ORIGINAL

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 16, 2004

Mr. Paul Blackford
Federal Aviation Administration - Southwest Region
2601 Meacham Boulevard
Fort Worth, Texas 76137-4298

Re: Dallas/Fort Worth (DFW) Airport Aviation Growth Projects - Conditional General Conformity Certification

Dear Mr. Blackford:

The DFW Airport has notified the Texas Commission on Environmental Quality (TCEQ) of upcoming aviation growth projects which will trigger the need for a General Conformity determination by the Federal Aviation Administration (FAA), the entity responsible for the associated federal action. These projects include construction of a new Terminal F, removal of operational restrictions on Terminal A Satellite and air cargo facilities, construction of a new cargo complex, demolition and reconstruction of some existing air cargo facilities, and improvement of airport parking. The TCEQ is providing this letter to aid the FAA in making a General Conformity determination for these projects.

The proposed projects involve a federal action and will be located in the DFW ozone nonattainment area. Therefore it is potentially subject to federal and state General Conformity regulations. Based on estimates of direct and indirect nitrogen oxide (NO_x) and volatile organic compound (VOC) emissions resulting from the project, as submitted by the DFW Airport to the TCEQ in a letter dated January 30, 2003, this project will exceed the General Conformity *de minimis* threshold of 50 tons per year of NO_x or VOCs in years 2004 through 2015. During the attainment year of 2007, only NO_x emissions exceed *de minimis* levels, and in the peak year of 2015, both NO_x and VOC emissions exceed *de minimis*. As a result, a General Conformity determination is required pursuant to 40 CFR Part 51, Subpart W and 30 Texas Administrative Code §101.30.

The DFW Airport worked with the Regional Transportation Council (RTC) of the North Central Texas Council of Governments in 2002 to identify emission reductions accrued through Transportation Emission Reduction Measures to be used to offset the emissions associated with several planned airport expansion projects. On December 12, 2002, the RTC resolved to provide offsets in the amount of 0.32 tons per day (tpd) NO_x and 0.07 tpd VOCs to the DFW Airport in 2007. The RTC also resolved to assist the DFW Airport needs of 1.17 tpd NO_x and 0.26 tpd VOC in 2015 based on the fact that year 2015 motor vehicle emissions estimates were demonstrated to be below the motor vehicle emissions budgets for that year. The aviation growth projects that the DFW Airport is currently seeking to construct were identified in the RTC commitment and the emissions from these projects are calculated to be 0.18 tpd NO_x and 0.04 tpd VOC in 2007 and 1.16 tpd NO_x in 2015 (estimated VOC emissions in 2015 remained at 0.26 tpd). A future environmental review for a perimeter taxiway system is expected to rely upon the remainder of the RTC offset commitment.

The General Conformity definition of emission offsets (§101.30(b)(9)) requires enforceability under both state and federal law. In order to make the emission offsets provided to the DFW Airport by the RTC enforceable, the RTC entered into a Memorandum of Agreement (MOA) with the TCEQ on January 14, 2004. This agreement committed the RTC to providing the DFW Airport with 0.18 tpd NO_x and 0.04 tpd VOC in 2007 needed for offsetting emissions generated by the revised airport expansion project. The MOA also committed the RTC to include the airport project's anticipated emissions of 1.16 tpd NO_x and 0.26 tpd VOC into the regional transportation plans (Metropolitan Transportation Plan and Transportation Improvement Plan), and to adjust the calculated 2015 on-road emission estimates by an increase of these amounts. On January 14, 2004, the TCEQ approved this MOA, incorporated it into the Texas State Implementation Plan (SIP), thus making the offsets enforceable under state law, and submitted that SIP revision to the Environmental Protection Agency (EPA) on February 17, 2004. The EPA has received this SIP revision and intends to take action on it in the summer of 2004. If the EPA approves this SIP revision, the MOA and commitments made within will be enforceable under federal law.

Based on actions taken to date, the TCEQ confirms that the proposed DFW Airport project will comply with state General Conformity rules per sections 30 TAC §101.30(h)(1)(E)(ii) and 30 TAC §101.30(h)(1)(E)(iii) provided that (1) the transportation plan and transportation improvement program or the Transportation Conformity SIP for the DFW Nonattainment Area incorporates the DFW Airport expansion project's emissions for year 2015 as laid out in the MOA and (2) the EPA approves the Texas SIP submitted on February 17, 2004, containing the MOA between the TCEQ and RTC. This confirmation is also contingent upon the issuance by the FAA of a Final General Conformity Determination containing emissions estimates that do not show emissions greater than 0.18 tpd NO_x and 0.04 tpd VOC in 2007 and 1.16 tpd NO_x and 0.26 tpd VOC. If actual emissions for this project exceed these amounts, a new conformity determination may be required pursuant to 30 TAC §101.30(g)(3).

If you require further assistance on this matter, please contact John Minter of my staff at (512) 239-0663 or jminter@tceq.state.tx.us.

Sincerely,

Mark R. Vickery, P.G.
Acting Deputy Executive Director
Texas Commission on Environmental Quality

Enclosures

cc: Mr. Darcy Zarubiak, Environmental Affairs Department, DFW International Airport
Mr. Eli Bell, Bell, Turney, Coogan & Richards, L.L.P.
Mr. Chris Klaus, Transportation Department, North Central Texas Council of Governments
Ms. Peggy Wade, EPA Region 6

MEMORANDUM OF AGREEMENT
("MEMORANDUM")

I. Parties

This Memorandum of Agreement ("Memorandum") is entered into between the Texas Commission on Environmental Quality ("TCEQ") and the North Central Texas Council of Governments' Regional Transportation Council ("RTC"), collectively, "the Parties."

II. Intent and Purpose

The intent of this Memorandum is to memorialize the agreement between RTC, and TCEQ on control of emissions of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) in the DFW non-attainment area. The RTC is providing selected Mobile Source Emission Reduction Strategies, not already included in the region's Attainment Demonstration State Implementation Plan (SIP), not used as emission reductions in the latest transportation conformity determination, nor reserved elsewhere. The resulting emission reductions will be made available to the Dallas-Fort Worth International Airport (DFWIA) for use as offsets to demonstrate that certain contemplated construction projects meet the general conformity requirements of the Federal Clean Air Act. The Parties enter into this Memorandum of Agreement for the purposes of making a portion of RTC's planned strategies and its commitment to include DFWIA's increased emissions in future Metropolitan Transportation Plans, a part of the Texas State Implementation Plan ("SIP").

III. Definitions

As used in this Memorandum, the following terms have the meanings given below:

(A) "DFWIA" shall mean the Dallas-Fort Worth International Airport.

(B) "tpd" shall mean tons per day.

(C) "EPA" shall mean the United States Environmental Protection Agency.

IV. Background

1. The four (4) county region of the Dallas/Fort Worth area has been designated as a serious

non-attainment area for ozone by the EPA.

2. Under Section 110 of the Federal Clean Air Act, 42 U.S.C. § 7410, each state that has a non-attainment area must submit a SIP to the EPA demonstrating strategies to come into compliance with the National Ambient Air Quality Standards ("NAAQS").

3. Section 110 of the Federal Clean Air Act, 42 U.S.C. § 7410 also requires Texas to submit to the EPA for approval any SIP revisions and to demonstrate that such SIP revisions will not hinder the Dallas/Fort Worth non-attainment area from reaching the NAAQS.

4. The current Dallas-Fort Worth Attainment Demonstration SIP motor vehicle emission budgets were determined adequate by EPA effective November 6, 2000.

5. Section 176 of the Federal Clean Air Act, 42 U.S.C. § 7506 et seq. requires a demonstration that federally funded or approved projects conform to the applicable SIP. Pursuant to Section 176(c)(4)(C), Texas adopted rules in 30 TAC §101.30 implementing general conformity criteria and procedures and submitted the rules as a revision to the SIP.

6. NCTCOG has been designated as the Metropolitan Planning Organization for the Dallas-Fort Worth Area by the Governor of Texas in accordance with federal law. The Regional Transportation Council (RTC) is the regional transportation policy body associated with the NCTCOG, and has been and continues to be a forum for cooperative decisions on transportation.

7. The Federal Highway Administration approved a positive transportation conformity determination for Mobility 2025 Update: The Metropolitan Transportation Plan (The Plan) and revised 2002-2004 Transportation Improvement Program for the Dallas-Fort Worth Metropolitan Area (The Program) on October 19, 2002.

8. In order to meet general conformity procedural requirements of 30 TAC §101.30, the Federal Aviation Administration (FAA) must base its analysis on the total of direct and indirect emissions from the construction project and reflect emission scenarios expected to occur in the DFW attainment year (2007) and the year of expected peak emissions (2015).

9. The DFWIA submitted a request on November 19, 2002, to the RTC for allocation of emissions reductions for aviation-related capital developments for which a general conformity determination by the FAA is required. The aviation-related capital developments include: (1) additional terminal space (a 22-33 gate Terminal F depending on aircraft size, continued operation of 1E Satellite Terminal, apron space, and roadway improvements); expanding and renovating air cargo facilities (12 additional wide-body aircraft parking positions, approximately 500,000 square feet of additional warehouse); approximately 10,920 additional vehicle parking spaces, (2) perimeter taxiways, and (3) Phase II of Terminal F.

10. DFWIA has estimated total net increase in construction and operational emissions resulting from the aviation-related capital development projects listed in Paragraph 9 to be 0.32 tpd of NO_x and 0.07 tpd of VOCs in 2007, and 1.17 tpd of NO_x and 0.26 tpd of VOCs in 2015.

11. The DFWIA prepared an update to the Airport Development Plan in 2002 and based upon that plan, submitted to the FAA revisions to the Airport Layout Plan, which defines development of the airport. At this time, DFWIA intends to ask FAA for a conformity determination for only the aviation-related developments listed in Paragraph 9(1) above.

12. On December 12, 2002, the Regional Transportation Council adopted Resolution Number R02-06 Supporting Mobile Source Emission Reduction Strategies for DFWIA. By the terms of the resolution, the RTC agrees to provide selected Mobile Source Emission Reduction Strategies (MOSERS) not already included in the region's Attainment Demonstration SIP, not used as emission reductions in the latest transportation conformity determination, nor reserved elsewhere. The resulting emission reductions will be made available to the DFWIA for use as offsets to demonstrate that its contemplated project meets the general conformity requirements of the Federal Clean Air Act.

13. The emission reductions associated with the MOSERS that the RTC agrees to provide pursuant to this Memorandum will commence upon implementation of the MOSERS and continue thereafter. Emission reductions for the lifetime of the identified MOSERS will be made available to DFWIA. The

identified MOSERS are anticipated to achieve year 2007 emission reductions of 0.32 tpd and 1.250 tpd for NO_X and VOC respectively.

PROJECT TYPE	YEAR	NUMBER OF PROJECTS
SIGNAL IMPROVEMENT	2000	7
SIGNAL IMPROVEMENT	2002	109
SIGNAL IMPROVEMENT	2003	270
	TOTAL	386

14. In the Regional Transportation Council October 2002 transportation conformity determination, the 2015 regional on-road emission estimates are projected to be significantly below the EPA-approved 2007 motor vehicle emission budget (MVEB) established in the SIP. This projection is based on federal, state and local government programs and projects committed to being implemented in order to reach attainment in 2007. Federal initiatives including low-sulfur gasoline and Tier II automobile standards implemented in 2004, low-sulfur diesel in 2006 and advanced diesel technology in 2007 and traditional vehicle turnover rates (i.e. replacing older high-emitting vehicles with new low-emitting vehicles) are projected to have significant emission reduction benefits over time. As a result, the RTC will adjust the calculated 2015 on-road emission estimate as appropriate.

15. The TCEQ and RTC acknowledge that RTC has entered into this Memorandum voluntarily. In order to safeguard the air resources of the State of Texas, RTC agrees to comply with the terms of this Memorandum of Agreement.

16. The RTC agrees not to challenge whether it is subject to the Commission's jurisdiction.

17. Nothing in this Memorandum shall be interpreted as evidence that RTC is causing or contributing to a violation of the NAAQS, or is in any respect non-compliant with any federal, state or local law. Additionally, this Memorandum shall not constitute a "compliance event" as defined in 30 TAC §116.11 or any similar designation under federal, state or local law.

V. Obligations of Parties

(A) RTC agrees as follows:

1. In accordance with the terms of this Memorandum, RTC agrees to reduce 2007 emissions of NO_x and VOCs as specified herein through implementation of the MOSERS listed in the table in Section IV, Paragraph 13.

2. RTC also agrees to allocate to DFWIA emission reductions of 0.18 tpd of NO_x and 0.04 tpd of VOCs generated by MOSERS in 2007, to offset net emissions increases from the construction and operation of additional terminal space (a 22-33 gate Terminal F depending on aircraft size, continued operation of 1E Satellite Terminal, apron space, and roadway improvements); expanding and renovating air cargo facilities (12 additional wide-body aircraft parking positions, approximately 500,000 square feet of additional warehouse); and approximately 10,920 additional vehicle parking spaces.

3. A portion of the difference between the 2015 on-road emission estimates and the 2007 MVEB that is sufficient to meet DFWIA's 2015 needs of 1.16 tpd and 0.26 tpd for NOx and VOCs, respectively, will be allocated to DFWIA.

4. To ensure 2015 emission reductions are not allocated elsewhere (i.e. double-counted), RTC further agrees to certify in writing to TCEQ and the FAA that the DFWIA's 2015 emissions are included in the Plan and the Program and that in future transportation conformity determinations for the DFW region, RTC will adjust the calculated 2015 on-road emission estimates by an increase of 1.17 tpd and 0.26 tpd for NOx and VOCs, respectively.

(B) TCEQ agrees as follows:

The TCEQ agrees to support this Memorandum as a revision to the SIP and to recommend that the Governor submit it as such to EPA.

The TCEQ will not require the RTC to regulate the activities of entities that use DFW Airport.

VI. Term

The term of this Memorandum shall begin upon signature and approval by all Parties and shall expire

on December 31, 2015 unless sooner terminated by mutual written consent of all Parties or as allowed herein.

VII. Miscellaneous

This Memorandum represents the entire agreement between the TCEQ and RTC and supersedes all other agreements, understandings or commitments, written or oral relative to the subject matter of this Memorandum.

This Memorandum may not be amended or modified except pursuant to a mutual written agreement executed by each of the Parties.

This Memorandum shall be governed by and interpreted in accordance with the laws of the State of Texas, without giving effect to the conflicts laws thereof.

The Parties represent they have authority to enter into this Memorandum, including the authority granted in the Texas Government Code Chapter 791, Interlocal Cooperation Contracts, and upon approval of the TCEQ Commission, it will be binding on all Parties.

In Witness Whereof, Texas Commission on Environmental Quality and the North Central Texas Council of Governments Regional Transportation Council, by their authorized officers, have made and executed this Memorandum in multiple copies, each of which is deemed an original.

Texas Commission on Environmental Quality
"TCEQ"

By: Margaret Hoffman — 23 Oct 03
Name: Margaret Hoffman — Date
Title: Executive Director

North Central Texas Council of Governments' Regional Transportation Council
"RTC"

for By: [signature] P.E. MPO Director — 10/20/03
Name: B. Glen Whitley — Date
Title: Chair
Commissioner, Tarrant County

PASSED AND APPROVED at the regular meeting of the Texas Commission on Environmental Quality on JAN 14 2004.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Kathleen Hartnett White

For the Commission

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DFW AIRPORT, TEXAS 75261-9428
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T 972 574 8888

January 30, 2003

Mr. Chuck Mueller
Texas Commission on Environmental Quality
State Implementation Plan Development
12100 Park 35 Circle, Building F
Austin, TX 78753

Dear Mr. Mueller:

The Dallas Fort Worth International Airport (DFW) intends to seek authorization from the Federal Aviation Administration (FAA) to construct several independent development projects, including new terminal facilities, changes to restrictions for existing terminal facilities, new air cargo facilities, redevelopment of existing air cargo facilities, and parking improvements. DFW's environmental review of these projects has determined that the associated emissions may trigger general conformity (30 TAC 101.30) review. The proposed development projects are generally described below and a detailed description is attached.

Proposed Development Projects:

- Construct a 1.2 million square foot passenger terminal (Terminal F) that will enhance airline competition by improving access to facilities that can support new service.
- Continue commercial air service operations at existing Terminal A Satellite (formerly referred to as Terminal 1E) by removing operational restrictions instituted during the environmental review for the Terminal D project.
- Construct a 95 acre air cargo complex on the east side of the Airport.
- Modernize (demolish and reconstruct) existing air cargo facilities at the Airport that no-longer meet modern design standards, and remove operational restrictions at other air cargo facilities.
- Improve airport parking facilities by constructing approximately 15,200 additional spaces for passengers, tenants and employees. These parking spaces will be constructed at a variety of airport locations including adjacent to terminals, and at remote locations served by shuttle buses.

The proposed development projects will include supporting infrastructure (e.g. fueling systems, heating boilers, etc.), roadway and access improvements, and when necessary, the relocation of displaced facilities (e.g. moving General Aviation, and a salvage yard) as further described in the attached list of proposed development projects.

The direct and indirect emissions of nonattainment pollutants resulting from the proposed development projects have been considered for 2007 and 2015. These years have been selected for analysis because TCEQ's adopted State Implementation Plan (SIP) specifically identifies regional emissions in 2007 (also the Clean Air Act's attainment year), while the furthest reasonably foreseeable year (and year of peak emissions) for the development projects has been determined to be 2015.

The estimated net increase of operational and construction emissions resulting from the proposed group of projects is given in the table below. A summary of the emission calculation methodology is attached. As requested by your staff, the summary also contains a forecasted construction schedule by year in order to assist the TCEQ in monitoring regional emission trends. This annual forecast of construction emissions is attached for TCEQ planning purposes only and is not expected to be part of a proposed conformity determination.

Net Increase of Operational and Construction Emissions

	Total Annual		Ozone Season Day	
Year	VOC (tpy)	NOx (tpy)	VOC (tpd)	NOx (tpd)
2007	14.3	62.4	0.04	0.18
2015	94.0	407.0	0.26	1.16

DFW's aviation emission budget contained in TCEQ's adopted 2007 attainment SIP contains adequate emissions to ensure that the increase in emissions estimated to result from the proposed group of projects conforms to the adopted SIP. Furthermore, DFW has worked with the North Central Texas Council of Governments (NCTCOG) to identify emission offsets accrued through Transportation Emission Reduction Measures (TERMs) that could be used to offset the increased emissions from the group of independent development projects. NCTCOG identified sufficient emissions for the proposed projects (see attached), and committed to institute appropriate controls to allow the TERMs credits to be applied as offsets for use in a conformity determination for the projects.

The list of options that may be used to determine that the projects will satisfy general conformity requirements are cited at 30 TAC 101.30(h), as acknowledged in Mr. Tom Diggs' (EPA Region VI) December 23, 2002 letter directed to you. This list contains at least two alternatives that could be applied to this request. 30 TAC 101.30(h)(1)(B) allows conformity to be demonstrated through the acquisition of offsets (i.e. as provided by NCTCOG). 30 TAC 101.30(h)(1)(E) allows conformity to be demonstrated by TCEQ formally agreeing to ensure the emissions will be included in the approved SIP (DFW Airport's projected emissions already included in TCEQ's adopted SIP). Using either option we can demonstrate that the proposed development projects will conform to the SIP.

DFW recognizes that either of these options will involve TCEQ staff commitments and certain procedural steps and we are prepared to assist as appropriate. In order to expedite the preparation of our formal conformity determination request and to facilitate your review of a draft conformity determination, we would appreciate the opportunity to meet with you and your staff in the near future to discuss implementing the alternatives referenced above in the most efficient and expeditious way possible. We will contact your staff to arrange such a meeting and would welcome the participation of EPA.

The construction of a number of the facilities identified in the list of proposed development projects will include stationary sources (e.g. boilers for heating). At this preliminary stage, the operational emission estimates include emissions from such sources. Separate permitting applications (i.e. Permit by Rule or New Source Review permits) will be undertaken when there is greater clarity about the nature of any stationary sources.

If you have any questions, please do not hesitate to call Dan Bergman at 972-574-4466.

Sincerely,

James M. Crites
Executive Vice President, Operations Division

Attachments

cc: M. Nicely, R. Compton, N. Terry, F. Espino, K. Cox, C. Paslay, D. Bergman
C. Sylo, D. Zarubiak, D. Hennessy, H. Evans, K. Rowland, P. Wade

Proposed Development Projects

1. Terminal F
   Project includes demolition of all existing facilities at the Terminal F site and the construction of a new passenger terminal building. The project will consist of 1,200,000 square feet and 22 gates for Group IV and V aircraft (Number of Gates varies based upon assumptions regarding distribution of aircraft sizes). There are future plans for a satellite facility near Terminal F (an additional 590,220 square feet and 14 gates), however there are no current plans to construct the satellite facility and it is not expected to be constructed within the time frame of the proposed development projects. Therefore the satellite facility is not included in the proposed conformity determination nor the air emission calculations. The terminal project would include apron construction, utilities, fuel system, heating and cooling systems, Airport People Mover Stations, parking structures, and road access. The utility improvements include additional glycol collection and treatment facilities. Additional fuel tanks would be constructed at the fuel farm located on the northwest side of the airfield to provide fueling capacity for the terminal. A passenger skybridge between Terminal C and E is also included in this project. Terminal F will also require the relocation of General Aviation facilities and the displacement of approximately 5,000 long-term vehicle parking spaces.
2. Terminal A Satellite
   Terminal A Satellite was built in 2000 by American Eagle as a temporary facility to be used until Terminal D opens. The facility includes the terminal building, apron, and remote aircraft parking positions around the 1E and 2E apron areas. The approved plan (as part of the FAA Terminal D General Conformity Determination) is to restrict aircraft passenger operations at Terminal A Satellite and the associated remote aircraft parking positions after Terminal D opens. DFW proposes to permanently maintain the ability to operate commercial air service at the Terminal A Satellite facility.
3. East Air Cargo Facility
   The proposal is to develop an area between 17C/35C and 17L/35R, north of Delta hangar, as the East Air Cargo site. The area to be considered in the evaluation is approximately 95 acres in size. The area will have parking space for between 8 and 12 cargo aircraft (Number of aircraft varies based upon assumptions regarding distribution of aircraft sizes) and up to 500,000 square feet of warehouse space. The facility will be designed to accommodate Group VI aircraft although the aircraft actually using the facility are expected to vary in size. The project includes a new fuel storage facility and the widening of a portion of East Airfield Drive from two to four lanes. The project may also necessitate the relocation of the existing airport salvage yard.
4. Re-develop Existing Air Cargo Facilities
   The project includes the demolition of existing air cargo facilities in the West Air Cargo Complex and North Air Cargo Complex. They will be replaced by new facilities that will meet modern expectations for air cargo operations and apron space, accommodating modern aircraft types.

   At the West Air Cargo complex, this project will involve the demolition of 508,000 square feet of warehouses and 12 aircraft parking spaces. The facilities included are: Evergreen (5 Group IV spaces), American Eagle (4 Group IV spaces), MLR, Kitty Hawk 1 & 2 (2 Group III spaces), Grammar (1 Group III space), and Tessey (former Ogden Bus Maintenance Facility). These facilities will be replaced by approximately 500,000 square feet of modern warehouse and 10 Group VI aircraft parking spaces. The 133,000 square foot Evergreen building and five associated aircraft parking positions have operational restrictions that were imposed during the NEPA determination for Air Cargo Centre III, these restrictions will be eliminated during this environmental review.

   At the North Cargo Complex, 290,000 square feet of buildings will be demolished and the existing ramp will be expanded by 143,600 square feet to provide for modern warehouse facilities and deeper ramp space. The expanded ramp space will enable large, modern aircraft at the air cargo facility to access and move around the North Cargo Complex independent of other aircraft at the complex, and without impacting operations on runway

13L/31R. Truck dock and parking area (61,800 square feet) will also be constructed to replace that demolished. It is anticipated that the re-development planning will be based on Group VI aircraft. The roadway accessing the facility will be realigned and reconstructed as four-lane divided roadway in order to support this change.

These redevelopment projects are dependent upon tenant demand for facility modernization. It is possible that some of these projects will be undertaken piecemeal, or with alternate parking space and warehouse space configurations. It is also possible that there may be interim uses of the facilities, continuing use as air cargo facilities, or as a possible interim site for relocating general aviation facilities. Recognizing this variability, the environmental analysis of these projects has been based upon the largest potential impact – the assumption that all projects will be implemented as described above.

5. **Relocate GA Facilities**
Terminal F will occupy the site currently used by DFW's general aviation facility. This facility (apron, terminal, automobile parking, and access) will have to be relocated and the currently preferred alternative is a site located between runway17L/35R and Valley View Lane. Capital costs for construction at this site are likely to result in the need to move the facility to lower cost interim sites, however for air quality purposes for this assessment, the preferred site is evaluated as the largest potential impact for this project. Alternatives include: 1) Between 17C/35C and 17L/35R, near Taxiway ER (30th Street), and 2) at the Evergreen Air Cargo facility site (see above).

6. **Parking Improvements**
   - 6A Terminal B Parking: Demolish two existing approximately 850 space parking garages and construct two new 1,800-2,000 space parking garages, causing an increase in parking capacity by approximately 2,000 spaces.
   - 6B Terminal E Parking: Demolish an existing 855-space garage and construct a new parking garage to increase capacity by approximately 1,000 spaces.
   - 6C 6E Employee Parking: Expand employee parking by 1,000 surface spaces. The configuration of the parking lot may be controlled by the location of drainage ways.
   - 6D Express South Parking: Construct a new long-term surface parking lot, in phases, to accommodate up to 7,000 vehicles. This lot will replace and expand the existing Express South parking lot that occupies the Terminal F site.
   - 6E Express North Parking: Expand existing Express North Parking facility by 400 spaces to the north.
   - 6F North Remote Lot: Expand existing surface parking lot by approximately 900 spaces.
   - 6G South Remote Lot: Expand existing South Remote Lot by approximately 1,100 spaces to the east.
   - 6H Rehabilitate North Rental Car Return Lot: Reconfigure a section of the rental car return lot to provide approximately 1,782 long-term surface parking spaces.
   - 6I "Signature" Parking Lot: Construct a high-end surface parking lot to compete with off-airport providers north of the airfield at IH-635 and Royal Lane. The lot will have 2,000-3,000 spaces.
   - 6J North Parking Control Plaza: Expand the north parking control plaza by building additional booths in the center of International Parkway between the existing entry and exit plazas.
   - 6K New Bus Maintenance Facility: Implementation of the proposed parking improvements may necessitate the construction of a new bus maintenance facility in an area located between East Airfield Drive and Runway 17L/35R, north of existing airport maintenance facilities. The project includes development of a 13,800 square foot maintenance building and associated site improvements.

APPENDIX A

DFW ENVIORNMENTAL SCREENING PROJECTS AIR EMISSIONS INVENTORY DEVELOPMENT APPROACH, METHODOLOGY & MODELS

This appendix discusses the methods, models and other supporting materials used and/or developed in connection with the Air Emissions Inventory for the DFW Environmental Screening Projects.

A.1 Operational Emissions

A-1.1 Methodology & Models

This emissions inventory was prepared in general accordance with conventional methods and models developed and/or approved by the EPA and the FAA for this purpose. This approach, largely described in the FAA publication *Air Quality Procedures for Civilian Airports & Air Force Bases,* helps to ensure that the results are based on the best available computational techniques and modeling tools [FAA, 1997].

A-1.2 Sources & Types of Emissions

In general terms, the primary sources of air emissions at large metropolitan air carrier airports such as DFW are aircraft, GSE and motor vehicles. Other sources include fuel storage facilities, a variety of stationary sources (i.e., utility plant boilers, back-up generators, etc.) and construction activities.

Again, following FAA convention, the types of air emissions included in this inventory update are NOx, VOCs and CO. Because O_3 emissions are not directly emitted by airport sources, the emissions of VOCs and NO_x (the precursors to O_3 formation) are used to evaluate the potential effects of this pollutant. The two EPA-criteria pollutants of sulfur dioxide (SO_2) and lead (Pb) are not included in the emissions inventory because airports (including DFW) are not identified by the EPA as potentially significant sources of these pollutants. Particulate matter (PM_{10} and $PM_{2.5}$) was also not included in the inventory as PM emission factors for aircraft are currently unavailable.

A-1.3 Models & Other Sources of Emission Factors

Several EPA-approved computer models were used to prepare the emissions inventory update and were selected based on their intended function and applicability to this analysis. Based on appropriate input data, these models provide the emission factors for the various sources of air emissions at DFW included in the analysis. The only exception to this are GSE whereby the emission data were taken from an analysis previously undertaken by others in support of the SIP for the Dallas Fort Worth Area, as explained below.

The models and data sources used for this analysis are listed in Table A-1 and are briefly discussed below, by emission source.

Table A-1
Sources of Emission Factors

Emissions Source	Source of Emissions Factors	Basis for Selection
Aircraft	EDMS 4.1	*Emission Dispersion Modeling System (Version 4.1)* - FAA required and EPA preferred model for airport and aircraft air quality assessments.
Ground Support Equipment	TCEQ/ATA	*Dallas / Fort Worth Attainment Demonstration, Appendix W – Discussion of Methodology of Airport Ground Support Equipment Inventory*, (April 2000 Revision), Texas Commission on Environmental Quality (TCEQ) – Supporting analysis and documentation for the State Implementation Plan (SIP) and the Memorandum of Agreement (MOA) between TCEQ and GSE owners/operators in the Dallas Ft. Worth area to reduce NOx emissions. Prepared by TCEQ and the Air Transportation Association (ATA).
On-road motor vehicles	MOBILE5a_h / b	MOBILE is EPA preferred model for motor vehicle emission factors.
Stationary Sources & Fuel Facilities	Operating Permits, Stack test data & AP-42	CAA Title V Operation Permits issued by TCEQ; stack test data from DFW; and *Compilation of Air Pollution Emission Factors (AP-42)* - EPA source of emission factors for stationary and area sources.
Construction Equipment	NONROAD & MOBILE5a_h/b	NONROAD is the EPA database of emission factors for non-road vehicles and equipment (i.e. GSE and construction equipment). MOBILE5 was used for on-road construction vehicles

A-1.3.1 Aircraft

As stated previously, consistent with EPA and FAA guidelines for conducting airport-related air quality analyses, the latest version of EDMS 4.1 was used [FAA, 2002]. EDMS is the FAA required and EPA preferred model and source of aircraft emission factors for airport emission inventories [Federal Register, 1998, 40 CFR Appendix W]. For this analysis, standard EDMS parameters and databases were used except where DFW-specific inputs were more appropriate, as discussed below in Section A-4.

A-1.3.2 Ground Service Equipment

For this analysis, emissions associated with GSE and vehicles are based on data and information developed for the TCEQ and Air Transportation Association (ATA) in support of the SIP for the Dallas Ft. Worth Ozone Non-Attainment Area [TCEQ, 2000]. This material, contained in Appendix W – *Discussion of Methodology of Airport Ground Support Equipment Emission*

Inventory of the SIP was also developed as part of the *Memorandum of Agreements* (MOA's) between TCEQ and the various owners/operators of GSE in the Dallas Fort Worth Area, including DFW.

In summary, the MOU's call for a 90 percent reduction of current levels of GSE-related NOx emissions (an O_3 precursor) by 2007. The data are based on an analysis conducted by the ATA of the population of GSE at the three major airports metropolitan area (including DFW) and emission factors from the EPA NONROAD Model. GSE-related VOC and CO emissions for DFW were also obtained from the same SIP Appendix material analysis and used in this analysis.

A-1.3.3 Motor Vehicles

Emissions associated with motor vehicle trips by airport patrons, employees, cargo and thru traffic at DFW were derived from emission factors contained in the U.S. EPA motor vehicle emissions model, MOBILE5a_h and MOBILE5b. Using input factors that reflect local motor vehicle fleet characteristics, operating conditions and emission control measures, MOBILE produces emission factors for several vehicle types (i.e. light-duty gas, heavy-duty gas, heavy duty diesel, etc.). Consistent with guidelines established by the North Central Texas Council of Government (NCTCOG), MOBILE5a_h was used for the period 2000 through 2010 and MOBILE5b was used for 2010 through 2015.

A-1.3.4 Stationary Sources & Fuel Facilities

For this analysis, emissions from stationary sources at DFW were derived from TCEQ operating permits and stack test data for the individual sources. In some cases, the stack test data was supplemented with emission factors from the EPA publication *Compilation of Air Pollution Emission Factors* (AP-42). AP-42 is a widely used and accepted resource for computing emissions from a broad range of stationary and area sources. Emission factors for fuel storage/transfer facilities (i.e. storage tanks, pipelines, etc.) were also obtained from this publication.

A-1.4 Airport Operational Data & Assumptions

For the purposes of this analysis, the staff of the DFW Planning Department provided most of the airport operational data, information and assumptions for both existing and future conditions. These materials are briefly discussed below.

A-1.4.1 Analysis Periods

In order to more completely assess both the current and future operational conditions at DFW, four different analysis years, or periods, were evaluated as part of this analysis. These periods are listed and described below in Table 2 along with a brief explanation as to why these conditions were selected. As shown, the consideration of multiple factors was given to selection of the analysis periods including a) the effects on the aviation industry following the events of

September 11, 2001; b) the potential effects of DFW Environmental Screening Projects on airport operations; and c) the SIP timeframe for compliance with the NAAQS for the non-attainment pollutant O_3. A long-range estimate based on reasonably foreseeable DFW operational conditions was also considered.

Table A-2
Emissions Inventory Analysis Periods

Time Period	Conditions	Explanation
2000	Current / Existing	The year considered being representative of current conditions without the effects of the events of September 11, 2001.
2005	Future, near term	The closest future year when planned improvements to the airport potentially have an effect on the operational conditions at DFW.
2007	SIP Attainment Year	The year by which the Dallas Ft. Worth area will achieve attainment of the NAAQS for O_3.
2015	DFW long-term planning horizon year	The furthest future year for which airport planning information and forecasts are reasonably foreseeable and reliable.

For construction-related emissions associated with the planned improvements to DFW, the analysis was conducted on an annual basis over the planned 13-year construction period starting in 2003 (the upcoming year of construction activity) and ending in 2015 (the last year of construction activity).

A-1.4.2 Airport Operational Levels & Conditions

The number of aircraft operations by aircraft type (i.e., commercial, cargo, general aviation, etc.) for both current and future conditions at the airport was obtained from data and forecasts provided by the DFW Planning Department. For future conditions (i.e. 2005, 2007 and 2015), two sets of forecasts were also analyzed: a) aircraft operational levels with the planned improvements to the airport – referred to the "build" scenario; and b) aircraft operational levels without the planned improvements – referred to as the "no-build" scenario. These operational data for DFW, expressed as Landing & Take-Off cycles (LTOs), are summarized below in Table A-3. These data are broken out by aircraft type in the supporting materials following this discussion.

Table A-3
Annual Landing/Take-Off Operations at DFW

Time Period	Scenario	Total LTOs
2000	Current / Existing	418,790
2005	No Build	437,905
	Build	439,077
2007	No Build	492,335
	Build	494,335
2015	No Build	612,711
	Build	649,717

Notes:
2005 & 2007 – Build Scenario includes East Cargo Operations.
2015 – Build Scenario includes East Cargo Operations and Terminal F Operations.
Post September 11 impacts were included in 2005 and 2007 operations.
Source: DFW Planning Department, 2002.

Another important element of the aircraft component of the emissions inventory is the times-in-mode data. In EDMS, these modes are termed approach / landing, climbout, take-off and taxi / idle.

The ground-based taxi / idle mode (including all ground-based delays incurred or encountered between the runway ends and the terminal gates) varies with changes in airport operations or airfield layout characteristics. For existing (i.e. 2000) and near-term future (i.e. 2005 and 2007) conditions, the taxi / idle / delay mode was derived from DFW-specific airfield modeling results and assumed to be about 31 minutes/LTO.

For annual and average day conditions, the aircraft approach / landing, take-off and climbout times-in-modes reflect EDMS default data and a 1,640-foot (ft) atmospheric mixing height established for the Dallas Ft. Worth area [NCDC 2002, EPA 1972]. These data were then adjusted to account for the differences in the atmospheric mixing height and aircraft performance characteristics occurring on Ozone-Season days, as discussed below in Section A-4.

A-1.4.3 Ground Service Equipment

As explained above, GSE emissions for DFW were obtained from an analysis recently prepared by the ATA and TCEQ in support of the SIP for the Dallas Ft. Worth O_3 non-attainment area and MOAs with DFW and the GSE owners/operators at the airport. These data are contained in Appendix W – *Discussion of Methodology of Airport Ground Support Equipment Emission Inventory* of the SIP and take into account a 90 percent reduction in GSE-related NOx emissions by 2007. According to the MOAs, approximately 75 percent of this reduction in NOx emissions is from the GSE owners/operators with the balance (i.e. 25 percent) from DFW. For this analysis, it is assumed that the no- (or low-) NOx emitting GSE will remain in-place at the airport after 2007 and the DFW obligation will have been fulfilled.

A-1.4.4 Motor Vehicles

On the airport (i.e., within DFW boundaries), motor vehicles operating on the primary access/egress roadway network (i.e., International Parkway, the frontage roads and the terminal area access/egress roads) and within the parking facilities and lots (i.e. long-term, short-term, employee, rental cars) were based on data obtained from the DFW Planning Department.

The MOBILE5 input parameters that account for the Dallas Ft. Worth Area-specific climatic factors, motor vehicle operating characteristics and emission control programs were obtained from the NCTCOG. The vehicle fleet mix distribution (i.e. percentages of light- and heavy-duty vehicles) was based on a survey undertaken by DFW for this purpose [DFW, 2002].

DFW-related off-site motor vehicle traffic (i.e., patrons, employees, and air cargo vehicles) that occurs on the highways and roadways leading to, from, and going around the airport are accounted for by TNRCC in the regional travel model for the Dallas-Fort Worth area. Therefore, the emissions associated with these vehicles are included in the Transportation Improvement Plan (TIP) for Dallas and Tarrant Counties. Consequently, DFW-related motor vehicles emissions, as well as passenger trips to and from the airport, generated on the "off-airport" surface transportation network are covered under the TIP and are not duplicated in this analysis.

A-1.4.5 Stationary Sources & Fuel Facilities

Stationary sources of air emissions at DFW fall into four general categories: a) steam boilers/back-up generators, b) solid waste incinerators, c) the live fire training facility, and d) an assortment of small fuel tanks, paint booths, etc. These sources are operated by both DFW and several airport tenants and are individually permitted to operate by the TCEQ. For this analysis, the operational and emissions data for the DFW permits (obtained from the DFW Environmental Affairs Department) served as the basis for the emissions inventory. It is assumed that the airport tenants represent an additional 50% of this total. For future year conditions (i.e., 2005, 2007, and 2015) these data were adjusted concurrent with the planned changes in airport operations and terminal building space.

Fueling activities represent potential sources of evaporative VOC emissions. At DFW, the vast majority of fueling is associated with the refueling of commercial jet aircraft, with comparatively smaller utilization of avgas and gasoline. Therefore, the amounts of fuel-related VOC emissions are based primarily by the types (i.e. jet fuel, diesel and gasoline) and amounts of fuels stored and dispensed over a daily or annual time period. Because of the relatively low vapor pressure of jet fuel and diesel, these fuel types are not considered significant sources of air emissions at DFW.

For this analysis, the 1998 fuel throughput data for DFW was used in combination with appropriate emission factors from AP-42 to derive the total amounts of VOC emitted on an average daily basis. These data were adjusted according to the forecasted increases in aircraft operations at the airport for the year 2000, 2005, 2007 and 2015 time periods.

A-1.5 Ozone Season Considerations

As discussed above, the operational emissions inventory for existing and future conditions was first completed for NOx, VOCs and CO for conditions representing annual and average daily conditions. In addition, because climatic conditions and aircraft performance characteristics differ somewhat during the summer months, the results were also adjusted to better reflect the "ozone season" environment (i.e. June 1st to September 30th).

For climatic conditions, this was accomplished by factoring in the difference in atmospheric mixing height (i.e. 1,805 ft.) and ambient temperature (i.e. 85 degrees F) based on climatological data for the Dallas-Fort Worth area [NCDC, 2002 and EPA, 1972]. These model input parameters are shown in Table A-7.

Table A-4
Climatological Modeling Parameters

Conditions	Mixing Height (ft)	Temperature (°F)
Annual & Average Daily	1,640	65
Ozone Season	1,805	85

A-2 Construction Emissions

Construction-related emissions generated by the wide assortment of vehicles and equipment (i.e., trucks, graders, scrapers, etc.) involved in site preparation and building of the proposed improvements to DFW were based on data obtained from the EPA NONROAD model. NONROAD is a computerized database of emission factors developed in support of preparing emission inventories for this category of mobile sources.

This model reflects the EPA-mandated replacement of diesel-fueled engines with cleaner-burning Tier 2 and Tier 3 engines over the next decade. For this analysis, the Texas-specific database of construction equipment operating characteristics was used.

During the construction process, emissions of NOx, VOCs and CO are generated from the combustion of gasoline and diesel fuels in construction vehicles and equipment. These vehicles and equipment include everything from off-road 600-horsepower (hp) engines mounted on heavy-duty earthmovers to 10-hp hand-held equipment. On-road motor vehicles (i.e., dump trucks, concrete trucks, pick-up trucks, etc.) are also included.

As discussed above, emission factors for this analysis were obtained from the two EPA models MOBILEa_h/b (for on-road motor vehicles) and NONROAD (for non-road construction vehicles and equipment). Appropriate input factors for MOBILEa_h/b were obtained from the NCTCOG. For NONROAD, equipment operational data such as horsepower and load factors were also

based on State of Texas data. This includes the EPA-mandated Tier 2 / Tier 3 Diesel Equipment Replacement schedule integral to the NONROAD database.

For on-road motor vehicles, construction related emissions were computed using the following general equation:

*On-road emissions = emission factor at 15 mph (grams/mile) * 15 mph * hours of operation.*

For non-road vehicles and equipment, the following general equation was used:

*Non-road emissions = emission factor (grams/horsepower (HP)/hour) * HP * load factor * hours of operation.*

The construction period time frame, estimated cost, approximate size and other construction requirements for each project was obtained from the DFW Planning Department. This information was supplemented wherever necessary by URS personnel based on experience and training, comparison with other similar projects and "best engineering" estimates of equipment types, utilization needs and other construction activities necessary to complete the work.

Construction Emissions (tons) by Project and Year

		VOC						
(tons)		2003	2004	2005	2006	2007	2008	2009
Terminal F Phase 1	Clear & Grub	0.00	0.14	0.00	0.00	0.00	0.00	0.00
	Excavation Terminal F	0.00	0.83	0.00	0.00	0.00	0.00	0.00
	Terminal	0.00	0.00	0.21	0.48	0.48	0.08	0.00
	D-F Connector	0.00	0.00	0.02	0.04	0.04	0.01	0.00
	Parking	0.00	0.00	0.33	0.73	0.73	0.12	0.00
	Apron	0.00	0.00	0.55	1.22	1.22	0.21	0.00
	Access Roads	0.00	0.00	0.57	1.26	1.26	0.21	0.00
	Glycol and Fuel Farm	0.00	0.00	0.07	0.07	0.07	0.07	0.00
	Skybridges	0.00	0.00	0.30	0.30	0.30	0.30	0.00
Terminal F Total		0.00	0.97	2.05	4.10	4.10	1.01	0.00
East Cargo Phase 1	Excavation East Cargo	0.00	0.08	0.17	0.08	0.00	0.08	0.08
	Clear & Grub	0.00	0.01	0.02	0.01	0.00	0.01	0.01
	Facility	0.00	0.07	0.15	0.07	0.00	0.07	0.07
	Apron	0.00	0.14	0.27	0.14	0.00	0.14	0.14
	New Fuel Storage Facility	0.00	0.05	0.05	0.05	0.00	0.00	0.00
	East Airfield Dr widening	0.00	0.17	0.17	0.18	0.00	0.00	0.00
East Cargo Total		0.00	0.53	0.83	0.53	0.00	0.31	0.31
West Cargo Demolish	Existing Building plus	0.27	0.74	0.00	0.00	0.00	0.00	0.00
West Cargo "Re-Life"		0.00	0.28	0.00	0.00	0.00	0.00	0.00
West Cargo Total		0.27	1.02	0.00	0.00	0.00	0.00	0.00
6E Expansion		0.00	0.00	0.18	0.00	0.00	0.00	0.00
Express South Parking - Remote Lot Phase 1 & 2		0.00	0.00	0.00	0.00	0.00	0.00	1.27
Express North Parking		0.00	0.07	0.00	0.00	0.00	0.00	0.00
North Remote		0.16	0.00	0.00	0.00	0.00	0.00	0.00
South Remote		0.00	0.20	0.00	0.00	0.00	0.00	0.00
Rehabilitate North Rental Car Return Lot		0.00	0.00	0.32	0.00	0.00	0.00	0.00
Signature Lot		0.00	0.27	0.27	0.00	0.00	0.00	0.00
Terminal B Garages		1.19	0.00	0.00	0.00	0.00	0.00	0.86
Terminal E Garage		0.00	0.00	0.00	0.00	0.00	0.00	1.03
Toll Booth		0.00	0.00	0.00	0.00	0.19	0.19	0.00
Parking Areas Total		1.36	0.55	0.78	0.00	0.19	0.19	3.16
GA Relocation		1.57	20.75					
North Cargo		0.00	0.96	1.78	1.25	0.00	0.00	0.00
Bus Maintenance		0.36	0.36	0.00	0.00	0.00	0.00	0.00
	Totals	**3.5**	**25.1**	**5.4**	**5.9**	**4.3**	**1.5**	**3.5**

Construction Emissions (tons) by Project and Year

		NOx						
(tons)		2003	2004	2005	2006	2007	2008	2009
Terminal F Phase 1	Clear & Grub	0.00	0.82	0.00	0.00	0.00	0.00	0.00
	Excavation Terminal F	0.00	5.34	0.00	0.00	0.00	0.00	0.00
	Terminal	0.00	0.00	1.30	2.90	2.90	0.49	0.00
	D-F Connector	0.00	0.00	0.10	0.23	0.23	0.04	0.00
	Parking	0.00	0.00	3.62	8.04	8.04	1.37	0.00
	Apron	0.00	0.00	5.86	13.01	13.01	2.21	0.00
	Access Roads	0.00	0.00	2.81	6.26	6.26	1.06	0.00
	Glycol and Fuel Farm	0.00	0.00	0.41	0.41	0.41	0.41	0.00
	Skybridges	0.00	0.00	1.35	1.35	1.35	1.35	0.00
Terminal F Total		0.00	6.15	15.45	32.19	32.19	6.93	0.00
East Cargo Phase 1	Excavation East Cargo	0.00	0.44	0.87	0.44	0.00	0.44	0.44
	Clear & Grub	0.00	0.07	0.14	0.07	0.00	0.07	0.07
	Facility	0.00	0.44	0.88	0.44	0.00	0.44	0.44
	Apron	0.00	1.38	2.75	1.38	0.00	1.38	1.38
	New Fuel Storage Facility	0.00	0.27	0.27	0.28	0.00	0.00	0.00
	East Airfield Dr widening	0.00	1.04	1.04	1.07	0.00	0.00	0.00
East Cargo Total		0.00	3.63	5.95	3.67	0.00	2.32	2.32
West Cargo Demolish		1.61	4.41	0.00	0.00	0.00	0.00	0.00
West Cargo "Re-Life"		0.00	1.65	0.00	0.00	0.00	0.00	0.00
West Cargo Total		1.61	6.07	0.00	0.00	0.00	0.00	0.00
6E Expansion		0.00	0.00	1.83	0.00	0.00	0.00	0.00
Express South Parking - Remote Lot Phase 1 & 2		0.00	0.00	0.00	0.00	0.00	0.00	12.82
Express North Parking		0.00	0.73	0.00	0.00	0.00	0.00	0.00
North Remote		1.65	0.00	0.00	0.00	0.00	0.00	0.00
South Remote		0.00	2.01	0.00	0.00	0.00	0.00	0.00
Rehabilitate North Rental Car Return Lot		0.00	0.00	3.26	0.00	0.00	0.00	0.00
Signature Lot		0.00	2.75	2.75	0.00	0.00	0.00	0.00
Terminal B Garages		11.07	0.00	0.00	0.00	0.00	0.00	7.96
Terminal E Garage		0.00	0.00	0.00	0.00	0.00	0.00	9.51
Toll Booth		0.00	0.00	0.00	0.00	2.24	2.24	0.00
Parking Areas Total		12.72	5.50	7.84	0.00	2.24	2.24	30.30
GA Relocation		17.27	17.27	0.00				
North Cargo		0.00	5.74	15.84	12.68	0.00	0.00	0.00
Bus Maintenance		3.92	3.92	0.00	0.00	0.00	0.00	0.00
	Totals	**35.5**	**48.3**	**45.1**	**48.5**	**34.4**	**11.5**	**32.6**

1/31/03