394-C (M-3) PSD and the full potential emission from 2009-394-C (M-4) PSD. Individually, 2009-394-C (M-3) PSD is a retroactive PSD permit where VOC emissions have increased to address a correction in products used and 2009-394-C (M-4) PSD evaluates future increased emissions from the KC-46A project. These projects are separate but are undergoing PSD evaluation at the same time therefore emissions were combined in the modeling study. While the M-3 permit has been evaluated at the full increase, rather than merely the difference due to the correction; as these emissions are already captured in the monitoring data, this method would overestimate the projected ozone impact in a cumulative analysis that takes in to account the M-4 emissions as well. Therefore the 608 TPY reflects the increase in VOC emissions from the correction in (M-3) and the full increase from (M-4). The full increase from M-3 was 400 TPY of VOC and the new emissions for M-4 were 319 TPY of VOC. Modeling results from the 608 TPY evaluation can be considered to provide conservative results for each project, as it is greater than each individual potential, and a cumulative impact that reflects only new added emissions.

The maximum increase in DMAX8 ozone due to the new TAFB emissions was 0.10 ppb that occurred on June 4 and June 26, 2012. The effect of the new TAFB emissions would not be seen in the ozone measurements.

D. Additional Impact Analysis

An additional impacts analysis was performed as part of this application that considered existing air quality, the quantity of emissions, and the sensitivity of local soils, vegetation, and visibility in the source's impact area. The following impacts were addressed:

- Class I Area Impacts
- Class II Area Visibility Impacts
- Growth Impact Analysis
- Soil and Vegetation Impact Analysis

Class I Area Impacts Analysis

Class I areas are defined by EPA's *New Source Review Manual* as those areas of the nation that are of special natural scenic, recreational, or historic interest to the public. The nearest Class I area to Tinker AFB is the Wichita Mountain Wildlife Refuge, located approximately 135 kilometers (km) southwest of the facility.

Class I area analyses examine two separate items: 1) Class I increments and 2) air quality-related values (AQRVs). EPA regulates Class I increment modeling, while AQRVs are regulated by the U.S. Forest Service (USFS) Federal Land Manager (FLM). For the Class I increment analysis, the impacts of the facility in the general direction of the Class I area are compared to the Class I

SIL. However, EPA has not established VOC or ozone SILs.

The FLM considers a source located greater than 50 km from a Class I area to have negligible impacts with respect to Class I AQRV if its total SO_2, NO_X, PM_{10}, and sulfuric acid (H_2SO_4) annual emissions (in TPY), divided by the distance (in km) from the Class I area (Q/D), is 10 or less. Based on the FLM's *Air Quality Related Values Workgroup (FLAG), Phase I Report-Revised 2010*, the FLM would not request any further Class I AQRV impact analyses from such sources. Therefore, the FLM recommended use of formula Q/D<10 to complete the Class I impact analysis. The proposed project will have potential emissions of the following pollutants:

- SO_2: 1.9 TPY
- NO_x: 37.8 TPY
- PM_{10}: 9.8 TPY
- H_2SO_4: 0 TPY
- Total: 49.5 TPY

The only Class I area within 300 km of the affected facility was reviewed for the AQRV. The Q/D ratio to this area is less than 10, which indicates the project is not expected to significantly impact any AQRV. Therefore, no further analyses are required.

Q/D<10 Analysis

Class I Area	Quantity (TPY)	Distance (km)	Q/D	Q/D<10?
Wichita Mountains Wildlife Refuge, Oklahoma	49.5	135	0.37	Yes

Class II Area Visibility Impacts Analysis

According to ODEQ's *Air Dispersion Modeling Guidelines* (April 2011), applicants proposing to construct PSD major sources within 40 km of a Class II sensitive area are required to use the VISCREEN model to address the visibility impacts within the Class II sensitive area. Tinker AFB is not located within 40 km of any Class II sensitive area, with the nearest such area to the facility located at a distance of more than 100 km. Therefore, no VISCREEN modeling is required.

Growth Impact Analysis

A growth analysis is intended to quantify the amount of new growth likely to occur in support of the facility and to estimate emissions resulting from that associated growth. Associated growth includes residential and commercial/industrial growth resulting from the new facility. Residential growth depends on the number of new employees and the availability of housing in the area, while associated commercial and industrial growth consists of new sources providing services to the new employees and the facility. No additional residential and commercial/industrial growth will result from the new facility because it will be located in an area that has an available population to supply employees, and the area is currently commercially/industrially developed.

Soil and Vegetation Impacts Analysis

The effects of gaseous air pollutants on vegetation may be classified into three broad categories:

acute, chronic, and long term. Acute effects are those that result from relatively short (less than 1 month) exposures to high concentrations of pollutants. Chronic effects occur when organisms are exposed for months or even years to certain threshold levels of pollutants. Long-term effects include abnormal changes in ecosystems and subtle physiological alterations in organisms. Acute and chronic effects are caused by the gaseous pollutant acting directly on the organism, whereas long-term effects may be indirectly caused by secondary agents, such as changes in soil pH. It is expected that compliance with the primary and secondary NAAQS will ensure that emissions from the facility will not adversely affect vegetation or soils in the surrounding area. The maximum predicted concentrations of VOC and GHG emissions from the proposed facility are not expected to have adverse impacts on soils and vegetation.

SECTION VI. INSIGNIFICANT ACTIVITIES

The insignificant activities identified and justified in the application are duplicated below. Records are available to confirm the insignificance of the activities. Any activity to which a state or federal applicable requirement applies is not insignificant even if it is included on the insignificant activities list. Appropriate recordkeeping of activities indicated below with an "*" is specified in the Specific Conditions.

- Space heaters, boilers, process heaters, and emergency flares less than or equal to 5 MMBTUH heat input (commercial natural gas). The facility will have a boiler that will be rated less than or equal to 5 MMBTUH.

- * Emissions from storage tanks constructed with a capacity less than 39,894 gallons that store VOCs with a vapor pressure less than 1.5 pounds per square in absolute (psia) at maximum storage temperature. The facility has tanks that store oil that will have capacities less than 39,894 gallons, and will store products having a vapor pressure less than 1.5 psia.

SECTION VII. OKLAHOMA AIR POLLUTION CONTROL RULES

OAC 252:100-1 (General Provisions) [Applicable]
Subchapter 1 includes definitions but there are no regulatory requirements.

OAC 252:100-2 (Incorporation by Reference) [Applicable]
This subchapter incorporates by reference applicable provisions of 40 CFR. These requirements are addressed in the "Federal Regulations" section.

OAC 252:100-3 (Air Quality Standards and Increments) [Applicable]
Subchapter 3 enumerates the primary and secondary ambient air quality standards and the PSD increments. The Primary Standards are in Appendix E and the Secondary Standards are in Appendix F of the Air Pollution Control Rules. At this time, all of Oklahoma is in attainment of these standards.

OAC 252:100-5 (Registration of Air Contaminant Sources) [Applicable]
Subchapter 5 requires sources of air contaminants to register with ODEQ's Air Quality Division (AQD), file emission inventories annually, and pay annual operating fees based upon total annual emissions of regulated pollutants. The owner/operator will be required to submit emissions inventories and pay the appropriate fees.

OAC 252:100-8 (Permits for Part 70 Sources) [Applicable]
Part 5 includes the general administrative requirements for part 70 permits. Any planned changes in the operation of the facility that result in emissions not authorized in the permit and which exceed the "Insignificant Activities" or "Trivial Activities" thresholds require prior notification to AQD and may require a permit modification. Insignificant activities mean individual emission units that either are on the list in Appendix I (OAC 252:100) or whose actual calendar year emissions do not exceed the following limits:

- 5 TPY of any one criteria pollutant
- 2 TPY of any one hazardous air pollutant (HAP) or 5 TPY of multiple HAP or 20 percent of any threshold less than 10 TPY for a HAP that EPA may establish by rule

Tinker AFB submitted a Title V permit application on March 5, 1999. The Title V Operating permit for Tinker AFB was issued on May 11, 2005, with subsequent updates. Currently, Tinker AFB is operating under Permit No. 2009-394-TVR issued on September 2, 2010. In addition, ODEQ has issued three construction permits, one for the modification of the engine test cells, one for relocation of the fuel component testing operations, and the third being the original KC-46A PSD permit (Permit Number 2009-394-C (M-2) (PSD)).

Emission limitations and operational requirements necessary to assure compliance with all applicable requirements for all sources are based on information in the application and current operating permit, or developed from the applicable requirements.

Part 7 A PSD evaluation was completed for all regulated new source review (NSR) pollutants for which the KC-46A Program resulted in a significant emission increase (NO_x, CO, VOC, PM, PM_{10}, $PM_{2.5}$, and CO_2e). Section 5B of this permit contains BACT analyses for those regulated NSR pollutants for which the project will result in a significant emission increase. Section 5C of this permit contains ambient air quality analyses for each PSD-subject pollutant, and Section 5D of this permit contains additional impacts analyses for the PSD-subject pollutants.

OAC 252:100-9 (Excess Emissions Reporting Requirements) [Applicable]
Except as provided in OAC 252:100-9-7(a)(1), the owner or operator of a source of excess emissions shall notify the Director as soon as possible but no later than 4:30 p.m. the following working day of the first occurrence of excess emissions in each excess emission event. No later than 30 calendar days after the start of any excess emission event, the owner or operator of an air contaminant source from which excess emissions have occurred shall submit a report for each excess emission event describing the extent of the event and the actions taken by the owner or operator of the facility in response to this event. Request for affirmative defense, as described in OAC 252:100-9-8, shall be included in the excess emission event report. Additional reporting

may be required in the case of ongoing emission events and for excess emissions reporting required by 40 CFR 60, 61, or 63.

OAC 252:100-13 (Open Burning) [Applicable]
Open burning of refuse and other combustible material is prohibited except as authorized in the specific examples and under the conditions listed in this subchapter.

OAC 252:100-19 (Particulate Matter (PM) [Applicable]
This subchapter specifies PM emission limits based on heat input capacity and applies to the combustion of fuel in any new or existing fuel-burning unit. Emissions shall not exceed the limits specified in Appendix C of this regulation. Emission factors from AP-42 are considered representative of expected emissions rates in absence of specific manufacturers' data. Because the engine test operation does not qualify as a fuel-burning unit and it does not have a quantifiable process rate, this rule does not apply to engine testing.

This subchapter specifies a PM emissions limitation of 0.6 lb/MMBTU from fuel-burning equipment with a rated heat input of 10 MMBTUH or less. For external combustion units burning natural gas, AP-42, Table 1.4-2 (7/98) lists the total PM emissions for natural gas to be 7.6 pounds per million cubic feet (lb/MMft^3) or about 0.0076 lb/MMBTU.

For fuel-burning equipment rated less than 1,000 MMBTUH but greater than 10 MMBTUH, the allowable PM emissions are calculated using the formula: $E = 1.042808\ X^{(-0.238561)}$, where E is the limit in lb/MMBTU and X is the maximum heat input. The table below lists the fuel-burning equipment greater than 10 MMBTUH and their applicable emission limits.

Equipment	Max. Heat Input (MMBTUH) (HHV)	Allowable PM Emission Rate (lb/MMBTU) (HHV)	Potential PM Emissions (lb/MMBTU) (HHV)
Hot Water Boiler	17.3	0.528	0.0076
Steam Boiler	14.5	0.551	0.0076
Steam Boiler	13.5	0.560	0.0076

OAC 252:100-25 (Visible Emissions and Particulates) [Applicable]
No discharge of greater than 20 percent opacity is allowed except for short-term occurrences that consist of not more than one 6-minute period in any consecutive 60 minutes, not to exceed three such periods in any consecutive 24 hours. In no case shall the average of any six-minute period exceed 60% opacity. When burning natural gas, there is very little possibility of exceeding these standards. To ensure compliance with Subchapter 25, the permit requires all heaters and boilers to use natural gas as fuel and all diesel-fueled fire pump engines to use ultra-low sulfur diesel as fuel. Both fuels are described in the Specific Conditions for each type of equipment.

OAC 252:100-29 (Control of Fugitive Dust) [Applicable]
No person shall cause or permit the discharge of any visible fugitive dust emissions beyond the property line on which the emissions originate in such a manner as to damage or to interfere with

the use of adjacent properties, or cause air quality standards to be exceeded, or interfere with the maintenance of air quality standards. Under normal operating conditions, this facility has negligible potential to violate this requirement; therefore, it is not necessary to require specific precautions to be taken.

OAC 252:100-31 (Control of Emissions of Sulfur Compounds) [Applicable]
No person shall cause, suffer, or allow the discharge into the atmosphere of sulfur oxides measured as SO_2 in excess of 0.8 lb/MMBTU heat input, maximum 3-hour average from liquid fuel-burning equipment. Jet-5/8, a kerosene-based jet fuel, is estimated to have emission of sulfur oxide (SOx) of approximately 0.13 lb/MMBTU. Calculations are based on 1996 survey of refineries producing JP-5/8 found in Table 3.6 of the USAF IERA study prepared in 2002. Oklahoma is considered to be in the East-Central United States. The average sulfur content in JP-5/8 is 0.085 percent average weight percent, the highest sulfur content listed for all the regions. This equates to 1.7 pounds per 1000 lb of JP-5/8 combusted of ~0.09 lb/MMBTU. Although the rule does not directly address aircraft engine test cells, emissions will be well below 0.8 lb/ MMBTU. Therefore, burning jet fuel will ensure compliance with this subchapter.

Part 5 Limits SO_2 emissions from new petroleum or natural gas process equipment (constructed after July 1, 1972). For gaseous fuels, the limit is 0.2 lb/MMBTU heat input averaged over 3 hours. For fuel gas having a gross calorific value of 1,000 BTU per standard cubic feet (SCF), this limit corresponds to fuel sulfur content of 1,203 parts per million by volume (ppmv). Gas produced from oil and gas wells having 343 ppmv or less total sulfur will ensure compliance with Subchapter 31. The permit requires the use of pipeline-grade natural gas or field gas with a maximum sulfur content of 343 ppmv for all fuel-burning equipment to ensure compliance with Subchapter 31.

OAC 252:100-33 (Control of Emissions of Nitrogen Oxides) [Not Applicable]
This subchapter sets limits of NOx emissions from fuel-burning equipment with a rated heat input of 50 MMBTU/hr or more. The KC-46A Program will not have any heaters/boilers greater than or equal to 50 MMBTU/hr.

OAC 252:100-35 (Control of Emissions of Carbon Monoxide) [Not Applicable]
None of the following affected sources is located at this facility: gray iron cupola, blast furnace, basic oxygen furnace, petroleum catalytic cracking unit, or petroleum catalytic reforming unit.

OAC 252:100-37 (Control of Emissions of VOCs) [Applicable]
Part 3 requires storage tanks constructed after December 28, 1974, with a capacity of 400 gallons or more and storing a VOC with a vapor pressure greater than 1.5 psia at maximum storage temperature to be equipped with a permanent submerged fill pipe or with an organic vapor recovery system. The Jet-A storage tanks are equipped with a closed-loop hydrant system in which fuel is delivered to the tanks by pipeline; therefore, no air emissions are expected to be released from these tanks.

Part 5 limits the VOC content of coatings from any coating line or other coating operation. Coating of parts and products is considered under Section 37-25. The OAQD is in the process of

reviewing and proposing changes to Subchapter 37 to address overlap issues with Subchapter 37 and Subchapter 39. In the interim, compliance with OAC 252:100-39-47 and 40 CFR 63, Subpart GG satisfies the requirements of Part 5. Once changes to Subchapter 37 are finalized, Tinker AFB shall comply with those requirements. The facility shall use compliant coatings for sources not addressed in 39-47 or GG. Routine maintenance of the facility and equipment is exempt.

Part 7 requires fuel-burning and refuse-burning equipment to be operated and maintained so as to minimize VOC emissions. Temperature and available air must be sufficient to provide essentially complete combustion.

Part 7 requires all effluent water separators openings or floating roofs to be sealed or equipped with an organic vapor recovery system. No effluent water separators are located at this facility.

OAC 252:100-39 (VOCs in Nonattainment and Former Nonattainment Areas) [Applicable]
This subchapter imposes additional conditions beyond those of Subchapter 37 on emissions of organic materials from new and existing facilities in Tulsa and Oklahoma counties.
Section 39-41 requires storage tanks with a capacity of 400 gallons or more and storing a VOC with a vapor pressure greater than 1.5 psia to be equipped with a permanent submerged fill pipe or with an organic vapor recovery system. Tinker AFB's Jet-A storage tanks are equipped with a closed-loop hydrant system in which fuel is delivered to the tanks by pipeline; therefore, no air emissions are expected to be released from these tanks. These tanks are equipped with a submerged fill pipe to comply with this rule.
Section 47 covers VOC emissions from aerospace industries coating operations, with requirements specifically applicable to aerospace vehicle and component coating operations at aerospace manufacturing, rework, or repair facilities located in Tulsa County that have the potential to emit more than 10 TPY of VOC from coating operations. Coating operations include associated cleaning operations and surface preparation. This section is modeled on, and closely tracks, the Aerospace MACT found in federal NESHAP, 40 CFR 63 Subpart GG. With the exception of "specialty coatings," as that term is defined in §39-47(c)(5), standards and requirements for VOC content, application equipment, control equipment, housekeeping measures, solvent cleaning operations, and general standards reference appropriate sections of GG. Standards for specialty coatings are addressed in §39-47(d). With the exception of specialty coatings, each of these areas has been addressed in Section V (Federal Regulations). Note that the low volume exemption is modified in §39-47 to include specialty coatings in the 50-gallon/200 gallon standard. In similar fashion, monitoring, recordkeeping, and test methods reference appropriate sections of GG, excepting specialty coatings. These topics were also addressed in Section V. The compliance date provisions of §39-47(h) also reference GG, stating that compliance with GG constitutes a demonstration of compliance with §39-47, again with particular attention paid to specialty coatings.

The VOC content of specialty coatings must meet the specifications listed in OAC 252:100 Appendix N. These standards shall be met by as-applied coatings, but do not apply to touch-up, aerosol, or DOD "classified" coatings. Compliance with the specialty coating VOC limits may be achieved through the use of control equipment, provided that the equipment has a combined

capture and control efficiency of 81% or greater by weight. If control equipment is used to comply with the Appendix N standards, a monitoring plan describing the parameter and its range shall be submitted, and the equipment must be installed, calibrated, operated and maintained

OAC 252:100-42 (Toxic Air Contaminants (TAC) [Applicable]
This subchapter regulates toxic air contaminants (TAC) that are emitted into the ambient air in areas of concern (AOC). Any work practice, material substitution, or control equipment required by ODEQ prior to June 11, 2004, to control a TAC, shall be retained unless a modification is approved by the ADQ Director. Because no AOC has been designated anywhere in the state, there are no specific requirements for this facility at this time.

OAC 252:100-43 (Sampling and Testing Methods) [Applicable]
This subchapter provides general requirements for testing, monitoring, and recordkeeping and applies to any testing, monitoring, or recordkeeping activity conducted at any stationary source. To determine compliance with emissions limitations or standards, the AQD Director may require the owner or operator of any source in Oklahoma to install, maintain, and operate monitoring equipment or to conduct tests, including stack tests, of the air contaminant source. All required testing must be conducted by methods approved by the AQD director and under the direction of qualified personnel. A notice-of-intent to test and a testing protocol shall be submitted to ADQ at least 30 days prior to any EPA Reference Method stack tests. Emissions and other data required to demonstrate compliance with any federal or state emission limit or standard, or any requirement set forth in a valid permit shall be recorded, maintained, and submitted as required by this subchapter, an applicable rule, or permit requirement. Data from any required testing or monitoring not conducted in accordance with the provisions of this subchapter shall be considered invalid. Nothing shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

The following Oklahoma Air Quality Rules are not applicable to this facility:

OAC 252:100-11	Alternative Emissions Reduction	not eligible
OAC 252:100-17	Incinerators	not type of emission unit
OAC 252:100-23	Cotton Gins	not type of emission unit
OAC 252:100-24	Grain, Feed, or Seed Facility	not in source category
OAC 252:100-40	Friable Asbestos	not type of source category
OAC 252:100-47	Municipal Solid Waste Landfills	not type of source category

SECTION VIII. FEDERAL REGULATIONS

PSD, 40 CFR 52 [Applicable]
Total potential emissions of GHGs are greater than the major source threshold of 75,000 TPY of CO_2e. As a result, this permitting action must include a PSD review. This permitting action will also result in increases in emissions in excess of PSD significance thresholds for VOCs. The PSD review is in Section V. Any future increases of emissions must be evaluated for PSD if they

exceed a significance level (40 TPY NO_X, 100 TPY CO, 40 TPY VOC, 40 TPY SO_2, 25 TPY PM_{10}, 10 TPY $PM_{2.5}$, and 75,000 TPY CO_2e).

NSPS, 40 CFR 60 [Subparts A, Dc, and IIII Applicable]
Subpart A, General Provisions. This subpart contains requirements for general notification and reporting requirements.

Subpart Dc, Small Industrial-Commercial-Institutional Steam Generating Units. This subpart affects steam-generating units constructed after June 9, 1989, and with capacity between 10 and 100 MMBTUH. The multipurpose hangar and corrosion control hangar heating units have boilers with capacities above the regulatory threshold. These units will combust only natural gas and will be subject only to the recordkeeping requirements of this subpart. These requirements have been included in the permit.

Subpart IIII, Stationary Compression Ignition Internal Combustion Engines. This subpart affects stationary compression ignition (CI) internal combustion engines (ICE) based on power and displacement ratings, depending on date of construction, beginning with those constructed after July 11, 2005. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator. The new diesel-fired emergency fire pump engines were manufactured after the applicability date and are subject to this subpart. The new units will have a displacement of less than 30 liters and a rating of 250 hp. In accordance with 60.4205(c), fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards in Table 4 of Subpart IIII for all pollutants. These units will be subject to the following emission limitations:

Emission Limits for Fire Pump Engines[1]

	NMHC + NO_X	**CO**	**PM**
Max Engine Power	**g/kW-hr (g/hp-hr)**	**g/kW-hr (g/hp-hr)**	**g/kW-hr (g/hp-hr)**
300 ≤ HP < 600	4.0 (3.0)	3.5 (2.6)	0.2 (0.15)

[1] – For model year 2009 and later.

Any operation other than emergency operation, including maintenance and testing, emergency demand response, and operation in non-emergency situations, for 50 hours per year is prohibited. There is no time limit on the use of an emergency stationary internal combustion engine (ICE) in emergency situations. Emergency stationary ICE may be operated for any combination of the purposes specified in § 60.4211(f)(2)(i) through (iii) for a maximum of 100 hours per calendar year. All applicable requirements were incorporated into the specific conditions.

NESHAP, 40 CFR 61 [Not Applicable]
There are no emissions of any of the regulated pollutants: arsenic, asbestos, beryllium, benzene, coke oven emissions, mercury, radionuclides, or vinyl chloride except for trace amounts of benzene. Subpart J (Equipment Leaks of Benzene) concerns only process streams, which contain more than 10 percent benzene by weight. All process streams at this facility are below this threshold.

NESHAP, 40 CFR 63 [Subpart GG, ZZZZ and DDDDD Applicable]
Subpart GG, Aerospace Manufacturing and Rework Facilities. This subpart applies because Tinker AFB is currently a major source for HAPs and performs operations meeting the applicability criteria. Discussion of the applicable requirements is presented in sections covering the specific emission unit groups. Compliance is demonstrated by the use of compliant solvents, installation, operation, and maintenance of appropriate filters and surface coating equipment, and use of logs to track usage. Routine inspections and training are performed.

Subpart ZZZZ, Reciprocating Internal Combustion Engines (RICE). This subpart affects any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions. Owners and operators of the following new or reconstructed RICE must meet the requirements of Subpart ZZZZ by complying with either 40 CFR 60, Subpart IIII (for CI engines) or 40 CFR 60, Subpart JJJJ (for SI engines):

The new fire pump engines are subject to this subpart and will comply with this subpart by complying with NSPS, Subpart IIII. No further requirements apply for engines subject to NSPS under this part.

Subpart DDDDD, Industrial, Commercial and Institutional Boilers and Process Heaters. This subpart affects industrial, commercial and institutional boilers and process heaters at major sources of HAPs. On January 31, 2013, EPA published the final changes to this subpart, which became effective on April 1, 2013. This subpart establishes emission limitations and work practice standards for HAP emitted from industrial, commercial, and institutional boilers and process heaters within a fuel subcategory located at major sources of HAP. A boiler or process heater is new or reconstructed if it commenced construction or reconstruction after June 4, 2010.

The steam boilers and hot water boilers installed for this project are considered units in the Gas 1 subcategory because they are only fired by natural gas. Units in the Gas 1 subcategory will conduct the tune-up as a work practice for all regulated emissions under this subpart. Hot water heaters with a capacity of less than 120 gallons are not subject to this subpart. All applicable requirements have been incorporated into the permit

Compliance Assurance Monitoring (CAM), 40 CFR 64 [Not Applicable]
This part applies to any pollutant-specific emission unit at a major source that is required to obtain an operating permit, for any application for an initial operating permit submitted after April 18, 1998, that addresses "large emissions units," or any application that addresses "large emissions units" as a significant modification to an operating permit, or for any application for renewal of an operating permit, if it meets all of the following criteria:

- It is subject to an emission limit or standard for an applicable regulated air pollutant;
- It uses a control device to achieve compliance with the applicable emission limit or standard; and
- It has potential emissions, prior to the control device, of the applicable regulated air pollutant greater than major source thresholds (100 TPY of a criteria pollutant, 10 TPY of a HAP, or 25 TPY of total HAP).

None of the sources meet all three criteria.

Chemical Accident Prevention Provisions, 40 CFR 68 [Not Applicable]
Naturally occurring hydrocarbon mixtures, prior to entry into a natural gas processing plant or a petroleum refining process unit, including condensate, crude oil, field gas, and produced water, are exempt for the purpose of determining whether more than a threshold quantity of a regulated substance is present at the stationary source. This facility is not a natural gas processing plant as defined in §68.3(b) of 40 CFR 68. More information on this federal program is available on the web page: *www.epa.gov/ceppo*.

Stratospheric Ozone Protection, 40 CFR 82 [Not Applicable]
These standards require phase-out of Class I and II substances; reductions of emissions of Class I and II substances to the lowest achievable level in all use sectors, ban on use of nonessential products containing ozone-depleting substances (Subparts A and C); control servicing of motor vehicle air conditioners (Subpart B); require federal agencies to adopt procurement regulations that meet phase-out requirements and which maximize the substitution of safe alternatives to Class I and Class II substances (Subpart D); require warning labels on products made with or containing Class I or II substances (Subpart E); maximize the use of recycling and recovery upon disposal (Subpart F); require producers to identify substitutes for ozone-depleting compounds under the Significant New Alternatives Program (Subpart G); and reduce the emissions of halons (Subpart H).

Subpart A identifies ozone-depleting substances and divides them into two classes. Class I controlled substances are divided into seven groups; the chemicals typically used by the manufacturing industry include carbon tetrachloride (Class I, Group IV) and methyl chloroform (Class I, Group V). A complete phase-out of production of Class I substances is required by January 1, 2000 (January 1, 2002, for methyl chloroform). Class II chemicals, which are hydrochlorofluorocarbons (HCFCs), are generally seen as interim substitutes for Class I CFCs. Class II substances consist of 33 HCFCs. A complete phase-out of Class II substances, scheduled in phases starting by 2002, is required by January 1, 2030.

This facility does not produce, consume, recycle, import, or export any controlled substances or controlled products as defined in this part, nor does this facility perform service on motor (fleet) vehicles that involves ozone-depleting substances. Therefore, as currently operated, this facility is not subject to these requirements. To the extent that the facility has air-conditioning units that apply, the permit requires compliance with Part 82.

SECTION IX. COMPLIANCE

Tier Classification

This application has been determined to be **Tier II** based on a new construction (a PSD significant construction modification) permit for an existing major source facility operating under

a Part 70 operating permit.

The permittee submitted a landowner affidavit that they are not seeking a permit for land use or for any operation upon land owned by others without their knowledge. The affidavit certified that the applicant owns ~4900 acres of the land and leases ~430 acres from Oklahoma County. This 50-year lease dated September 24, 2008, authorizes Tinker AFB to conduct permitted operations on the leased property.

Public Review

The applicant published the "Notice of Filing a Tier II Application" in *The Oklahoman*, a daily newspaper printed in Oklahoma County, on September 16, 2015. The notice stated that the application was available for public review at the Midwest City Library at 8143 East Reno, Midwest City, Oklahoma or at the Air Quality Division's Main Office in Oklahoma City, Oklahoma.

The applicant published the "Notice of Tier II Draft Permit" in *The Oklahoman*, a daily newspaper printed in Oklahoma County, on October 1, 2015. The notice stated that the draft permit was available for public review at the Midwest City Library at 8143 East Reno, Midwest City, Oklahoma or at the Air Quality Division's Main Office in Oklahoma City, Oklahoma.

The applicant was allowed to run public notice of Tier II draft permit concurrently with EPA review. Public notice started October 1, 2015 and ended September 1, 2015. EPA Region 6 45-day review started September 30, 2015 and ended November 15, 2015.

Public Comments
There were no public comments.

EPA Comments
There were no EPA comments.

Information on all permit actions is available for review by the public in the Air Quality section of the ODEQ Web page: http://www.deq.state.ok.us/.

The facility is not located within 50 miles of the border of any state adjacent to the state of Oklahoma. Therefore, notification to the bordering states for this permit is not required.

Fees Paid
A construction permit fee will be submitted by the applicant upon receipt of an invoice.

SECTION X. SUMMARY

Tinker AFB will continue to operate under Permit No. 2009-394-TVR, issued September 2, 2010 and concurrently with Permit No. 2009-394-C (M-3) PSD when it is issued.

This facility has demonstrated the ability to comply with all Air Quality rules and regulations. Ambient air quality standards are not threatened at this site. There are no active Air Quality compliance or enforcement issues concerning this facility. Issuance of the modified construction permit is recommended.

PERMIT TO CONSTRUCT
AIR POLLUTION CONTROL FACILITY
SPECIFIC CONDITIONS

Tinker Air Force Base **Permit Number 2009-394-C (M-4) (PSD)**
KC-46A Project

The permittee is authorized to construct in conformity with the specifications submitted to Air Quality on August 24, 2015. The Evaluation Memorandum dated November 17, 2015, explains the derivation of applicable permit requirements and estimates of emissions; however, it does not contain specific operating standards, or monitoring, reporting, and recordkeeping (MRR) requirements. Commencing construction/continuing operations under this permit constitutes acceptance of, and consent to, the conditions contained herein.

1. Points of emissions and emissions limitations for each point: [OAC 252:100-8-34(b)]

Natural Gas-Fired Boilers and Heaters: Emission limits have been established for NO_X and CO for the EUGs below. All other emissions limits were based on the heat input rating and AP-42 (7/98), Section 1.4. Emissions limits for NOx, CO and VOC are listed below:

Emission Limits for Natural Gas-Fired Boilers and Heaters

Emission Unit Group (EUG)	Location	Total Heat Input Capacity (MMBTUH)	NO_x		CO		VOC	
			lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
EC-8/Insig.	Two-Bay Multipurpose Hangar	95.4	1.43	6.27	6.20	27.16	0.51	2.25
EC-8/Insig.	Corrosion Control Hangar	95.4	1.43	6.27	6.20	27.16	0.51	2.25
Insig.	Single-Bay PDM Hangar 1	11.5	0.17	0.76	0.75	3.27	0.06	0.27
Insig.	Single-Bay PDM Hangar 2	11.5	0.17	0.76	0.75	3.27	0.06	0.27
EC-6/Insig.	Double-Bay PDM Hangar 1	19.2	0.29	1.26	1.25	5.47	0.10	0.45
EC-6/Insig.	Double-Bay PDM Hangar 2	19.2	0.29	1.26	1.25	5.47	0.10	0.45
EC-6/Insig.	Double-Bay PDM Hangar 3	19.2	0.29	1.26	1.25	5.47	0.10	0.45
EC-6/Insig.	Fuel Cell Maintenance Hangar	19.2	0.29	1.26	1.25	5.47	0.10	0.45
Insig.	Kitting Facility	4.9	0.07	0.32	0.32	1.4	0.03	0.12
Insig.	Fire Pump House	0.5	0.01	0.03	0.03	0.14	0.01	0.01
Insig.	Chiller Building	3.7	0.05	0.24	0.24	1.05	0.02	0.09

BACT Limits for Boilers and Heaters

Pollutant	Control Technology	Emission Limits
VOC	Good Combustion Practices	0.005 lb/MMBTU [1]
GHG	Use of Pipeline-Quality Natural Gas	GHG as CO_2e: 153,713 TPY
	Good Combustion Practices	
	Tune-Ups for Applicable Boilers/Heaters per 40 CFR 63, Subpart DDDDD	

1. Based on AP-42 (7/1998), Section 1.4.

a. The heaters and boilers shall only be fired with natural gas having a maximum sulfur content of 0.25 grains or less of total sulfur (as hydrogen sulfide) per 100 standard cubic

feet (scf) (< 4 ppmv). Compliance can be shown by the following methods: for gaseous fuel, a current gas company bill, laboratory analysis, stain-tube analysis, gas contract, tariff sheet, or other approved methods. Compliance shall be demonstrated at least once every calendar year. [OAC 252:100-31]

b. The owner/operator (O/O) shall comply with the Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, NSPS, Subpart Dc, for all affected emission units, including but not limited to the reporting and recordkeeping requirements (§ 60.48c), demonstrating that the units combust only natural gas containing 0.25 grains or less of total sulfur (as hydrogen sulfide) per 100 scf (< 4 ppmv). The permittee shall comply with this subpart including, but not limited to, the following requirements. [40 CFR 60 Subpart Dc]

1. §60.40c Applicability and delegation of authority.
2. §60.41c Definitions.
3. §60.42c Standard for sulfur dioxide (SO_2).
4. §60.43c Standard for particulate matter (PM).
5. §60.44c Compliance and performance test methods and procedures for sulfur dioxide.
6. §60.45c Compliance and performance test methods and procedures for particulate matter.
7. §60.46c Emission monitoring for sulfur dioxide.
8. §60.47c Emission monitoring for particulate matter.
9. §60.48c Reporting and recordkeeping requirements.

c. The owner/operator shall comply with all applicable requirements of NESHAP Subpart DDDDD, Industrial, Commercial and Institutional Boilers and Process Heaters. This subpart affects industrial, commercial and institutional boilers and process heaters at major sources of HAPs. [40 CFR 63 Subpart DDDDD]

1. § 63.7480 What is the purpose of this subpart?
2. § 63.7485 Am I subject to this subpart?
3. § 63.7490 What is the affected source of this subpart?
4. § 63.7491 When do I have to comply with this subpart?
5. § 63.7499 What are the subcategories of boilers and process heaters?
6. § 63.7500 What emission limitations, work practice standards, and operating limits must I meet?
7. § 63.7501 Affirmative defense for violation of emission standards during malfunction?
8. § 63.7505 What are my general requirements for complying with this subpart?
9. § 63.7510 What are my initial compliance requirements and by what date must I conduct them?
10. § 63.7515 When must I conduct subsequent performance tests, fuel analyses, or tune-ups?
11. § 63.7520 What stack tests and procedures must I use?
12. § 63.7521 What fuel analyses, fuel specification, and procedures must I use?
13. § 63.7522 Can I use emissions averaging to comply with this subpart?
14. § 63.7525 What are my monitoring, installation, operation, and maintenance

requirements?
15. § 63.7530 How do I demonstrate initial compliance with the emission limitations, fuel specifications and work practice standards?
16. § 63.7533 Can I use efficiency credits earned from implementation of energy conservation measures to comply with this subpart?
17. § 63.7535 Is there a minimum amount of monitoring data I must obtain?
18. § 63.7540 How do I demonstrate continuous compliance with the emission limitations, fuel specifications and work practice standards?
19. § 63.7541 How do I demonstrate continuous compliance under the emissions averaging provision?
20. § 63.7545 What notifications must I submit and when?
21. § 63.7550 What reports must I submit and when?
22. §63.7555 What records must I keep?
23. §63.7560 In what form and how long must I keep my records?
24. §63.7565 What parts of the General Provisions apply to me?
25. §63.7570 Who implements and enforces this subpart?
26. §63.7575 What definitions apply to this subpart?

d. All the heaters and boilers shall be equipped with low-NO_X burners and be manufacturer-guaranteed for the following emission factors: 0.015 pound per million British thermal unit (lb/MMBTU) for NO_X and 0.065 lb/MMBTU for CO.
e. Redundant heaters/boilers have a total design heat input capacity of approximately 96.7 MMBTUH. These redundant boilers and heaters will be operated only as backup units during periods when the primary unit is not functional.
f. Compliance with emission limits and BACT limits for the boilers and heaters in the above tables shall be demonstrated based on the following.
    i. NOx and CO shall be determined using factors from d. above.
    ii. GHG shall be calculated based on methods from 40 CFR Part 98.
    iii. All other emissions shall be determined using AP-42 factors, thermal ratings of burners, fuel sulfur content, and fuel throughputs of the natural gas-fired heaters and boilers.
    iv. Emissions shall be calculated and recorded on a 12-month rolling total.

Diesel Fire Pump Engines: Emission limitations have been established for IC1. All other emissions were based on the heat input rating, AP-42 (7/98), Section 3.4-1, and a fuel sulfur content of 15 ppmv. It should be noted that these engines are each authorized for up to 100 hours of operation annually. Emission limitations for each diesel fire pump are as follows:

Emission Limits for Fire Pump Engines

EUG	Source Category	NO_X		CO		VOC	
		lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
IC1	Fire Pump Engine	1.98	0.10	1.72	0.09	0.75	0.04

Note: There are three (3) engines. Emission limits shown are for each engine operating at a maximum of 100 hours per year (12-month rolling total).

BACT Limits for Diesel Fire Pump Engines

Pollutant	Control Technology	Emission Limits
VOC	Good Combustion Practices	0.15 g/hp-hr
GHGs	Good Combustion Practices	GHG as CO_2e: 44 TPY
	Efficient Designed	

a. The engines shall only be fired with ultra-low-sulfur diesel having a maximum sulfur content of 15 ppmv or less of total sulfur (as hydrogen sulfide). Compliance can be shown by the following methods: for gaseous fuel, a current gas company bill, laboratory analysis, stain-tube analysis, gas contract, tariff sheet, or other approved methods. Compliance shall be demonstrated at least once every calendar year.

[OAC 252:100-31]

b. Each engine shall be equipped with a non-resettable hour meter. Each engine shall be operated for no more than 100 hours per 12-month period. For each diesel-fueled fire pump engine, the permittee shall record hours operated each month and calculate 12-month rolling totals.

c. Each engine shall have a permanent identification plate attached that shows the make, model number, and serial number. [OAC 252:100-43]

d. The owner/operator (O/O) shall comply with Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, NSPS, Subpart IIII, for all affected emission units, including, but not limited to, the following: [40 CFR 63 Subpart IIII]

1. §60.4205 What emission standards must I meet for emergency engines if I am an O/O of a stationary CI internal combustion engine?
2. §60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?
3. §60.4208 What is the deadline for importing or installing stationary CI ICE produced in previous model years?
4. §60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?
5. §60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?
6. §60.4212 What test methods and other procedures must I use if I am an owner or operator of a stationary CI internal combustion engine with a displacement of less than 30 liters per cylinder?
7. §60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?
8. §60.4218 What parts of the General Provisions apply to me?

e. By the initial compliance date of October 19, 2013, the owner/operator shall comply with all applicable requirements of the NESHAP: Reciprocating Internal Combustion Engines, Subpart ZZZZ, for each affected facility including but not limited to the provisions listed below. [40 CFR 63 Subpart ZZZZ]

1. § 63.6580 What is the purpose of subpart ZZZZ?
2. § 63.6585 Am I subject to this subpart?
3. § 63.6590 What parts of my plant does this subpart cover?
4. § 63.6595 When do I have to comply with this subpart?
5. § 63.6603 What emission limitations and operating limitations must I meet if I own or operate an existing stationary RICE located at an area source of HAP emissions?
6. § 63.6605 What are my general requirements for complying with this subpart?
7. § 63.6625 What are my monitoring, installation, operation, and maintenance requirements?
8. § 63.6630 How do I demonstrate initial compliance with the emission limitations and operating limitations?
9. § 63.6640 How do I demonstrate continuous compliance with the emission limitations and operating limitations?
10. § 63.6650 What reports must I submit and when?
11. § 63.6655 What records must I keep?
12. § 63.6660 In what form and how long must I keep my records?
13. § 63.6665 What parts of the General Provisions apply to me?
14. § 63.6670 Who implements and enforces this subpart?
15. § 63.6675 What definitions apply to this subpart?

f. Compliance with emission limits and BACT limits for the fire pumps in the above tables shall be demonstrated based on the following.
   v. Emissions shall be determined using AP-42 factors, fuel sulfur content, and fuel throughputs of the fire pump engines.
   vi. GHG shall be calculated based on methods from 40 CFR Part 98.
   vii. Emissions shall be calculated and recorded on a 12-month rolling total.

Jet Engine Testing: Emission assumptions have been made for ET1. Pollutant emission factors for NO_X, CO, and HC as well as fuel flows were obtained from ICAO Engine Exhaust Emissions Data Bank, PW4062 - unique ID 12PW102 - Test dates 30 Nov 2012, through 12 Mar 2013. SOx emission factors followed methodology provided in Chapter 3 (Aircraft Engine Testing, p24), AFCEE AEI Guidance for Stationary Sources, 2009. Pollutant emission factors for PM_{10} were determined from "Smoke Number Correlation by Deutsches Zentrum für Luft- und Raumfahrt," reported by A. Kugele in *Aircraft Particulate Matter Emission Estimation through all Phases of Flight*.

Emission Factors for Jet Engine Testing

Test Power Setting	Fuel Flow Rate	(lb/1000 lb fuel)				
(Mode)	(lb/hr)	NOx	CO	HC (VOC)	SO2	PM10
Idle	1663	3.78	42.61	10.86	1.42	0.015
Approach	5687	12.17	1.93	0.09	1.42	0.015
Climb Out	16830	25.98	0.5	0.07	1.42	0.037
Take-off	21582	34.36	0.61	0.08	1.42	0.043

Emission Limits for Jet Engine Testing

Emission Source	NOx		CO		VOC	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
Jet Engine Testing	4.08	17.86	1.57	6.88	0.39	1.70

BACT Limits for Jet Engine Testing

Pollutant	Control Technology	Emission Limits
VOC	No Control	1.7 TPY
GHG	No Control	GHG as CO_2e: 2,481 TPY

a. Fifty-two PW4062 (F139) engines used on the KC-46A aircraft will be tested annually.
b. Two tests will be performed per engine.
c. The owner/operator shall comply with all applicable requirements of the NESHAP: Engine Test Cells/Stands, Subpart PPPPP, for each affected facility including but not limited to the provisions listed below: [40 CFR 63 Subpart PPPPP]

1. §63.9280 What is the purpose of subpart PPPPP?
2. §63.9285 Am I subject to this subpart?
3. §63.9290 What parts of my plant does this subpart cover?
4. §63.9295 When do I have to comply with this subpart?
5. §63.9300 What emission limitations must I meet?
6. §63.9301 What are my options for meeting the emission limits?
7. §63.9302 What operating limits must I meet?
8. §63.9305 What are my general requirements for complying with this subpart?
9. §63.9306 What are my continuous parameter monitoring system (CPMS) installation, operation, and maintenance requirements?
10. §63.9307 What are my continuous emissions monitoring system installation, operation, and maintenance requirements?
11. §63.9310 By what date must I conduct the initial compliance demonstrations?
12. §63.9320 What procedures must I use?
13. §63.9321 What are the general requirements for performance tests?
14. §63.9322 How do I determine the emission capture system efficiency?
15. §63.9323 How do I determine the add-on control device emission destruction or removal efficiency?
16. §63.9324 How do I establish the emission capture system and add-on control device operating limits during the performance test?
17. §63.9330 How do I demonstrate initial compliance with the emission limitation?
18. §63.9335 How do I monitor and collect data to demonstrate continuous compliance?
19. §63.9340 How do I demonstrate continuous compliance with the emission limitations?
20. §63.9345 What notifications must I submit and when?
21. §63.9350 What reports must I submit and when?
22. §63.9355 What records must I keep?
23. §63.9360 In what form and how long must I keep my records?

d. Compliance with emission limits and BACT limits for the jet engine testing in the above

tables shall be demonstrated based on the following.

i. Emissions shall be determined using factors from the appropriate reference sources described in this section for jet engine testing.
ii. GHG shall be calculated based on methods from 40 CFR Part 98.
iii. Emissions shall be calculated and recorded on a 12-month rolling total.

Painting/Depainting: Emission assumptions have been made for SC1/2/3, CD1/2/3, ND1. VOC and HAP lb/gal content based on material safety data sheets (MSDS).

Summary of Materials Information Used for PTE Calculations

Material	Throughput (gal/aircraft)	VOC Content (lb/gal)	HAP Content (lb/gal)
Non-HAP-Containing Stripper Desolift 5269	2,997.5	5.1	0
HAP-Containing Stripper McGean-Rohco CeeBee R-256	50	1.4	6.0
Primer Akzo Nobel 10P20-44	65	2.9	2.9
Topcoat PPG (Desothane) CA9311/9300B	110	3.5	0.8
Conversion Coating (pretreatment coating) Alodine 1200S	80	0	0

Emission and Limitations for Painting and Depainting Operations

Materials	Annual VOC Emissions		Total HAP Emissions	
	lb/yr	TPY	lb/yr	TPY
Non-HAP -Containing Stripper	204,000	306.1	0.00	0.00
HAP-Containing Stripper	2,781	1.4	11,926	5.96
Primer	7,540	3.8	4,761	2.38
Topcoat	15,379	7.7	3,351	1.68
Pretreatment Coating	0	0.0	0.00	0.00
Totals	**229,940**	**319.0**	**20,038**	**10.0**

BACT Limits for Painting/Depainting Operations

Pollutant	Production Activity	Control Technology
VOC	Low-VOC vapor-pressure cleaning solvents and strippers.	Less than 45 mm Hg at 20°C or as specified in Table 1 of 40 CFR 63, Subpart GG.
	Low-VOC vapor-pressure cleaning solvents and strippers.	Use of low VOC coatings (VOC content not to exceed lb/gal show in table above)
	Solvents and stripper application	High transfer efficiency coating equipment (High Volume Low Pressure: HVLP) or manual application.
	Work practice	Good work practices in compliance with Aerospace NESHAP (40 CFR 63, Subpart GG)

a. Emissions based on a maximum of 40 KC-46A aircraft subject to annual depot-level maintenance that result in complete painting/depainting.
b. Maximum stripper usage limit provided in the Aerospace Manufacturing and Rework Facilities NESHAP [40 CFR 63.756(b)(3)] for military aircraft.
c. Non-HAP stripper usage based on a KC-135 aircraft and a ratio of aircraft surface area: 2,997.5 gallons/aircraft/year (620 gallons/KC-135 x 1.35 x 2.9975).
d. Primer, topcoat, and conversion coating throughput based on the KC-10 aircraft, which has a surface area approximately equivalent to the KC-46A.
e. NESHAP Subpart GG; Aero Manufacturing and Rework Facilities, applies to facilities that are engaged, either in part or in whole, in the manufacture or rework of commercial, civil, or military aerospace vehicles or components and that are major sources of HAPs. The owner/operator shall comply with all applicable requirements of the NESHAP: Aero Manufacturing and Rework Facilities, Subpart GG, for each affected facility including but not limited to the provisions listed below [40 CFR 63 Subpart GG]

    1. §63.741 Applicability and designation of affected sources.
    2. §63.742 Definitions.
    3. §63.743 Standards: General.
    4. §63.744 Standards: Cleaning operations.
    5. §63.745 Standards: Primer and topcoat application operations.
    6. §63.746 Standards: Depainting operations.
    7. §63.747 Standards: Chemical milling maskant application operations.
    8. §63.748 Standards: Handling and storage of waste.
    9. §63.749 Compliance dates and determinations.
    10. §63.750 Test methods and procedures.
    11. §63.751 Monitoring requirements.
    12. §63.752 Recordkeeping requirements.
    13. §63.753 Reporting requirements.
    14. §63.759 Implementation and enforcement.

f. Compliance with emission limits and BACT limits for the painting/depainting in the above tables shall be demonstrated based on the following.
    i. Emissions shall be determined using factors from the appropriate reference sources described in this section for painting/depainting.
    ii. Emissions shall be calculated on a mass balance basis and assuming all VOCs and HAPs are emitted.
    iii. GHG shall be calculated based on methods from 40 CFR Part 98.
    iv. Emissions shall be calculated and recorded on a 12-month rolling total.

Cleaning Operations: Emission assumptions have been made for handwipe (CH1), flushing (CF1), and spray gun cleaning operations (CS1).

a. VOCs are emitted from these cleaning sources at the same ratio measured between the specific cleaning operation and the surface coating operations, which includes EUGs SC-1 and SC-2 (Primers and Topcoats) as reported in the 2012 Tinker AFB AEI.
b. Based on the 2012 AEI emissions shown above, the ratios used to calculated the VOC

emissions from cleaning operations related to the KC-46A were as follows:

i. CF1: 0.021 tons of VOCs from flush cleaning emissions/ton of VOCs from surface coating emissions
ii. CH1: 0.292 tons of VOCs from handwipe cleaning emissions/ton of VOS form surface coating emissions
iii. CS1: 0.167 tons of VOCs from paint spray gun cleaning emissions/ton of VOCs from surface coating emissions.

c. The ratios shown above were multiplied by the KC-46A PTE emissions estimated for painting operations (primers and topcoats only) to obtain the total VOC PTE for cleaning operations related to the KC-46A aircraft.

d. Compliance with emission limits and BACT limits for cleaning operations in tables below shall be demonstrated based on the following.
   i. Emissions shall be determined using factors from the appropriate reference sources described in this section for cleaning.
   ii. Emissions shall be calculated on a mass balance basis and assuming all VOCs and HAPs are emitted.
   iii. GHG shall be calculated based on methods from 40 CFR Part 98.
   iv. Emissions shall be calculated and recorded on a 12-month rolling total.

Emission Limitations for Cleaning Operations (CH1, CF1, CS1)

Cleaning Operation Type (EUG)	KC-46A VOC Emissions (TPY)	KC-46A HAPs Emissions (TPY)
Flush Cleaning (CF1)	0.24	0.01
Hand Wipe Cleaning (CH1)	3.35	0.01
Paint Spray Gun Cleaning (CS1)	1.92	0.57

BACT Limits for Handwipe Cleaning

Pollutant	Control Technologies Identified
VOC	Bagging used solvent hand wipe cleaning rags

BACT Limits for Flush Cleaning Operations

Pollutant	Control Technology
VOC	Capturing and containing solvent used for aircraft part flush cleaning operations

BACT Limits for Spray Gun Cleaning Operations

Pollutant	Control Technology
VOC	Enclosed container for spray gun cleaning

Fuel Storage Tanks: Two new aboveground storage tanks are proposed as part of the KC-46A Program. Both are proposed fixed-roof tanks, which will be manifolded with Tinker AFB's existing Jet-A storage tank and connected to a closed-loop hydrant system. The closed loop system is considered BACT for the tanks because no air emissions are expected to be released from these tanks. No further analysis has been completed.

2. The permittee shall apply for a modification of their current Title V operating permit within 180 days of operational start-up.

3. This Permit No. 2009-394-C (M-4) PSD shall run concurrently with the facility's current Title V operating Permit No. 2009-394-TVR.

Recordkeeping Requirements: The permittee shall maintain records of operations as listed below. These records shall be maintained on-site for at least five years after the date or recording and shall be provided to regulatory personnel upon request.[OAC 252:100-43 & 40 CFR 63, Subpart A]

1. This permit shall incorporate all Specific Conditions, Compliance Monitoring, Reporting and Recordkeeping requirements specified in the Specific Conditions of Permit No. 2009-394-TVR.

2. Natural Gas-Fired Boilers and Heaters.
   a. For the fuel burned, the appropriate document(s) as described in Specific Condition for natural gas-fired boilers and heaters.
   b. Total natural gas usage for each boiler/heater (annually).
   c. Total operating hours for each boiler/heater (annually).
   d. Operation, maintenance, and inspection log for each boiler/heater.
   e. The heat input for each boiler/heater (MMBtu, monthly, 12-month rolling total).
   f. The permittee shall perform and maintain annual emissions calculations and report them in the Annual Emission Inventory.
   g. Emissions calculation (monthly and 12-month rolling totals).
   h. Records required by 40 CFR §60, NSPS, Subpart Dc.
   i. Records required by 40 CFR §63, NESHAP, Subpart DDDDD.

3. Diesel Fire Pump Engines.
   a. O&M records for each fire pump engine.
   b. Fuel usage per fire pump engine (monthly and 12-month rolling totals).
   c. Spreadsheet of emission calculations based on fuel usage and emission data to demonstrate compliance with emission limits.
   d. Hours of operation for each fire pump engine measured by a non-resettable hour meter.
   e. Vendor or manufacturer's emission data for each fire pump engine.
   f. Results of testing of NOx and CO exhaust in grams/hp-hr from each fire pump engine to verify vendor's emission data.
   g. At least once each year, in July or August, the permittee shall conduct tests of NO_x and CO concentration in exhaust gases from the generator engines when operating under representative conditions for the season. Testing shall be conducted using portable engine analyzers or an equivalent method approved by the ODEQ.
   h. Compliance with the sulfur emission standards shall be fulfilled by using only low sulfur diesel oil (0.05 weight percent or less).
   i. Records required by 40 CFR §60, NSPS, Subpart IIII.
   j. Records required by 40 CFR §63, NSPS, Subpart ZZZZ.

4. Jet Engine Testing.
   a. Monthly total number of test runs per engine type.
   b. Emissions calculation (monthly and 12-month rolling totals).
   c. The permittee shall conduct, register, and submit an annual inventory of regulated pollutants.
   d. Records required by 40 CFR §63, NSPS, Subpart PPPPP.

5. Painting/Depainting
   a. Monthly usage of coatings and depainting chemicals, by type and volume.
   b. Emissions calculation (monthly and 12-month rolling totals).
   c. The permittee shall conduct, register, and submit an annual inventory of regulated pollutants.
   d. Records required by 40 CFR §63, NSPS, Subpart GG.

Concurrent Permits: This permit shall be effective concurrently with Permit No. 2009-394-TVR and Permit No. 2009-394-C (M-3) PSD.

Cancelled Permit: This permit replaces and cancels Permit No. 2009-394-C (M-2) PSD.

Operating Permit: The permittee shall apply for a modification of their current Title V operating permit within 180 days of operational start-up.

MAJOR SOURCE AIR QUALITY PERMIT
STANDARD CONDITIONS
(July 21, 2009)

SECTION I. DUTY TO COMPLY

A. This is a permit to operate / construct this specific facility in accordance with the federal Clean Air Act (42 U.S.C. 7401, et al.) and under the authority of the Oklahoma Clean Air Act and the rules promulgated there under. [Oklahoma Clean Air Act, 27A O.S. § 2-5-112]

B. The issuing Authority for the permit is the Air Quality Division (AQD) of the Oklahoma Department of Environmental Quality (DEQ). The permit does not relieve the holder of the obligation to comply with other applicable federal, state, or local statutes, regulations, rules, or ordinances. [Oklahoma Clean Air Act, 27A O.S. § 2-5-112]

C. The permittee shall comply with all conditions of this permit. Any permit noncompliance shall constitute a violation of the Oklahoma Clean Air Act and shall be grounds for enforcement action, permit termination, revocation and reissuance, or modification, or for denial of a permit renewal application. All terms and conditions are enforceable by the DEQ, by the Environmental Protection Agency (EPA), and by citizens under section 304 of the Federal Clean Air Act (excluding state-only requirements). This permit is valid for operations only at the specific location listed.
[40 CFR §70.6(b), OAC 252:100-8-1.3 and OAC 252:100-8-6(a)(7)(A) and (b)(1)]

D. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in assessing penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continuing operations. [OAC 252:100-8-6(a)(7)(B)]

SECTION II. REPORTING OF DEVIATIONS FROM PERMIT TERMS

A. Any exceedance resulting from an emergency and/or posing an imminent and substantial danger to public health, safety, or the environment shall be reported in accordance with Section XIV (Emergencies). [OAC 252:100-8-6(a)(3)(C)(iii)(I) & (II)]

B. Deviations that result in emissions exceeding those allowed in this permit shall be reported consistent with the requirements of OAC 252:100-9, Excess Emission Reporting Requirements.
[OAC 252:100-8-6(a)(3)(C)(iv)]

C. Every written report submitted under this section shall be certified as required by Section III (Monitoring, Testing, Recordkeeping, and Reporting), Paragraph F.
[OAC 252:100-8-6(a)(3)(C)(iv)]

SECTION III. MONITORING, TESTING, RECORDKEEPING & REPORTING

A. The permittee shall keep records as specified in this permit. These records, including monitoring data and necessary support information, shall be retained onsite or at a nearby field office for a period of at least five (5) years from the date of the monitoring sample, measurement, report, or application, and shall be made available for inspection by regulatory personnel upon request. Support information includes all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Where appropriate, the permit may specify that records may be maintained in computerized form.

[OAC 252:100-8-6 (a)(3)(B)(ii), OAC 252:100-8-6(c)(1), and OAC 252:100-8-6(c)(2)(B)]

B. Records of required monitoring shall include:

(1) Date, place and time of sampling or measurement;
(2) Date or dates analyses were performed;
(3) Company or entity which performed the analyses;
(4) Analytical techniques or methods used;
(5) Results of such analyses; and
(6) Operating conditions existing at the time of sampling or measurement.

[OAC 252:100-8-6(a)(3)(B)(i)]

C. No later than 30 days after each six (6) month period, after the date of the issuance of the original Part 70 operating permit or alternative date as specifically identified in a subsequent Part 70 operating permit, the permittee shall submit to AQD a report of the results of any required monitoring. All instances of deviations from permit requirements since the previous report shall be clearly identified in the report. Submission of these periodic reports will satisfy any reporting requirement of Paragraph E below that is duplicative of the periodic reports, if so noted on the submitted report. [OAC 252:100-8-6(a)(3)(C)(i) and (ii)]

D. If any testing shows emissions in excess of limitations specified in this permit, the owner or operator shall comply with the provisions of Section II (Reporting Of Deviations From Permit Terms) of these standard conditions. [OAC 252:100-8-6(a)(3)(C)(iii)]

E. In addition to any monitoring, recordkeeping or reporting requirement specified in this permit, monitoring and reporting may be required under the provisions of OAC 252:100-43, Testing, Monitoring, and Recordkeeping, or as required by any provision of the Federal Clean Air Act or Oklahoma Clean Air Act. [OAC 252:100-43]

F. Any Annual Certification of Compliance, Semi Annual Monitoring and Deviation Report, Excess Emission Report, and Annual Emission Inventory submitted in accordance with this permit shall be certified by a responsible official. This certification shall be signed by a responsible official, and shall contain the following language: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."

[OAC 252:100-8-5(f), OAC 252:100-8-6(a)(3)(C)(iv), OAC 252:100-8-6(c)(1), OAC 252:100-9-7(e), and OAC 252:100-5-2.1(f)]

G. Any owner or operator subject to the provisions of New Source Performance Standards ("NSPS") under 40 CFR 60 or National Emission Standards for Hazardous Air Pollutants ("NESHAPs") under 40 CFR 61 and 63 shall maintain a file of all measurements and other information required by the applicable general provisions and subpart(s). These records shall be maintained in a permanent file suitable for inspection, shall be retained for a period of at least five years as required by Paragraph A of this Section, and shall include records of the occurrence and duration of any start-up, shutdown, or malfunction in the operation of an affected facility, any malfunction of the air pollution control equipment; and any periods during which a continuous monitoring system or monitoring device is inoperative.

[40 CFR. §§60.7 and 63.10, 40 CFR Parts 61, Subpart A, and OAC 252:100, Appendix Q]

H. The permittee of a facility that is operating subject to a schedule of compliance shall submit to the DEQ a progress report at least semi-annually. The progress reports shall contain dates for achieving the activities, milestones or compliance required in the schedule of compliance and the dates when such activities, milestones or compliance was achieved. The progress reports shall also contain an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted. [OAC 252:100-8-6(c)(4)]

I. All testing must be conducted under the direction of qualified personnel by methods approved by the Division Director. All tests shall be made and the results calculated in accordance with standard test procedures. The use of alternative test procedures must be approved by EPA. When a portable analyzer is used to measure emissions it shall be setup, calibrated, and operated in accordance with the manufacturer's instructions and in accordance with a protocol meeting the requirements of the "AQD Portable Analyzer Guidance" document or an equivalent method approved by Air Quality.

[OAC 252:100-8-6(a)(3)(A)(iv), and OAC 252:100-43]

J. The reporting of total particulate matter emissions as required in Part 7 of OAC 252:100-8 (Permits for Part 70 Sources), OAC 252:100-19 (Control of Emission of Particulate Matter), and OAC 252:100-5 (Emission Inventory), shall be conducted in accordance with applicable testing or calculation procedures, modified to include back-half condensables, for the concentration of particulate matter less than 10 microns in diameter (PM_{10}). NSPS may allow reporting of only particulate matter emissions caught in the filter (obtained using Reference Method 5).

K. The permittee shall submit to the AQD a copy of all reports submitted to the EPA as required by 40 CFR Part 60, 61, and 63, for all equipment constructed or operated under this permit subject to such standards. [OAC 252:100-8-6(c)(1) and OAC 252:100, Appendix Q]

SECTION IV. COMPLIANCE CERTIFICATIONS

A. No later than 30 days after each anniversary date of the issuance of the original Part 70 operating permit or alternative date as specifically identified in a subsequent Part 70 operating permit, the permittee shall submit to the AQD, with a copy to the US EPA, Region 6, a certification of compliance with the terms and conditions of this permit and of any other applicable requirements which have become effective since the issuance of this permit.

[OAC 252:100-8-6(c)(5)(A), and (D)]

B. The compliance certification shall describe the operating permit term or condition that is the basis of the certification; the current compliance status; whether compliance was continuous or intermittent; the methods used for determining compliance, currently and over the reporting period. The compliance certification shall also include such other facts as the permitting authority may require to determine the compliance status of the source.

[OAC 252:100-8-6(c)(5)(C)(i)-(v)]

C. The compliance certification shall contain a certification by a responsible official as to the results of the required monitoring. This certification shall be signed by a responsible official, and shall contain the following language: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete." [OAC 252:100-8-5(f) and OAC 252:100-8-6(c)(1)]

D. Any facility reporting noncompliance shall submit a schedule of compliance for emissions units or stationary sources that are not in compliance with all applicable requirements. This schedule shall include a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance with any applicable requirements for which the emissions unit or stationary source is in noncompliance. This compliance schedule shall resemble and be at least as stringent as that contained in any judicial consent decree or administrative order to which the emissions unit or stationary source is subject. Any such schedule of compliance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based, except that a compliance plan shall not be required for any noncompliance condition that is corrected within 24 hours of discovery.

[OAC 252:100-8-5(e)(8)(B) and OAC 252:100-8-6(c)(3)]

SECTION V. REQUIREMENTS THAT BECOME APPLICABLE DURING THE PERMIT TERM

The permittee shall comply with any additional requirements that become effective during the permit term and that are applicable to the facility. Compliance with all new requirements shall be certified in the next annual certification. [OAC 252:100-8-6(c)(6)]

SECTION VI. PERMIT SHIELD

A. Compliance with the terms and conditions of this permit (including terms and conditions established for alternate operating scenarios, emissions trading, and emissions averaging, but excluding terms and conditions for which the permit shield is expressly prohibited under OAC 252:100-8) shall be deemed compliance with the applicable requirements identified and included in this permit. [OAC 252:100-8-6(d)(1)]

B. Those requirements that are applicable are listed in the Standard Conditions and the Specific Conditions of this permit. Those requirements that the applicant requested be determined as not applicable are summarized in the Specific Conditions of this permit. [OAC 252:100-8-6(d)(2)]

SECTION VII. ANNUAL EMISSIONS INVENTORY & FEE PAYMENT

The permittee shall file with the AQD an annual emission inventory and shall pay annual fees based on emissions inventories. The methods used to calculate emissions for inventory purposes shall be based on the best available information accepted by AQD.
[OAC 252:100-5-2.1, OAC 252:100-5-2.2, and OAC 252:100-8-6(a)(8)]

SECTION VIII. TERM OF PERMIT

A. Unless specified otherwise, the term of an operating permit shall be five years from the date of issuance. [OAC 252:100-8-6(a)(2)(A)]

B. A source's right to operate shall terminate upon the expiration of its permit unless a timely and complete renewal application has been submitted at least 180 days before the date of expiration. [OAC 252:100-8-7.1(d)(1)]

C. A duly issued construction permit or authorization to construct or modify will terminate and become null and void (unless extended as provided in OAC 252:100-8-1.4(b)) if the construction is not commenced within 18 months after the date the permit or authorization was issued, or if work is suspended for more than 18 months after it is commenced. [OAC 252:100-8-1.4(a)]

D. The recipient of a construction permit shall apply for a permit to operate (or modified operating permit) within 180 days following the first day of operation. [OAC 252:100-8-4(b)(5)]

SECTION IX. SEVERABILITY

The provisions of this permit are severable and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
[OAC 252:100-8-6 (a)(6)]

SECTION X. PROPERTY RIGHTS

A. This permit does not convey any property rights of any sort, or any exclusive privilege.
[OAC 252:100-8-6(a)(7)(D)]

B. This permit shall not be considered in any manner affecting the title of the premises upon which the equipment is located and does not release the permittee from any liability for damage to persons or property caused by or resulting from the maintenance or operation of the equipment for which the permit is issued. [OAC 252:100-8-6(c)(6)]

SECTION XI. DUTY TO PROVIDE INFORMATION

A. The permittee shall furnish to the DEQ, upon receipt of a written request and within sixty (60) days of the request unless the DEQ specifies another time period, any information that the

DEQ may request to determine whether cause exists for modifying, reopening, revoking, reissuing, terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the DEQ copies of records required to be kept by the permit.
[OAC 252:100-8-6(a)(7)(E)]

B. The permittee may make a claim of confidentiality for any information or records submitted pursuant to 27A O.S. § 2-5-105(18). Confidential information shall be clearly labeled as such and shall be separable from the main body of the document such as in an attachment.
[OAC 252:100-8-6(a)(7)(E)]

C. Notification to the AQD of the sale or transfer of ownership of this facility is required and shall be made in writing within thirty (30) days after such sale or transfer.
[Oklahoma Clean Air Act, 27A O.S. § 2-5-112(G)]

SECTION XII. REOPENING, MODIFICATION & REVOCATION

A. The permit may be modified, revoked, reopened and reissued, or terminated for cause. Except as provided for minor permit modifications, the filing of a request by the permittee for a permit modification, revocation and reissuance, termination, notification of planned changes, or anticipated noncompliance does not stay any permit condition.
[OAC 252:100-8-6(a)(7)(C) and OAC 252:100-8-7.2(b)]

B. The DEQ will reopen and revise or revoke this permit prior to the expiration date in the following circumstances: [OAC 252:100-8-7.3 and OAC 252:100-8-7.4(a)(2)]

(1) Additional requirements under the Clean Air Act become applicable to a major source category three or more years prior to the expiration date of this permit. No such reopening is required if the effective date of the requirement is later than the expiration date of this permit.
(2) The DEQ or the EPA determines that this permit contains a material mistake or that the permit must be revised or revoked to assure compliance with the applicable requirements.
(3) The DEQ or the EPA determines that inaccurate information was used in establishing the emission standards, limitations, or other conditions of this permit. The DEQ may revoke and not reissue this permit if it determines that the permittee has submitted false or misleading information to the DEQ.
(4) DEQ determines that the permit should be amended under the discretionary reopening provisions of OAC 252:100-8-7.3(b).

C. The permit may be reopened for cause by EPA, pursuant to the provisions of OAC 100-8-7.3(d). [OAC 100-8-7.3(d)]

D. The permittee shall notify AQD before making changes other than those described in Section XVIII (Operational Flexibility), those qualifying for administrative permit amendments, or those defined as an Insignificant Activity (Section XVI) or Trivial Activity (Section XVII). The notification should include any changes, which may alter the status of a "grandfathered source,"

as defined under AQD rules. Such changes may require a permit modification.
[OAC 252:100-8-7.2(b) and OAC 252:100-5-1.1]

E. Activities that will result in air emissions that exceed the trivial/insignificant levels and that are not specifically approved by this permit are prohibited. [OAC 252:100-8-6(c)(6)]

SECTION XIII. INSPECTION & ENTRY

A. Upon presentation of credentials and other documents as may be required by law, the permittee shall allow authorized regulatory officials to perform the following (subject to the permittee's right to seek confidential treatment pursuant to 27A O.S. Supp. 1998, § 2-5-105(18) for confidential information submitted to or obtained by the DEQ under this section):

(1) Enter upon the permittee's premises during reasonable/normal working hours where a source is located or emissions-related activity is conducted, or where records must be kept under the conditions of the permit;
(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;
(3) Inspect, at reasonable times and using reasonable safety practices, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and
(4) As authorized by the Oklahoma Clean Air Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit.
[OAC 252:100-8-6(c)(2)]

SECTION XIV. EMERGENCIES

A. Any exceedance resulting from an emergency shall be reported to AQD promptly but no later than 4:30 p.m. on the next working day after the permittee first becomes aware of the exceedance. This notice shall contain a description of the emergency, the probable cause of the exceedance, any steps taken to mitigate emissions, and corrective actions taken.
[OAC 252:100-8-6 (a)(3)(C)(iii)(I) and (IV)]

B. Any exceedance that poses an imminent and substantial danger to public health, safety, or the environment shall be reported to AQD as soon as is practicable; but under no circumstance shall notification be more than 24 hours after the exceedance. [OAC 252:100-8-6(a)(3)(C)(iii)(II)]

C. An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under this permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operator error. [OAC 252:100-8-2]

D. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that: [OAC 252:100-8-6 (e)(2)]

(1) An emergency occurred and the permittee can identify the cause or causes of the emergency;
(2) The permitted facility was at the time being properly operated;
(3) During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit.

E. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency shall have the burden of proof. [OAC 252:100-8-6(e)(3)]

F. Every written report or document submitted under this section shall be certified as required by Section III (Monitoring, Testing, Recordkeeping, & Reporting), Paragraph F.
[OAC 252:100-8-6(a)(3)(C)(iv)]

SECTION XV. RISK MANAGEMENT PLAN

The permittee, if subject to the provision of Section 112(r) of the Clean Air Act, shall develop and register with the appropriate agency a risk management plan by June 20, 1999, or the applicable effective date. [OAC 252:100-8-6(a)(4)]

SECTION XVI. INSIGNIFICANT ACTIVITIES

Except as otherwise prohibited or limited by this permit, the permittee is hereby authorized to operate individual emissions units that are either on the list in Appendix I to OAC Title 252, Chapter 100, or whose actual calendar year emissions do not exceed any of the limits below. Any activity to which a State or Federal applicable requirement applies is not insignificant even if it meets the criteria below or is included on the insignificant activities list.

(1) 5 TPY of any one criteria pollutant.
(2) 2 TPY for any one hazardous air pollutant (HAP) or 5 TPY for an aggregate of two or more HAP's, or 20 percent of any threshold less than 10 TPY for single HAP that the EPA may establish by rule.

[OAC 252:100-8-2 and OAC 252:100, Appendix I]

SECTION XVII. TRIVIAL ACTIVITIES

Except as otherwise prohibited or limited by this permit, the permittee is hereby authorized to operate any individual or combination of air emissions units that are considered inconsequential and are on the list in Appendix J. Any activity to which a state or federal applicable requirement applies is not trivial even if included on the trivial activities list.

[OAC 252:100-8-2 and OAC 252:100, Appendix J]

SECTION XVIII. OPERATIONAL FLEXIBILITY

A. A facility may implement any operating scenario allowed for in its Part 70 permit without the need for any permit revision or any notification to the DEQ (unless specified otherwise in the permit). When an operating scenario is changed, the permittee shall record in a log at the facility the scenario under which it is operating. [OAC 252:100-8-6(a)(10) and (f)(1)]

B. The permittee may make changes within the facility that:

(1) Result in no net emissions increases,
(2) Are not modifications under any provision of Title I of the federal Clean Air Act, and
(3) Do not cause any hourly or annual permitted emission rate of any existing emissions unit to be exceeded;

provided that the facility provides EPA and the DEQ with written notification as required below in advance of the proposed changes, which shall be a minimum of seven (7) days, or twenty four (24) hours for emergencies as defined in OAC 252:100-8-6 (e). The permittee, the DEQ, and the EPA shall attach each such notice to their copy of the permit. For each such change, the written notification required above shall include a brief description of the change within the permitted facility, the date on which the change will occur, any change in emissions, and any permit term or condition that is no longer applicable as a result of the change. The permit shield provided by this permit does not apply to any change made pursuant to this paragraph.
[OAC 252:100-8-6(f)(2)]

SECTION XIX. OTHER APPLICABLE & STATE-ONLY REQUIREMENTS

A. The following applicable requirements and state-only requirements apply to the facility unless elsewhere covered by a more restrictive requirement:

(1) Open burning of refuse and other combustible material is prohibited except as authorized in the specific examples and under the conditions listed in the Open Burning Subchapter.
[OAC 252:100-13]
(2) No particulate emissions from any fuel-burning equipment with a rated heat input of 10 MMBTUH or less shall exceed 0.6 lb/MMBTU. [OAC 252:100-19]

(3) For all emissions units not subject to an opacity limit promulgated under 40 CFR, Part 60, NSPS, no discharge of greater than 20% opacity is allowed except for:
[OAC 252:100-25]

(a) Short-term occurrences which consist of not more than one six-minute period in any consecutive 60 minutes, not to exceed three such periods in any consecutive 24 hours. In no case shall the average of any six-minute period exceed 60% opacity;
(b) Smoke resulting from fires covered by the exceptions outlined in OAC 252:100-13-7;
(c) An emission, where the presence of uncombined water is the only reason for failure to meet the requirements of OAC 252:100-25-3(a); or

(d) Smoke generated due to a malfunction in a facility, when the source of the fuel producing the smoke is not under the direct and immediate control of the facility and the immediate constriction of the fuel flow at the facility would produce a hazard to life and/or property.

(4) No visible fugitive dust emissions shall be discharged beyond the property line on which the emissions originate in such a manner as to damage or to interfere with the use of adjacent properties, or cause air quality standards to be exceeded, or interfere with the maintenance of air quality standards. [OAC 252:100-29]

(5) No sulfur oxide emissions from new gas-fired fuel-burning equipment shall exceed 0.2 lb/MMBTU. No existing source shall exceed the listed ambient air standards for sulfur dioxide. [OAC 252:100-31]

(6) Volatile Organic Compound (VOC) storage tanks built after December 28, 1974, and with a capacity of 400 gallons or more storing a liquid with a vapor pressure of 1.5 psia or greater under actual conditions shall be equipped with a permanent submerged fill pipe or with a vapor-recovery system. [OAC 252:100-37-15(b)]

(7) All fuel-burning equipment shall at all times be properly operated and maintained in a manner that will minimize emissions of VOCs. [OAC 252:100-37-36]

SECTION XX. STRATOSPHERIC OZONE PROTECTION

A. The permittee shall comply with the following standards for production and consumption of ozone-depleting substances: [40 CFR 82, Subpart A]

(1) Persons producing, importing, or placing an order for production or importation of certain class I and class II substances, HCFC-22, or HCFC-141b shall be subject to the requirements of §82.4;
(2) Producers, importers, exporters, purchasers, and persons who transform or destroy certain class I and class II substances, HCFC-22, or HCFC-141b are subject to the recordkeeping requirements at §82.13; and
(3) Class I substances (listed at Appendix A to Subpart A) include certain CFCs, Halons, HBFCs, carbon tetrachloride, trichloroethane (methyl chloroform), and bromomethane (Methyl Bromide). Class II substances (listed at Appendix B to Subpart A) include HCFCs.

B. If the permittee performs a service on motor (fleet) vehicles when this service involves an ozone-depleting substance refrigerant (or regulated substitute substance) in the motor vehicle air conditioner (MVAC), the permittee is subject to all applicable requirements. Note: The term "motor vehicle" as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed. The term "MVAC" as used in Subpart B does not include the air-tight sealed refrigeration system used as refrigerated cargo, or the system used on passenger buses using HCFC-22 refrigerant. [40 CFR 82, Subpart B]

C. The permittee shall comply with the following standards for recycling and emissions reduction except as provided for MVACs in Subpart B: [40 CFR 82, Subpart F]

(1) Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to § 82.156;
(2) Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to § 82.158;
(3) Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to § 82.161;
(4) Persons disposing of small appliances, MVACs, and MVAC-like appliances must comply with record-keeping requirements pursuant to § 82.166;
(5) Persons owning commercial or industrial process refrigeration equipment must comply with leak repair requirements pursuant to § 82.158; and
(6) Owners/operators of appliances normally containing 50 or more pounds of refrigerant must keep records of refrigerant purchased and added to such appliances pursuant to § 82.166.

SECTION XXI. TITLE V APPROVAL LANGUAGE

A. DEQ wishes to reduce the time and work associated with permit review and, wherever it is not inconsistent with Federal requirements, to provide for incorporation of requirements established through construction permitting into the Source's Title V permit without causing redundant review. Requirements from construction permits may be incorporated into the Title V permit through the administrative amendment process set forth in OAC 252:100-8-7.2(a) only if the following procedures are followed:

(1) The construction permit goes out for a 30-day public notice and comment using the procedures set forth in 40 CFR § 70.7(h)(1). This public notice shall include notice to the public that this permit is subject to EPA review, EPA objection, and petition to EPA, as provided by 40 CFR § 70.8; that the requirements of the construction permit will be incorporated into the Title V permit through the administrative amendment process; that the public will not receive another opportunity to provide comments when the requirements are incorporated into the Title V permit; and that EPA review, EPA objection, and petitions to EPA will not be available to the public when requirements from the construction permit are incorporated into the Title V permit.
(2) A copy of the construction permit application is sent to EPA, as provided by 40 CFR § 70.8(a)(1).
(3) A copy of the draft construction permit is sent to any affected State, as provided by 40 CFR § 70.8(b).
(4) A copy of the proposed construction permit is sent to EPA for a 45-day review period as provided by 40 CFR§ 70.8(a) and (c).
(5) The DEQ complies with 40 CFR § 70.8(c) upon the written receipt within the 45-day comment period of any EPA objection to the construction permit. The DEQ shall not issue the permit until EPA's objections are resolved to the satisfaction of EPA.
(6) The DEQ complies with 40 CFR § 70.8(d).

(7) A copy of the final construction permit is sent to EPA as provided by 40 CFR § 70.8(a).
(8) The DEQ shall not issue the proposed construction permit until any affected State and EPA have had an opportunity to review the proposed permit, as provided by these permit conditions.
(9) Any requirements of the construction permit may be reopened for cause after incorporation into the Title V permit by the administrative amendment process, by DEQ as provided in OAC 252:100-8-7.3(a), (b), and (c), and by EPA as provided in 40 CFR § 70.7(f) and (g).
(10) The DEQ shall not issue the administrative permit amendment if performance tests fail to demonstrate that the source is operating in substantial compliance with all permit requirements.

B. To the extent that these conditions are not followed, the Title V permit must go through the Title V review process.

SECTION XXII. CREDIBLE EVIDENCE

For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any provision of the Oklahoma implementation plan, nothing shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

[OAC 252:100-43-6]

PART 70 PERMIT

AIR QUALITY DIVISION
STATE OF OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY
707 NORTH ROBINSON, SUITE 4100
P.O. BOX 1677
OKLAHOMA CITY, OKLAHOMA 73101-1677

Permit No. 2009-394-C (M-4) (PSD)

Tinker Air Force Base

having complied with the requirements of the law, is hereby granted permission to construct the KC-46A Project, located within their boundaries in Midwest City, Oklahoma County, Oklahoma, subject to Specific Conditions and Standard Conditions dated July 21, 2009, both of which are attached.

In the absence of construction commencement, this permit shall expire 18 months from the issuance date, except as authorized under Section VIII of the Standard Conditions.

Division Director **Date**

Air Quality Division

Tinker Air Force Base
72 Air Base Wing (AFMC)
Attn: Martin Wheeler
7535 5th St, Building 400
Tinker AFB, Oklahoma 73145

Permit Number: 2009-394-C (M-4) (PSD)
Permit Writer: Ellis Fischer

SUBJECT: Facility: USAF Military Base, Air Force Material Command
KC-46A Project
Location: Sec 24, T11N, R2W
Facility ID: 1518
Oklahoma County, Oklahoma

Dear Mr. Wheeler:

Enclosed is the permit authorizing construction of the referenced facility. Please note that this permit is issued subject to standard and specific conditions that are attached. These conditions must be carefully followed since they define the limits of the permit and will be confirmed by periodic inspections.

As is customary with permit actions for federal installations in Oklahoma, permit fees are not collected until the permit is issued. Please consider this letter to be the invoice for the permit, with a fee of $5,000 now due. Payment should go to Ms. Kerri Housley, Air Quality Division, 707 N. Robinson, Suite 4100, Oklahoma City, OK, 73102, and reference the permit number in the correspondence.

Also note that you are required to submit an emissions inventory for this facility. An emissions inventory must be completed on approved AQD forms and submitted (hardcopy or electronically) by April 1st of every year. Any questions concerning the form or submittal process should be referred to the Emissions Inventory Staff at 405-702-4100.

Thank you for your cooperation. If you have any questions, please refer to the permit number above and contact the permit writer at (405) 702-4100 or email to ellis.fischer@deq.ok.gov.

Sincerely,

Phillip Fielder, P.E.
Permits and Engineering Group Manager
AIR QUALITY DIVISION