OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

MEMORANDUM **May 26, 2004**

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THROUGH: David Schutz, P.E., New Source Permits Section
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THROUGH: Peer Review

FROM: Richard Kienlen, P.E.

SUBJECT: Evaluation of Permit Application No. **2004-057-C (PSD)**
Fuel Component Testing Operations in Building 3108
Tinker Air Force Base
Oklahoma City, Oklahoma County
Directions: I-40 and Air Depot

SECTION I. INTRODUCTION

Tinker AFB (TAFB) submitted an application for a construction permit on February 17, 2004. During a recent comprehensive review of operations, equipment, and compliance surveys of air emission sources associated with the preparation of an Environmental Assessment for proposed construction, Tinker discovered a project that should have been permitted. The Base Realignment and Closure (BRAC) mandate to close Kelly AFB required a workload transfer, and corresponding equipment transfer, to TAFB.

Tinker is an existing major facility (SIC Code 9711) with emissions of nitrogen oxides (NOx), carbon monoxide (CO), and volatile organic compounds (VOCs) each exceeding 250 tons per year (tpy). The transferred equipment and workload from Kelly AFB increased VOC emissions above the Prevention of Significant Deterioration (PSD) Significant Emission Rate (SER) threshold of 40 tpy for major sources. Although the process in Building 3108 has not changed, the relocation of bulk replacement equipment to support newer weapon systems qualifies as a modification and is therefore subject to permit review.

SECTION II. PROCESS DESCRIPTION

TAFB provides depot-level maintenance for various weapon systems in the Air Force inventory. Part of this maintenance operation includes rework, repair, and calibration of accessories and components critical to aircraft fuel systems. This has been an integral part of Tinker's operational support mission provided under task from the Air Force Materiel Command.

Operational testing and calibrating of fuel system components in Building 3108 have been conducted since the 1940s. Building 3108 is located just west of Building 3001 and east of the primary North-South runway. The building has a north-south orientation extending for approximately 770 feet in length and varies in width from 100 to 140 feet, covering approximately 85,000 square feet.

Fuel system components are placed in the test stands, and calibration fluid (Stoddard solvent, CAS #64742-88-7), which simulates jet fuel, is circulated through each unit. Using calibration fluid in the test stands generates VOC emissions that are exhausted to the atmosphere. Although the operations and the testing process have not changed, the workload has changed as individual pieces of test equipment were replaced to accommodate updated weapon system support. In the early 1980s, the facility housed 163 individual fuel component test stands. Due to phasing out of aging weapon systems, gradually stands were used less and many were retired in place. In the mid-1990s, Tinker modified operations to expand to a new consolidated test facility (CTF) constructed east of Douglas Boulevard, but retained most operations in Building 3108. However, the facility was modified during the period 1999 through 2001 to accommodate workload transferred from Kelly AFB. Most of the Kelly fuel component testing workload and equipment were transferred to Tinker. The equipment was moved in three phases spanning over three calendar years. Since Tinker constructed (installed) these relocated test stands from the San Antonio Air Logistic Center, this initiative constituted a new workload and equipment, and thus it should have been reviewed for a permitting action. Some of this equipment at Kelly operated under two permits (Permits No. 20018 and No. 6493) issued by the Texas Natural Resource Conservation Commission (TNRCC).

SECTION III. EQUIPMENT

Listed below are descriptions of the equipment associated with the process:

Calibration Fuel Tanks

Calibration fuel (Stoddard solvent or "calfluid") is delivered via tanker truck and stored in two 10,000-gallon storage tanks. The tanks are below ground-level in a concrete-vaulted containment constructed such that any leaks/spills would be contained therein. Two additional 10,000-gallon recovery tanks contain wastewater and spent calibration fluid. The wastewater and waste calfluid are pumped into tanker trucks for disposal. Wastewater is processed through Tinker's industrial wastewater pretreatment plant. Waste calfluid is pumped to tanker trucks and stored at Tinker's hazardous waste facility until removed for disposal.

Test Stands

Tinker has approximately 90 test stands housed in Building 3108. The stands were manufactured from the 1960s to the newest one in 1996. About 75 of the stands are operational at this time, although many operate only intermittently to meet workload demand. Of the remaining 15, some are destined for removal while others are pending repair. Approximately half of the total stands were transferred from Kelly AFB. Much of the relocated workload supports the F100 system (the F-15 and F-16 aircraft engines).

Each test stand is unique in that it is designed to test and calibrate a specific component or accessory of an aircraft fuel system. These test stands evaluate various parameters to ensure that particular components such as pumps, fuel control units, nozzles, et cetera, meet manufacturer performance specifications. Emissions from testing operations emanate either from the test stand during fuel circulation or from the sink area, if the stand is so equipped. Depending on the individual stand, many have sinks associated with them which catch calfluid losses due to connections, repairs, purging of calfluid, etc., while others such as the fuel spray ring stands do not have separate sinks. Most fluid losses are fugitive emissions. The test stands vent directly to the atmosphere through rooftop vents, while sink emissions are routed to the atmosphere via routine building ventilation.

Stoddard solvent, a medium petroleum naphtha, sometimes referred to as calibrating fluid or calfluid, is used to simulate aircraft fuel. Stoddard solvent is a Category C toxic and a VOC with a vapor pressure of approximately 3.1 millimeters of mercury (mmHG) (~0.06 pounds per square inch absolute [psia]) at 70°F. This is the only pollutant emitted as a result of these testing operations. The only other emissions associated with the operation are VOCs (calfluid) from delivery of calfluid to supply tanks and pickup of spent calfluid from recovery tanks.

SECTION IV. EMISSIONS

Emission calculations are grouped as shown in the previous section with all factors and assumptions described. No chemical classified as a Hazardous Air Pollutant (HAP) is used in the testing operations.

Calfluid Storage Tanks

The Environmental Protection Agency's (EPA) Tanks 4.09b program was used to calculate tank emissions based on a throughput of 154,000 gallons per year per tank. Since there are two supply tanks, this equates to a total yearly throughput of 308,000 gallons of Stoddard solvent. This quantity of calfluid represents the amount to accommodate potential workload fluctuations and generate approximately 400 tpy of emissions based on a 40% loss rate. Stoddard solvent is a medium naphtha (medium mineral spirit) with a molecular weight of ~128. The solvent is approximately 88% nonane. Since nonane is the most volatile solvent in the mixture, Tinker estimated tank emissions assuming 100% nonane, resulting in the conservatively estimated VOC emissions. The following table summarizes expected emissions assuming no losses in the process and thus the same emissions from both the supply tanks and waste fluid tanks.

Table IV-1: Tank Information and Losses

Tank Identification	Bldg 3108 – Tanks
Description	Horizontal
Contents	Nonane
Molecular Weight	128.26
Shell Length (ft)	15.0
Diameter (ft)	10.7
Volume (gallons)	10,000
Turnovers	15.4
Net Throughput (gal/yr)	154,000
Total Throughput (2 tanks)	308,000

Components	Losses (lbs/year)		
	Working Loss	Breathing Loss	Total Emissions
Nonane (-n) (per tank)	32.90	20.77	53.67
Total (4 tanks)	131.60	83.08	214.68

Note: Waste tanks are considered to contain calfluid also to provide total emissions versus the mixture of water and calfluid.

Test Stands

Emissions from test stands in the CTF were assumed to originate from tank venting and the volatization of solvent from both the sink and test units. A study later conducted to determine the effectiveness of the carbon adsorption filtration system in Building 3902 included other calculation assumptions to account for potential leaks. That study established a unit emission factor of 1.12 pounds (lbs) of solvent/stand/shift. Leak factors were applied from EPA's reference for VOC fugitive emission losses (EPA-453/R-95-017) to arrive at the 1.12 lb estimate. Leaks in the calibration piping, valves, flanges and fittings (inside the stand) appeared to be a significant contributor to the emissions from this operation accounting for over half of the emissions. Using standard evaporative calculations, sink losses accounted for only 35.7% of the losses. Tank filling losses at the test stand were estimated to be approximately 8% of the total.

The net result was that varying the assumptions would create a very wide range of emission rates based on factors such as size of sink, fluid levels, air velocity, mass transfer coefficient, etc. Consequently, Tinker continued to use the mass balance method of calculating VOC emissions assuming all calfluid not accounted for as having been emitted to the atmosphere. This is certainly conservative and accurate since emissions are based on calfluid delivered and calfluid recovered.

SECTION V. SCOPE OF REVIEW

Under Oklahoma Administrative Code (OAC) 252:100-8-31, Actual Emissions equal the average rate in tons per year at which the unit emitted a pollutant during a two-year period which precedes the particular date and which is representative of normal operation. For any emission unit which has not begun normal operations, Actual Emissions are equal to the potential to emit of the unit.

Table V-1: Building 3108 Emissions (from AEI)

Calendar Year	Permitted	Reported
1997	NA	31.60
1998	NA	28.67

The equipment from Kelly AFB was installed between 1999 and 2001. Therefore, the pre-project Actual Emissions are equal to 30 tpy of VOCs. Full PSD review is required for each pollutant emitted above a PSD SER level. Comparison of PSD SER thresholds to emissions is shown in the following table. The Potential to Emit is 400 tpy of VOCs, which is based on the actual emissions after the change plus 25% for workload variation. This results in a Net Emissions Increase of 370 tpy of VOCs from Building 3108 as shown in the following table:

Table V-2: PSD Applicability for Building 3108

Pollutant	Net Emission Increase	PSD Significance Level	PSD Review Required?
Ozone (as VOC)	370 tpy	40 tpy	Yes

The only pollutant emitted that exceeds the 40 tpy SER as a result of this operation is VOCs. Therefore, only emissions of VOCs from the test stand operations in Building 3108 are subject to PSD review.

SECTION VI. PSD REVIEW

As shown above, the proposed facility will have potential emissions above the PSD SER for VOCs. A full PSD review of emissions consists of the following:

- Determination of best available control technology (BACT)
- Evaluation of existing air quality and analysis of compliance with National Ambient Air Quality Standards (NAAQS)
- Evaluation of PSD increment consumption
- Determination of monitoring requirements
- Evaluation of source-related impacts on growth, soils, vegetation, visibility
- Evaluation of Class I area impact

These topics have been grouped together in the following manner:

1) BACT
2) Air Quality Impacts (contains all other remaining topics)

1) BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

1.1) Introduction

This BACT demonstration presents the information and analysis used to develop the control technology requirements for emissions of VOCs that may be released during operations of aircraft fuel component test stands in Building 3108 at Tinker. Included in this demonstration are sections on activities within Building 3108 subject to the BACT demonstration including emissions and source configuration data, regulatory applicability, the top-down methodology used to perform the BACT demonstration (EPA 1990), annualized cost information, and results of the cost-effectiveness analysis of the various control technology options.

1.1.1) <u>Regulatory Applicability</u>

Tinker is a major source of VOC emissions located in an ozone attainment area. In accordance with the project review and emission control programs under the Clean Air Act (CAA), Federal BACT requirements apply to any major source of a pollutant that triggers PSD review. Based on projected emission estimates of operations within Building 3108, VOCs are the only criteria pollutant emitted above its PSD level. This BACT analysis therefore covers VOCs in the top down analysis process.

1.1.2) <u>BACT Methodology</u>

A BACT demonstration is based on a top-down evaluation of emission control technologies outlined in the US Environmental Protection Agency's (EPA's) *Fundamentals of New Source Review 1995-1996 Workshop Series* and *1990 New Source Review Workshop Manual (draft)*, consisting of five steps.

This BACT analysis identifies available control options for the air pollutant of concern and determines technical feasibility of each control option. Technically infeasible options may be eliminated from further consideration and the remaining control options are ranked in order of control effectiveness. Following control efficiency, the remaining control options are evaluated for cost-effectiveness, beginning with the most effective control system. If the top technology is shown to be inappropriate, then the next most effective control is evaluated. This process continues until the technology under consideration cannot be eliminated, or until "no controls" is the only remaining option.

1.2) Identification of Control Technologies

1.2.1) BACT/LAER Clearinghouse Review and Literature Search

A review was conducted of EPA's RACT/BACT/LAER Clearinghouse (RBLC), to identify BACT demonstrations for similar permit applications (http://cfpub1.epa.gov/rblc/cfm). Because aircraft component testing is not listed as a specific process type in the RBLC, the database was reviewed for similar types of processes.

The RBLC search identified a BACT determination for organic evaporative losses (process type 49.999) for one project conducted by Delphi Energy and Engine and Management Systems (Delphi) that showed similar source characteristics. Permit Application No. 118-97A to the Michigan Department of Environmental Quality (MDEQ) proposed modification to automobile fuel testing operations for electric fuel pumps at Plant 2 located in Flint, Michigan. As with the Tinker test stands, the Delphi facility conducts performance testing on fuel pumps using Stoddard solvent. The Delphi project was the only RACT/BACT/LAER determination identified for an operation similar to the Tinker process.

1.2.2) Determination of Technological Feasibility

The determination of feasibility is based on availability and applicability. For availability, the control must have at least reached the licensing and commercial development stage to be considered. For applicability, the control must demonstrate that, based on physical, chemical, and engineering principles, the control option could be used successfully.

Technologically feasible VOC control technologies include granular activated carbon beds, catalytic oxidation, and thermal non-catalytic oxidation. Other methods are commercially available for VOC abatement from off gas streams, such as membrane vapor separation, pressure swing adsorption or desorption, and cryogenic separation, but these are mainly concerned with VOC recovery as opposed to destruction. These control technologies were considered less environmentally preferable (and more expensive) because they all involve an exchange in media rather than the destruction of the pollutant. Such a recovered liquid stream would result in a different hazardous waste concern. Control options determined to be technologically infeasible were eliminated from further consideration in the BACT analysis. A brief description of the technically feasible control options is presented below.

1.2.2.1) Granular Activated Carbon Beds

Activated carbon beds have been used extensively in controlling VOC emissions from a wide variety of sources due to their scalability and versatility and effective control of low temperature emission streams. The effectiveness of a carbon bed system depends on the contact time between the air being purified and the activated carbon. The thicker the carbon bed is and longer the contact (residence) time, the higher the removal efficiency. The effectiveness of an activated carbon bed for removal of VOC can be measured by its adsorption capacity, which is a function of the type of VOC, its influent concentration, the operating temperature, and type of carbon. The adsorption capacity is typically expresses as weight percent (mass of VOC adsorbed per unit mass of carbon). Compounds with higher boiling points have a greater affinity for adsorption than compounds with lower boiling points.

There are two types of carbon beds: regenerative and non-regenerative. When the carbon is regenerated using steam or an inert gas, it is operated in the opposite direction to maximize removal of VOC. On-site regeneration is often performed when there is an economic incentive to recover the adsorbed VOC or extend the life of the carbon. For applications where low influent VOC concentrations result in a long carbon change-out frequency, replacement of the carbon instead of regeneration may be a more viable option. Based upon research and applications, VOC control efficiencies range between 95% and 98% for input organic concentrations between 500 and 2,000 parts per million (ppm) in air (EPA 1999c).

1.2.2.2) Catalytic Oxidation

A catalytic oxidation unit allows the oxidation of VOCs at relatively low temperatures, using a metal catalyst such as platinum alloys, copper oxide, etc. In this unit, organics are decomposed into carbon dioxide and water vapor. VOC destruction efficiencies range between 95% and 99%, depending on the operating temperature. These temperatures can range from as low as 275 °F (135 °C) to as high as 850 °F (455 °C), depending on the catalyst and the desired destruction efficiency. A heater might be needed upstream from the oxidation unit to achieve the reaction temperature. Once heated, the offgas enters the oxidizer and mixing chamber, where the offgas constituents are mixed thoroughly and obtain a uniform temperature. The offgas stream enters the catalyst bed and an exothermic reaction occurs, leading to combustion of the VOCs.

1.2.2.3) Thermal Non-Catalytic Oxidation

This unit oxidizes VOCs in a similar way to the catalytic oxidation unit described above, with the difference that the thermal unit operates at a higher temperature, up to 1,500 °F (800 °C) and contains no catalyst. Thermal oxidation units are typically single chamber, refractory-lined oxidizers equipped with a propane or natural gas burner and a stack. Lightweight ceramic blanket refractory is used because many of these units are mounted on skids or trailers. Thermal oxidizers are often equipped with heat exchangers where combustion gas is used to preheat the incoming contaminated gas. Flame arrestors are always installed between the vapor source and the thermal oxidizer. Burner capacities in the combustion chamber range from 0.5 to 2.0 giga-joules (GJ) (0.5 to 2 million British thermal units [MM Btu]) per hour. Operating temperatures range from 760 to 871 °C (1,400 to 1,600 °F), and gas residence times are typically 1 second or less. This condition causes the molecular structure to break down into carbon dioxide and water vapor.

As with the catalytic oxidation unit, the gas enters the unit through a heating system, is preheated to its combustion temperature, and is held at this temperature until the organics present have been oxidized. For low concentration streams of VOC exhaust, supplemental fuel is needed to maintain the proper oxidation temperature. For VOC streams above a concentration of 3.8%, the reaction is self-sustaining. Per manufacturers' data, this process can attain greater than 98% VOC destruction and 95% heat recovery. These units are available off-the-shelf by a variety of manufacturers.

A heat exchanger may also be used as a heat recovery unit. A summary of the advantages and disadvantages for each of the three technically feasible control options is presented in Table 1-1.

Table 1-1: Summary of Technically Feasible Technologies

Control Technology	Advantages	Disadvantages	Control Efficiency
Granular activated carbon bed	• Simple design and inexpensive • Adaptable to high flow rate	• Poisoning of the carbon (sorbent) can cause release of high levels of untreated VOCs to the environment • Organic vapor mixtures and moisture in the emission stream may impact efficiency of carbon bed.	95 – 98 %
Catalytic oxidation	• High level of VOC destruction • Simple, passive, packed bed design • Reaction products are carbon dioxide and steam	• Careful monitoring of temperature for proper functioning • Catalyst bed will need to be disposed of as mixed waste if contamination occurs • Incomplete destruction of VOCs can produce flammable compounds • Poisoning of the catalyst can cause release of high levels of untreated VOCs to the environment	95 - 99 %
Thermal non-catalytic oxidation	• No catalyst or sorbent requiring disposal as mixed waste • No internal components requiring maintenance or removal other than preheater elements, which can be sheathed to prevent contamination • Proven technology which has obtained regulatory approval as BACT • Complete destruction of VOCs to form carbon dioxide and steam	• High temperature and high energy consumption • Temperature has to be controlled to ensure satisfactory operation • Incomplete destruction of VOCs can produce flammable compounds	95 – 99 %

Another thermal oxidation process is Regenerative Thermal Oxidation (RTO). RTO units are distinguished from other thermal incinerators by their ability to recover heat at high efficiency. RTO technology uses high temperature to convert VOCs into carbon dioxide and water vapor.

RTO units commonly take advantage of the heat recovery system in the unit to condense organic vapors and concentrate the emissions stream. This allows more efficient combustion, decreases supplemental fuel needs, and may require a smaller unit to control the emission stream.

1.3) Ranking of Control Technologies

There are advantages and disadvantages associated with each type of control technology, as shown in Table 1-1, however there is little difference between the control technologies when compared against each other for control efficiency. All three technologies show a 95% control as low-end destruction efficiency. Oxidation processes, however, demonstrate up to 99% control, whereas carbon only reports an upper-end value of 98% control of VOC emissions as achievable. Although lower maximum achievable control efficiency does not, in itself, remove activated carbon from being a feasible alternative, it may be used when considering the overall ranking of this control technology.

Cost data may also be used to rank activated carbon absorption, catalytic oxidation, and thermal oxidation. The cost data developed for that application evaluated four separate types of control technologies: activated carbon (regenerative and non-regenerative), catalytic oxidation, and thermal oxidation. The cost data for each type of VOC emission control technology was compared to determine the relative annualized costs for each. Table 1-2 presents a summary of cost data for the Delphi test stands.

Table 1-2: Summary of Cost Data for Delphi Test Stands [1]

Cost Parameter	Regenerative Carbon	Thermal Oxidation	Catalytic Oxidation	Non-regenerative Carbon
Total Capital Cost	$1,009,015	$945,251	$873,950	$989,720
Annualization Factor (0.1628) [2]	$164,268	$153,887	$142,279	$161,126
Total Annual Costs	$172,549	$119,765	$135,125	$165,656
Total Annualized Cost	**$336,817**	**$273,652**	**$277,404**	**$326,782**

[1] Cost data obtained for Permit Application 118-97A from MDEQ.
[2] Annualized cost based on a 10% interest and 10-year depreciation.

The cost data suggests that thermal oxidation is the least expensive emission control technology when compared to catalytic oxidation and activated carbon processes. Conversations with the MDEQ confirmed that these costs were based on assumptions that they control an influent emissions stream with the same characteristics (type of pollutant, volumetric flowrate, VOC concentration, temperature, etc.) to ensure fair comparison of the cost data.

Because thermal oxidation is shown to provide the highest destruction efficiency, while also being the least expensive control technology evaluated, it may be assumed that for the purposes of this BACT analysis thermal oxidation will provide the most cost effective control option when compared with other technologically feasible alternatives. Therefore, the cost-effectiveness analysis for equipping the test stands with BACT will be based on evaluating various types of thermal oxidation control systems. As discussed earlier, an RTO is designed to maximize the use of heat recovery in the destruction process and may be considered as a cost-effective alternative to traditional thermal oxidation designs.

1.4) BACT Cost-Effectiveness Analysis

PSD regulations allow the cost-effectiveness to be considered when determining emission reduction requirements for projects subject to BACT. Cost effectiveness is determined as the cost, in dollars, to control a specific quantity of pollutant. Cost-effectiveness is usually expressed in units of dollars per ton of pollutant removed.

To assist facilities with BACT cost-effectiveness evaluations, the EPA Office of Air Quality Planning and Standards (OAQPS) has developed methodologies for calculating annualized costs based on standardized capital cost multipliers. This cost-effectiveness evaluation used the OAQPS methodology for estimating costs of emission controls.

To determine the cost of purchasing, installing, and operating an emission control device, a basis of cost must be assumed. For the purpose of this BACT analysis, the cost data generated in support of Delphi permit application 118-97A was used as the basis of cost estimation. The Delphi permit application contains the only similar BACT determination in the clearinghouse for a fuel component testing operation. The BACT analysis performed for the Delphi facility used OAQPS methods for cost estimation. Extrapolating cost data for thermal oxidation developed by Delphi is a suitable approach based on the similarity in process type to the test stand operations at Tinker, the identification in the RBLC, and the relative cost of thermal oxidation when compared to other technically feasibly technologies.

To validate this approach, the OAQPS Air Compliance Advisor (ACA) software version 7.5 was used. The ACA is a software tool designed to assist in the development of strategies for addressing air pollution compliance issues. The ACA utilizes source characterization, emission reduction techniques, permit requirements, and existing air pollution regulations. The results can then be used to address the requirements of the 1990 CAA including Title V. Version 7.5 updates the control device cost equations, based on Version 6.0 of the EPA’s Cost Control Manual.

The distribution of test stands throughout Building 3108 presents a particular challenge for evaluating an effective emission control design. The analysis is based on controlling up to 320 tons/year of VOC from the test stands located throughout Building 3108 assuming a combined capture and control effiency of 80%. Emissions control may be centralized, connecting emission streams from all test stand areas in the building to a single thermal oxidation unit through an extensive system of ductwork, or decentralized where multiple thermal oxidation systems are installed to remove VOC emissions from specific sets of test stands. The available cost data supports a separate evaluation of these two control designs. Cost data was modified to account for equipment and site-specific requirements for a centralized and distributed control system.

1.4.1) Use of Alternative Materials

Performance testing of fuel control components at Tinker is performed to ensure the equipment is defect free. It is necessary to test all fuel components. When in use, fuel components are required to deliver JP-5 (military aircraft fuel) from the fuel tank to the engine under very complex flight conditions and the fuel delivery system plays an important role in aircraft safety. Failure of the fuel delivery system under flight conditions could cause injury to aircraft occupants and is not acceptable. Therefore, testing of the fuel components must simulate actual condition of fuel delivery. JP-5, however, is a volatile and flammable organic material. In an effort to reduce emissions and safety hazards that would be associated with using JP-5 for fuel component testing, Tinker uses Stoddard solvent to test fuel components. Tests show that Stoddard solvent has the necessary characteristics to simulate JP-5, while possessing the characteristics of lower volatility and lower odor. Stoddard solvent is used in lieu of JP-5 for all aircraft fuel components testing performed in Building 3108 test stands.

1.4.2) Centralized Emission Control System

This section discusses the assumptions included in the cost-effectiveness determination for a centralized emission control system and the results of the cost analysis. Some of the costs associated with a central system, however, cannot be quantified. For example, operations that rely on one control unit operate at an increased overall risk. If the device is out-of-service for any period of time without an emergency back-up system due to unscheduled repairs, then production level at the depot may be impacted. An emergency breakdown could also delay the regulatory agency authorizing use of the test stands. These impacts are not included in this determination and will have to be considered as managed risks and evaluated separately from cost-effectiveness.

1.4.3) Basis of Cost Analysis

Developing a centralized system to control VOC emissions from test stand operations in Building 3108 has advantages and disadvantages that affect cost-effectiveness. The assumptions and methodologies used to develop capital and operating costs are presented below.

1.5) Capital Costs

1.5.1) <u>Estimation for Purchase Cost</u>

Capital costs include the purchase of equipment, and direct and indirect installation costs. The cost for a thermal oxidizer depends on the size of the unit. The selection of a thermal oxidizer unit size would be dependent on both the quantity of emissions that must be controlled, and the volume of air that must be handled through the system. Because the size of a thermal oxidizer big enough to control all VOC emissions from test stand operations in Building 3108 is significantly larger than the units evaluated by Delphi, cost data of the control equipment was extrapolated based on two reference points. The extrapolation was based on a linear regression. Detailed cost spreadsheets for the two cost reference points are provided in Attachment A of the application.

1.5.2) <u>Estimation of Installation Costs</u>

Also included in capital cost estimates are direct and indirect installation costs. To adequately control the quantity of VOC emissions from all Building 3108 test stands will require moving a very large volume of air. A central control system in Building 3108 will require a system that can handle a flowrate of at least 114,000 cubic feet per minute (assuming 48 test stands each with a minimum fan requirement of 2,300 cubic feet per minute). The actual fan requirement may need to be even greater in order to overcome the static resistance of the air mass moving with a high degree of surface area contact through such long stretches of ductwork. Also of importance would be creating and maintaining equalized pressure across the ventilation lines and hood system between test stands, which may be located over 400 feet from the emission control unit. Special site considerations such as these may require larger or more numerous fans than is typically associated with traditional thermal oxidation designs for conveyance of emissions. For this analysis however, Delphi data was extrapolated to estimate fan requirements.

To account for connecting test stands to a central control device the cost analysis assumed that additional ductwork would be required. The factor used to estimate the cost of ductwork was increased from the OAQPS default value of 0.01 to an adjusted value of 0.10. Although the actual cost for ductwork may differ based on a final design, this provides a good working estimate that catches the upper bound. An increase in costs for engineering was also assumed to account for additional design considerations. All capital costs were annualized based on 10% interest and 10-year depreciation.

1.5.3) <u>Application of the Consumer Price Index</u>

The Delphi data was developed in 1997, so purchase equipment costs had to be escalated for inflation. Purchase costs were escalated from 1997 costs to 2003 costs, inclusive, (seven annual adjustments) using the Consumer Price Index (CPI) from Consumer Price Index Summary: September 2003 from the US Department of Labor: <u>http://www.bls.gov/cpi/</u>. The CPI was applied only to the purchase cost of the unit. This can be done because other estimates, such as the cost of installation and auxiliary equipment are developed as direct multipliers of the purchase cost.

1.5.4) Operating Costs

The direct annual cost necessary to operate the control system includes operating and maintenance labor, and utilities. The OAQPS default values of 0.5 hours per day for the number of operating days per year was used to estimate the operations and maintenance requirement. An hourly rate of $12.96/hour was assumed. Other operating variables that may affect cost, such as supplemental fuel requirements are assumed to be the same as a distributed emission control system because it is expected that the concentration of VOC will remain the same. The cost for repair and maintenance are based on the requirements of a single unit and also assumed to be the same as OAQPS default values for BACT cost-effectiveness determinations. Utility rates for power and fuel were based on Oklahoma rates. The analysis used the average electricity rate in Oklahoma of $0.041 per kilowatt-hour, based on data from 2003 Electricity Cost in Oklahoma from Oklahoma Electric Cooperative, Inc. (http://www.okcoop.org/services/rates.shtm). Natural gas was estimated to cost $4.500/million cubic feet based on 2003-2004 forecast data developed by the Natural Gas Supply Association (http://www.ngsa.org/docs/winter_2003/winter_outlook_exec_summary.pdf).

1.5.5) Results of Cost Analysis for Centralized Control

A result of the cost analysis is a cost-effectiveness value for controlling VOC emissions from the test stands in Building 3108 assuming a single thermal oxidation system. The control system has the capacity to remove 320 tons of VOC emissions annually with a flow rate of 114,369 standard cubic feet per minute (SCFM). The total capital investment for a centralized thermal oxidizer control system would be approximately $5,874,347. The total capital investment was annualized assuming an annualization factor of 0.1627, which is based on 10% interest and ten year depreciation. Including direct costs, the total annualized cost for the central system is estimated at $1,439,171, which corresponds to a cost effectiveness figure of $4,497 per ton of VOC removed. This estimated expense is not within the cost effectiveness guidelines for an add-on control device.

Table 1-3 presents the key elements of the cost analysis for the centralized option. The entire cost analysis spreadsheet for the centralized system is provided in Attachment B of the application.

Table 1-3: Summary of Cost Analysis for Centralized Thermal Oxidizer System

Centralized Control System	Value
Total SCFM	114,369
Total Tons VOC Controlled / Yr [1]	320
Total SCFM / Total Tons VOC Controlled	357
Purchase Equipment Cost	$3,648,663
Total Capital Investment	$5,874,347
Total Operating Cost	$293,370
Total Annual Cost [2]	$1,439,171
Cost Effectiveness ($ Cost / Ton VOC Removed)	$4,497

[1] This is based on 80% control of 400 tpy.

[2] Total Annual Cost based upon 10% interest and 10-year depreciation.

1.5.6) Distributed Emission Control System

Even if thermal oxidation is cost-effective as a control technology, physical limitations such as static air resistance or difficulties in achieving equal or consistent pressure (vacuum) across all emission units may make some design configurations unrealistic. Therefore, a cost-effectiveness demonstration was completed to evaluate the installation of multiple thermal oxidation units to see if this was also a cost-effective alternative.

This section discusses the assumptions included in the cost-effectiveness determination for a decentralized or distributed emission control system, and the results of the costs analysis.

1.5.7) Basis of Cost Analysis

Developing a distributed system to control VOC emissions from test stand operations in Building 3108 has advantages and disadvantages that affect cost-effectiveness. The assumptions and methodologies used to develop capital and operating costs are presented below.

1.5.7.1) Capital Costs

This analysis assumes four separate thermal oxidizers, and that each system is sized to handle the same mass of air VOC pollutant. Based on these assumptions, Delphi data was extrapolated to estimate the cost of four emission control systems that each removed 80 tons/year of VOC using the same approach used to develop cost estimates for a centralized control system. Purchase costs were also escalated based on the CPI. The distributed system did not include increased costs for ductwork or other cost functions beyond the cost multipliers recommended by OAQPS.

To estimate the total cost to control all 320 tons of VOC emissions/year from test stand operations, the capital cost estimated for an 80-tons/year-control system was multiplied by a factor of four.

1.5.7.2) Operating Costs

Estimation of operating costs for a distributed system generally follows the approach detailed for the centralized system. Most direct and indirect annual cost categories are multiplied by a factor of four to estimate the total annual cost for the entire distributed system. However, direct annual cost estimates assume minor changes to operational and maintenance costs due to an expected decrease in labor requirements for operating and maintaining four thermal oxidation units. Operations and maintenance costs for the single system are scaled up by a factor of two (rather than four) when calculating costs for the entire distributed system. As a result, indirect annual costs also decrease, as overhead is a function of the operational and maintenance labor costs. Overhead is also scaled up by a factor of 2 when calculating the cost for the entire distributed system. These scaling assumptions provide a slightly lower estimation of total annual cost for the entire distributed system, therefore decreasing the overall cost-effectiveness value slightly (e.g., making it a slightly more cost-effective alternative to consider).

1.5.7.3) Results of Cost Analysis for Decentralized Control

A separate cost analysis was conducted for the control of VOC emissions using a system of four thermal oxidation control units. The cost analysis for the distributed control system is a two-step process. First, a cost basis was developed for a single thermal oxidation control system. The size of this unit was based on the control requirements to remove 80 tons of VOC emissions annually from 12 test stands with a flow rate of 28,592 SCFM.

To control all VOC emissions from Building 3108, the single system's cost basis is scaled to incorporate an additional 3 thermal oxidation systems. The development of the cost analysis for the entire distributed system incorporates minor changes in the direct annual costs by assuming that operation and maintenance costs do not increase linearly with number of systems implemented. The total capital investment for the entire distributed system is $5,874,347 with a cost effectiveness of $6,638 per ton of VOC removed. The decrease in cost effectiveness is a result of scaled up operational and maintenance costs, with the assumption that the labor requirements to operate and maintain 4 units do not increase linearly with the number of systems implemented. Table 1-4 provides the key elements of the cost analysis for the distributed option. The detailed cost analysis spreadsheets are provided in Attachment C of the application.

Table 1-4: Summary of Cost Analysis for Distributed Thermal Oxidizer System

Distributed Control System (4 units)	Total System
Total SCFM	114,368
Total Tons VOC Controlled / Yr [1]	320
Purchase Equipment Cost	$3,648,664
Total Capital Investment	$5,874,347
Total Annual Cost [2]	$2,124,012
Cost Effectiveness ($ Cost / Ton VOC Removed)	$6,638

[1] This is based on 80% control of 400 tpy.

[2] Total Annual Cost based upon 10% interest and 10-year depreciation.

1.5.8) *Summary of Cost-Effectiveness*

This summary compares the cost-effectiveness of a centralized control system with a distributed control system. The BACT analysis estimated the cost-effectiveness to control VOC emissions generated by operations from the fuel component test stands in Building 3108 at Tinker. Costs developed to determine control technology effectiveness were based on a previously conducted BACT submitted to the MDEQ by Delphi, and supplemented with site-specific cost considerations. Table 1-5 summarizes these costs.

Socio-economic factors are considered when regulatory agencies develop cost-effectiveness thresholds. However, any potential cost associated with the environmental justice program have not been addressed in this analysis.

Because of the scheduled demolition and replacement of Building 3108, this analysis shows that the centralized and distributed systems are not cost-effective alternatives for controlling VOC emissions from Building 3108 test stand operations. It should be noted that site-specific conditions were not considered that would likely increase the control costs. These include, most significantly, construction costs related to the retrofit of ducting into the aged building and space constraints.

Table 1-5: VOC Control Technology Cost Effectiveness

Cost Parameter	Central Thermal Oxidation Control System	Distributed Thermal OxidationControl System
Number of Units	1	4
Total Capital Investment	$5,874,347	$5,874,347
Tons Controlled [1]	320	320
Total Annual Cost [2]	$1,439,171	$2,124,012
Cost Effectiveness ($/Ton VOC Removed)	$4,497	$6,638

[1] This is based on 80% control of 400 tpy.

[2] Total Annual Cost based upon 10% interest and 10-year depreciation.

1.6) BACT Selection

Because of the unique design challenges that Tinker would face in collecting VOC emissions and routing them to a control device, actual engineering work on the system must be performed before a final cost can be determined. Also, a replacement facility for Building 3108 is programmed in the FY08 military construction program. This BACT analysis determined that thermal oxidation is not cost-effective in controlling VOC emissions from stand operations when total annual costs are depreciated over the ten-year time period that Bldg. 3108 will be in use.

Therefore, for this building BACT is acceptable as no add-on control, and proper operation and maintenance of the stands.

This conclusion is affected by the depreciation period. These control technologies appear to be cost-effective for longer depreciation periods. Tinker will review control technology options for the future building that will house the Building 3108 test stand operations.

AIR QUALITY IMPACTS

The following air quality impact analyses includes comparison of modeled impacts to Significant Impact Levels (SILs) and NAAQS, modeled impacts to allowable increment concentrations, and monitoring exemption levels.

2.1) Ozone (VOC) Impacts

Ozone is unique among other criteria pollutants because the EPA has not established a PSD modeling significance level; however, the EPA has established a PSD SER of 40 tpy of VOCs as a precursor to ozone formation. In accordance with applicable guidance, an ambient impact screening analysis using the Scheffe Method was performed to demonstrate compliance with the ozone NAAQS. ODEQ AQ guidance requires such analysis if project VOC emissions are greater than 100 tpy.

The Scheffe Method is a screening procedure used to calculate the increase in ozone above an ambient value due to a VOC dominated source. A series of lookup tables are used to estimate the ozone increase due to the project-related emissions. Use of the Scheffe method requires knowledge of the ratio of maximum annual non-methane volatile organic compounds (NMVOC) to NO_X emissions from the facility. For this screening analysis, total VOC emissions reported in the Air Emissions Inventory (AEI) are assumed to be NMVOC and VOC and NO_X emissions were assumed to be equal to the reported emissions from the past two years (2001 & 2002). Thus, the Scheffe analysis was based on annual facility VOC and NO_X emissions of 674 tpy and 297 tpy, respectively, yielding a NMVOC/NO_X ratio of 2.27. This ratio was multiplied by 2.88 to relate emissions to molar units consistent with ambient VOC/NO_x ratios,[1] for an adjusted ratio equal to 6.52.

Based on the prevailing project area land use, the urban area look-up table was used to determine the ozone increment attributable to activities at Tinker AFB. The ozone increment was determined by linear interpolation of the values from the column for NMVOC/NO_X ratio between 5 and 20 and maximum VOC emissions between 500 tpy and 750 tpy as shown below:

$$\text{Ozone Increment (ppm)} = 0.020\,\text{ppm} + \frac{(674-500)\,tpy}{(750-500)\,tpy}\; x\,(0.026\;ppm - 0.020\;\;ppm) = 0.024\,\text{ppm}$$

The predicted 1-hour ozone concentration is the sum of the ozone increment attributable to activities at Tinker AFB and the appropriate background concentration. The closest background (upwind) ozone monitor is located in McClain County, Oklahoma (SLAMS Monitor Number 400871073)[2]. Attainment of the 1-hour ozone standard is achieved when there are no more than

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[1] Texas Council on Environmental Quality (formerly Texas Natural Resource Conservation Commission) Interoffice Memorandum, “One-Hour Ozone Screening Technique”, March 3, 2000.

[2] The monitored concentrations from monitors located in OK and Cleveland counties include include ozone which can reasonably be attributed to emissions from Tinker AFB. Therefore, they are not representative of background conditions. The monitoring objective of the McClain County monitor listed on the USEPA AirData website is upwind/background for the Oklahoma City MSA; therefore, this monitor is appropriate for background concentration.

3 exceedances of the standard in a given 3-year period. Therefore, the fourth highest monitored hourly ozone concentration is used as the appropriate background concentration. The fourth highest monitored hourly ozone concentration for the McClain County, Oklahoma monitor in the three-year period (2000-2002) was 0.094 parts per million (ppm). Therefore, the predicted 1-hour ozone concentration is 0.118 ppm (0.024 ppm + 0.094 ppm), which is less than the applicable standard of 0.12 ppm.

The Scheffe Method is not appropriate to predict 8-hour average ozone concentrations. However, since this is a retroactive permit, the use of actual ambient concentration data provides real-world impact data. The November 2003 issue of the *Air Quality Update* included a table showing the highest 8-hour ozone concentrations for the period 01 January 2001 through 02 October 2003. The data for all Oklahoma County area monitoring sites indicate the area is in compliance with the new ozone NAAQS 8-hour standard of 0.08 ppm.

2.2) PSD Increment

A PSD increment is the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a pollutant. The baseline concentration is defined for each pollutant and, generally, is set as the ambient concentration existing at the time that the first complete PSD permit application affecting the area was submitted. Significant deterioration is said to occur when the amount of new pollution would exceed the applicable PSD increment. It is important to note, however, that the air quality cannot deteriorate beyond the concentration allowed by the applicable NAAQS, even if the entire PSD increment is not consumed.

Neither the EPA nor the ODEQ has promulgated or otherwise adopted a PSD increment for ozone. Since VOCs are a precursor to ozone formation and not a criteria pollutant, an increment analysis cannot be performed for this project. As noted above, the predicted 1-hour ozone impact for the project is less than the applicable NAAQS.

2.3) Additional Impacts Analysis

2.1.1) Growth Impacts

Operating the new test stands generated approximately 35 new, permanent jobs. Some highly experienced and trained staff transferred to Tinker AFB from Kelly AFB. The Oklahoma Employment Security Commission reported an unemployment rate of 2.7% in 1999 for Oklahoma County. This amounts to an available unemployed labor force of approximately 9,000. Since an available labor force existed in Oklahoma County, it is unlikely that the additional work load contributed to any appreciable population growth in the Oklahoma City area.

2.1.2) <u>Soils and Vegetation</u>

This section considers potential impacts to soil and vegetation resulting from the VOC emissions. VOCs generally do not deposit onto surfaces due to their intrinsic volatile properties. Furthermore, there are no major commercial agricultural activities nearby Tinker. Therefore, it is reasonable to assume that these emissions will not have any adverse effects on local soils or vegetation.

2.1.3) <u>Visibility Impairment</u>

The project is not expected to produce any perceptible visibility impacts in the vicinity of the source. The EPA program used to perform a visibility impacts analysis is intended to predict distant impacts. However, because VOCs are largely transparent to visible light, they do not contribute to visibility impairments. It is concluded that there will be minimal impairment of visibility resulting from the facility's emissions. Given the limitation of 20% opacity of emissions, and a reasonable expectation that normal operation will result in 0% opacity, no local visibility impairment is anticipated.

2.1.4) <u>Class I Area Impact Analysis</u>

The closest Class I Area is the Wichita Mountain Wildlife Refuge at approximately 142 km (88 miles). No impact to Class I areas is anticipated given the distance from the source. Therefore a formal demonstration of this is not provided.

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 252:100-3 (Air Quality Standards and Increments) [Applicable]
Subchapter 3 enumerates the primary and secondary ambient air quality standards and the significant deterioration increments. At this time, all of Oklahoma is in "attainment" of these standards. In addition, the facility was required to model proposed emissions to demonstrate that the facility would not have a significant impact on ambient air quality standards.

OAC 252:100-4 (New Source Performance Standards) [Not Applicable]
Federal regulations in 40 CFR Part 60 are incorporated by reference as they exist on July 1, 2002, except for the following: Subpart A (Sections 60.4, 60.9, 60.10, and 60.16), Subpart B, Subpart C, Subpart Ca, Subpart Cb, Subpart Cc, Subpart Cd, Subpart Ce, Subpart AAA, and Appendix G. NSPS are addressed in the "Federal Regulations" section.

OAC 252:100-5 (Registration, Emission Inventory, and Annual Fees) [Applicable]
The owner or operator of any facility that is a source of air emissions shall submit a complete emission inventory annually on forms obtained from the Air Quality Division. Because this is a

retroactive construction permit for a facility already in operation, the annual emission inventory report included the emissions, and fees associated with those emissions have been paid annually as invoiced by ODEQ.

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 which 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 HAPs or 20% of any threshold less than 10 TPY for single HAP that the EPA may establish by rule
- 0.6 TPY of any one Category A toxic substance
- 1.2 TPY of any one Category B toxic substance
- 6.0 TPY of any one Category C toxic substance

Tinker AFB submitted a Title V permit application on March 5, 1999. This construction permit establishes emission limits to include both previously 'grandfathered' equipment and replacement equipment. After appropriate public review, emission limitations on the process equipment will be incorporated into the Title V permit when issued or administratively if completed post-issuance.

OAC 252:100-9 (Excess Emission Reporting Requirements) [Applicable]
In the event of any release which results in excess emissions, the owner or operator of such facility shall notify the Air Quality Division as soon as practical during normal office hours and no later than 4:30 pm the next working day following the malfunction or release. Within ten (10) business days further notice shall be tendered in writing containing specific details of the incident. Part 70 sources must report any exceedance that poses an imminent and substantial danger to public health, safety, or the environment as soon as is practical; but under no circumstances shall notification be more than 24 hours after the exceedance.

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) [Not Applicable]
This subchapter specifies particulate matter (PM) emissions limits from new and existing fuel-burning equipment based on rated heat inputs. This application and permit does not have any fuel-burning equipment associated with this operation.

This subchapter also limits PM emissions from industrial processes. There are no particulate emissions from this facility.

OAC 252:100-25 (Visible Emissions and Particulates) [Applicable]
No discharge of greater than 20% opacity is allowed except for 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. No opacity is expected from volatile solvent evaporation, therefore, it is not necessary to specify any unique procedures to ensure compliance.

OAC 252:100-29 (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 will not cause a problem in this area; therefore it is not necessary to require specific precautions to be taken.

OAC 252:100-31 (Sulfur Compounds) [Not Applicable]
Part 5 limits sulfur dioxide emissions from new equipment (constructed after July 1, 1972). This application and permit does not have any fuel-burning equipment associated with this operation.

OAC 252:100-33 (Nitrogen Oxides) [Not Applicable]
This subchapter limits nitrogen oxides calculated as nitrogen dioxide from any new gas-fired fuel-burning equipment with a rated heat input of 50 MMBTU or greater to a three-hour maximum of 0.20 lbs/MMBTU. This fuel component test operation does not use fuel-burning equipment.

OAC 252:100-35 (Carbon Monoxide) [Not Applicable]
This facility has none of the affected sources: gray iron cupola, blast furnace, basic oxygen furnace, petroleum catalytic cracking unit, or petroleum catalytic reforming unit.

OAC 252:100-37 (Volatile Organic Compounds) [Not Applicable]
Part 3 requires VOC storage tanks with a capacity of 400 gallons or more to be equipped with a permanent submerged fill pipe or with a vapor recovery system. All tanks store a product with a vapor pressure below 1.5 psia.
Part 5 limits the VOC content of coatings used in coating lines or operations.
Part 7 requires fuel-burning and refuse-burning equipment to be operated and maintained so as to minimize emissions. Temperature and available air must be sufficient to provide essentially complete combustion.
Part 7 requires all effluent water separator openings, which receive water containing more than 200 gallons per day of any VOC, to be sealed or the separator to be equipped with an external floating roof or a fixed roof with an internal floating roof or a vapor recovery system.
Part 7 also requires all reciprocating pumps and compressors handling VOCs to be equipped with packing glands that are properly installed and maintained in good working order and rotating pumps and compressors handling VOCs to be equipped with mechanical seals.

None of the above requirements are applicable to this operation. Stoddard solvent has a vapor pressure of approximately 0.10 psi – well below the 1.5 psi threshold. There are neither coating operations nor fuel-burning equipment associated with this process.

OAC 252:100-39 (Emission of VOCs in Former Nonattainment Areas) [Not Applicable]
Part 7, Requirements for Specific Operations
-39-41 Storage, loading, and transport/delivery of VOCs. Per OAC 252:100-39-4, the facility is exempt from these requirements based on the Stoddard solvent having a vapor pressure below 1.5 psia.

OAC 252:100-41 (Hazardous and Toxic Air Contaminants) [Applicable]
Part 3 addresses hazardous air contaminants. National Emission Standards for Hazardous Air Pollutants (NESHAPs), as found in 40 Code of Federal Regulations (CFR) Part 61, are adopted by reference as they exist on July 31, 2002, with the exception of Subparts B, H, I, K, Q, R, S, T, W and Appendices D and E, all of which address radionuclides. In addition, General Provisions as found in 40 CFR Part 63, Subpart A, and the Maximum Achievable Control Technology (MACT) standards as found in 40 CFR Part 63, Subparts F, G, H, I, L, M, N, O, Q, R, S, T, U, W, X, Y, CC, DD, EE, GG, HH, II, JJ, LL, KK, OO, PP, QQ, RR, SS, TT, UU, VV, WW, YY, CCC, DDD, EEE, GGG, HHH, III, JJJ, LLL, MMM, NNN, OOO, PPP, RRR, TTT, VVV XXX, CCCC, GGGG, HHHH, NNNN, SSSS, TTTT, UUUU, VVVV, and XXXX are adopted by reference as they exist on July 31, 2002. These standards apply to both existing and new sources of hazardous air contaminants. NESHAP are addressed in the "Federal Regulations" section.
Part 5 is a state-only requirement governing toxic air contaminants. New sources (constructed after March 9, 1987) emitting any category "A" pollutant above de minimis levels must perform a BACT analysis and, if necessary, install BACT. All sources are required to demonstrate that emissions of any toxic air contaminant that exceeds the de minimis level do not cause or contribute to a violation of the Maximum Acceptable Ambient Concentration (MAAC). No category "A" pollutants are emitted as part of this testing process, however, BACT was required for PSD review. HAPs from sources subject to a Part 63 NESHAP are exempted from review under this part.

All sources are required to demonstrate that emissions of any toxic air contaminant which exceed the *de minimis* level do not cause or contribute to a violation of the MAAC. This section summarizes the methodology and results of the air dispersion modeling analysis conducted to demonstrate compliance with the MAAC standard for Stoddard solvent emissions at Tinker AFB. All modeling procedures used in this analysis are consistent with current USEPA and ODEQ guidelines.

The Industrial Source Complex Short-Term Version 3 (ISCST3) Prime model was utilized to determine maximum ground-level concentrations at the off-property receptors. Modeling was performed using the regulatory default option, which includes stack heights adjusted for stack-tip downwash, buoyancy-induced dispersion, and final plume rise. Ground-level concentrations occurring during "calm" wind conditions are calculated by the model using the calm processing feature. Regulatory default values for wind profile exponents and vertical potential temperature gradients are used. Other model options that are used include the use of urban dispersion coefficients and flat terrain. Per USEPA requirements, direction-specific building dimensions were used for both the Schulman-Scire and the Huber-Snyder downwash algorithms. Direction-specific building dimensions and the dominant downwash structure parameters used as input to the ISCST3 Prime model were determined using the BPIP Prime algorithm.

The modeling was performed using the Oklahoma City surface station (National Weather Service [NWS] Number 13967) and Oklahoma City upper air station (NWS Number 13967), and Norman upper air station (NWS Number 3948) for the years 1986, 1987, 1988, 1990, and 1991, elevated terrain, and urban dispersion coefficients. 1989 was excluded because of data which were not recorded during 3 weeks when the monitoring station was moved.

There are two sources of Stoddard solvent emissions on base, Buildings 3902 and 3108. Operations in Building 3902 have a PTE of 70 tpy, per permit 2002-095-0. Thus, the modeled Stoddard solvent emissions from all sources total 470 tons per year. The maximum modeled concentration was 202 $\mu g/m^3$ (using the 1986 meteorological data), which is considerably lower than the MAAC standard of 35,000 $\mu g/m^3$. Therefore, increased emissions of Stoddard solvent resulting from the proposed project are not expected to have a significant off-property impact. The following tables summarize the modeling results.

Table VII: MAAC De Minimis Thresholds for Calibration Fluid (Stoddard solvent)

Toxic	**CAS #**	**Category**	**De minimis Levels**		**Emissions**	
			lbs/hr	**tpy**	**lbs/hr**	**tpy**
Calibration Fluid	64742-88-7	C	5.6	6.0	107	470

Toxic	**CAS #**	**MAAC Allowed**	**Modeled Concentration**
Calibration Fluid	64742-88-7	35,000 ug/m^3	202 ug/m^3

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 Air Quality Director may require the owner or operator of any source in the state of 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 Air Quality Director and under the direction of qualified personnel. A notice-of-intent to test and a testing protocol shall be submitted to Air Quality 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.

SECTION VIII. FEDERAL REGULATIONS

PSD, 40 CFR Part 51 [Applicable]
The facility has VOC emissions exceeding the 250 TPY, and thus this modification exceeds the 40 TPY VOC threshold, therefore, it is subject to PSD review. PSD review has been completed in Section VI.

NSPS, 40 CFR Part 60 [Not Applicable]
Subpart Kb, Volatile Organic Liquids Storage Vessels.
This subpart affects VOL storage vessels (including petroleum liquids storage vessels) for which construction, reconstruction, or modification commenced after July 23, 1984, and which have a capacity of 19,813 gallons (75 cubic meters) or more. The EPA published a final rule in the October 15, 2003, Federal Register raising the applicable threshold along with other changes. Each storage and waste tank has a capacity of 10,000 gallons and therefore the tanks are exempt from this subpart as their capacity is below the de minimis level for applicability.

NESHAP, 40 CFR Part 61 [Not Applicable]
There are no emissions of any of the regulated pollutants: arsenic, asbestos, benzene, beryllium, coke oven emissions, radionuclides or vinyl chloride.

NESHAP, 40 CFR Part 63 [Not Applicable]
There are no emissions of any HAP associated with this process, therefore, this operation is not subject to Part 63.

CAM, 40 CFR Part 64 [Not Applicable At This Time]
Compliance Assurance Monitoring (CAM) as published in the Federal Register on October 22, 1997, applies to any pollutant specific emission unit at a major source, that is required to obtain a Title V 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
- It has potential emissions, prior to the control device, of the applicable regulated air pollutant of 100 TPY

No control devices are used to achieve compliance with applicable emission limits, therefore, Part 64 is not applicable.

Chemical Accident Prevention Provisions, 40 CFR Part 68 [Not Applicable]
This facility does not process or store more than the threshold quantity of any regulated substance [Section 112r of the Clean Air Act (CAA) 1990 Amendments]. Significant quantities of various fuels are stored at the base. However, on March 13, 2000, EPA published in the Federal Register an exemption for "flammable substances used as fuel," which is the case at Tinker. More information on this federal program is available at the web site: *http://www.epa.gov/ceppo/*.

Stratospheric Ozone Protection, 40 CFR Part 82 [Applicable]
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 which involves ozone-depleting substances. Therefore, this facility is not subject to these requirements. To the extent that the facility will have air-conditioning units that apply, the permit requires compliance with Part 82.

SECTION IX. COMPLIANCE

Tier Classification And Public Review

This application has been classified as a **Tier II** based on the request for a new construction permit for an existing major facility for any facility change considered significant under OAC 252:100-8-7(e)(2)(A) and which is not classified under Tier III. The applicant published the "Notice of Filing a Tier II Application" in the *Daily Oklahoman*, a daily newspaper in Oklahoma County, on February 28, 2004. The notice stated that the application was available for public review at the Midwest City Library, Midwest City, Oklahoma or at Air Quality Division's main office at 707 North Robinson, Oklahoma City, Oklahoma. A "Notice of Tier II Draft Permit" was published in the *Daily Oklahoman* on April 3, 2004, stating the draft permit was available for 30-day public review at the places listed above, and on the DEQ web page: www.deq.state.ok.us. EPA's 45-day concurrent review time began April 7, 2004, and ended May 21, 2004. No comments were received from either the public or EPA. This facility is not located within 50 miles of the Oklahoma border.

The permittee has submitted an 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 certifies that Tinker owns the land.

Inspection

Richard Kienlen and Rick Groshong of the ODEQ were accompanied on the inspection by Teresa Wheeler of Tinker AFB. The facility exists as described in the permit application and in this draft permit. Tinker has expanded their calibration fluid tracking database to include operations proposed to be permitted in this permit. That database system resides on a Sequel server on Tinker's intranet system so that recordkeeping is easily monitored. That recordkeeping system is being used to monitor the rolling 12-month averaging of emissions. The facility was operating as described in the permit application.

Fee Paid

Upon issuance of this permit, Tinker will be invoiced the construction permit application fee of $1,500.

SECTION X. SUMMARY

This facility is as described in the application. Ambient air quality standards are not threatened at this site. Air Quality's Compliance and Enforcement Sections concur with the issuance of this permit. Issuance of the construction permit is recommended.

PERMIT TO CONSTRUCT
AIR POLLUTION CONTROL FACILITY
SPECIFIC CONDITIONS

Tinker Air Force Base
Oklahoma City Facility **Permit No. 2004-057-C (PSD)**

The permittee is authorized to construct in conformity with the specifications submitted to Air Quality on February 17, 2004. The Evaluation Memorandum, dated May 26, 2004, is attached to this permit to explain the derivation of applicable permit requirements and estimates of emissions; however, it does not contain operating limitations or permit requirements. Commencing construction or operations under this permit constitutes acceptance of, and consent to, the conditions contained herein:

1. Points of emissions, emissions limitations, and requirements for each point:
[OAC 252:100-8-6(a)]

A) Test Stands

The permittee shall be authorized to construct (install) 48 fuel component test stands transferred from Kelly AFB in Building 3108. The remaining test stands were previously grandfathered, but are now subject to and included in the following requirements and limits:

VOC Emissions and Usage Limits for Test Stands in Building 3108

Product	Maximum VOC Content by Wt.	Emissions	
		lbs/hr*	TPY
Test Stands			
VOC (Stoddard solvent)**	100%	400.00	400.00

* The lb/hr assumes worst case in which the stands operate 8 hr/day, 5 day/wk, and 50 wk/yr.
** Calibration fluid (Stoddard solvent) is a medium aliphatic mineral spirit.

i) Compliance with the hourly emission rate limit shall be determined monthly and based on the total monthly usage divided by the total hours of operation of the test stands (facility). Compliance with the annual emission limit shall be determined monthly and based on 12-month rolling totals. [OAC 252:100-8-6(a)]

ii) All emission calculations shall be based on the highest concentrations (100%) as listed on the respective MSDS, and calculated according to (i) and mass balance.
[OAC 252:100-8-6(a)]

B) Tanks

Tank Number	Tank Use	Material	Size, gallons
T-1	Supply Tank	Calibration Fluid	10,000
T-2	Supply Tank	Calibration Fluid	10,000
T-3	Waste Fluid	Spent Calibration Fluid and Water	10,000
T-4	Waste Fluid	Spent Calibration Fluid and Water	10,000

Note: No limitations have been placed on the tanks as emissions are accounted for in the mass balance. Compliance with the annual emission limits shall be determined monthly and based on 12-month rolling totals. [OAC 252:100-8-6(a)]

2. Upon issuance of an operating permit, the permittee shall be authorized to operate continuously (24 hours per day, every day of the year). [OAC 252:100-8-6(a)]

3. Applicant shall not substitute any solvent for the Stoddard solvent used in this permit application which would alter the quality and nature, or increase the quantity, of the emission of an air contaminant beyond the level which has been described in the application and allowed by this permit, without prior notification of the Air Quality Division.

4. The permittee shall keep records of operations as listed below. These records shall be retained on-site for a period of at least five years following dates of recording and shall be made available to regulatory personnel upon request. [OAC 252:100-8-6(a)(1)]

a. Calfluid (Stoddard solvent) purchases and waste shipments (monthly and 12-month rolling total).
b. Current MSDS for Calfluid.
c. Mass balance and emission calculations demonstrating compliance with Specific Condition 1 (monthly and 12-month rolling total).

TITLE V (PART 70) PERMIT TO OPERATE / CONSTRUCT STANDARD CONDITIONS (October 15, 2003)

SECTION I. DUTY TO COMPLY

A. This is a permit to operate / construct this specific facility in accordance with Title V of the federal Clean Air Act (42 U.S.C. 7401, et seq.) 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, for revocation of the approval to operate under the terms of this permit, or for denial of an application to renew this permit. All applicable requirements (excluding state-only requirements) are enforceable by the DEQ, by EPA, and by citizens under section 304 of the Clean Air Act. This permit is valid for operations only at the specific location listed.
[OAC 252:100-8-1.3 and 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. [OAC 252:100-8-6 (a)(7)(B)]

SECTION II. REPORTING OF DEVIATIONS FROM PERMIT TERMS

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

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. Oral notifications (fax is also acceptable) shall be made to the AQD central office as soon as the owner or operator of the facility has knowledge of such emissions but no later than 4:30 p.m. the next working day the permittee becomes aware of the exceedance. Within ten (10) working days after the immediate notice is given, the owner operator shall submit a written report describing the extent of the excess emissions and response actions taken by the facility. Every written report submitted under this section shall be certified by a responsible official.
[OAC 252:100-8-6 (a)(3)(C)(iii)(I) and (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 on-site or at a nearby field office for a period of at least five 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), 8-6 (c)(1), and 8-6 (c)(2)(B)]

B. Records of required monitoring shall include:

(1) the date, place and time of sampling or measurement;
(2) the date or dates analyses were performed;
(3) the company or entity which performed the analyses;
(4) the analytical techniques or methods used;
(5) the results of such analyses; and
(6) the operating conditions as 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, 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. [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 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.

F. Submission of quarterly or semi-annual reports required by any applicable requirement that are duplicative of the reporting required in the previous paragraph will satisfy the reporting requirements of the previous paragraph if noted on the submitted report.

G. Every report submitted under this section shall be certified by a responsible official.

[OAC 252:100-8-6 (a)(3)(C)(iv)]

H. Any owner or operator subject to the provisions of NSPS shall maintain records of the occurrence and duration of any start-up, shutdown, or malfunction in the operation of an affected facility or any malfunction of the air pollution control equipment. [40 CFR 60.7 (b)]

I. Any owner or operator subject to the provisions of NSPS shall maintain a file of all measurements and other information required by the subpart recorded in a permanent file suitable for inspection. This file shall be retained for at least two years following the date of such measurements, maintenance, and records. [40 CFR 60.7 (d)]

J. 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 preventative or corrective measures adopted. [OAC 252:100-8-6 (c)(4)]

K. All testing must be conducted by methods approved by the Division Director under the direction of qualified personnel. All tests shall be made and the results calculated in accordance with standard test procedures. The permittee may request the use of alternative test methods or analysis procedures. The AQD shall approve or disapprove the request within 60 days. 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]

L. 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 252:100-4-5 and OAC 252:100-41-15]

SECTION IV. COMPLIANCE CERTIFICATIONS

A. No later than 30 days after each anniversary date of the issuance of the original 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. 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)(A), (C)(v), and (D)]

B. The 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; and a statement that the facility will continue to comply with all applicable requirements.

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

C. Any document required to be submitted in accordance with this permit shall be certified as being true, accurate, and complete by a responsible official. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the certification 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 which 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 listed in the Evaluation Memorandum and 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, -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 10 days after such date.

[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, 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 as necessary to remedy deficiencies 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 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.

C. If "grandfathered" status is claimed and granted for any equipment covered by this permit, it shall only apply under the following circumstances: [OAC 252:100-5-1.1]

(1) It only applies to that specific item by serial number or some other permanent identification.
(2) Grandfathered status is lost if the item is significantly modified or if it is relocated outside the boundaries of the facility.

D. To make changes other than (1) those described in Section XVIII (Operational Flexibility), (2) administrative permit amendments, and (3) those not defined as an Insignificant Activity (Section XVI) or Trivial Activity (Section XVII), the permittee shall notify AQD. Such changes may require a permit modification. [OAC 252:100-8-7.2 (b)]

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 emergency and/or 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. [The degree of promptness in reporting shall be proportional to the degree of danger.]

[OAC 252:100-8-6 (a)(3)(C)(iii)(II)]

B. 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. [OAC 252:100-8-2]

C. An emergency shall constitute an affirmative defense to an action brought for noncompliance with such technology-based emission limitation if the conditions of paragraph D below are met. [OAC 252:100-8-6 (e)(1)]

D. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that:

(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;
(4) the permittee submitted notice of the emergency to AQD within 24 hours of the time when emission limitations were exceeded due to the emergency. 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; and
(5) the permittee submitted a follow up written report within 10 working days of first becoming aware of the exceedance.

[OAC 252:100-8-6 (e)(2), (a)(3)(C)(iii)(I) and (IV)]

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)]

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, 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. [OAC 252:100-8-2]

(1) 5 tons per year of any one criteria pollutant.

(2) 2 tons per year for any one hazardous air pollutant (HAP) or 5 tons per year for an aggregate of two or more HAP's, or 20 percent of any threshold less than 10 tons per year for single HAP that the EPA may establish by rule.
(3) 0.6 tons per year for any one category A substance, 1.2 tons per year for any one category B substance or 6 tons per year for any one category C substance as defined in 252:100-41-40.

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]

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 the EPA and the DEQ with written notification as required below in advance of the proposed changes, which shall be a minimum of 7 days, or 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 subsection. [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) No person shall cause or permit the discharge of emissions such that National Ambient Air Quality Standards (NAAQS) are exceeded on land outside the permitted facility. [OAC 252:100-3]

(2) 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]

(3) 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]

(4) 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 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. [OAC 252:100-25]

(5) 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]

(6) 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]

(7) Volatile Organic Compound (VOC) storage tanks built after December 24, 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)]

(8) 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]

(9) Except as otherwise provided, no person shall cause or permit the emissions of any toxic air contaminant in such concentration as to cause or to contribute to a violation of the MAAC. **(State only)** [OAC 252:100-41]

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.
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.
(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 Sources' 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 Oklahoma Administrative Code 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 Code of Federal Regulations (CFR) § 70.7 (h)(1). This public notice shall include notice to the public that this permit is subject to Environmental Protection Agency (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]

Attachment A

Detailed Cost Sheets for
Two Cost Reference Points

Cost Reference Point 1					
Delphi - Thermal Oxidation Unit					
Total SCFM			5,522	**Solvent Concentration**	
Total Tons VOC / Year -- Controlled			14.4	VOC lbs./hr	6.9
Total SCFM / Total Tons VOC Controlled			383		
Hrs / Day Operation			16		
Days / Year Operation			260		
Heat Recovery			95%		
Purchase Equipment Cost (A)			$341,147	**Heat Value=**	5.33
Auxilary Equipment Costs		**Factor**	**Cost**	**Fuel Cost Calculations**	
Instrumentation	.10*A	0.10	$34,115	Tfi=	1400
Sales Tax	.03*A	0.03	$10,234	Two=	1334
Freight	.05*A	0.05	$17,057	Twi=	77
Purchase Equipment Cost (B)			$402,553	Hcwo=	5.33
Direct Installation Costs					
Foundations & Support	.08*B	0.08	$32,204	Fuel Cost / 1000 cu ft=	$4.83
Handling & Erection	.14*B	0.14	$56,357	Annual Fuel Cost=	$10,485
Electrical	.04*B	0.04	$16,102		
Piping	.02*B	0.02	$8,051		
Installation for Ductwork	.01*B	0.01	$4,026	Two may not exceed the ignition temperature of solvent.	
Painting & Misc.	.01*B	0.01	$4,026	[(SCFM) (1.20) (Tfi-Twi) (1-Eff) - (0.9) (Heat Value)] / 84	
Direct Installation Costs (C)			$120,766	522	SCFH
Indirect Installation Costs				**Power Requirement Calculation**	
Engineering	.10*B	0.10	$40,255	Efficiency=	60%
Construction & Field Expl.	.05*B	0.05	$20,128	Pressure Required "IN H20" P=	18
Contractor Fees	.10*B	0.10	$40,255	Power Required=	19.38
Start-up	.02*B	0.02	$8,051	Electricity Cost / KWH=	$0.048
Performance Testing	.01*B	0.01	$4,026	Electricity Cost / YR=	$3,870
Contingincies	.03*B	0.03	$12,077		
Indirect Installation Costs (D)			$124,792		
Total Capital Investment			**$648,111**		
Direct Annual Costs				**Burner Fuel Stabilization**	
Operating Labor		**Factor**	**Cost**	Total Energy Input=	150,680
Operator at $12.96/hr		260	$3,370	Auxilary Fuel Energy Input=	457,791
Supervisor		$505	$505		
Maintenance					
Labor at $14.26/hr		260	$3,708		
Material		$3,708	$3,708		
Utilities					
Natural Gas		$10,485	$10,485		
Electricity		$3,870	$3,870		
Total			**$25,645**		
Indirect Annual Costs					
Overhead			$6,774		
Adminstrative			$12,962		
Insurance			$6,481		
Capital Recovery (annualization factor = 0.1628)			$105,512	(based upon 10% interest and 10 year depreciation)	
Total			**$131,730**		
Total Annual Cost			**$157,374**		
Cost Effectiveness ($ / Ton)			**$10,929**		

Cost Reference Point 2					
Delphi - Thermal Oxidation Unit					
Total SCFM			25,447	**Solvent Concentration**	
Total Tons VOC / Year -- Controlled			71.2	VOC lbs./hr	34.2
Total SCFM / Total Tons VOC Controlled			357		
Hrs / Day Operation			16		
Days / Year Operation			260		
Heat Recovery			95%		
Purchase Equipment Cost (A)			$617,786	**Heat Value=**	5.72
Auxilary Equipment Costs		**Factor**	**Cost**	**Fuel Cost Calculations**	
Instrumentation	.10*A	0.10	$61,779	Tfi=	1400
Sales Tax	.03*A	0.03	$18,534	Two=	1334
Freight	.05*A	0.05	$30,889	Twi=	77
Purchase Equipment Cost (B)			$728,987	Hcwo=	5.72
Direct Installation Costs					
Foundations & Support	.08*B	0.08	$58,319	Fuel Cost / 1000 cu ft=	$4.83
Handling & Erection	.14*B	0.14	$102,058	Annual Fuel Cost=	$48,318
Electrical	.04*B	0.04	$29,159		
Piping	.02*B	0.02	$14,580		
Installation for Ductwork	.01*B	0.01	$7,290	Two may not exceed the ignition temperature of solvent.	
Painting & Misc.	.01*B	0.01	$7,290	[(SCFM) (1.20) (Tfi-Twi) (1-Eff) - (0.9) (Heat Value)] / 84	
Direct Installation Costs (C)			$218,696	2405	SCFH
Indirect Installation Costs				**Power Requirement Calculation**	
Engineering	.10*B	0.10	$72,899	Efficiency=	60%
Construction & Field Expl.	.05*B	0.05	$36,449	Pressure Required "IN H20" P=	18
Contractor Fees	.10*B	0.10	$72,899	Power Required=	89.32
Start-up	.02*B	0.02	$14,580	Electricity Cost / KWH=	$0.048
Performance Testing	.01*B	0.01	$7,290	Electricity Cost / YR=	$17,835
Contingincies	.03*B	0.03	$21,870		
Indirect Installation Costs (D)			$225,986		
Total Capital Investment			**$1,173,670**		
Direct Annual Costs				**Burner Fuel Stabilization**	
Operating Labor		**Factor**	**Cost**	Total Energy Input=	694,379
Operator at $12.96/hr		260	$3,370	Auxilary Fuel Energy Input=	2,109,635
Supervisor		$505	$505		
Maintenance					
Labor at $14.26/hr		260	$3,708		
Material		$3,708	$3,708		
Utilities					
Natural Gas		$48,318	$48,318		
Electricity		$17,835	$17,835		
Total			**$77,443**		
Indirect Annual Costs					
Overhead			$6,774		
Adminstrative			$23,473		
Insurance			$11,737		
Capital Recovery (annualization factor = 0.1628)			$191,073	(based upon 10% interest and 10 year depreciation)	
Total			**$233,057**		
Total Annual Cost			**$310,501**		
Cost Effectiveness ($ / Ton)			**$4,361**		

Attachment B

Detailed Cost Sheet for Centralized Control System

Centralized VOC Control System					
Thermal Oxidation Unit					
Total SCFM			114,369	**Solvent Concentration**	
Total Tons VOC / Year -- Controlled			320	VOC lbs./hr	153.8
Total SCFM / Total Tons VOC Controlled			357		
Hrs / Day Operation			16		
Days / Year Operation			260		
Heat Recovery			95%		
Purchase Equipment Cost (A)			$2,140,749	**Heat Value=**	7.46
Auxilary Equipment Costs		**Factor**	**Cost**	**Fuel Cost Calculations**	
Instrumentation	.10*A	0.10	$214,075	Tfi=	1400
Sales Tax	.03*A	0.03	$64,222	Two=	1334
Freight	.05*A	0.05	$107,037	Twi=	77
Purchase Equipment Cost (B)			$2,526,084	Hcwo=	7.46
Direct Installation Costs					
Foundations & Support	.08*B	0.08	$202,087	Fuel Cost / 1000 cu ft=	$4.50
Handling & Erection	.14*B	0.14	$353,652	Annual Fuel Cost=	$ 457,142.40
Electrical	.04*B	0.04	$101,043		
Piping	.02*B	0.02	$50,522		
Ductwork Installation	.10*B	0.10	$252,608	Two may not exceed the ignition temperature of solvent.	
Painting & Misc.	.01*B	0.01	$25,261	[(SCFM) (1.20) (Tfi-Twi) (1-Eff) - (0.9) (Heat Value)] / 84	
Direct Installation Costs (C)			$985,173	10,809	SCFH
Indirect Installation Costs				**Power Requirement Calculation**	
Engineering	.15*B	0.15	$378,913	Efficiency=	60%
Construction & Field Expl.	.05*B	0.05	$126,304	Pressure Required "IN H20" P=	18
Contractor Fees	.10*B	0.10	$252,608	Power Required=	401.45
Start-up	.02*B	0.02	$50,522	Electricity Cost / KWH=	$0.041
Performance Testing	.01*B	0.01	$25,261	Electricity Cost / YR=	$68,471
Contingincies	.03*B	0.03	$75,783		
Indirect Installation Costs (D)			$909,390		
Total Capital Investment			**$4,420,647**		
Direct Annual Costs				**Burner Fuel Stabilization**	
Operating Labor		**Factor**	**Cost**	Total Energy Input=	3,120,818
Operator at $12.96/hr		260	$3,370	Auxilary Fuel Energy Input=	9,481,543
Supervisor		$505	$505		
Maintenance					
Labor at $14.26/hr		260	$3,708		
Material		$3,708	$3,708		
Utilities					
Natural Gas		$457,142	$457,142		
Electricity		$68,471	$68,471		
Total			$536,903		
Indirect Annual Costs					
Overhead			$6,774	Annual Interest Rate	10%
Adminstrative			$88,413	Number of Years of Payment	10
Insurance			$44,206	Annualization Factor	0.1627
Capital Recovery (straight line depreciation)			$719,440	(based upon 10% interest and 10-year depreciation)	
Total			$858,833		
Total Annual Cost			**$1,395,736**		
Cost Effectiveness ($ / Ton)			**$4,362**		

Attachment C

Detailed Cost Sheets for Distributed Control System

4 - Distributed VOC Control Systems				use this	
Thermal Oxidation Unit					
Total SCFM			114,368	**Solvent Concentration**	
Total Tons VOC / Year -- Controlled			320	VOC lbs./hr	153.8
Total SCFM / Total Tons VOC Controlled			357		
Hrs / Day Operation			16		
Days / Year Operation			260		
Heat Recovery			95%		
Purchase Equipment Cost (A)			$3,092,087	**Heat Value=**	5.78
Auxilary Equipment Costs		**Factor**	**Cost**	**Fuel Cost Calculations**	
Instrumentation	.10*A	0.10	$309,209	Tfi=	1400
Sales Tax	.03*A	0.03	$92,763	Two=	1334
Freight	.05*A	0.05	$154,604	Twi=	77
Purchase Equipment Cost (B)			$3,648,663	Hcwo=	5.78
Direct Installation Costs					
Foundations & Support	.08*B	0.08	$291,893	Fuel Cost / 1000 cu ft=	$4.50
Handling & Erection	.14*B	0.14	$510,813	Annual Fuel Cost=	$50,580
Electrical	.04*B	0.04	$145,947		
Piping	.02*B	0.02	$72,973		
Ductwork Installation	.01*B	0.01	$36,487	Two may not exceed the ignition temperature of solvent.	
Painting & Misc.	.01*B	0.01	$36,487	[(SCFM) (1.20) (Tfi-Twi) (1-Eff) - (0.9) (Heat Value)] / 84	
Direct Installation Costs (C)			$1,094,599	2,702	SCFH
Indirect Installation Costs				**Power Requirement Calculation**	
Engineering	.10*B	0.10	$364,866	Efficiency=	60%
Construction & Field Expl.	.05*B	0.05	$182,433	Pressure Required "IN H20" P=	18
Contractor Fees	.10*B	0.10	$364,866	Power Required=	100.36
Start-up	.02*B	0.02	$72,973	Electricity Cost / KWH=	$0.041
Performance Testing	.01*B	0.01	$36,487	Electricity Cost / YR=	$17,117
Contingincies	.03*B	0.03	$109,460		
Indirect Installation Costs (D)			$1,131,085		
Total Capital Investment			**$5,874,347**		
Direct Annual Costs				**Burner Fuel Stabilization**	
Operating Labor	**Factor**	**Basis**	**Cost**	Total Energy Input=	780,197
Operator at $12.96/hr	2	260	$6,739	Auxilary Fuel Energy Input=	2,370,365
Supervisor	2	$505	$1,010		
Maintenance					
Labor at $14.26/hr	2	260	$7,415		
Material	2	$3,708	$7,415		
Utilities					
Natural Gas	4		$202,322		
Electricity	4		$68,469		
Total			**$293,370**		
Indirect Annual Costs					
Overhead			$13,548	Annual Interest Rate	10%
Adminstrative			$117,487	**Number of Years of Payment**	**10**
Insurance			$58,743	**Annualization Factor**	**0.1627**
Capital Recovery (straight line depreciation)			$956,023	(based upon 10% interest and 10-year depreciation)	
Total			**$1,145,801**		
Total Annual Cost			**$1,439,171**		
Cost Effectiveness ($ / Ton)			**$4,497**		

Tinker Air Force Base
Attn: Ms. Teresa Wheeler
Air Permits Manager
OC-ALC/EMOC
7701 Arnold Street, Suite 202
Tinker AFB, OK 73145-9100

Re: Permit Number **2004-057-C (PSD)**
Fuel Component Test Facility, Building 3108

Dear Ms. Wheeler:

Enclosed is the permit authorizing construction of the referenced facility. Please note that this permit is issued subject to certain standard and specific conditions which are attached. The equipment and conditions in this permit will be included in the facility's Title V permit when it is issued.

The issuance and transmittal of this permit to Tinker is to be considered the invoice for the permit fee of $1,500. Please send payment to Kerri Housley, Air Quality Division, Oklahoma Dept. of Environmental Quality. If there are any questions regarding payment, her phone number is 702-4100.

Thank you for your cooperation in this matter. If we may be of further service, please contact me at (405) 702-4181.

Sincerely,

Richard Kienlen, P.E.
New Source Permits Section
AIR QUALITY DIVISION

encl.

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

Issuance Date: ______________________ **Permit No.: 2004-057-C (PSD)**

Tinker Air Force Base,

having complied with the requirements of the law, is hereby granted permission to modify the component fuel test facility in Building 3108 with installation of additional test stands transferred from Kelly Air Force Base and associated equipment in Oklahoma City, Oklahoma County, OK,

subject to the following conditions, attached:

[X] Standard Conditions dated October 15, 2003

[X] Specific Conditions

____ Director, Air Quality Division