APPENDIX D
Air Quality

This appendix contains a description of air pollutants considered in this EIS, data on aircraft and vehicle fleet mix and operations, emission inventories, and air quality modeling output used in the preparation of this EIS.

The air quality analyses were prepared for a projected initial full year of operation in 2008. While the initial full year of operation is now projected to 2009, test calculations have been determined that the projected emissions for 2008 would be the same for an initial operating year of 2009. The number of projected operations and the associated aircraft emissions for 2015 are the same for both analyses.

Appendix D

Air Quality

This appendix contains a description of air pollutants considered in this EIS (including Greenhouse Gases); describes the California Air Districts; presents the 2005 air quality monitoring data; provides data on aircraft, motor vehicles, deicer fluid use, and fuel consumption; and a provides description of the methodologies and results of the HAPs analysis.

The air quality analyses were prepared for a projected initial full year of operation in 2008. While the initial full year of operation is now projected to be 2009, test calculations have been determined that the projected emissions for 2008 would be the same for an initial operating year of 2009. The number of projected operations and the associated aircraft emissions for 2015 are the same for both analyses.

A.1 AIR POLLUTANTS ASSESSED IN THE EIS

The air pollutants of concern in the assessment of impacts from Airport-related sources that have federal, state, or local standards are described below, along with a description of their potential health effects.

Carbon monoxide is a colorless, odorless, tasteless gas, which is a product of incomplete combustion. CO is absorbed by the lungs and reacts with hemoglobin to reduce the oxygen-carrying capacity of the blood. At moderate concentrations, CO has been shown to aggravate the symptoms of cardiovascular disease. It can cause headaches and nausea, and at sustained high concentration levels can lead to coma and death. Transportation activities, indoor heating, and open burning are among the predominant anthropogenic (e.g., manmade) sources of CO.

Nitrogen dioxide (NO_2), nitric oxide (NO), and the nitrate radical (NO_3) are collectively called oxides of nitrogen (NO_x). When combustion temperatures are extremely high, as in aircraft engines, boilers, furnaces, or automobile engines, nitrogen gas from the atmosphere and from fuel will combine with oxygen gas to form various oxides of nitrogen. These three compounds are interrelated, often changing from one form to another in chemical reactions, and NO_2 is the compound commonly measured with ambient air monitors. NO_x is generally emitted in the form of NO (a colorless and odorless gas), which is oxidized to NO_2. NO_2 has been found to be a lung irritant capable of producing pulmonary edema at high concentrations and can lead to respiratory illnesses such as bronchitis and pneumonia. The principal man-made sources of NO_x are fuel combustion in aircraft engines, motor vehicles and power plants. Reactions of NO_x with other atmospheric chemicals can lead to formation of ozone.

Volatile organic compounds (VOCs) are a general class of compounds, containing various levels of hydrogen and carbon, which are chemically active in the atmosphere. VOCs in the atmosphere come from evaporated fuel, partially burned fuel, solvent use, industrial processes, and natural sources. While concentrations of VOCs in the atmosphere are not generally measured, VOCs are known precursors to ozone, and it is ozone that is measured and used to assess potential health effects.

Ozone is a pulmonary irritant that affects the respiratory mucous membranes, other lung tissues, and respiratory functions. Exposure to ozone at certain concentrations can result in symptoms such as tightness in the chest, coughing, and wheezing, and can trigger an attack or exacerbate the symptoms of asthma, bronchitis, and emphysema. Exposure to ozone can also cause damage to vegetation. Ground level ozone is a secondary pollutant, formed from daytime reactions of NO_x and volatile organic compounds (VOCs), rather than being directly emitted by natural or man-made sources.

Particulate matter (PM) comprises very small particles of dirt, dust, soot, or liquid droplets called aerosols. The regulatory standards for particulate matter segregate PM by sizes (i.e., less than 10 and less than 2.5 microns as PM_{10} and $PM_{2.5}$, respectively). PM is formed as an exhaust product in the internal combustion engine or can be generated from the breakdown and dispersion of other solid materials (e.g., fugitive dust). Particulates larger than 10 micrometers are captured on the mucous membranes of the nose and throat and are readily expelled. These particles have very little effect on human health. Particles of 10 micrometers and smaller can reach the air ducts (bronchi) and the air sacs (alveoli) of the lung. Particulates have been associated with increased respiratory diseases such as asthma, bronchitis, and emphysema; cardiopulmonary disease (heart attack); and cancer.

Sulfur dioxide (SO_2) is a colorless gas that is formed during the combustion of fuels containing sulfur compounds. It can cause irritation and inflammation of sensitive tissues with which it comes into contact. Inhalation in sufficient concentrations can cause irritation of the mucous membranes, causing bronchial damage, and can exacerbate pre-existing respiratory diseases such as asthma, bronchitis, and emphysema. Exposure to SO_2 can cause damage to vegetation, corrosion damage to many materials, and soiling of clothing and buildings.

Lead (Pb) is a stable compound that accumulates in the environment and in living organisms. Pb interferes with the maturation and development of red blood cells, affects liver and kidney functions, and disturbs enzyme activity. The major source of Pb in ambient air had been from motor vehicles burning fuels containing Pb additives. However, Pb emissions from these sources have been nearly eliminated as unleaded gasoline has replaced leaded gasoline nationwide. The major aircraft fuel used by aircraft, Jet A, does not contain Pb.

Greenhouse Gases (GHG) are atmospheric gases that act as global insulators by reflecting visible light and infrared radiation back to Earth. Some greenhouse gases, such as water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), occur naturally and are emitted to the atmosphere through natural processes. Although CO_2, CH_4, and N_2O occur naturally in the atmosphere, human activities have increased their atmospheric concentrations, which may be causing the Earth's average temperature to rise. Rises in average temperature may lead to changes in climate patterns and shrinking polar ice caps and a rise in sea level, with a host of corresponding impacts to humans and ecosystems. There are no federal requirements for calculating or reporting GHG emissions in the Clean Air Act. There are no approved and generally accepted methodologies for calculating GHG emissions from transportation sources generally and airport-related sources in particular. There are also no significant impact levels for assessing impacts of GHG emissions. For this reason, analysis of impacts on GHG emissions and global climate change would be speculative.

California Air Districts

California is divided into Air Pollution Control Districts (APCDs) and Air Quality Management Districts (AQMDs). These entities are administered by County or regional governing authorities that have primary responsibility for controlling air pollution in California's air basins. Their primary responsibility is preparing the SIPs and/or air quality management plans for nonattainment areas under their jurisdiction. The Great Basin Unified Air Pollution Control District is responsible for monitoring air pollution within the Owens Valley and adjacent areas.

2005 Air Quality Monitoring Data in the Vicinity of MMH

The nearest air quality monitoring station to the Airport is located approximately 7.5 miles from MMH at Highway 203 and Old Mammoth Road at the Gateway Home Center in Mammoth Lakes. This site monitors PM_{10} and $PM_{2.5}$ concentrations. The nearest ozone monitoring station is located in Yosemite National Park at the Merced River Site (about 42 miles from MMH) and also measures CO concentrations. The nearest NO_2 monitoring station is locate about 74 miles from MMH in Fresno County. These last two stations are so far from MMH as to make their data unrepresentative of the air quality conditions around MMH. **Table 4.7-3** of the EIS contains the detailed site information (site location, distance, and direction from MMH) and the measured PM_{10} and $PM_{2.5}$ data from the Gateway Home Center Site for 2005 (the most recent complete year of data available). No air monitoring stations are located directly on, or adjacent to, MMH.

The annual average PM_{10} concentration in 2005 was 24 $\mu g/m^3$ and is well below the NAAQS of 50 $\mu g/m^3$. The highest recorded 24-hour average $PM_{2.5}$ concentration in 2005 was 27 $\mu g/m^3$, which is well below the NAAQS of 35 $\mu g/m^3$. The annual average $PM_{2.5}$ concentration in 2005 was 7.6 $\mu g/m^3$, which is also well below the NAAQS of 15 $\mu g/m^3$.

California Global Warming Solutions Act

At the state level, Assembly Bill (AB) 32, the California Global Warming Solutions Act, was signed by the Governor of California in September 2006. AB 32 requires that the California Air Resources Board (CARB) adopt regulations requiring the reporting and verification of statewide GHG emissions. AB 32 also requires that CARB adopt a statewide GHG emissions limit equivalent to the statewide GHG emissions in 1990 to be achieved by year 2020.

Although state-wide reduction rates for GHGs were established in AB 32, there are no established significance thresholds and no approved methodologies for calculating GHG emissions from transportation sources generally and airport-related sources in particular as part of or for use in the California Environmental Quality Act (CEQA) process. Part of the issue with establishing CEQA significance thresholds and proposing mitigation is that global warming, as the name implies, is not a localized phenomenon.

Town of Mammoth Lakes Greenhouse Gas Initiatives

At the local level, the Town of Mammoth Lakes is taking the initiative and implementing many strategies to address global warming, greenhouse gases and other emission reductions. These include:

- The Town Council joined and adopted the resolution of the U. S. Mayors Climate Protection Agreement which commits the Town to specific measures to reduce its greenhouse emission,

- The 2007 Mammoth Lakes' General Plan addresses concerns related to global warming and greenhouse gases and has adopted several policies and implementation measures found on pages 111-115, 370 and 426 of Responses to Comments, Volume II of the 2007 General Plan.

- Guiding Principle 1 of the General Plan Vision Statement acknowledges the Town's unique relationship with the natural environment and the need to be committed to the efficient use of energy and continued development of natural resources. Adopted Goals, Policies and Implementation Measures are included in the Resource Management and Conservation Chapter of the General Plan and include being a leader in green building technology, increasing use of renewable resources, and continuing to improve air quality.

- Guiding Principle 7 of the General Plan Vision Statement emphasizes connectivity, convenience and alternatives to the use of the personal automobile with a strong pedestrian emphasis and to that end the Town is spending over $13 million in trails construction, proposing air service combined with public transit to reduce visitor's use of the automobile while they are in the Town, narrowing roadways and accepting a lower level of service for automobile function and programming almost $50 million for pedestrian improvements in the Town's Master Facilities Plan.

- The Town currently has a transportation impact fee on new development to contribute to operations of a town-wide transit system. The Town dedicates 1% of the Transient Occupancy Tax (a measure passed by the voters of Mammoth Lakes) to funding transit services in Town. The Town has formed a multi-jurisdictional agency to address regional transit needs, the Eastern Sierra Transit Authority.

A.2 DATA USED IN THE AIR QUALITY ANALYSIS

Aircraft Data

Annual aircraft Landing and Take Off operations data (LTOs) and fleet mixes were developed specifically for this analysis and are shown in **Table D-1** for the 2005 Existing Conditions, the 2008 No Action Alternative, and the 2015 No Action Alternative. **Table D-2** presents these same parameters for the 2008 and the 2015 Proposed Action Alternatives. Aircraft taxi times were calculated based on the average travel distance from the terminal to the runway ends and back, using an average travel speed of 15 mph.

Motor Vehicle Data

Annual motor vehicle volumes, VMTs, and EMFAC2002 emission factors for the 2005 Existing Conditions are shown in **Table D-3**. Similar data for the 2008 No Action Alternative, the 2008 Proposed Action Alternative, the 2015 No Action Alternative, and the 2015 Proposed Action Alternative are presented in **Tables D-4 through D-7**, respectively.

Emissions factors for motor vehicles were developed specifically for this analysis using CARB's EMFAC2002 motor vehicle emissions program. An example EMFAC2002 input file for Mono County for 2015 is provided in **Figure D-1**, and an excerpt of the EMFAC2002 output file for Mono County for 2015 is presented in **Figure D-2**.

Deicing Fluid Usage Data

Annual deicing fluid usage and fuel consumption data were developed specifically for this analysis and are shown in **Table D-8**. Data provided by the Town of Mammoth indicated that no deicing was performed at MMH in 2005, and that this practice would continue in 2008 and 2015 without the Proposed Action. Data for the 2008 and 2015 Proposed Action were taken from data supplied by Horizon Air.

Fuel Consumption Data

Annual aviation gasoline (Av Gas) and Jet A fuel consumption data were developed specifically for this analysis and are also presented in **Table D-8**. 2005 consumption data for aviation gasoline and Jet A fuel was provided by the Town of Mammoth. These data were then adjusted for the 2008 and 2015 No Action and Proposed Action Alternatives based on growth in general aviation aircraft operations. Due to operational considerations, it was assumed that the aircraft for the new scheduled air service (the Q400) would not refuel at MMH.

TABLE D-1
AIRCRAFT FLEET MIXES AND OPERATIONS FOR THE 2005 EXISTING CONDITIONS AND THE 2008 AND 2015 NO ACTION ALTERNATIVES

Aircraft	Engine	LTOs			Category	Taxi Time[1]
		2005	2008	2015		
Baron58[2]	User-Created	938	993	1133	SGPB	5.80
Bell 206	250B17B	48	50	58	SGTH	5.80
BH-1900	PT6A-67B	12	13	14	SCTP	5.80
C-130 HERCULES	T56 series III	5	5	5	LMTC	5.80
Cessna 172 Skyhawk	IO-360-B	543	575	655	SGPP	5.80
Cessna 208 Caravan	PT6A-114	1242	1314	1499	SGTB	5.80
Cessna 441 Conquest2	TPE331-8	344	364	415	SGTP	5.80
CITATION II	JT15D-4 (B,C,D)	136	144	165	SGJB	5.80
Citation VII	TFE731-3	14	14	16	SGJB	5.80
CITATION X	AE3007C (Type 1)	14	14	16	SGJB	5.80
CL600	CF34-3B	20	21	24	LGJB	5.80
Comanche	TIO-540-J2B2	1754	1855	2116	SGPP	5.80
DHC-6	PT6A-20	634	670	765	SCTP	5.80
Falcon 20	CF700-2D	3	3	4	SGJB	5.80
Gulfstream II	SPEY MK511-8	21	22	25	LCJP	5.80
Gulfstream IV	TAY Mk611-8	12	13	15	LCJP	5.80
H-60 Black Hawk	T700-GE-700	12	13	15	SMTH	5.80
HS 125	TFE731-3	6	7	8	SMJP	5.80
Learjet 25C	CJ610-6	42	45	51	SGJB	5.80
Learjet 35/36	TFE 731-2-2B	139	148	168	SGJB	5.80
MU-300	JT15D-4 (B,C,D)	312	330	377	SGJB	5.80
Navajo	TIO-540-J2B2	6	6	7	SGPB	5.80
OH-6 Cayuse	250B17B	8	9	10	SMTH	5.80
PA-31T Cheyenne	PT6A-28	95	101	115	SGTB	5.80
Piper PA-28	O-320	1	2	2	SGPP	5.80
Robinson R22	IO-360-B	15	15	18	SGPH	5.80
Saberliner 75A	CF700-2D	4	4	5	SGJB	5.80
Westwind 1	TFE731-3	21	22	26	SGJB	5.80
	Total Operations	6401	6772	7727		

Notes:
1. Taxi times are in minutes per LTO.
2. Denotes User Defined Aircraft.

Source: URS Corporation, 2006.

TABLE D-2
AIRCRAFT FLEET MIXES AND OPERATIONS FOR THE 2008 AND 2015 PROPOSED ACTION ALTERNATIVES

Aircraft	Engine	LTOs		Category	Taxi Time[1]
		2008	2015		
Baron58[2]	User-Created	993	1133	SGPB	5.80
Bell 206	250B17B	50	58	SGTH	5.80
BH-1900	PT6A-67B	13	14	SCTP	5.80
C-130 HERCULES	T56 series III	5	5	LMTC	5.80
Cessna 172 Skyhawk	IO-360-B	575	655	SGPP	5.80
Cessna 208 Caravan	PT6A-114	1314	1499	SGTB	5.80
Cessna 441 Conquest2	TPE331-8	364	415	SGTP	5.80
CITATION II	JT15D-4 (B,C,D)	144	165	SGJB	5.80
Citation VII	TFE731-3	14	16	SGJB	5.80
CITATION X	AE3007C (Type 1)	14	16	SGJB	5.80
CL600	CF34-3B	21	24	LGJB	5.80
Comanche	TIO-540-J2B2	1855	2116	SGPP	5.80
Dash 8-400	PW123	224	1016	LCTP	5.80
DHC-6	PT6A-20	670	765	SCTP	5.80
Falcon 20	CF700-2D	3	4	SGJB	5.80
Gulfstream II	SPEY MK511-8	22	25	LCJP	5.80
Gulfstream IV	TAY Mk611-8	13	15	LCJP	5.80
H-60 Black Hawk	T700-GE-700	13	15	SMTH	5.80
HS 125	TFE731-3	7	8	SMJP	5.80
Learjet 25C	CJ610-6	45	51	SGJB	5.80
Learjet 35/36	TFE 731-2-2B	148	168	SGJB	5.80
MU-300	JT15D-4 (B,C,D)	330	377	SGJB	5.80
Navajo	TIO-540-J2B2	6	7	SGPB	5.80
OH-6 Cayuse	250B17B	9	10	SMTH	5.80
PA-31T Cheyenne	PT6A-28	101	115	SGTB	5.80
Piper PA-28	O-320	2	2	SGPP	5.80
Robinson R22	IO-360-B	15	18	SGPH	5.80
Saberliner 75A	CF700-2D	4	5	SGJB	5.80
Westwind 1	TFE731-3	22	26	SGJB	5.80
	Total Operations	6996	8743		

Notes:
1. Taxi times are in minutes per LTO.
2. Denotes User Defined Aircraft.

Source: URS Corporation, 2006.

TABLE D-3
VEHICLE VOLUMES, VMTS, AND EMFAC2002 EMISSION FACTORS
FOR THE 2005 EXISTING CONDITIONS

Source	Volume (trips) Per Year	Miles (RT)	VMT Per year	Speed (mph)	Emission Factor (g/mi) VOCs	CO	NOx	PM	SO_2
Shuttle Vans	3,791	17	64,447	varies					
US 395	3791	6	22,746	65	0.370	8.177	2.234	0.039	0.009
SR 203 - Link 1	3791	2.32	8,795	35	0.346	6.393	1.600	0.039	0.008
SR 203 - Link 2	3791	0.48	1,820	45	0.293	5.964	1.631	0.036	0.008
SR 203 - Link 3	3791	5	18,955	55	0.299	6.381	1.817	0.036	0.008
Hot Creek Rd.	3791	0.6	2,275	35	0.346	6.393	1.600	0.039	0.008
Airport Rd.	3791	2.6	9,857	35	0.346	6.393	1.600	0.039	0.008
Rental Cars	840	17	14,280	varies					
US 395	840	6	5,040	65	0.372	8.602	1.260	0.034	0.005
SR 203 - Link 1	840	2.32	1,949	35	0.328	7.337	1.009	0.065	0.004
SR 203 - Link 2	840	0.48	403	45	0.282	6.778	1.004	0.032	0.004
SR 203 - Link 3	840	5	4,200	55	0.293	7.037	1.079	0.032	0.004
Hot Creek Rd.	840	0.6	504	35	0.328	7.337	1.009	0.065	0.004
Airport Rd.	840	2.6	2,184	35	0.328	7.337	1.009	0.065	0.004
Private Vehicles, employees	8,424	17	143,208	varies					
US 395	8424	6	50,544	65	0.372	8.602	1.260	0.034	0.005
SR 203 - Link 1	8424	2.32	19,544	35	0.328	7.337	1.009	0.065	0.004
SR 203 - Link 2	8424	0.48	4,044	45	0.282	6.778	1.004	0.032	0.004
SR 203 - Link 3	8424	5	42,120	55	0.293	7.037	1.079	0.032	0.004
Hot Creek Rd.	8424	0.6	5,054	35	0.328	7.337	1.009	0.065	0.004
Airport Rd.	8424	2.6	21,902	35	0.328	7.337	1.009	0.065	0.004
Private Vehicles, dropoff/pickup	2,254	17	38,318	varies					
US 395	2254	6	13,524	65	0.372	8.602	1.260	0.034	0.005
SR 203 - Link 1	2254	2.32	5,229	35	0.328	7.337	1.009	0.065	0.004
SR 203 - Link 2	2254	0.48	1,082	45	0.282	6.778	1.004	0.032	0.004
SR 203 - Link 3	2254	5	11,270	55	0.293	7.037	1.079	0.032	0.004
Hot Creek Rd.	2254	0.6	1,352	35	0.328	7.337	1.009	0.065	0.004
Airport Rd.	2254	2.6	5,860	35	0.328	7.337	1.009	0.065	0.004
Total	15,309		260,253						

Notes:

1. Average Round Trip Distance from MMH Airport to Downtown Mammoth is 17 miles.
2. Miles are for Round Trip distance.
3. VMT = vehicle-miles-traveled.

Source: URS Corporation, 2006.

TABLE D-4
VEHICLE VOLUMES, VMTS, AND EMFAC2002 EMISSION FACTORS
FOR THE 2008 NO ACTION ALTERNATIVE

Source	Volume (trips) Per Year	Miles (RT)	VMT Per year	Speed (mph)	Emission Factor (g/mi) VOCs	CO	NOx	PM	SO_2
Shuttle Vans	4,011	17	68,193	varies					
US 395	4011	6	24,068	65	0.272	5.875	1.747	0.039	0.006
SR 203 - Link 1	4011	2.32	9,306	35	0.254	4.862	1.259	0.039	0.005
SR 203 - Link 2	4011	0.48	1,925	45	0.215	4.499	1.279	0.036	0.005
SR 203 - Link 3	4011	5	20,057	55	0.219	4.718	1.422	0.036	0.005
Hot Creek Rd.	4011	0.6	2,407	35	0.254	4.862	1.259	0.039	0.005
Airport Rd.	4011	2.6	10,430	35	0.254	4.862	1.259	0.039	0.005
Rental Cars	889	17	15,110	varies					
US 395	889	6	5,333	65	0.267	6.369	0.959	0.034	0.005
SR 203 - Link 1	889	2.32	2,062	35	0.236	5.626	0.777	0.033	0.004
SR 203 - Link 2	889	0.48	427	45	0.202	5.170	0.771	0.032	0.004
SR 203 - Link 3	889	5	4,444	55	0.210	5.303	0.825	0.032	0.004
Hot Creek Rd.	889	0.6	533	35	0.236	5.626	0.777	0.033	0.004
Airport Rd.	889	2.6	2,311	35	0.236	5.626	0.777	0.033	0.004
Private Vehicles, employees	8,914	17	151,532	varies					
US 395	8,914	6	53,482	65	0.267	6.369	0.959	0.034	0.005
SR 203 - Link 1	8,914	2.32	20,680	35	0.236	5.626	0.777	0.033	0.004
SR 203 - Link 2	8,914	0.48	4,279	45	0.202	5.170	0.771	0.032	0.004
SR 203 - Link 3	8,914	5	44,568	55	0.210	5.303	0.825	0.032	0.004
Hot Creek Rd.	8,914	0.6	5,348	35	0.236	5.626	0.777	0.033	0.004
Airport Rd.	8,914	2.6	23,175	35	0.236	5.626	0.777	0.033	0.004
Private Vehicles, dropoff/pickup	2,385	17	40,545	varies					
US 395	2385	6	14,310	65	0.267	6.369	0.959	0.034	0.005
SR 203 - Link 1	2385	2.32	5,533	35	0.236	5.626	0.777	0.033	0.004
SR 203 - Link 2	2385	0.48	1,145	45	0.202	5.170	0.771	0.032	0.004
SR 203 - Link 3	2385	5	11,925	55	0.210	5.303	0.825	0.032	0.004
Hot Creek Rd.	2385	0.6	1,431	35	0.236	5.626	0.777	0.033	0.004
Airport Rd.	2385	2.6	6,201	35	0.236	5.626	0.777	0.033	0.004
Total	16,199		275,380						

Notes:

1. Average Round Trip Distance from MMH Airport to Downtown Mammoth is 17 miles.
2. Miles are for Round Trip distance.
3. VMT = vehicle-miles-traveled.

Source: URS Corporation, 2006.

TABLE D-5
VEHICLE VOLUMES, VMTS, AND EMFAC2002 EMISSION FACTORS
FOR THE 2008 PROPOSED ACTION ALTERNATIVE

Source	Volume (trips) Per Year	Miles (RT)	VMT Per year	Speed (mph)	Emission Factor (g/mi) VOCs	CO	NOx	PM	SO_2
Shuttle Vans	6,327	17	107,552	varies					
US 395	6327	6	37,960	65	0.272	5.875	1.747	0.039	0.006
SR 203 - Link 1	6327	2.32	14,678	35	0.254	4.862	1.259	0.039	0.005
SR 203 - Link 2	6327	0.48	3,037	45	0.215	4.499	1.279	0.036	0.005
SR 203 - Link 3	6327	5	31,633	55	0.219	4.718	1.422	0.036	0.005
Hot Creek Rd.	6327	0.6	3,796	35	0.254	4.862	1.259	0.039	0.005
Airport Rd.	6327	2.6	16,449	35	0.254	4.862	1.259	0.039	0.005
Rental Cars	1,655	17	28,133	varies					
US 395	1655	6	9,929	65	0.267	6.369	0.959	0.034	0.005
SR 203 - Link 1	1655	2.32	3,839	35	0.236	5.626	0.777	0.033	0.004
SR 203 - Link 2	1655	0.48	794	45	0.202	5.170	0.771	0.032	0.004
SR 203 - Link 3	1655	5	8,275	55	0.210	5.303	0.825	0.032	0.004
Hot Creek Rd.	1655	0.6	993	35	0.236	5.626	0.777	0.033	0.004
Airport Rd.	1655	2.6	4,303	35	0.236	5.626	0.777	0.033	0.004
Private Vehicles, employees	14,290	17	242,924	varies					
US 395	14290	6	85,738	65	0.267	6.369	0.959	0.034	0.005
SR 203 - Link 1	14290	2.32	33,152	35	0.236	5.626	0.777	0.033	0.004
SR 203 - Link 2	14290	0.48	6,859	45	0.202	5.170	0.771	0.032	0.004
SR 203 - Link 3	14290	5	71,448	55	0.210	5.303	0.825	0.032	0.004
Hot Creek Rd.	14290	0.6	8,574	35	0.236	5.626	0.777	0.033	0.004
Airport Rd.	14290	2.6	37,153	35	0.236	5.626	0.777	0.033	0.004
Private Vehicles, dropoff/pickup	2,794	17	47,491	varies					
US 395	2794	6	16,762	65	0.267	6.369	0.959	0.034	0.005
SR 203 - Link 1	2794	2.32	6,481	35	0.236	5.626	0.777	0.033	0.004
SR 203 - Link 2	2794	0.48	1,341	45	0.202	5.170	0.771	0.032	0.004
SR 203 - Link 3	2794	5	13,968	55	0.210	5.303	0.825	0.032	0.004
Hot Creek Rd.	2794	0.6	1,676	35	0.236	5.626	0.777	0.033	0.004
Airport Rd.	2794	2.6	7,263	35	0.236	5.626	0.777	0.033	0.004
Total	25,065		426,101						

Notes:

1. Average Round Trip Distance from MMH Airport to Downtown Mammoth is 17 miles.
2. Miles are for Round Trip distance.
3. VMT = vehicle-miles-traveled.

Source: URS Corporation, 2006.

TABLE D-6
VEHICLE VOLUMES, VMTS, AND EMFAC2002 EMISSION FACTORS
FOR THE 2015 NO ACTION ALTERNATIVE

Source	Volume (trips) Per Year	Miles (RT)	VMT Per year	Speed (mph)	Emission Factor (g/mi)				
					VOCs	CO	NOx	PM	SO_2
Shuttle Vans	4,576	17	77,795	varies					
US 395	4576	6	27,457	65	0.131	2.820	0.928	0.039	0.006
SR 203 - Link 1	4576	2.32	10,617	35	0.124	2.730	0.686	0.039	0.005
SR 203 - Link 2	4576	0.48	2,197	45	0.104	2.469	0.692	0.036	0.005
SR 203 - Link 3	4576	5	22,881	55	0.106	2.457	0.763	0.036	0.005
Hot Creek Rd.	4576	0.6	2,746	35	0.124	2.730	0.686	0.039	0.005
Airport Rd.	4576	2.6	11,898	35	0.124	2.730	0.686	0.039	0.005
Rental Cars	1,014	17	17,238	varies					
US 395	1014	6	6,084	65	0.089	2.368	0.407	0.033	0.005
SR 203 - Link 1	1014	2.32	2,352	35	0.081	2.455	0.339	0.032	0.004
SR 203 - Link 2	1014	0.48	487	45	0.069	2.205	0.332	0.030	0.003
SR 203 - Link 3	1014	5	5,070	55	0.071	2.147	0.353	0.031	0.004
Hot Creek Rd.	1014	0.6	608	35	0.081	2.455	0.339	0.032	0.004
Airport Rd.	1014	2.6	2,636	35	0.081	2.455	0.339	0.032	0.004
Private Vehicles, employees	10,169	17	172,868	varies					
US 395	10169	6	61,012	65	0.089	2.368	0.407	0.033	0.005
SR 203 - Link 1	10169	2.32	23,591	35	0.081	2.455	0.339	0.032	0.004
SR 203 - Link 2	10169	0.48	4,881	45	0.069	2.205	0.332	0.030	0.003
SR 203 - Link 3	10169	5	50,843	55	0.071	2.147	0.353	0.031	0.004
Hot Creek Rd.	10169	0.6	6,101	35	0.081	2.455	0.339	0.032	0.004
Airport Rd.	10169	2.6	26,439	35	0.081	2.455	0.339	0.032	0.004
Private Vehicles, dropoff/pickup	2,721	17	46,254	varies					
US 395	2721	6	16,325	65	0.089	2.368	0.407	0.033	0.005
SR 203 - Link 1	2721	2.32	6,312	35	0.081	2.455	0.339	0.032	0.004
SR 203 - Link 2	2721	0.48	1,306	45	0.069	2.205	0.332	0.030	0.003
SR 203 - Link 3	2721	5	13,604	55	0.071	2.147	0.353	0.031	0.004
Hot Creek Rd.	2721	0.6	1,632	35	0.081	2.455	0.339	0.032	0.004
Airport Rd.	2721	2.6	7,074	35	0.081	2.455	0.339	0.032	0.004
Total	18,480		314,154						

Notes:

1. Average Round Trip Distance from MMH Airport to Downtown Mammoth is 17 miles.
2. Miles are for Round Trip distance.
3. VMT = vehicle-miles-traveled.

Source: URS Corporation, 2006.

TABLE D-7
VEHICLE VOLUMES, VMTS, AND EMFAC2002 EMISSION FACTORS
FOR THE 2015 PROPOSED ACTION ALTERNATIVE

Source	Volume (trips) Per Year	Miles (RT)	VMT Per year	Speed (mph)	Emission Factor (g/mi) VOCs	CO	NOx	PM	SO_2
Shuttle Vans	19,801	17	336,615	varies					
US 395	19801	6	118,805	65	0.131	2.820	0.928	0.039	0.006
SR 203 - Link 1	19801	2.32	45,938	35	0.124	2.730	0.686	0.039	0.005
SR 203 - Link 2	19801	0.48	9,504	45	0.104	2.469	0.692	0.036	0.005
SR 203 - Link 3	19801	5	99,004	55	0.106	2.457	0.763	0.036	0.005
Hot Creek Rd.	19801	0.6	11,881	35	0.124	2.730	0.686	0.039	0.005
Airport Rd.	19801	2.6	51,482	35	0.124	2.730	0.686	0.039	0.005
Rental Cars	6,052	17	102,877	varies					
US 395	6052	6	36,309	65	0.089	2.368	0.407	0.033	0.005
SR 203 - Link 1	6052	2.32	14,040	35	0.081	2.455	0.339	0.032	0.004
SR 203 - Link 2	6052	0.48	2,905	45	0.069	2.205	0.332	0.030	0.003
SR 203 - Link 3	6052	5	30,258	55	0.071	2.147	0.353	0.031	0.004
Hot Creek Rd.	6052	0.6	3,631	35	0.081	2.455	0.339	0.032	0.004
Airport Rd.	6052	2.6	15,734	35	0.081	2.455	0.339	0.032	0.004
Private Vehicles, employees	18,425	17	313,220	varies					
US 395	18425	6	110,548	65	0.089	2.368	0.407	0.033	0.005
SR 203 - Link 1	18425	2.32	42,745	35	0.081	2.455	0.339	0.032	0.004
SR 203 - Link 2	18425	0.48	8,844	45	0.069	2.205	0.332	0.030	0.003
SR 203 - Link 3	18425	5	92,123	55	0.071	2.147	0.353	0.031	0.004
Hot Creek Rd.	18425	0.6	11,055	35	0.081	2.455	0.339	0.032	0.004
Airport Rd.	18425	2.6	47,904	35	0.081	2.455	0.339	0.032	0.004
Private Vehicles, dropoff/pickup	5,408	17	91,928	varies					
US 395	5408	6	32,445	65	0.089	2.368	0.407	0.033	0.005
SR 203 - Link 1	5408	2.32	12,546	35	0.081	2.455	0.339	0.032	0.004
SR 203 - Link 2	5408	0.48	2,596	45	0.069	2.205	0.332	0.030	0.003
SR 203 - Link 3	5408	5	27,038	55	0.071	2.147	0.353	0.031	0.004
Hot Creek Rd.	5408	0.6	3,245	35	0.081	2.455	0.339	0.032	0.004
Airport Rd.	5408	2.6	14,060	35	0.081	2.455	0.339	0.032	0.004
Total	49,685		844,640						

Notes:

1. Average Round Trip Distance from MMH Airport to Downtown Mammoth is 17 miles.
2. Miles are for Round Trip distance.
3. VMT = vehicle-miles-traveled.

Source: URS Corporation, 2006.

TABLE D-8
ANNUAL DEICING FLUID USAGE AND FUEL CONSUMPTION (GAL/YR)

Analysis Scenario	Deicing Fluid[1]	Fuel Type[2]	
		Av Gas	Jet A
2005 Existing Conditions	0	60,000	180,000
2008 No Action	0	63,482	190,420
2008 Proposed Action	3,700	63,482	190,420
2015 No Action	0	72,398	217,385
2015 Proposed Action	16,800	72,398	217,385

Note:

1. No deicing fluid is consumed by the existing aircraft at MMH in 2005, and it was assumed that no deicing fluid would be consumed at MMH without the Proposed Action in 2008 and 2015. Data for deicing usage in 2008 and 2015 was provided by Horizon Air.

2. 2005 data provided by the Town of Mammoth, July 2006.

Source: URS Corporation, 2006.

FIGURE D – 1
EMFAC2002 INPUT FILE FOR MONO COUNTY

```
3 2 20 6 30423            ! Number of scenarios in file, version info
Mono County Avg 2015 Annual ! Scenario Title
Emfac     9  2            ! Program mode ROG  PM10
2015                      ! Calendar Year
15                        ! Month/Season
 4                        ! Geographic area selection: Mono County
26                        ! County Number
    4    1    1           ! Number of "Emfac" mode speeds, temps, RHs
                          ! Emfac speeds (hours 1-24)
  35.0  45.0  55.0  65.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
                          ! Emfac temperatures (hours 1-24)
  56.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
                          ! Emfac rel humidities (hours 1-24)
  40.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
FFFFF                     ! WEIGHT Output Options
FFTTF                     ! EMFAC Output Options
TFFFF                     ! BURDEN Output Options
FTFFF                     ! CALIMFAC Output Options
FFFFF                     ! EMFACnn Output Options
25                        ! First hour printed for detailed Burden output
6 1                       ! Bag and correction for Calimfac output
1970                      ! First model year considered in calculations
2015                      ! Last model year considered in calculations
                          ! Data on I/M Programs
                          ! --------------------
 0                        ! Number of I/M programs (num_prog) in scenario  1

#
Mono County Avg 2008 Annual ! Scenario Title
Emfac     9  2            ! Program mode ROG  PM10
2008                      ! Calendar Year
15                        ! Month/Season
 4                        ! Geographic area selection: Mono County
26                        ! County Number
    4    1    1           ! Number of "Emfac" mode speeds, temps, RHs
                          ! Emfac speeds (hours 1-24)
  35.0  45.0  55.0  65.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
                          ! Emfac temperatures (hours 1-24)
  56.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
                          ! Emfac rel humidities (hours 1-24)
  40.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
FFFFF                     ! WEIGHT Output Options
FFTTF                     ! EMFAC Output Options
TFFFF                     ! BURDEN Output Options
FTFFF                     ! CALIMFAC Output Options
FFFFF                     ! EMFACnn Output Options
25                        ! First hour printed for detailed Burden output
6 1                       ! Bag and correction for Calimfac output
1965                      ! First model year considered in calculations
2008                      ! Last model year considered in calculations
                          ! Data on I/M Programs
                          ! --------------------
 0                        ! Number of I/M programs (num_prog) in scenario  3
```

```
#
Mono County Avg 2005 Annual ! Scenario Title
Emfac     9  2            ! Program mode ROG  PM10
2005                      ! Calendar Year
15                        ! Month/Season
 4                        ! Geographic area selection: Mono County
26                        ! County Number
    4    1    1           ! Number of "Emfac" mode speeds, temps, RHs
                          ! Emfac speeds (hours 1-24)
  35.0  45.0  55.0  65.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
                          ! Emfac temperatures (hours 1-24)
  56.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
                          ! Emfac rel humidities (hours 1-24)
  40.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
FFFFF                     ! WEIGHT Output Options
FFTTF                     ! EMFAC Output Options
TFFFF                     ! BURDEN Output Options
FTFFF                     ! CALIMFAC Output Options
FFFFF                     ! EMFACnn Output Options
25                        ! First hour printed for detailed Burden output
6 1                       ! Bag and correction for Calimfac output
1965                      ! First model year considered in calculations
2005                      ! Last model year considered in calculations

                          ! Data on I/M Programs
                          ! --------------------
 0                        ! Number of I/M programs (num_prog) in scenario  4
#
```

FIGURE D – 2
EXCERPTS OF THE EMFAC2002 OUTPUT FILE FOR MONO CO.

```
Title    : Mono County Avg 2005 Annual
Version  : Emfac2002 V2.2 Apr 23 2003
Run Date : 08/11/06 08:40:08
Scen Year: 2005 -- Model Years: 1965 to 2005
Season   : Annual
Area     : Mono County
*******************************************************************************
     Year:2005 -- Model Years 1965 to 2005 Inclusive --  Annual
     Emfac2002 Emission Factors: V2.2 Apr 23 2003

     County Average                                  Mono Count          County Average

                            Table   1:  Running Exhaust Emissions (grams/mile)

     Pollutant Name: Reactive Org Gases        Temperature:  56F  Relative Humidity:  40%

     Speed
      MPH       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       35      0.267    0.359    0.346    0.664    0.634    2.756    0.389
       45      0.228    0.310    0.293    0.516    0.503    3.110    0.335
       55      0.236    0.323    0.299    0.456    0.465    4.229    0.349
       65      0.299    0.410    0.370    0.455    0.500    6.905    0.444



     Pollutant Name: Carbon Monoxide           Temperature:  56F  Relative Humidity:  40%

     Speed
      MPH       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       35      5.677    8.193    6.393    8.866    6.704   30.321    7.497
       45      5.162    7.612    5.964    7.959    6.017   39.840    7.030
       55      5.172    7.999    6.381    8.860    6.754   64.409    7.620
       65      5.984    9.953    8.177   12.242    9.480  128.200   10.013



     Pollutant Name: Oxides of Nitrogen        Temperature:  56F  Relative Humidity:  40%

     Speed
      MPH       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       35      0.710    1.163    1.600    9.680    9.760    1.477    2.007
       45      0.701    1.161    1.631   10.558   10.924    1.592    2.103
       55      0.745    1.252    1.817   13.113   14.843    1.710    2.463
       65      0.855    1.469    2.234   18.637   24.577    1.830    3.269



     Pollutant Name: Carbon Dioxide            Temperature:  56F  Relative Humidity:  40%

     Speed
      MPH       LDA      LDT      MDT      HDT      UBUS     MCY      ALL

       35    320.359  384.746  522.530 1813.396 1742.808  110.644  538.472
       45    296.858  357.056  484.663 1805.317 1722.730  100.104  511.667
       55    318.872  382.995  522.531 1815.111 1747.070   97.202  537.404
       65    397.132  475.203  657.424 1850.184 1834.236  101.958  629.130
```

Pollutant Name: Sulfur Dioxide Temperature: 56F Relative Humidity: 40%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
35	0.003	0.005	0.008	0.155	0.139	0.002	0.020
45	0.003	0.004	0.008	0.155	0.138	0.002	0.020
55	0.003	0.005	0.008	0.155	0.139	0.002	0.020
65	0.004	0.006	0.009	0.155	0.140	0.003	0.021

Pollutant Name: PM10 Temperature: 56F Relative Humidity: 40%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
35	0.010	0.015	0.017	0.209	0.143	0.032	0.033
45	0.008	0.013	0.014	0.171	0.118	0.036	0.028
55	0.008	0.013	0.014	0.154	0.113	0.048	0.026
65	0.010	0.015	0.017	0.150	0.123	0.078	0.028

Pollutant Name: PM10 - Tire Wear Temperature: 56F Relative Humidity: 40%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
35	0.008	0.008	0.009	0.029	0.010	0.004	0.010
45	0.008	0.008	0.009	0.029	0.010	0.004	0.010
55	0.008	0.008	0.009	0.029	0.010	0.004	0.010
65	0.008	0.008	0.009	0.029	0.010	0.004	0.010

Pollutant Name: PM10 - Break Wear Temperature: 56F Relative Humidity: 40%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
35	0.013	0.013	0.013	0.013	0.013	0.013	0.013
45	0.013	0.013	0.013	0.013	0.013	0.013	0.013
55	0.013	0.013	0.013	0.013	0.013	0.013	0.013
65	0.013	0.013	0.013	0.013	0.013	0.013	0.013

A.3 HAZARDOUS AIR POLLUTANTS EMISSIONS INVENTORY

Methodology

The assessment of toxic air pollutants was prepared in response to comments received during the scoping process for this EIS and was prepared for disclosure purposes only, as part of the overall environmental disclosure. Emissions inventories of HAPs were prepared in accordance with FAA guidelines for conducting air quality analyses. For the purposes of this discussion, the terms "toxic air pollutants", "toxics", "toxic air contaminants", and "hazardous air pollutants" are interchangeable. These terms all refer to pollutants that do not have established NAAQS but present potential adverse human health risks from short-term or long-term exposures. Although no federal or state reporting requirements applicable to airports exist for these pollutants, the analysis presented here is consistent with current agency guidelines for quantifying emissions of toxics from airports.

The toxic substances evaluated here are a subset of VOC and particulate emissions. Their effects and potential toxicity vary, and they have or are suspected to have impacts on human health, including risks of cancer, respiratory conditions, and other health effects. The substances evaluated here include only those aircraft and airport-related pollutants identified in Table 1 of FAA's guidance document *Select Resource Materials and Annotated Bibliography on the Topic of Hazardous Air Pollutants (HAPS) Associated with Aircraft, Airports, and Aviation* (FAA, 2003). The twelve compounds that were assessed in this analysis represent the vast majority (about 99 percent) of HAPs that are reported to occur in aircraft and GSE exhaust (FAA, 2003). Diesel particulate matter from GSE and other motor vehicles is also considered appropriate to include in this assessment. These compounds are identified as follows: formaldehyde, acetaldehyde, benzene, toluene, acrolein, 1,3-butadiene, xylenes, lead, naphthalene, propionaldehyde, ethylbenzene, styrene, and diesel particulate matter.

The emissions inventories of HAPs were developed using published source-specific speciation profile data. Speciation profiles list the weight fractions or weight percentages of compounds which are included in the total hydrocarbons (THC) and particulate matter (assumed to be PM_{10}) emissions for each source category. Because some of the speciation profiles present the data in terms of volatile organic compounds (VOC) or total organic gases (TOG), it was necessary to convert the calculated THC emissions to corresponding VOC or TOG emissions prior to applying the speciation profile data.

For this analysis, the same emissions sources and activity data that were analyzed for the EPA "criteria pollutants" analysis described in Air Quality impacts Section of the EA were assessed for HAPs emissions. These sources include aircraft, GSE, motor vehicles, and stationary sources (i.e., fuel storage facilities and deicing activities) associated with the airport.

Emissions of individual HAPs were calculated by multiplying the appropriate criteria pollutant (VOC or particulate matter) emissions (in units of tons per year) by the relative toxic pollutant speciation profile factor.

HAPs Emissions Inventory Results

The detailed results of this analysis are presented in **Tables D-9 through D-13**.

2005 Existing Conditions HAPs Emissions Inventory

As shown in **Table D-9**, under the 2005 Existing Conditions, emissions of xylenes (the pollutant with the highest emissions) are estimated to be about 0.121046 tons per year (tpy) and toluene emissions (the pollutant with the second highest emissions) are estimated to be approximately 0.073416 tpy. Emissions of formaldehyde (the pollutant with the third highest emissions) are estimated to be about 0.073095 tpy.

2008 No-Action HAPs Emissions Inventory

As shown in **Table D-10**, under the No-Action Alternative in 2008, emissions of xylenes (the pollutant with the highest emissions) are estimated to be about 0.126929 tpy and formaldehyde emissions (the pollutant with the second highest emissions) are estimated to be approximately 0.076760 tpy. Emissions of toluene (the pollutant with the third highest emissions) are estimated to be about 0.076206 tpy.

2008 Proposed Action HAPs Emissions Inventory

As presented in **Table D-11**, for the Proposed Action in 2008, emissions of xylenes (the pollutant with the highest emissions) are estimated to be about 0.132974 tpy and toluene emissions (the pollutant with the second highest emissions) are estimated to be approximately 0.081189 tpy. Emissions of formaldehyde (the pollutant with the third highest emissions) are estimated to be about 0.078244 tpy. Compared to the results for the 2008 No-Action Alternative, the Proposed Action, in 2008, is estimated to have increases in emissions of each of the toxic pollutants analyzed, except for diesel particulates which decrease due the implementation of the low sulfur diesel fuel rules. These increases are attributable to the addition of air carrier operations and associated increase in motor vehicle trips.

2015 No-Action Hazardous Air Pollutant Emissions Inventory

Table D-12 presents the HAPs emissions inventories for the No-Action Alternative in 2015, and shows that emissions of xylenes (the pollutant with the highest emissions) are estimated to be about 0.141648 tpy and formaldehyde emissions (the pollutant with the second highest emissions) are estimated to be approximately 0.086446 tpy. Emissions of toluene (the pollutant with the third highest emissions) are estimated to be about 0.083170 tpy.

2015 Proposed Action Hazardous Air Pollutant Emissions Inventory

As presented in **Table D-13**, for the Proposed Action in 2015, emissions of xylenes (the pollutant with the highest emissions) are estimated to be about 0.176827 tpy and toluene emissions (the pollutant with the second highest emissions) are estimated to be approximately 0.105066 tpy. Emissions of formaldehyde (the pollutant with the third highest emissions) are estimated to be about 0.090848 tpy. Compared to the results for the 2015 No-Action Alternative, the Proposed Action in 2015 is estimated to have emissions increases of 0.03518 tpy of xylenes, 0.02189 tpy of toluene, and 0.00294 tpy of diesel particulate. Similar increases occur for the other pollutants that were analyzed. These increases are attributable to the increase in scheduled air carrier operations and associated increase in motor vehicle trips.

TABLE D-9
2005 HAPS EMISSIONS BY SOURCE CATEGORY (TONS PER YEAR)

Pollutant	Jet-Fueled Aircraft	Aviation Gas-Fueled Aircraft	Jet-Fueled APU	Gas-Fueled GSE	Diesel-Fueled GSE	Gas Motor Vehicles	Diesel Motor Vehicles	Aviation Gas Evaporation	Total Emissions
Formaldehyde	0.063471	0.007303	0.000000	0.000000	0.000036	0.001894	0.000391	0.000000	0.073095
Acetaldehyde	0.010148	0.004445	0.000000	0.000000	0.000018	0.000269	0.000196	0.000000	0.015076
Benzene	0.010418	0.029846	0.000000	0.000000	0.000005	0.002925	0.000053	0.024951	0.068198
Toluene	0.008330	0.058502	0.000000	0.000000	0.000000	0.006545	0.000039	0.000000	0.073416
Acrolein	0.004854	0.001032	0.000000	0.000000	0.000001	0.000157	0.000000	0.000000	0.006044
1,3-Butadiene	0.008128	0.005715	0.000000	0.000000	0.000000	0.000605	0.000005	0.000005	0.014459
Xylene	0.010713	0.104859	0.000000	0.000000	0.000000	0.005447	0.000028	0.000000	0.121046
Lead	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Naphthalene	0.002252	0.000953	0.000000	0.000000	0.000000	0.000056	0.000002	0.000000	0.003263
Propionaldehyde	0.000000	0.000000	0.000000	0.000000	0.000000	0.000045	0.000026	0.000000	0.000071
Ethylbenzene	0.001389	0.011669	0.000000	0.000000	0.000000	0.001199	0.000008	0.000000	0.014265
Styrene	0.002069	0.002223	0.000000	0.000000	0.000000	0.000134	0.000002	0.000000	0.004428
Diesel PM	N/A	N/A	N/A	N/A	0.008818	N/A	0.000185	N/A	0.009004

TABLE D-10
2008 NO ACTION HAPS EMISSIONS BY SOURCE CATEGORY (TONS PER YEAR)

Pollutant	Jet-Fueled Aircraft	Aviation Gas-Fueled Aircraft	Jet-Fueled APU	Gas-Fueled GSE	Diesel-Fueled GSE	Gas Motor Vehicles	Diesel Motor Vehicles	Aviation Gas Evaporation	Total Emissions
Formaldehyde	0.067178	0.007737	0.000000	0.000000	0.000032	0.001557	0.000256	0.000000	0.076760
Acetaldehyde	0.010741	0.004709	0.000000	0.000000	0.000016	0.000221	0.000128	0.000000	0.015816
Benzene	0.011028	0.031620	0.000000	0.000000	0.000004	0.002405	0.000035	0.024951	0.070043
Toluene	0.008821	0.061979	0.000000	0.000000	0.000000	0.005380	0.000026	0.000000	0.076206
Acrolein	0.005140	0.001093	0.000000	0.000000	0.000001	0.000129	0.000000	0.000000	0.006363
1,3-Butadiene	0.008606	0.006055	0.000000	0.000000	0.000000	0.000498	0.000003	0.000003	0.015166
Xylene	0.011342	0.111091	0.000000	0.000000	0.000000	0.004478	0.000018	0.000000	0.126929
Lead	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Naphthalene	0.002384	0.001009	0.000000	0.000000	0.000000	0.000046	0.000001	0.000000	0.003441
Propionaldehyde	0.000000	0.000000	0.000000	0.000000	0.000000	0.000037	0.000017	0.000000	0.000054
Ethylbenzene	0.001471	0.012362	0.000000	0.000000	0.000000	0.000986	0.000005	0.000000	0.014824
Styrene	0.002190	0.002355	0.000000	0.000000	0.000000	0.000111	0.000001	0.000000	0.004657
Diesel PM	N/A	N/A	N/A	N/A	0.020944	N/A	0.000185	N/A	0.021129

TABLE D-11
2008 PROPOSED ACTION HAPS EMISSIONS BY SOURCE CATEGORY (TONS PER YEAR)

Pollutant	Jet-Fueled Aircraft[1]	Aviation Gas-Fueled Aircraft	Jet-Fueled APU	Gas-Fueled GSE	Diesel-Fueled GSE	Gas Motor Vehicles	Diesel Motor Vehicles	Aviation Gas Evaporation	Total Emissions
Formaldehyde	0.067178	0.007737	0.000000	0.001366	0.000083	0.002422	0.000398	0.000000	0.079184
Acetaldehyde	0.010741	0.004709	0.000000	0.000832	0.000041	0.000344	0.000199	0.000000	0.016866
Benzene	0.011028	0.031620	0.000000	0.005585	0.000011	0.003741	0.000054	0.024951	0.076990
Toluene	0.008821	0.061979	0.000000	0.010947	0.000000	0.008370	0.000040	0.036040	0.126196
Acrolein	0.005140	0.001093	0.000000	0.000193	0.000002	0.000201	0.000000	0.000000	0.006629
1,3-Butadiene	0.008606	0.006055	0.000000	0.001069	0.000001	0.000774	0.000005	0.000000	0.016511
Xylene	0.011342	0.111091	0.000000	0.019621	0.000000	0.006965	0.000028	0.013862	0.162908
Lead	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Naphthalene	0.002384	0.001009	0.000000	0.000178	0.000000	0.000072	0.000002	0.001386	0.005032
Propionaldehyde	0.000000	0.000000	0.000000	0.000000	0.000000	0.000057	0.000026	0.000000	0.000084
Ethylbenzene	0.001471	0.012362	0.000000	0.002183	0.000000	0.001533	0.000008	0.002772	0.020330
Styrene	0.002190	0.002355	0.000000	0.000416	0.000000	0.000172	0.000002	0.000000	0.005135
Diesel PM	N/A	N/A	N/A	N/A	0.021357	N/A	0.000370	N/A	0.021728

[1] EDMS Version 4.5 (and previous versions) does not have any Emission Indices for HC for the Q-400 (Dash8-400) engines.

TABLE D-12
2015 NO ACTION HAPS EMISSIONS BY SOURCE CATEGORY (TONS PER YEAR)

Pollutant	Jet-Fueled Aircraft	Aviation Gas-Fueled Aircraft	Jet-Fueled APU	Gas-Fueled GSE	Diesel-Fueled GSE	Gas Motor Vehicles	Diesel Motor Vehicles	Aviation Gas Evaporation	Total Emissions
Formaldehyde	0.076852	0.008822	0.000000	0.000000	0.000017	0.000699	0.000057	0.000000	0.086446
Acetaldehyde	0.012288	0.005370	0.000000	0.000000	0.000008	0.000099	0.000028	0.000000	0.017794
Benzene	0.012611	0.036055	0.000000	0.000000	0.000002	0.001079	0.000008	0.024951	0.074706
Toluene	0.010079	0.070672	0.000000	0.000000	0.000000	0.002414	0.000006	0.000000	0.083170
Acrolein	0.005874	0.001247	0.000000	0.000000	0.000000	0.000058	0.000000	0.000000	0.007179
1,3-Butadiene	0.009829	0.006904	0.000000	0.000000	0.000000	0.000223	0.000001	0.000001	0.016958
Xylene	0.012963	0.126672	0.000000	0.000000	0.000000	0.002009	0.000004	0.000000	0.141648
Lead	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Naphthalene	0.002724	0.001151	0.000000	0.000000	0.000000	0.000021	0.000000	0.000000	0.003895
Propionaldehyde	0.000000	0.000000	0.000000	0.000000	0.000000	0.000017	0.000004	0.000000	0.000020
Ethylbenzene	0.001681	0.014096	0.000000	0.000000	0.000000	0.000442	0.000001	0.000000	0.016221
Styrene	0.002503	0.002685	0.000000	0.000000	0.000000	0.000050	0.000000	0.000000	0.005238
Diesel PM	N/A	N/A	N/A	N/A	0.062832	N/A	0.000093	N/A	0.062924

TABLE D-13
2015 PROPOSED ACTION HAPS EMISSIONS BY SOURCE CATEGORY (TONS PER YEAR)

Pollutant	Jet-Fueled Aircraft[1]	Aviation Gas-Fueled Aircraft	Jet-Fueled APU	Gas-Fueled GSE	Diesel-Fueled GSE	Gas Motor Vehicles	Diesel Motor Vehicles	Aviation Gas Evaporation	Total Emissions
Formaldehyde	0.076852	0.008822	0.000000	0.003993	0.000606	0.001921	0.000156	0.000000	0.092351
Acetaldehyde	0.012288	0.005370	0.000000	0.002431	0.000303	0.000273	0.000078	0.000000	0.020743
Benzene	0.012611	0.036055	0.000000	0.016320	0.000082	0.002967	0.000021	0.024951	0.093008
Toluene	0.010079	0.070672	0.000000	0.031989	0.000000	0.006638	0.000016	0.036040	0.155433
Acrolein	0.005874	0.001247	0.000000	0.000564	0.000014	0.000159	0.000000	0.000000	0.007859
1,3-Butadiene	0.009829	0.006904	0.000000	0.003125	0.000008	0.000614	0.000002	0.000000	0.020482
Xylene	0.012963	0.126672	0.000000	0.057337	0.000000	0.005524	0.000011	0.013862	0.216369
Lead	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Naphthalene	0.002724	0.001151	0.000000	0.000521	0.000000	0.000057	0.000001	0.001386	0.005839
Propionaldehyde	0.000000	0.000000	0.000000	0.000000	0.000000	0.000045	0.000010	0.000000	0.000056
Ethylbenzene	0.001681	0.014096	0.000000	0.006380	0.000000	0.001216	0.000003	0.002772	0.026149
Styrene	0.002503	0.002685	0.000000	0.001215	0.000000	0.000136	0.000001	0.000000	0.006540
Diesel PM	N/A	N/A	N/A	N/A	0.076589	N/A	0.000278	N/A	0.076867

[1] EDMS Version 4.5 (and previous versions) does not have any Emission Indices for HC for the Q-400 (Dash8-400) engines.