
5.17 ENERGY SUPPLY AND NATURAL RESOURCES

The operation of an airport requires energy in the form of electricity, natural gas, aviation fuel, diesel fuel, and gasoline. Airport improvements would require additional electric energy and natural gas to cool, heat, or provide lighting to new buildings, gates, or airfield reconfigurations. This section describes the potential impact of the proposed alternatives upon the supply and demand for energy and natural resources at the Airport. As part of the evaluation of energy and natural resource demands, consideration was given to the regulatory requirements of these issues.

5.17.1 Background and Methodology

5.17.1.1 Regulatory Context

Executive Order 13123, *Greening the Government Through Efficient Energy Management* (64 FR 30851),¹ requires each Federal agency to reduce petroleum use, total energy use and associated air emissions, and water consumptions in its facilities. It is also the policy of the FAA to encourage the development of facilities that exemplify the highest standards of design, including principles of sustainability. That policy notes that all elements of the transportation system should be designed with a view to their aesthetic impact, conservation of resources such as energy, pollution prevention, harmonization with the community environment, and sensitivity to the concerns of the traveling public.

The Voluntary Airport Low Emission (VALE) program, recently established by the FAA, provides airport sponsors with financial and regulatory incentives to increase their investments in low-emission technology, which includes alternative fuel vehicles. Although involvement in this program is only voluntary, this program could affect O'Hare's ground support equipment (GSE) fuel requirements by emphasizing the use of non-petroleum based fuels.

FAA Order 1050.1E (Appendix A, 13.2a) states:

Principles of environmental design and sustainability, including pollution prevention, waste minimization, and resource conservation should be followed generally in project or program planning. For purposes of the EA or EIS, the proposed action will be examined to identify any proposed major changes in stationary facilities or the movement of aircraft and ground vehicles that would have a measurable effect on local supplies of energy or natural resources. ...The use of natural resources other than for fuel need be examined only if the action involves a need for unusual materials or those in short supply. For example, if a large volume of water will be required, the availability of a supply of water from existing or planned water facilities or from surface or groundwater sources should be considered. Therefore, evaluation of significant energy, water, and other resource use for major construction actions is important.

¹ Executive Order 13123, *Greening the Government Through Efficient Energy Management* (64 FR 30851), June 8, 1999.

5.17.1.2 Thresholds of Significance

FAA Order 1050.1E (Appendix A, 13.2b) states:

For most actions, changes in energy demands or other natural resource consumption will not result in significant impacts. If an EA identifies problems such as demands exceeding supplies, additional analysis may be required in an EIS. Otherwise, it may be assumed that impacts are not significant.

5.17.1.3 Methodologies

The evaluation of energy and natural resource use focuses on: 1) energy required to operate stationary airport facilities, such as the airfield buildings; and 2) energy required to operate mobile vehicles (aircraft, ground support vehicles, and ground access vehicles). To evaluate the energy consumption associated with the proposed alternatives, the existing energy usage at O'Hare was assessed, based on records of the City of Chicago. Natural resource needs were then assessed for the alternatives.

Energy consumption was identified for two key sources: airport facility use and airport-related vehicular travel. Airport facility use reflects the energy use required to light, heat, and cool terminal buildings and to support all airfield lighting. At O'Hare, Peoples Energy supplies natural gas, while ComEd provides electrical power. A small amount of Number 2 Fuel Oil is also used to power generators and supply generators when natural gas is not available.

Airport vehicle energy use consists of energy needed to power: aircraft landing and takeoffs, ground support vehicles, and other ground access vehicles including passenger, cargo, and support vehicles. The evaluation of aircraft energy use consisted of first identifying the amount of fuel that was stored and pumped (both JetA and AvGas). The standard "Landing and Takeoff Cycle" (LTO) as used in the air quality analysis, was used to calculate fuel consumption associated with the existing and forecast activity levels. Consistent with the air quality analysis discussed in **Section 5.6, Air Quality**, the LTO cycle consists of four modes: approach, taxi/idle/delay, takeoff, and climbout. The energy consumed during the LTO cycle is a reflection of the unique characteristics at an airport, but do not reflect the total fuel consumed as a result of a flight. As an example, energy consumed in the LTO cycle reflects departure fuel burn until the aircraft reaches the mixing height, which can be as high as 5,000 feet above ground level. The source of information associated with fuel use in each mode was obtained from EPA's AP-42 and certification data generated for the International Civil Aviation Organization (ICAO).

Records were not available concerning the fuel usage associated with GSE, with the exception of City of Chicago owned vehicles (an estimated 4,200 equivalent gasoline gallons). Therefore, estimates, based on BTU fuel consumption per average aircraft operations were used to estimate GSE fuel consumption, reflecting that an estimated seven different fuel types are used at O'Hare (Diesel, Kerosene, Electric, gas, propane, CNG, and E85 – Ethanol). While it would be reasonable to assume that greater fuel efficiency would be achieved in the future, the existing BTU consumption was used for future years (approximately 410,000 BTU per aircraft operation for GSE fuel consumption).

Ground access vehicle (GAV) fuel consumption was evaluated based on an estimated vehicle miles traveled within the study area in **Section 5.3, Surface Transportation**, and average existing fuel consumption of 20.2 miles per gallon.² Vehicle miles traveled (VMT) was computed based on the surface traffic modeling conducted for the peak hour for each scenario. While the VMT methodology was used to calculate fuel consumption within the study area, it does not address any changes in roadway efficiencies that may occur over time or as a result of changes associated with a development proposal. However, it serves as a surrogate to evaluate changes in fuel consumption that may occur in the study area.

The conversion of fuel consumption in gallons, therms, kilowatt-hours to British Thermal Units was performed using the Department of Energy's *Transportation Data Energy Book* (version 23).³

Data is not maintained by the City concerning its use of other natural resources. Therefore, the natural resource consumption estimates were prepared by the CCT evaluating proposed development.⁴

5.17.2 Baseline Conditions

As described in the methodology section, energy use during 2002 was evaluated based primarily on existing energy use records maintained by the City of Chicago.

5.17.2.1 Airport Building Energy Use

The existing facilities use both electricity and natural gas. Electricity is used to power all of the buildings, to operate cooling systems, to light all buildings, parking lots, parking decks, and to light the airfield. Natural gas is used as the primary fuel to heat the terminals and most other on-airport buildings. As a backup fuel for generators, and in times of natural gas shortages, a small amount of Number 2 Fuel Oil (i.e., diesel) is used. See **Table 5.17-1**.

**TABLE 5.17-1
AIRPORT FACILITY ENERGY USE (BASELINE)**

Energy Used	Baseline (2002)	Billion British Thermal Units (BBTU)
Electricity	440,712,000 Kwh	1,503.7
Number 2 Fuel Oil	871 Gallons	0.1
Natural Gas	9,831,544 Therms	983.2
Total BBTU		2,487.0

Source: Synergy Consultants, Inc. [TPC] review of information supplied by the City of Chicago, August 13, 2004.
Conversions: 1 Kwh = 3,412 BTU; 1 Therm = 100,000 BTU; 1 gal No. 2 Fuel Oil = 138,700 BTU.

To enable a summary of the change in energy usage, each of the energy types were also converted to Billion British Thermal Units (BBTU). The British Thermal Unit (BTU) is the amount of heat or energy necessary to raise the temperature of one pound of water one degree

² From FHWA 2002 Highway Statistics showing travel in Illinois and fuel consumption in Illinois.

³ Available on the web at <http://www-cta.ornl.gov/data/Download23.html>

⁴ T-6 Terminal Program Criteria Document Baseline Estimate, T6 Partners, 2002; Concrete Basics, Portland Cement Association; O'Hare International Airport Master Plan, Ricondo & Associates, [CCT] 2004, Draft O'Hare Modernization Program Options for High Volume Material Handling, AOR/TOK, January 2003.

(from 58.5 to 59.5 degrees Fahrenheit). Conversion of the individual energy units to BBTU enables the energy use to be summarized.

5.17.2.2 Vehicle Energy Use (Ground Vehicles and Aircraft)

Table 5.17-2 shows the quantities of energy consumed by the various types of air and surface vehicles occurring at O'Hare during 2002. To enable a summary of total energy use, the individual source use was converted to BBTU and shows that 30,360 BBTU was consumed by vehicles. Of this use, 49.6 percent of the energy consumption was by aircraft and 49.2 percent was consumed by ground access vehicles in the study area.

**TABLE 5.17-2
VEHICLE ENERGY USE (BASELINE)**

Energy Used	Baseline (2002)	Billion British Thermal Units (BBTU)
Aircraft Fuel Consumed	118,139,275 gallons	15,062.8
GSE Fuel	Unavailable	369.7 estimated use
Ground Access Vehicles	2,412,313,682 VMT	14,927.7
Total BBTU		30,360.2

Source: Synergy Consultants, Inc. [TPC] review of information supplied by the City of Chicago, August 13, 2004.
 Conversions: 1 gal Auto gas = 125,000 BTU; 1 gal JetA = 127,500 BTU; 1 gal AvGas = 135,000 BTU; 20.2 miles/gal fuel per VMT.;
 GSE fuel estimated based on 400,000 BTU per operation as noted in Section 5.17.1.3.

5.17.2.3 Natural Resource Use

Activity at O'Hare also results in the consumption of water, concrete, asphalt, aggregate, and wood. Water is used on a daily basis to support passengers and operations. Other natural resources, such as cement and wood, are used in annual capital improvement projects, such as pavement maintenance and other building projects. No records are kept concerning existing consumption of these resources.

5.17.3 Alternatives Analysis

To evaluate energy and natural resource use, an evaluation of the Build Out + 5 phase was conducted for all alternatives. This scenario reflects the greatest quantities of energy use, since the dominant energy demand is associated with aircraft operations, as shown in the Baseline Conditions analysis. Since the Build Out + 5 scenario results in the consumption of the greatest amount of energy and natural resources, it was used to determine if demand exceeds supply. Natural resource consumption would be greatest during construction, and thus, consumption of raw materials is discussed in Section 5.17.3.4, Natural Resource Use.

5.17.3.1 Airport Building Energy Use – Build Out + 5

The following summarizes the airport building energy demands associated with each alternative. Table 5.17-3 summarizes the power required to support airport facilities with each alternative.

**TABLE 5.17-3
AIRPORT FACILITY ENERGY USE
(NO ACTION ALTERNATIVE AND BUILD ALTERNATIVES C, D, AND G)**

Energy Used	Alternative A	Build Alternatives		
	(No Action)	Alternative C	Alternative D	Alternative G
Electricity (Kwh)	440,712,000	607,411,000	605,945,500	607,411,000
No. 2 Fuel Oil (gal.)	871	871	871	871
Natural Gas (Therms)	9,831,544	15,533,600	15,533,600	15,533,600
Total BBTU	2,487.0	3,626.0	3,621.0	3,626.0

Source: Synergy Consultants, Inc. [TPC] review of information provided by and Landrum & Brown [CCT].

Alternative A - No Action

Under the No Action Alternative (Alternative A), some airport facility improvements would occur over the Baseline. Some airport improvements would occur, and airport energy demands would be expected to remain relatively constant. The energy requirements associated with the No Action Alternative (during each phase) would be expected to be about 2,487 BBTU as indicated in **Table 5.17-1**.

Alternative C and G

Of the three Build Alternatives evaluated, Alternative C and Alternative G would result in nearly equal airport facility energy demands. **Table 5.17-3** shows that electrical consumption would increase from about 440,712,000 Kwh with the No Action Alternative (Alternative A), to 607,411,000 Kwh with these Build Alternatives (Alternatives C and G). This 38 percent increase in electrical consumption is due to the near 7 million square feet of new terminal space that would need to be lighted, heated, and cooled. In addition, approximately 15,000 linear feet of additional runway and associated taxiway lighting would occur with these alternatives requiring additional electrical use. About 25,000 additional parking stalls would also be provided requiring associated lighting. Natural gas use would increase with these Build Alternatives from 9.8 million therms with the No Action Alternative (Alternative A) to about 15.5 million therms, an increase of 60 percent. This increase in natural gas use would be due to the increase in heating requirements of the additional airport building space. Contacts were made with ComEd and Peoples Energy to ensure that adequate supply would be available to meet this demand. Peoples Energy reported that they would be able to meet such increased energy demands.⁵ ComEd has not responded as of July 8, 2005. It is assumed, for purposes of this EIS, that adequate electricity would be available from ComEd based on past practices.

Alternative D

Alternative D would result in slightly less airport facility energy demands than would occur with either Alternative C or G, but greater than the No Action Alternative (Alternative A). As is shown in **Table 5.17-3**, electrical consumption would increase from about 440,712,000 Kwh

⁵ Letter from Heather T. Mitchell, Peoples Energy, to Amy Hanson, FAA, November 1, 2004.

with the No Action Alternative (Alternative A) to 605,945,500 Kwh with this Build Alternative. This 38 percent increase in electrical consumption is due to the near 7 million square feet of new terminal space that would need to be lighted, heated, and cooled. Slightly less electrical demand would occur with this alternative relative to Alternatives C and G, because one less runway and associated taxiway would be constructed. Virtually all other airport facilities would be the same as the other Build Alternatives, and thus, the natural gas and other building energy demands would be equal or similar. As Peoples Energy could meet the greater demands associated with Alternative C and G, the slightly lower electrical demands could also be met. It is assumed, for purposes of this EIS, that adequate electricity would be available from ComEd based on past practices.

5.17.3.2 Vehicle Energy Use (Ground Vehicles and Aircraft) – Build Out + 5

The following summarizes the airport-related vehicles (mobile) energy demands associated with each alternative. Table 5.17-4 summarizes the energy required to support aircraft (JetA and AvGas), ground support vehicles, and on-airport passenger and support vehicle travel with each alternative.

**TABLE 5.17-4
VEHICLE ENERGY USE
(NO ACTION ALTERNATIVE AND BUILD ALTERNATIVES C, D, AND G)**

Energy Used	Alternative A	Build Alternatives		
	(No Action)	Alternative C	Alternative D	Alternative G
Aircraft LTO JetA (gal)	135,650,920	172,135,090	213,981,730	181,928,980
Aircraft LTO AvGas (gal)	460	540	670	570
GSE (BBTU)	399.2	490.5	490.5	490.5
Ground Access Vehicles (VMT)	2,837,474,221	3,084,393,598	3,084,393,598	3,084,393,598
Total BBTU	35,253.5	41,523.4	46,858.9	42,772.2

Source: Synergy Consultants, Inc. [TPC] review of information provided by Landrum & Brown [CCT].
Conversions: 1 gal Auto gas = 125,000 BTU; 1 gal JetA = 127,500 BTU; 1 gal AvGas = 135,000 BTU.

Alternative A - No Action

Under the No Action Alternative (Alternative A), some planned airport facility improvements would occur over the Baseline. By 2018, the Airport would be expected to accommodate 974,000 annual aircraft operations and associated passenger and support vehicle activity. Some airport improvements would occur, and airport mobile vehicle energy demands would be expected to remain relatively constant. Aircraft JetA fuel consumption in the LTO cycle would increase from the baseline of about 118 million gallons to 135.6 million gallons. AvGas consumption would decrease from about 1,044 gallons to about 460 gallons. The increase in JetA consumption is due to the increase in delay at O'Hare while the decrease in AvGas is due to the reduction in piston powered aircraft (such as the movement to regional jets).

GSE fuel conversion is expected to change in the future with or without proposed airport improvements, as airlines convert their GSE to cleaner-burning vehicles and as new engines meeting lower emission standards/increased fuel consumption requirements are used.

However, because it is not known what specific fuel types would be used, the existing airport fuel use was assumed in for the No Action Alternative (Alternative A).

Alternative C

Of the three Build Alternatives, Alternative C would result in the lowest consumption of mobile vehicle fuel consumption, primarily due to the delay reduction benefits of this alternative. Relative to the No Action Alternative (Alternative A), Alternative C would increase JetA fuel consumption from 135.6 million gallons to 172.1 million gallons (27 percent increase), with an increase in AvGas consumption from 460 gallons to 540 gallons (17 percent increase) per year. This increase would be a result that Alternative C would accommodate 1,194,000 annual operations, 18.4 percent more than the No Action Alternative (Alternative A). The fuel increase does not parallel the activity increase, as average annual delay with the No Action Alternative would be 17.1 minutes, while with Alternative C, average overall delay would be 5.8 minutes in 2018.

GSE fuel consumption would be expected to increase in proportion to the level of aircraft operations that would be accommodated with Alternative C. As is shown, GSE-related fuel consumption would be expected to increase from 399 BBTU under the No Action Alternative (Alternative A) to about 490.5 BBTU in 2018 with Alternative C (a 48 percent increase).

Within the study area, VMT by ground access vehicles is expected to increase from the No Action Alternative in 2018 (2,837,474,221 VMT) to 3,084,393,598 VMT with Alternative C. This increase in VMT travel could increase fuel consumption for vehicles using the Airport and non-Airport roadways by 12.2 million or about 1,528 BBTU.

Alternative D

Alternative D would result in the highest vehicular energy consumption of all Build Alternatives, as aircraft delays would be the greatest with this alternative. Alternative D would accommodate the same level of activity as Alternative C (1,194,000 annual operations) but with average overall delay of 10.5 minutes. As a result, JetA fuel consumed in the LTO cycle would be about 214 million gallons, and AvGas would be about 670 gallons per year. This would be an increase of 57.7 percent and 45 percent over the No Action Alternative (Alternative A) for JetA and AvGas respectively. GSE and GAV fuel consumption for Alternative D would be expected to be similar to Alternative C.

Alternative G

Alternative G would result in the vehicular energy consumption similar to, but slightly higher than Alternative C. Alternative G would accommodate the same level of activity as Alternative C (1,194,000 annual operations) but with average overall delay of 6.9 minutes (19 percent higher than Alternative C and 29 percent lower, but with greater activity, than the No Action Alternative). As a result, JetA fuel consumed in the LTO cycle would be about 181.9 million gallons, and Avgas would be about 570 gallons per year. This would be an increase of 34 percent and 24 percent over the No Action Alternative (Alternative A) for JetA and AvGas

respectively. GSE and GAV fuel consumption for Alternative G would be expected to be similar to Alternative C.

5.17.3.3 Total Energy Use – Build Out + 5

Table 5.17-5 summarizes the energy demands associated with each of the Build Alternatives. When placed in a common energy metric (BTU), a summary can be prepared. As is shown, Alternative D would result in the greatest energy requirements, primarily due to the higher level of activity (relative to the No Action Alternative) and highest level of delay (relative to the three Build Alternatives).

**TABLE 5.17-5
SUMMARY ENERGY USE
(NO ACTION ALTERNATIVE AND BUILD ALTERNATIVES C, D, AND G)**

Energy Used	Alternative A	Build Alternatives		
	(No Action)	Alternative C	Alternative D	Alternative G
Airport Facility Energy (BBTU)	2,387.0	3,626.0	3,621.0	3,626.0
Airport Related Vehicles (BBTU)	35,253.5	41,523.4	46,858.9	42,772.2
Total Billion BTU	37,640.5	45,149.4	50,479.9	46,398.2
Change over Alternative A	N/A	20%	34%	23%

Source: Synergy Consultants, Inc. [TPC] review of information supplied by Landrum & Brown [CCT].

5.17.3.4 Natural Resource Use

Table 5.17-6 summarizes the natural resource consumption requirements associated with each alternative. The consumption of water, similar to the previously discussed energy, reflect annual requirements, whereas the remaining natural resource requirements are associated with the construction projects.

**TABLE 5.17-6
SUMMARY NATURAL RESOURCE REQUIREMENTS
(NO ACTION ALTERNATIVE AND BUILD ALTERNATIVES C, D, AND G)**

Energy Used	Alternative A	Build Alternatives		
	(No Action)	Alternative C	Alternative D	Alternative G
Water Consumption (MG)	845.5	1,119.4	1,119.4	1,119.4
Cement (tons)	9,800	728,700	607,250	728,700
Steel (tons)	1,530	56,180	56,180	56,180
Aggregate (tons)	120,650	4,438,420	3,698,700	4,438,420

Source: T-6 Terminal Program Criteria Document Baseline Estimate, T6 Partners, 2002; Concrete Basics, Portland Cement Association; O'Hare International Airport Master Plan, Ricondo Associates, 2004, Draft O'Hare Modernization Program Options for High Volume Material Handling, AOR/TOK, January 2003.)

The following subsections discuss the individual requirements associated with each alternative.

Alternative A - No Action

Under the No Action Alternative (Alternative A), continued demands for natural resources would occur as the City implements some airport facility improvements. The Airport

construction managers (AOR/TOK) identified about 9,800 tons of cement, 1,530 tons of steel, and 120,650 tons of aggregate (crushed rock) would be required to complete the No Action Alternative (Alternative A). As greater levels of source resources are available to meet this demand, the No Action Alternative projects would not result in a significant impact.

In addition to construction-related natural resources, water consumption was estimated. As noted in **Table 5.17-6**, about 850 million gallons of water are consumed by activities at O'Hare today. This level of water consumption is expected to continue under the No Action Alternative (Alternative A).

Alternative C

Natural resources would be consumed to complete the proposed projects reflected in Alternative C. These would primarily include: steel, aggregate, cement, and wood. As shown in **Table 5.17-6**, this alternative would consume about 728,700 tons of cement, 56,180 tons of steel, a quantity of wood that could not be quantified, and about 4,438,420 tons of aggregate. Aggregate would be hauled into the Airport for use at on-site batch plants that would produce concrete and asphalt for the projects. Wood would be used primarily as temporary forms for concrete/asphalt or for framing. The Airport construction managers (AOR/TOK) have reviewed the availability of construction-related natural resources and found that there is an available supply to meet this demand.

In addition to construction-related natural resources, annual water consumption associated with facility operation, tenant, and passenger consumption was estimated. As noted in **Table 5.17-6**, water consumption with this alternative is expected to increase to over 1.1 million gallons per year, an increase of 32 percent over the No Action Alternative (Alternative A). As noted in the correspondence from the City of Chicago Water Department (which supplies water to O'Hare), such an increase in demand can be met.⁶

Alternative D

Natural resources would be consumed to complete the proposed projects reflected in Alternative D. As shown in **Table 5.17-6**, this alternative would consume about 607,250 tons of cement, 56,180 tons of steel, a quantity of wood that could not be quantified, and about 3,698,700 tons of aggregate. Similar to Alternative C, aggregate would be hauled into the Airport for use at on-site batch plants that would produce concrete and asphalt for the projects. Wood would be use primarily as temporary forms for concrete/asphalt or for framing. The Airport construction managers (AOR/TOK) have reviewed the availability of construction-related natural resources and found that there is an available supply to meet this demand.

In addition to construction-related natural resources, annual water consumption associated with facility operation, tenant, and passenger consumption was estimated. As noted in **Table 5.17-6**, water consumption with this alternative is expected to increase to over 1.1 million gallons per year, an increase of 32 percent over the No Action Alternative (Alternative A). As

⁶ Letter from Richard A. Rice, City of Chicago Department of Water, to Amy B. Hanson, FAA, November 3, 2004.

noted in the correspondence from the City of Chicago Water Department (which supplies water to O'Hare), such an increase in demand can be met.⁷

Alternative G

Natural resources would be consumed to complete the proposed projects reflected in Alternative G. As shown in **Table 5.17-6**, this alternative would consume about 728,700 tons of cement, 56,180 tons of steel, a quantity of wood that could not be quantified, and about 4,438,420 tons of aggregate. Aggregate would be hauled into the Airport for use at on-site batch plants that would produce concrete and asphalt for the projects. Wood would be used primarily as temporary forms for concrete/asphalt or for framing. The Airport construction managers have reviewed the availability of construction-related natural resources and found that there is an available supply to meet this demand.

In addition to construction-related natural resources, annual water consumption associated with facility operation, tenant, and passenger consumption was estimated. As noted in **Table 5.17-6**, water consumption with this alternative is expected to increase to over 1.1 million gallons per year, an increase of 32 percent over the No Action Alternative (Alternative A). As noted in the correspondence from the City of Chicago Water Department (which supplies water to O'Hare), such an increase in demand can be met.⁸

5.17.4 Potential Mitigation Measures

The proposed alternatives would require increased energy and natural resource requirements. However, as is noted, Peoples Energy has indicated the ability to meet the electrical and natural gas requirements. ComEd has not responded as of July 8, 2005. It is assumed, for purposes of this EIS, that adequate electricity would be available from ComEd based on past practices.

While no mitigation is required, the City of Chicago has initiated, in their Sustainable Design Manual, that consideration of sustainable designs to be incorporated into the overall design and construction standards for the Airport.⁹ The purpose of this program is to promote "buildings that are environmental responsible, profitable, and healthy places to live and work. These projects are designed to meet the needs of the present generation without compromising the needs of future generations."¹⁰ Benefits that have been identified from such a sustainable development program are: increased energy efficiency, reduced consumption of natural resources through use of recycled or renewable resources, and lower usage of materials or compounds with potentially harmful environmental effects.

⁷ Letter from Richard A. Rice, City of Chicago Department of Water, to Amy B. Hanson, FAA, November 3, 2004.

⁸ Letter from Richard A. Rice, City of Chicago Department of Water, to Amy B. Hanson, FAA, November 3, 2004.

⁹ Sustainable Design Manual, City of Chicago O'Hare Modernization Program, December, 2003.

¹⁰ City of Chicago, August 13, 2004 "1.8 Sustainable Design" and Sustainable Design Manual, City of Chicago O'Hare Modernization Program, December 2003.

5.17.5 Summary

Table 5.17-7 provides a summary of energy and natural resource requirements. Energy demands are expected to increase in the future regardless of whether or not the proposed Build Alternatives occur. Energy demands associated with airport facilities would only increase if additional airport facilities are undertaken, but increases in aircraft fuel consumption would increase as activity increases and/or delay levels increase.

**TABLE 5.17-7
SUMMARY OF ENERGY AND NATURAL RESOURCE REQUIREMENTS
(NO ACTION ALTERNATIVE AND BUILD ALTERNATIVES C, D, AND G)**

Energy Used	Alternative A	Build Alternatives		
	(No Action)	Alternative C	Alternative D	Alternative G
Airport Energy (BBTU)	37,640.5	45,149.5	50,479.9	46,398.2
Water Consumption (MG)	845.5	1,119.4	1,119.4	1,119.4
Cement (tons)	9,800	728,700	607,250	728,700
Asphalt (tons)	1,530	56,180	56,180	56,180
Aggregate (tons)	120,650	4,438,420	3,698,700	4,438,420

Source: Synergy Consultants, Inc. [TPC] review of information supplied by Landrum & Brown [CCT]. T-6 Terminal Program Criteria Document Baseline Estimate, T6 Partners, 2002; Concrete Basics, Portland Cement Association; O'Hare International Airport Master Plan, Ricondo & Associates [CCT], 2004, Draft O'Hare Modernization Program Options for High Volume Material Handling, AOR/TOK, January 2003.

Contacts with local energy and natural resource suppliers and the Airport construction managers indicate the ability to meet the required demands with all alternatives. Therefore changes in energy demands or other natural resources consumption would not result in significant impacts for any alternative.

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