



Airport Master Plan Update



CHAPTER FIVE ENVIRONMENTAL REVIEW

An environmental review was prepared to provide an overview of the possible effects of proposed ultimate development of facilities at Rapid City Regional Airport. The review was prepared utilizing FAA Order 5050.4A entitled "Airport Environmental Handbook" as reference and impacts on both the human and natural environments were assessed. Economic and social factors, aircraft noise, and land use patterns were considered in the human environmental analysis. Air quality, water quality, vegetation, wildlife, waterfowl, and natural resources were considered in the natural environmental analysis. This document is not intended to be an Environmental Assessment (EA). It is intended only to identify the issues that will need to be formally addressed if a full EA is initiated or required at Rapid City Regional Airport in the future.

The information in this element was prepared following a systematic assessment and review of the potential impacts of proposed development. In this process, several federal, state, and local agencies were contacted to provide input concerning their areas of concern and expertise.

5.1 Environmental Consequences - Specific Impact Categories

To determine the extent of impact that may result from the proposed action, the following section addresses the 21 specific impact

categories as outlined in FAA Order 5050.4A "Airport Environmental Handbook."

5.1.1 Noise

FAA Order 5050.4A requires that a noise analysis be conducted for airports where forecast operations are greater than 90,000 annual adjusted propeller operations or 700 annual adjusted jet operations. During the planning period, a total of 83,901 operations are forecast in the year 2017 for Rapid City Regional Airport. Jet usage exceeds 700 operations and will continue to increase throughout the planning period.

Computer modeling of aircraft was completed using FAA Integrated Noise Model Version 5.1. The INM is a computer-noise model used to assess aircraft noise impacts at civilian airports.

The accepted level of *excessive* noise is defined by the 65 DNL noise contour (day-night average sound level). This is determined from a cumulative exposure of sound generated by aircraft measured in decibels and averaged over a span of one-year.

Exhibit 5.1 shows the future (2017) Noise Exposure Map for the Rapid City Regional Airport employing the 65, 70, 75, and 80 DNL contours.

The noise levels are calculated from the total number of *daily* operations averaged over

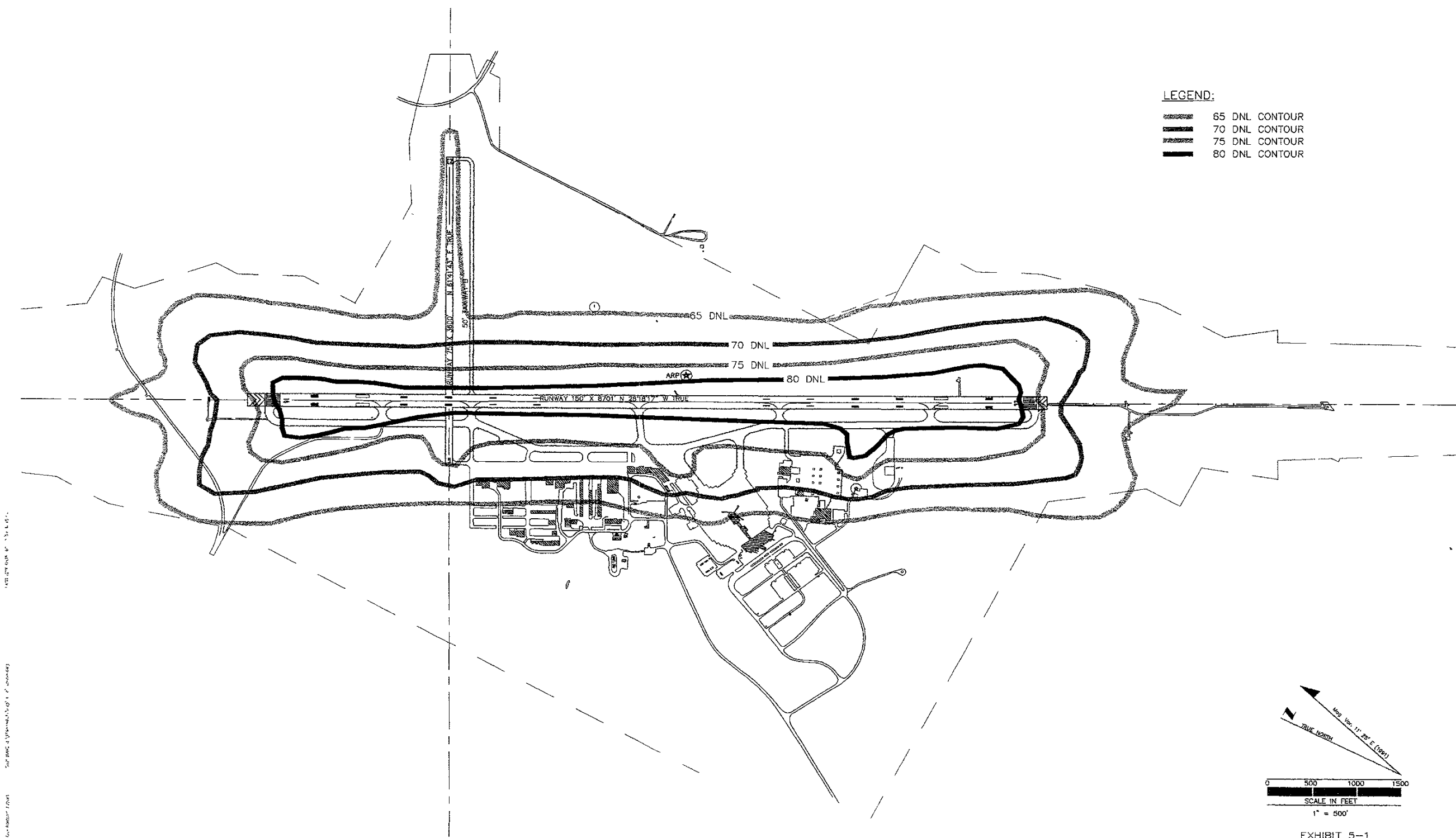


each of the approach, departure and touch & go tracks. Runway end use was assigned primarily with regard to prevailing strong-wind conditions. Track segments were assigned based on standard VFR traffic patterns and published IFR intermediate and final courses, using the Rapid City VORTAC as an approach and departure transition fix.





The noise model is constructed based on at least one departure and arrival track from each runway end, in addition to a standard touch & go pattern to Runway 14 - which is commonly used by single-engine airplanes during the summer months for flight training practice. No overflight tracks were assigned since there are no published victor airways or

high-intensity terminal NAVAIDS located at, or directly above, the airport. In addition, the model incorporates a helicopter run-up area at the Army Air National Guard apron, and a commercial aircraft run-up area at the terminal apron.

The analysis revealed that only a small 2-acre tract falls within the 65 DNL noise contour; therefore, only minimal impacts could be expected at this level of airport activity. The appendix contains the noise inputs, flight tracks, and computer generated noise contours. Table 5.1 shows the aircraft used to conduct the noise study.



LEGEND:

-  65 DNL CONTOUR
-  70 DNL CONTOUR
-  75 DNL CONTOUR
-  80 DNL CONTOUR

1:000 200' SCALE 11" x 17" E (2017)
 2017 MAPS & SURVEYING, INC. 1700 S. UNIVERSITY AVENUE, SUITE 100, RAPID CITY, SD 57701
 605.343.1111 www.2017maps.com
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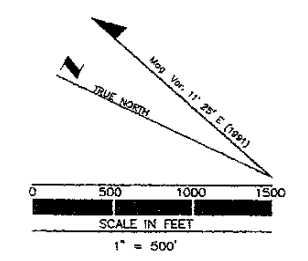


EXHIBIT 5-1

RAPID CITY, SOUTH DAKOTA
 RAPID CITY REGIONAL AIRPORT
**ANNUAL AVERAGE NOISE
 EXPOSURE FOR YEAR 2017**



**Table 5-1
AIRCRAFT USED IN THE INM 5.1 STUDY
Rapid City Regional Airport Study**

Aircraft Type/Category INM Aircraft Name/Identifier	Aircraft Type (Noise Stage)	Equivalent Aircraft in the Same Category
Small Fixed and Constant Speed 1985 Single-Engine Piston (SEP)	Composite SEP	Single-engine Cessna, Piper, Mooney, Grumman piston planes with fixed or variable speed propellers
Small Twin-Engine Piston (BEC58P)	Beech Baron	Twin-engine Cessna, Piper and Grumman Aircraft with variable speed propellers
Large Corporate Turbofan (COMJET) 1985 Composite Business Turbofan	Composite COMJET (Stage 2)	Saber 65, Falcon 10/50/200, Lockheed Jetstar I/II, Citation 3, HS 125-800, IAI Westwind, Beech Jet, Cessna 500-650, Lear 35
Air Carrier - Regional Turboprop (DHC8)	Bombardier Dash 8-100 (Stage 3)	ATR 42, Shorts 360, Embracer Brasillia EMB-120, Saab 340, Dornier 328
Air Carrier - Regional Turbofan (CL601)	Bombardier Candadair 601 (Stage 3)	Bombardier Regional Jet
Air Carrier - 2-Engine Narrow Body Turbofan (DC9Q9)	DC-9 (Stage 2)	Douglas Corporation DC-9-30 Series
Turbine Rotorcraft - Military (S-76)	S-76 (Stage 2)	Medium Rotorcraft
Note: Composite indicates a profile for a similar category of aircraft.		

Source: Bucher, Willis & Ratliff Corporation, INM 5.1 - Aircraft Selection - August, 1997.



5.1.2 Compatible Land Use

The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to airport activity. In an effort to maintain compatibility and ensure the safety of both aircraft and the surrounding area, land for runway protection zones, and noise contours should be acquired by easement or fee simple acquisition. There is one small parcel that needs to be acquired for these airfield needs. The development of housing, structures, or land uses that encourage the congregation of people will be discouraged through the use of compatible land use planning and zoning, (Reference AC 150/5060-6, Airport Land Use Compatibility Planning).

The primary land use concerns regarding airports occur due to levels of housing and population density. The greater the populated areas near the airport, the greater the noise and environmental conflicts. Rapid City and Pennington County are zoned; therefore, changes to land use and zoning will need governmental approval. At Rapid City Regional Airport the areas most critical (areas immediately beyond runway ends) for land use have been purchased in fee simple. These areas are all beyond the 65 DNL level; therefore, no significant impacts regarding noise exist.

5.1.3 Social Impacts

The physical changes to the airport are not expected to cause major disruptions in the

community. No roads will need to be closed nor will any residences need to be relocated.

5.1.4 Induced Socio-Economic Impacts

The improvement of an airport runway, etc. creates the potential for both direct and indirect impacts in the airport vicinity. Induced socio-economic impacts result from airport development and are usually associated with impacts in noise, land use or direct social impacts. The induced or secondary impacts relate to population and employment shifts, public service demand shifts and changes in business and economic activity. Although no significant induced socio-economic impacts have been identified as a result of the proposed activities at Rapid City Regional Airport, economic opportunities in the area could be expected to increase with the airport location along Highway 44 and with the possible development of an airport office/industrial park.

5.1.5 Air Quality

Impacts on air quality resulting from the proposed activity at Rapid City Regional Airport are not expected to be significant. FAA Order 5050.4A requires an air quality analysis for airports with greater than 180,000 operations forecast annually. Forecasts for Rapid City Regional Airport indicate 83,901 operations by 2017; therefore, an air quality analysis will not be necessary as part of a full environmental assessment. However, all major construction within three miles of city limits must comply with Pennington County's air quality ordinance. If there are any major



projects that would increase air pollution, the nearest federal land manager must review the project because of the proximity to the Badlands and Wind Cave National Monuments.

5.1.6 Water Quality

Water quality impacts from airport construction are usually in the form of non-point source pollution or surface runoff, alterations in natural drainage patterns, or disturbance of wetland habitat. In discussions with the Corps of Engineers, when a fill area is identified a 404 permit will be required to fully determine impacts, if any, to waters of the U.S.

In order to protect water quality, both on- and off-site, certain safeguards are necessary. These include the development of a storm water management program to control runoff from the site and an emergency plan for fuel spills.

5.1.7 Department of Transportation Act, Section 4(f) Land

FAA Order 5050.4A requires that activities which require the use of "...any publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance..." shall not be approved unless it can be shown that no reasonable alternative exists and all possible mitigation measures will be taken. No such lands will be affected by the proposed airport development program.

5.1.8 Historic, Architectural, Archeological and Cultural Resources

Consultation with the South Dakota State Historical Society indicates that areas of previous ground disturbance will not require further identification. Areas of new ground disturbance should be reviewed on a case by case basis and may require an archeological records check. The proposed development program at Rapid City is primarily located in areas of previously disturbed property.

5.1.9 Biotic Communities

The South Dakota Department of Game, Fish & Parks and the U.S. Fish & Wildlife has reviewed the proposed project in terms of its impact on threatened or endangered species. The projects, as described, will have no significant impact on fish and wildlife resources.

5.1.10 Endangered and Threatened Species

As noted above, there are no threatened or endangered species known to exist in the project area, according to correspondence with the U.S. Fish & Wildlife Department.

5.1.11 Wetlands

Waters of the U.S. are broadly defined and encompass most bodies of water, including wetlands, and their tributaries.



Wetlands are defined as "those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds."

The South Dakota Department of Environment and Natural Resources has indicated that some tributaries and wetlands may be impacted by this project. Any impacts due to fill operations will need a 404 permits issued by U.S. Army Corps of Engineers. Once a specific project with fill material has been identified, application for a 404 permit must be initiated.

5.1.12 Flood Plains

According to the Federal Emergency Management Agency, the airport site has not been mapped for flood plains. The airport is on a plateau and on the upper end of the Rapid Valley Drainage basin. However, portions of airport property to the west are along a meandering creek in a low area. This area must be mapped for flooding prior to any development.

5.1.13 Coastal Zone Management Program

This impact category refers to requirements of the Coastal Zone Management Act and is not applicable to this project.

5.1.14 Coastal Barriers

This impact category refers to the Coastal Barriers Resources Act and is not applicable to this project.

5.1.15 Wild and Scenic Rivers

There are no rivers in the project area which are on the national inventory of wild and scenic rivers according to the Wild and Scenic Rivers Act.

5.1.16 Prime and Unique Farmland

The Farmland Protection Policy Act authorizes the Department of Agriculture to develop criteria for identifying the effects of federal programs on the conversion of farmland to nonagricultural uses. The Department of Agricultural-Natural Resources Conservation Service 7 CFR Part 658, Farmland Protection Policy Final Rule states that sites receiving a score of less than 160 are given a minimal amount of consideration for protection, sites receiving a higher than 160 score are given increasingly higher levels of consideration for protection. The Natural Resources Conservation Service reviewed the project and determined that there are no prime or unique farmlands affected by the airport. Form AD-1006 was completed by the NRCS and is available for review. No adverse impacts to prime or unique farmland due to airport development will occur.



5.1.17 Energy Supply and Natural Resources

Energy demands for the proposed development at Rapid City Regional Airport are not expected to be significant and will not result in large demands on natural resources. Airfield lighting and terminal facility needs are the only primary energy demands. Given the nature of the facility and the proposed number of based aircraft and operations, no substantial change in local energy demand is anticipated.

5.1.18 Light Emissions

Rapid City Regional Airport is equipped with many lighting systems. These lighting systems, however, are primarily confined to the airport property, and their effects on adjacent property are expected to be minimal. If light emission impacts do occur, the impacts should be mitigated by shielding.

5.1.19 Solid Waste Impacts

The development at an airport facility will produce solid waste as a function of airport activity. The solid waste generated by the proposed development as well as all construction debris will be disposed of at the Rapid City Municipal landfill. Solid waste containers will be provided to ensure proper collection and a scheduled disposal plan initiated.

FAA Order 5200.5A provides criteria on the establishment and monitoring of land fills in the vicinity of an airport. The existing Pennington County landfill is located along

Highway 79 approximately three miles south of Rapid City. The landfill area does not present any problems with regard to the operational safety of the Rapid City Regional Airport as the landfill is beyond 10,000' from each runway end.

5.1.20 Hazardous Waste

Possible sources of hazardous substances include the possibility of a fuel spill during construction equipment refueling, spilling engine motor oil during maintenance operations or a spill during aircraft refueling operations.

In the event of a release of a hazardous substance in an amount greater than the reportable quantity as established by the EPA, the contractor would notify the Airport's designated person responsible for administering their Spill Prevention Control Plan. The airport representative would then contact the National Response Center (telephone 1-800-424-8802) and provide details of the incident and measures taken to reduce the effects of the release.

5.1.21 Construction Impacts

Potential impacts from construction of the proposed development include noise, dust, erosion and storm water runoff. These impacts would be temporarily confined to the construction site. During construction FAA Advisory Circular 150/5370-10, "Standards Specifying Construction of Airports" outlines measures to employ during construction to minimize these impacts on the site as well as



the surrounding area. These specifications should be used during the construction phases to mitigate any impacts. According to 150/5370-10 Section 70-02 "The Contractor will procure all permits and licenses, pay all charges and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work."

5.1.22 Summary

In the review of FAA Order 5050.4A, it should be noted that most of the proposed projects at

Rapid City Regional Airport are "categorically excluded" from the need for a full environmental assessment and have been identified as causing minimal negative impact to the surrounding environment. This section has identified issues that will require additional or state/federal coordination or construction permits when completed.