



Hill Air Force Base, Utah

Final

Environmental Assessment:

**Proposed T-10 Engine Test Cell Facilities,
Hill Air Force Base, Utah**

October 21, 2005

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14. ABSTRACT Hill AFB proposes to accommodate current United States Air Force (USAF) missions by constructing two engine test cell facilities. The proposed facilities would be large enough to house all of the required systems and equipment for testing F/A-22, F-16, and A-10 aircraft engines while mounted on an intact aircraft. The proposed action, alternate locations, and the no action alternative were all considered in detail. The proposed action could be implemented with minor air emissions of short term duration. Long term air emissions fall within the limits prescribed by the Hill AFB Title V permit. Appropriate re-use, recycling, and/or disposal opportunities exist for solid and liquid waste streams associated with engine testing and with drips, leaks, and spills of petroleum products. Surface water resources would be protected by preventing soil erosion during construction activities; providing structures to contain and transmit facility liquid effluents; and by implementing spill prevention control and countermeasure (SPCC) procedures. Potential noise impacts were modeled, and the projected noise levels would be much less than the noise created by the aircraft using the Hill AFB runway on a routine basis. No adverse cumulative environmental impacts are expected.		
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Final
Environmental Assessment (EA):
Proposed T-10 Engine Test Cell Facilities,
Hill Air Force Base, Utah

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Department of the Air Force
Air Force Materiel Command
Design Engineering Support Program (DESP)
Hill Air Force Base, Utah 84056

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Prepared in accordance with the Department of the Air Force Environmental Impact Analysis Process (EIAP) 32 CFR Part 989, Effective July 6, 1999, which implements the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) regulations.

EXECUTIVE SUMMARY

Purpose and Need

The purpose of the proposed action is to accommodate current and future United States Air Force (USAF) missions by constructing two T-10 engine test cell facilities (the engine test cell facilities are also called hush houses) on Hill Air Force Base (AFB). These new facilities would allow the aircraft to be tested at the point of repair. The proposed facilities are part of the Air Logistics Command's depot strategy for Hill AFB.

The proposed action is needed to meet current and future USAF workload requirements for F/A-22, F-16, and A-10 aircraft. The F/A-22 was newly introduced into the USAF fleet during 2005, and Hill AFB is the only USAF facility with the capability or assignment to repair F/A-22 aircraft. Similarly, Hill AFB is the only USAF facility with the capability or assignment to repair F-16 and A-10 aircraft. The existing engine test cell facilities are aging, and are occasionally taken out of service while repairs and remodeling activities are accomplished. The additional engine test cell facilities will allow workload requirements to be met, and will reduce the number of aircraft being towed across the main runway, which provides the additional benefit of not causing flight delays (reducing airfield capacity).

Scope of Review

No cultural and/or historical resources were identified within the area of the proposed action on Hill AFB property. No species of plants or animals listed as endangered, threatened, or sensitive by state or federal agencies were observed in or around the proposed excavation area, and no suitable habitat for any such species is likely to be disturbed by the project. Accidental spills of fuel, lubricants, or other chemicals during construction could occur. Operating the engine test cell facilities could require an on-site storage capacity of between 10,000 gallons and 30,000 gallons of jet fuel per facility. Post engine testing cleanup creates a liquid waste stream containing jet fuel and soap, and small leaks or spills of jet fuel, lubricating oil, and hydraulic fluid could occur at various times. The potential for accidental releases of large quantities of jet fuel would exist. Air emissions would be produced by construction equipment and by ongoing engine testing in the proposed engine test cell facilities. Evaluating noise impacts from operational testing of the F/A-22, F-16, and A-10 aircraft engines is one of the purposes of this document.

The issues that were identified and analyzed in the document are: air quality; solid and hazardous wastes (to include solid and liquid wastes); physical environment (surface soils and surface water); and noise. Environmental effects of the proposed action, alternate locations, and the no action alternative were all considered in detail.

Selection Criteria

The facility that accommodates the Hill AFB Aircraft Maintenance Group's (the group's organizational designation is 309AMXG) engine testing functions should:

- enable on-site testing capability for repaired F/A-22, F-16, and A-10 aircraft;
- provide sufficient space to house the aircraft and all necessary equipment;
- provide capacity to complete future USAF workload requirements; and
- be protective of facilities, human health, and the environment.

Proposed Action

Proposed Action - The proposed action includes all work necessary to construct the two engine test cell facilities to the east southeast of Building 680 and to the northwest of Building 18, Hill AFB. The proposed facilities would be large enough to house all of the required systems and equipment for testing F/A-22, F-16, and A-10 aircraft engines while mounted on an intact aircraft. The facilities would also be capable of testing other types of USAF single engine and twin-engine military aircraft. Features of these all steel facilities include acoustically treated main doors and enclosures; side air intake baffles and inlet air turning vanes to create stable airflow; an exhaust augments and a deflector ramp; a thrust restraint weighing between 70,000 and 100,000 pounds; fuel storage and an above ground fuel supply system; secondary containment for stored jet fuel; and an electronic control system.

Alternative to Construct at Alternate Locations - The alternative to construct one or both of the engine test facilities on Hill AFB, either to the east of Building 10 or to the south of Building 680 would include the same items as the proposed action.

No Action Alternative - Under the no action alternative, it is predicted that Hill AFB may be unable to provide sufficient capacity for testing repaired F/A-22, F-16, and A-10 aircraft. It is therefore possible that aircraft would be grounded, and mission requirements for sorties would not be met.

Additional Alternatives - Hill AFB program managers eliminated other potential locations for housing the future T-10 engine test cell facilities. Hill AFB is the only USAF facility with the capability or assignment to repair F/A-22, F-16, and A-10 aircraft. No other building exists on Hill AFB that could accommodate this workload, either in its current condition or by being renovated. The aircraft must be tested intact, before being flown, and are too large to transport intact by highway on trailers.

Results of the Environmental Assessment

The proposed action, an alternative to construct the engine test cell facilities at alternate locations, and the no action alternative were all considered in detail. The proposed action could be implemented with minor air emissions of short term duration. Projected long term air emissions fall within the limits prescribed by the Hill AFB Title V permit. Each proposed engine test cell would be expected to produce regulated solid and liquid waste streams associated with post engine testing cleanup and with drips, leaks, and spills of petroleum products. Appropriate re-use, recycling, and/or disposal opportunities exist for all of these waste streams. Following the construction phase, backfill and paving operations would prevent erosion of the site. Surface water resources would be protected by preventing soil erosion during construction activities; providing structures to contain

and transmit facility liquid effluents; and by implementing spill prevention control and countermeasure (SPCC) procedures. Potential noise impacts were modeled, and the projected noise levels would be much less than the noise created by the aircraft using the Hill AFB runway on a routine basis.

The impacts of constructing the engine test cells at the alternate locations would be the same as for the proposed action.

No long-term environmental impacts are expected from the proposed action, the alternative to construct the engine test cell facilities at alternate locations, or the no action alternative.

COMPARISON OF ALTERNATIVES

Issue	<u>Proposed Action</u> Construct the Engine Test Cells and Alternate Locations Alternative (similar impacts)	<u>No Action</u> Do Not Construct the Facilities
Air Quality	Temporary construction-related emissions. Long term air emissions fall within the limits prescribed by the Hill AFB Title V permit.	No impact.
Solid and Hazardous Wastes	Solid and liquid wastes containing petroleum products would all be properly stored, transported, disposed, and/or re-used or recycled.	No impact.
Surface Soils and Surface Water	Construction-related erosion control measures and stormwater permits may be required. Structures would be provided to contain and transmit facility liquid effluents. If external fuel storage is required, additional structures would be required to provide SPCC assurance.	No impact.
Noise	Projected noise levels would be much less than the noise created by the aircraft using the Hill AFB runway on a routine basis.	No impact.

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LIST OF ACRONYMS AND CHEMICAL TERMS

AFB	Air Force Base
AFI	Air Force Instruction
AICUZ	Air Installation Compatibility Use Zone
bgs	Below Ground Surface
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
DAQ	Division of Air Quality (State of Utah)
dBA	Decibels (A-weighted)
DWQ	Division of Water Quality (State of Utah)
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EPA	Environmental Protection Agency (United States)
FONSI	Finding of No Significant Impact
ft ²	Square Feet
IRP	Installation Restoration Program
NAAQS	National Ambient Air Quality Standards
NCA	Noise Control Act
NDCSD	North Davis County Sewer District
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NO _x	Oxides of Nitrogen
O ₃	Ozone
OSHA	Occupational Safety and Health Administration
PM-10	Particulates Smaller Than 10 Microns in Diameter
RCRA	Resource Conservation and Recovery Act
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
SO _x	Oxides of Sulfur
SPCC	Spill Prevention Control and Countermeasure
TSCA	Toxic Substances Control Act
UAC	Utah Administrative Code
UBC	Uniform Building Code
UPDES	Utah Pollutant Discharge Elimination System
USAF	United States Air Force
VOC	Volatile Organic Compound

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

Hill Air Force Base (AFB) is an air logistics center that maintains aircraft, missiles, and munitions for the United States Air Force (USAF). In support of that mission, Hill AFB: provides worldwide engineering and logistics management for the F-16 Fighting Falcon and A-10 Thunderbolt; accomplishes depot repair, modification, and maintenance of the F-16, A-10 Thunderbolt, and C-130 Hercules aircraft; and overhauls and repairs landing gear, wheels and brakes for military aircraft, rocket motors, air munitions, guided bombs, photonics equipment, training devices, avionics, instruments, hydraulics, software, and other aerospace related components.

This document addresses proposed construction activities related to two facilities that would each house a T-10 engine test cell facility, primarily for testing repaired F/A-22, F-16, and A-10 aircraft. The facilities would also be capable of testing other types of USAF single engine and twin-engine military aircraft. These activities would be performed in accordance with USAF mission requirements and technical order specifications by the Hill AFB Aircraft Maintenance Group (the group's organizational designation is 309AMXG).

1.2 Purpose and Need

The purpose of the proposed action is to accommodate current and future USAF missions by constructing two T-10 engine test cell facilities (the engine test cell facilities are also called hush houses) on Hill AFB. These new facilities would allow the aircraft to be tested at the point of repair. The proposed facilities are part of the Air Logistics Command's depot strategy for Hill AFB.

The proposed action is needed to meet current and future USAF workload requirements for F/A-22, F-16, and A-10 aircraft. The F/A-22 was newly introduced into the USAF fleet during 2005, and Hill AFB is the only USAF facility with the capability or assignment to repair F/A-22 aircraft. Similarly, Hill AFB is the only USAF facility with the capability or assignment to repair F-16 and A-10 aircraft. Since, after being repaired, the aircraft cannot be flown until they are tested, the T-10 engine test cell facilities are required at Hill AFB.

Hill AFB currently has five engine test cell facilities (Buildings 17, 18, 19, 24, and 33). The existing engine test cell facilities are aging, and are occasionally taken out of service while repairs and remodeling activities are accomplished. The additional engine test cell facilities will allow workload requirements to be met, and will reduce the number of aircraft being towed across the main runway, which provides the additional benefit of not causing flight delays (reducing airfield capacity).

It is possible that sharing existing and future engine test cell facilities among various aircraft maintenance organizations on Hill AFB might delay or eliminate the need for one of the two currently proposed facilities. For the purposes of this document, it is projected that workloads will increase to the point where both new engine test cell facilities are needed, requiring Hill AFB to analyze the environmental impacts of construction of both facilities.

1.3 Location of the Proposed Action

Hill AFB is located approximately twenty five miles north of downtown Salt Lake City and seven miles south of downtown Ogden, Utah (Figure 1). Hill AFB is surrounded by several communities: Roy and Riverdale to the north; South Weber to the northeast; Layton to the south; and Clearfield, Sunset, and Clinton to the west. The base lies primarily in northern Davis County with a small portion located in southern Weber County.

The location of the engine test cell facility whose primary function would be to test F/A-22 aircraft would be to the south of existing Building 680 (Figure 2, Figure 3). The primary F-16 engine test cell facility would be located to the northwest of existing Building 18 (Figure 2, Figure 4). Alternate locations are located to the east of existing Building 10 (Figure 2, Figure 5) and to the east of existing Building 680 (Figure 2, Figure 6).

1.4 Scope of the Environmental Review and Anticipated Environmental Issues

The scope of this environmental review is to analyze environmental concerns related to the proposed construction of two T-10 engine test cell facilities. During the construction process, soil would be disturbed to construct and/or install: the T-10 test cell facilities; secondary containment for fuel tanks or trailers; oil and fuel retention structures; and underground utilities. Construction drawings have not been completed for the proposed facilities. Based on the requirement per facility for approximately 13,000 square feet (ft²) of structure; an exterior fuel storage area with secondary containment; and utility trenches, the total square footage of soil to be disturbed per facility would most likely not exceed one acre.

During construction activities, solid wastes may be generated, and hazardous wastes could be generated if a spill of fuel, lubricants, or construction-related chemicals occurs. As a result of the proposed engine testing operations, minor amounts of hazardous waste would be generated, in both solid and liquid forms. Operating the engine test cell facilities could require an on-site storage capacity of between 10,000 gallons and 30,000 gallons of jet fuel per facility. Post engine testing cleanup creates a liquid waste stream containing jet fuel and soap, and small leaks or spills of jet fuel, lubricating oil, and hydraulic fluid could occur at various times. The potential for accidental releases of large quantities of jet fuel would exist. Air emissions would be produced by construction equipment and by ongoing engine testing in the proposed engine test cell facilities.

No species of plants or animals listed as threatened or endangered are known to occur on Hill AFB, and no suitable habitat for any such species is likely to be disturbed by the project. The condition of the ground surface at the location of the proposed action and the alternate locations is soil and weeds.

No cultural and/or historical resources are known to exist in the vicinity of the proposed action or the alternate locations.

Shallow soil contamination has been not been detected in the vicinity of the proposed action or the alternate locations. Depth to groundwater is approximately 45 feet below the ground surface (bgs) in the vicinity of Building 680, and according to the Hill AFB maps reviewed, the closest area of known groundwater contamination is approximately 1,700 feet to the east. Depth to groundwater is approximately 170 feet bgs in the vicinity of Buildings 10 and 18, and according to the Hill AFB maps reviewed, the closest area of known groundwater contamination is approximately 800 feet to the south. Due to these horizontal and vertical distances, and a maximum proposed excavation depth of approximately five feet bgs, groundwater impacts will not be addressed by this document.

External jet noise would be addressed by incorporating noise level reduction measures into the building designs, in compliance with the Uniform Building Code (UBC) Chapter 35, and the current version of the Hill AFB air installation compatibility use zone (AICUZ) report. Evaluating noise impacts from operational testing of the F/A-22, F-16, and A-10 aircraft engines is one of the purposes of this document.

The issues that have been identified for detailed consideration and are therefore presented in Sections 3 and 4 are: air quality; solid and hazardous wastes (to include solid and liquid wastes); physical environment (surface soils and surface water); and noise. Environmental effects of the proposed action, alternate locations, and the no action alternative were all considered in detail. Section 2.5 describes additional alternatives that were eliminated from detailed consideration.

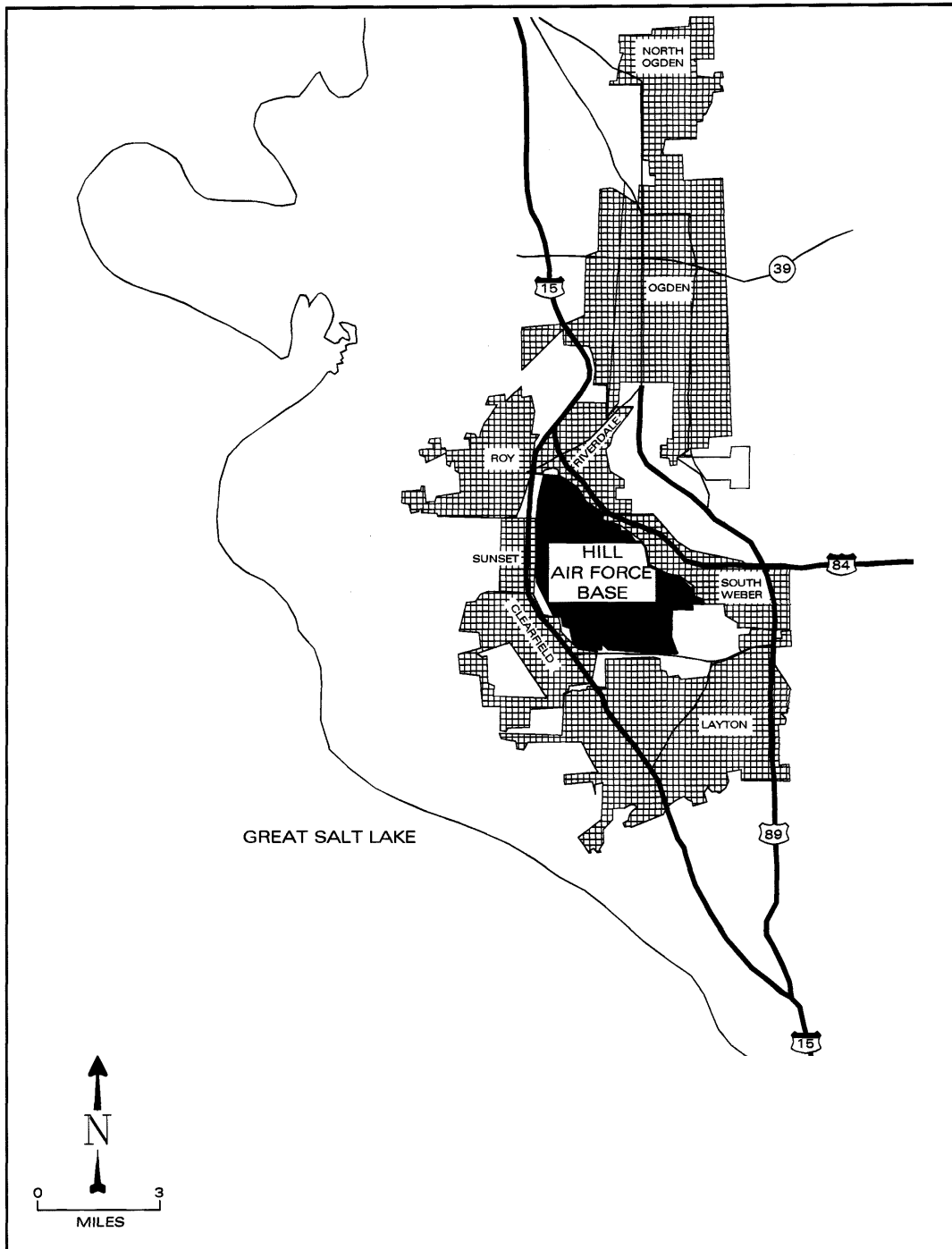


Figure 1: Hill AFB Location Map

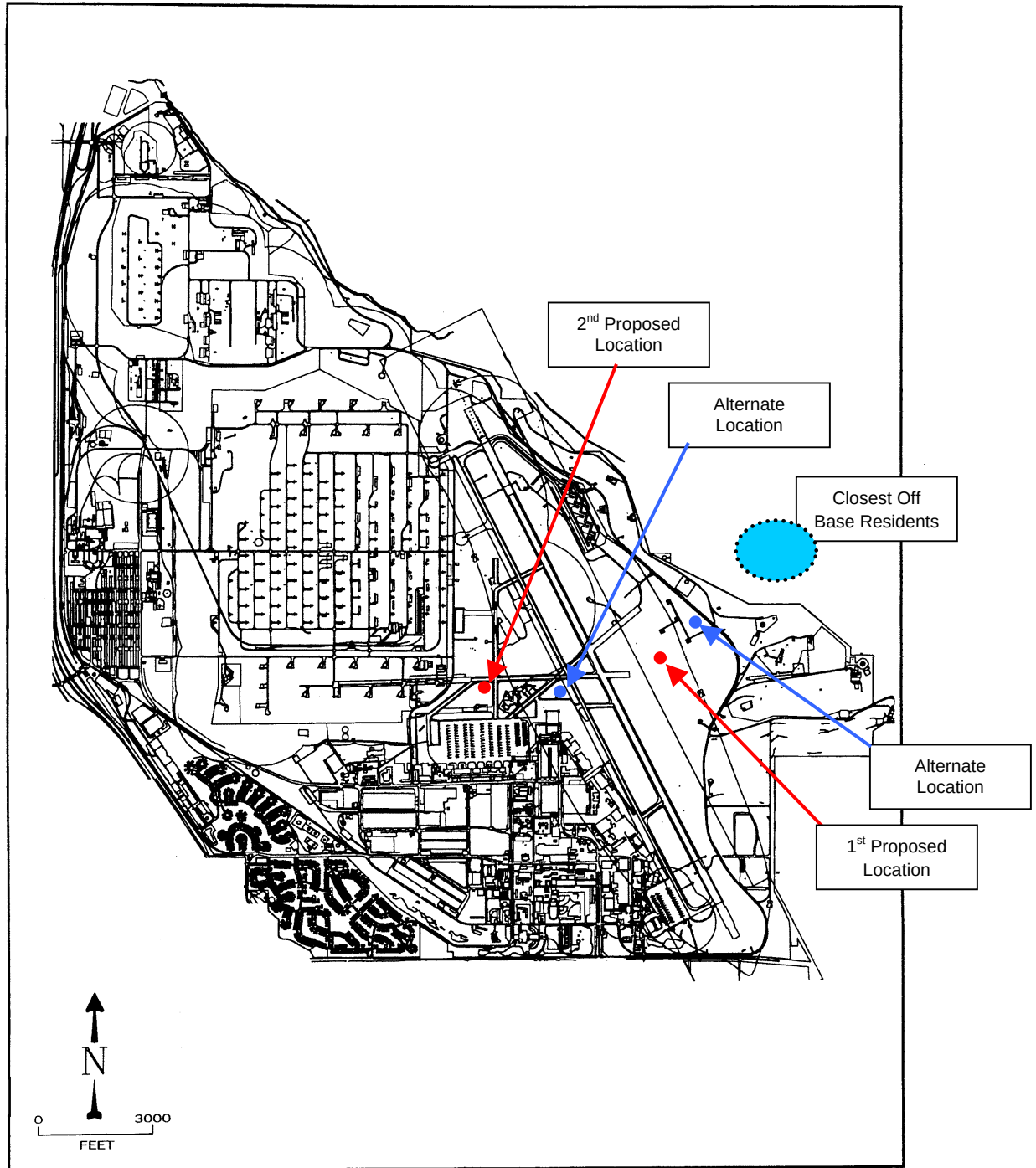


Figure 2: Portions of Hill AFB Affected By the Proposed Action

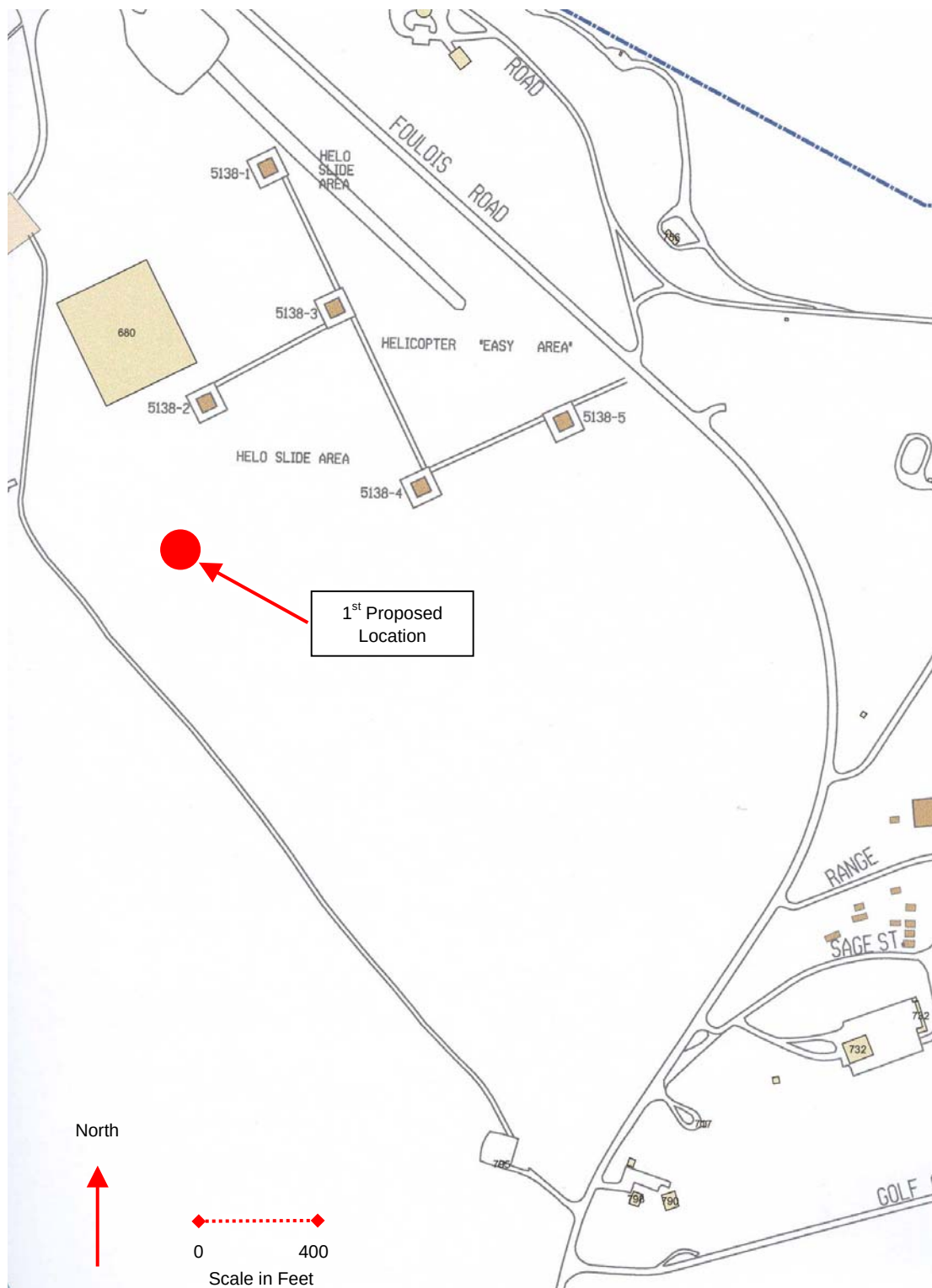


Figure 3: Location of 1st Proposed Facility, South of Building 680

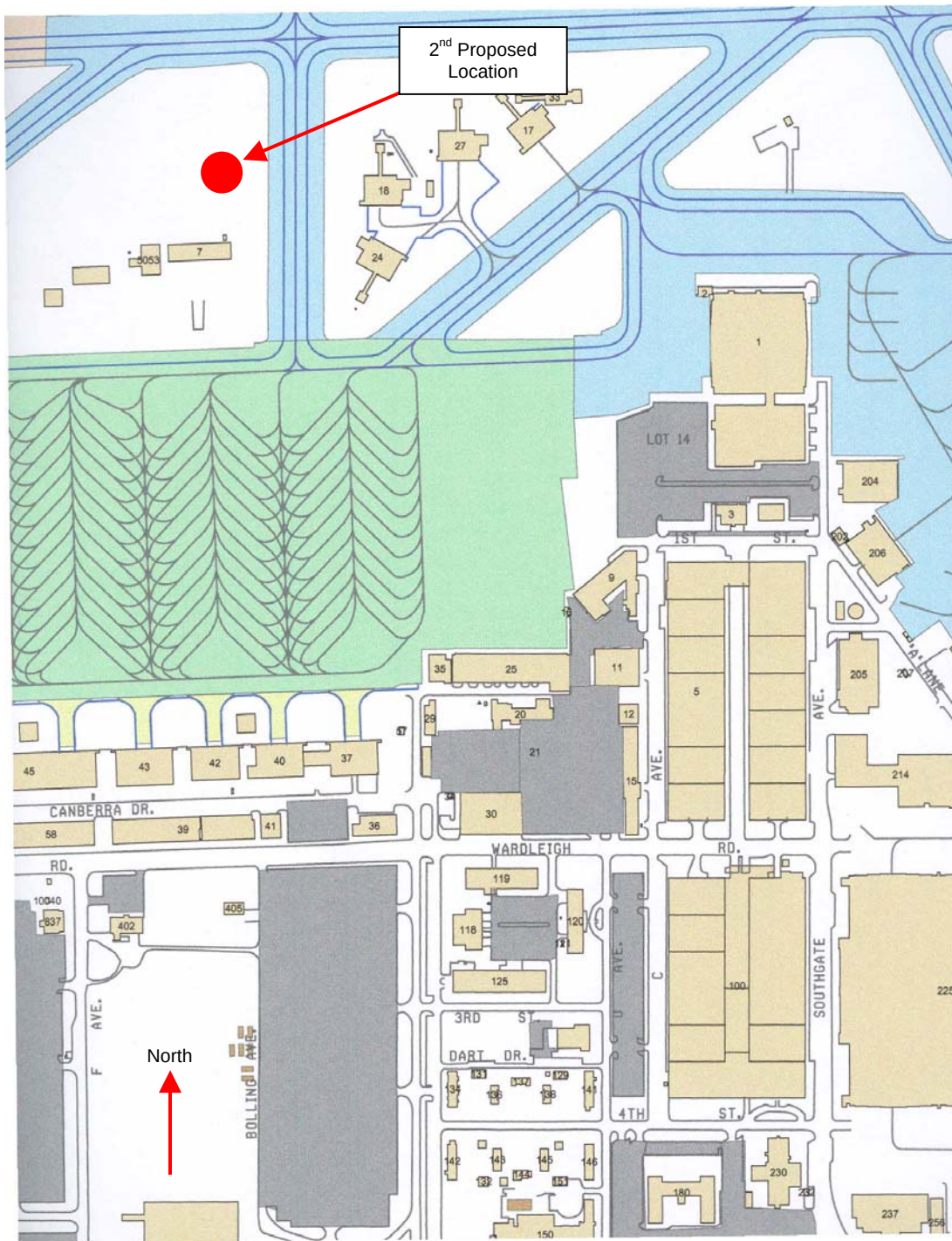


Figure 4: Location of 2nd Proposed Facility, Northwest of Building 18

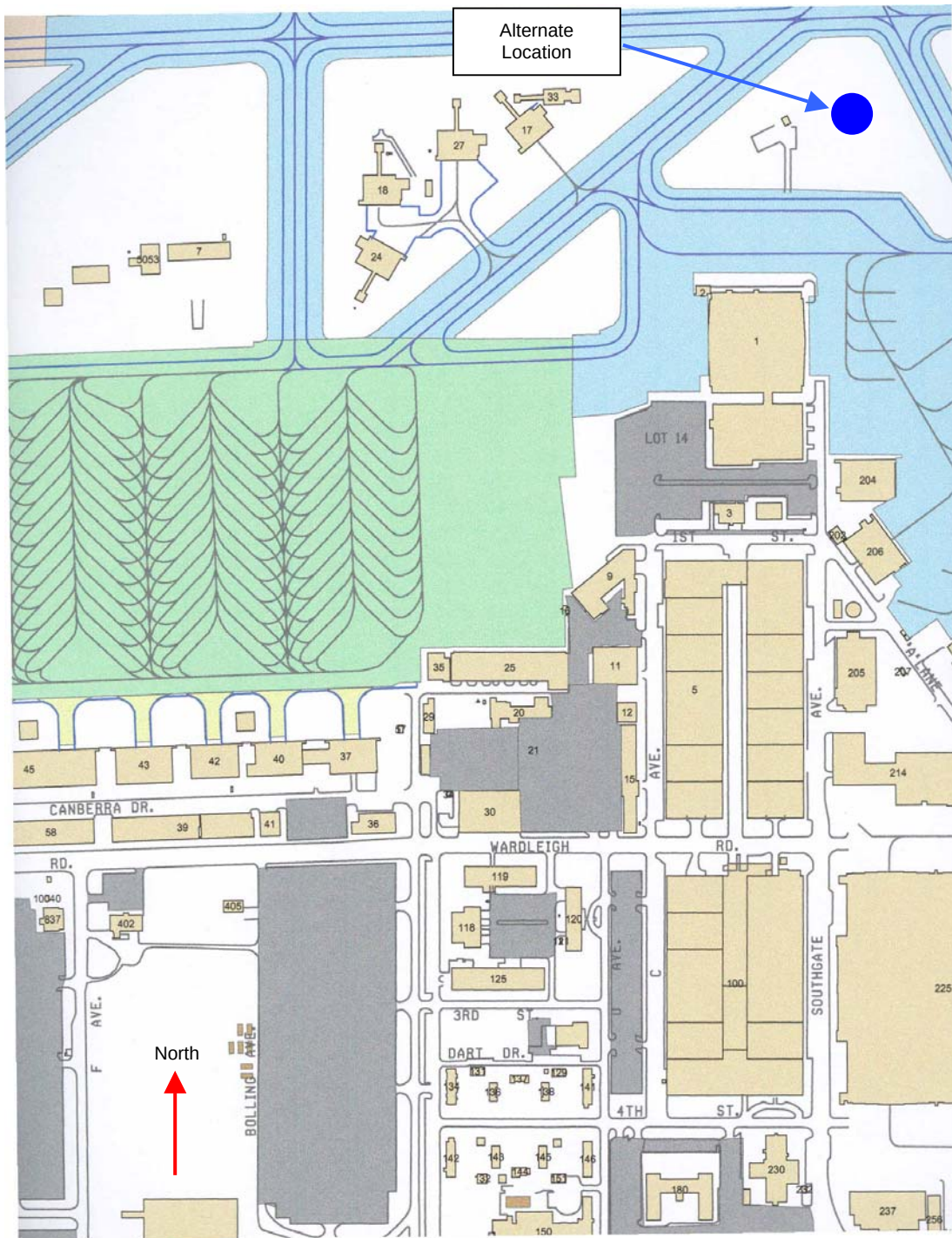


Figure 5: Alternate Location, East of Building 10

0 400
Scale in Feet



Figure 6: Alternate Location, East of Building 680

1.5 Applicable Regulations and Permits

USAF activities are mandated to comply with conditions of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality's regulations for implementing the procedural provisions of NEPA in Title 40 of the *Code of Federal Regulations* (CFR), 40 CFR 1500-1508, and USAF-specific requirements contained in 32 CFR Part 989, *Environmental Impact Analysis Process* (EIAP).

Throughout the construction phase of the project, Hill AFB contractors would follow safety guidelines of the Occupational Safety and Health Administration (OSHA) as presented in the CFR. Should any Hill AFB employees participate in constructing the proposed action, they would comply with relevant Air Force occupational safety and health standards.

Should the proposed construction disturb an area greater than or equal to one acre per facility, it would be covered under Utah's general construction permit rule for stormwater compliance. Coverage under this permit must be obtained and erosion and sediment controls must be installed according to a stormwater pollution prevention plan prior to initiating any grading activities. Since the proposed action would disturb less than five acres, it might qualify for a waiver from the permit based on low potential for erosion at the site. The waiver only applies to sites where construction begins and site stabilization is completed between January and April of the same year. A certification form must be filled out and sent to the Utah Division of Water Quality (DWQ) to obtain this waiver. Stormwater compliance is discussed in Sections 3 and 4 of this document (see the surface water discussion).

Air emissions generated by the proposed action (both during construction and during future facility operations) must be addressed in accordance with Utah's fugitive emissions and fugitive dust rules (*Utah Administrative Code* [UAC] Section R307-309) and Utah's *State Implementation Plan* (UAC Section R307-110), which complies with the Clean Air Act's *General Conformity Rule*, Section 176 (c). A conformity analysis was conducted for this proposed action as specified by "*Determining Conformity of Federal Actions to State or Federal Implementation Plans*," 40 CFR 93.154. Any air emissions associated with operating the proposed engine test facilities must be compliant with the Hill AFB *Title V Operating Permit* (*Permit Number: 1100007001*) and revisions to the operating permit could be required. Specific discussions for air emissions and potential impacts related to the proposed action are presented in Sections 3 and 4 of this document.

The proposed action would be expected to generate solid wastes that are regulated by the Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and similar laws. Hazardous wastes at Hill AFB are routinely and properly handled in accordance with RCRA regulations, Utah hazardous waste management regulations contained in UAC Section R315, and the *Hill AFB Hazardous Waste Management Plan*. These regulations control hazardous waste from its origin and storage to ultimate treatment, and/or disposal. In Utah, the above regulations are enforced by the Utah Division of Solid and Hazardous Waste. Hill AFB industrial wastewater discharges

must comply with an industrial pretreatment permit issued by the North Davis County Sewer District (NDCSD). The pretreatment permit regulates the quality of water entering the county sewer system and ensures compliance with requirements of the Clean Water Act (CWA) and the Utah Pollutant Discharge Elimination System (UPDES). The requirements for storing, treating, and disposing hazardous waste created by operations within the proposed engine test cell facilities are discussed in Sections 3 and 4 of this document.

If suspected or actual shallow soil contamination were to be identified within the area covered by the proposed action or the alternate locations, it would be addressed by the Hill AFB Installation Restoration Program (IRP) according to the conditions of a federal facility agreement and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

The proposed construction is not expected to contact any cultural resources (defined as archaeological, architectural, or traditional cultural properties). If suspected or actual cultural resources should be observed during construction, work in the immediate vicinity would stop, and the Hill AFB cultural resources manager would implement inadvertent discovery procedures in accordance with the Hill AFB *Integrated Cultural Resources Management Plan*.

USAF airfield and aircraft operations comply with conditions of the Noise Control Act (NCA) of 1972. Hill AFB implements USAF's AICUZ program in accordance with Air Force Instruction (AFI) 32-7063, *Air Installation Compatible Use Zone Program*, which includes defining zones of high noise and recommending land uses that are compatible within these zones. In addition, the Utah Code, Title 10, Chapter 08, *Powers and Duties of All Cities, 10-8-76, Noise Abatement -- Street Performances*, empowers cities within Utah to prevent the making of noise for any purpose. Specific discussions for noise and potential impacts related to the proposed action are presented in Sections 3 and 4 of this document.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section describes selection criteria, the proposed action, two alternate locations, the no action alternative, and additional alternatives that were considered.

2.1 Selection Criteria

As discussed in Sections 1.1 and 1.2, the Hill AFB 309 AMXG will be responsible for testing repaired F/A-22, F-16, and A-10 aircraft systems in accordance with USAF mission requirements and technical order specifications. Following repairs to each aircraft, the engines must be tested on the intact aircraft.

Due to these considerations, the following selection criteria were established. The facility that accommodates the Hill AFB 309 AMXG's engine testing functions should:

- enable on-site testing capability for repaired F/A-22, F-16, and A-10 aircraft;
- provide sufficient space to house the aircraft and all necessary equipment;
- provide capacity to complete future USAF workload requirements; and
- be protective of facilities, human health, and the environment.

2.2 Proposed Action: Construct the T-10 Engine Test Cell Facilities to the East Southeast of Building 680 and to the Northwest of Building 18

The proposed action includes all work necessary to construct the two engine test cell facilities to the east southeast of Building 680 and to the northwest of Building 18, Hill AFB. These engine test cells would provide an efficient solution for testing F/A-22, F-16, and A-10 aircraft in acoustically treated enclosures. T-10 engine test cells provide residual noise levels of approximately 80 decibels (dBA) or less at a distance of 250 feet from the facility during jet engine testing.

The proposed action would construct two facilities large enough to house all of the required systems and equipment for testing F/A-22, F-16, and A-10 aircraft engines while mounted on an intact aircraft. The facilities would also be capable of testing other types of USAF single engine and twin-engine military aircraft. Features of these all steel facilities include acoustically treated main doors and enclosures; side air intake baffles and inlet air turning vanes to create stable airflow; an exhaust augmentor and a deflector ramp; a thrust restraint weighing between 70,000 and 100,000 pounds; fuel storage and an above ground fuel supply system; secondary containment for stored jet fuel; and an electronic control system.

The environmental impacts of the proposed action are summarized in Section 4.5 of this document, and are discussed at greater length throughout Section 4 of this document.

2.3 Alternate Locations: Construct the Engine Test Cell Facilities to the East of Building 10 and to the South Southeast of Building 680

The alternative to construct one or both of the engine test facilities either to the east of Building 10 or to the south of Building 680 would include the same items as the proposed action.

The environmental impacts of the alternate locations are summarized in Section 4.5 of this document, and are discussed at greater length throughout Section 4 of this document.

2.4 No Action Alternative: Continue to Use Existing Facilities

The no action alternative does not meet the selection criteria to: enable on-site testing capability for repaired F/A-22, F-16, and A-10 aircraft; provide sufficient space to house the aircraft and all necessary equipment; or provide capacity to complete future USAF workload requirements. However, the framework of an environmental assessment requires that the no action alternative must be considered even if it does not meet all of the selection criteria.

Under the no action alternative, significant numbers of F/A-22, F-16, and A-10 aircraft would be required to wait in line for testing at other engine test cells on Hill AFB that already operate at or near the capacity of their assigned workloads, resulting in lengthy delays before final delivery of aircraft back into service, and it is predicted that Hill AFB may be unable to provide sufficient capacity for testing repaired F/A-22, F-16, and A-10 aircraft. It is therefore possible that aircraft would be grounded, and mission requirements for sorties would not be met.

The environmental impacts of the no action alternative are summarized in Section 4.5 of this document, and are discussed at greater length throughout Section 4 of this document.

2.5 Identification of Alternatives Eliminated From Further Consideration

Hill AFB Aircraft Division's (309 MA) program managers evaluated, but eliminated, other potential locations for housing the future T-10 engine test cell facilities. Hill AFB is the only USAF facility with the capability or assignment to repair F/A-22, F-16, and A-10 aircraft. No other building exists on Hill AFB that could accommodate this workload, either in its current condition or by being renovated. The aircraft must be tested intact, before being flown, and are too large to transport intact by highway on trailers. Therefore, other USAF bases, and nearby off base locations could not be used to test the F/A-22, F-16, and A-10 aircraft engines after repairs are complete.

3.0 EXISTING ENVIRONMENT

3.1 Air Quality

Hill AFB is located in Davis and Weber Counties, Utah. Neither county is in complete attainment status with federal clean air standards (Figure 7). Nonattainment areas fail to meet national ambient air quality standards (NAAQS) for one or more of the criteria pollutants: oxides of nitrogen (NO_x), sulfur dioxide (SO_2), ozone (O_3), particulates less than 10 microns in diameter (PM_{10}), carbon monoxide (CO), and lead. Davis County was upgraded from an ozone non-attainment area to a maintenance area, effective 1997. Current status according to the Utah Division of Air Quality (DAQ 2003) for the City of Ogden in Weber County (approximately seven miles north of the proposed action) is designation as a non-attainment area for PM_{10} and a maintenance area for CO .

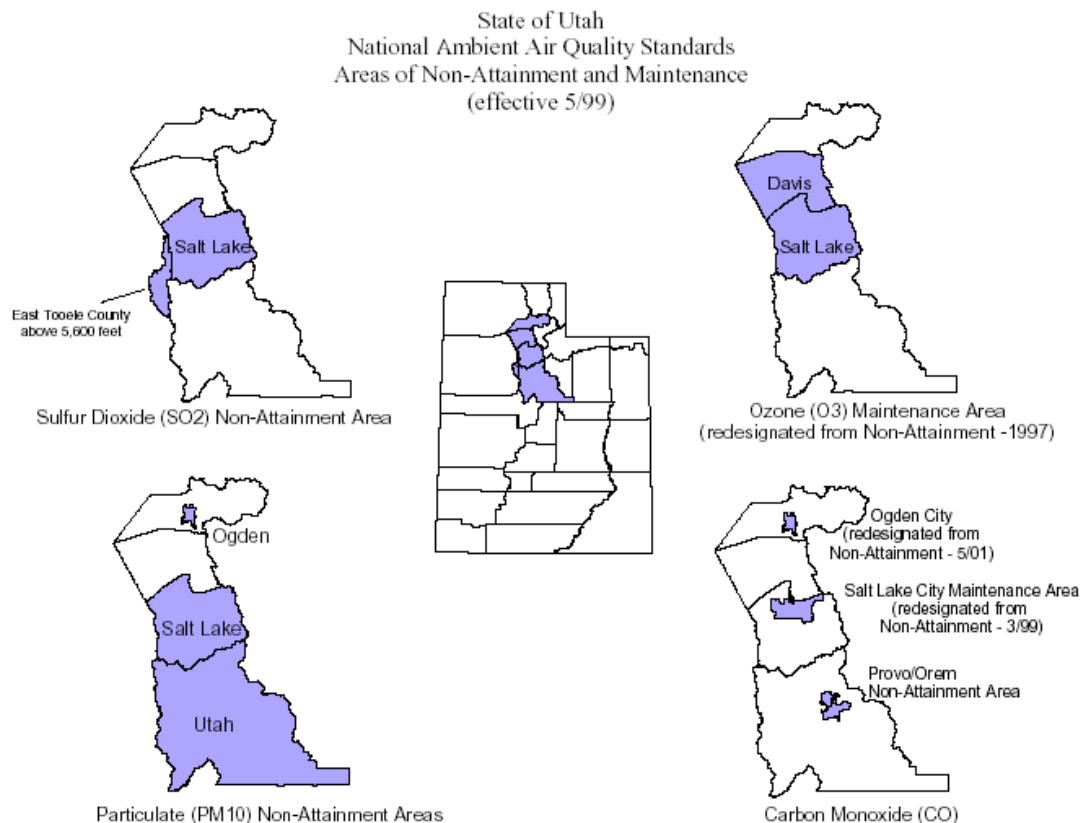


Figure 7: State of Utah National Ambient Air Quality Standards, Areas of Non-Attainment and Maintenance (Effective 5/99)

The current air quality trend at Hill AFB is one of controlling emissions as Hill AFB managers implement programs to eliminate ozone-depleting substances, limit use of volatile organic compounds (VOCs), install VOC emission control equipment for painting operations, switch to lower vapor pressure solvents and aircraft fuel, convert internal combustion engines from gasoline and diesel to natural gas, and improve the capture of particulates during painting and abrasive blasting operations (in compliance with the base's Title V air quality permit).

The proposed action would create new facilities for which air emissions do not currently exist. The Hill AFB Title V air quality permit currently addresses air emissions from the existing five engine test cell facilities located on Hill AFB.

3.2 Solid and Hazardous Wastes

In general, hazardous wastes include substances that, because of their concentration, physical, chemical, or other characteristics, may present substantial danger to public health or welfare or to the environment when released into the environment or otherwise improperly managed. Hazardous wastes generated at Hill AFB are managed as specified in the *Hill AFB Hazardous Waste Management Plan* with oversight by personnel from the Environmental Management Directorate and the Defense Reutilization and Marketing Office. Hazardous wastes at Hill AFB are properly stored during characterization, and then manifested and transported off site for treatment and/or disposal.

The proposed action would create new facilities for which solid and hazardous waste streams do not currently exist. Hill AFB waste management programs currently address wastes that are generated in the existing five engine test cell facilities located on Hill AFB.

3.3 Physical Environment

3.3.1 Surface Soils

The surface soils in the vicinity of proposed action are flat and covered with bare soil and weeds. There is no known shallow soil contamination in the vicinity of the proposed action (Hill AFB 2005, and personal communication, Mr. Mark Loucks).

3.3.2 Surface Water

No surface water resources exist within the immediate area of the proposed action. The topic of surface water is being included in this document to demonstrate compliance with stormwater and spill prevention regulations (see Section 4.3.2).

3.4 Noise

The existing engine test cells on Hill AFB provide residual noise levels of approximately 80 dBA or less at a distance of 250 feet from each facility during jet engine testing. On-base workers in close proximity to engine tests wear protective hearing devices as prescribed and monitored by the Hill AFB bioenvironmental engineers.

For off-base receptors, the primary exposure to noise generated on Hill AFB is due to aircraft operations (personal communication, Robert McKinley). Figure 2 shows the physical relationship of the closest off-base receptors to the locations of the potential new engine test cell facilities.

The existing Hill AFB noise contour map (Figure 8) was generated by Mr. Robert McKinley of the Human Effectiveness Directorate, Battle Space Acoustics Branch, Wright Patterson AFB, Ohio, using industry-accepted modeling software. On Figure 8, the off-base receptors of concern are seen to be located between the 69 dBA and 76 dBA contours. For purposes of comparison, Table 1 provides typical sources of environmental noise and their associated noise levels.

Table 1: Typical Environmental Noise Levels

Source	Noise Level (dBA)
Normal conversation	45-60
Normal city or freeway traffic	70
Vacuum cleaner	75
Hair dryer	80
Motorcycle, electric shaver	85
Lawn mower, heavy equipment	90
Screaming baby	115

Source: Ohio State University <http://ohioline.osu.edu/cd-fact/0190.html>

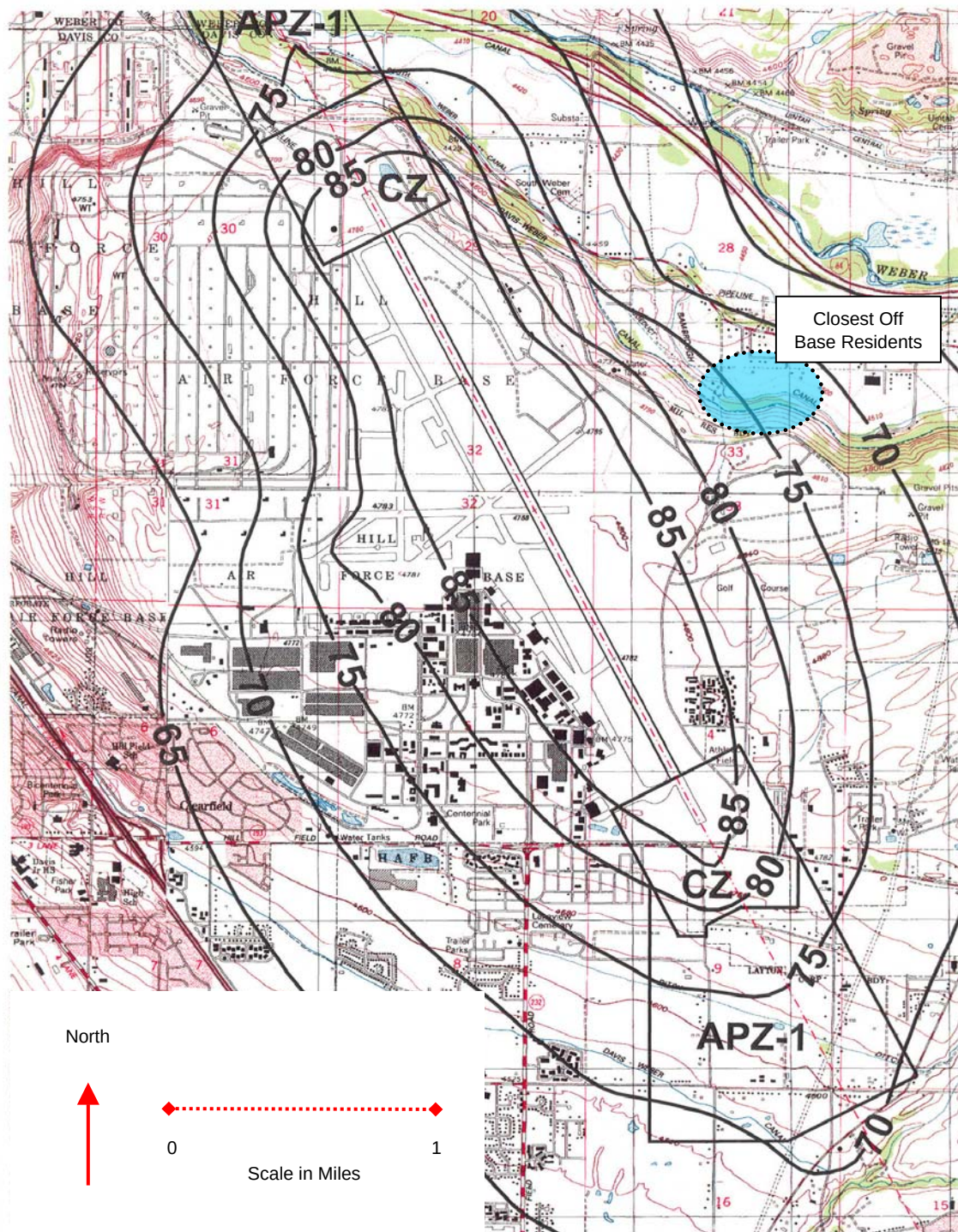


Figure 8: Noise Contours for Hill AFB

(from aircraft operations: other base activities have minimal impact on the noise contours)

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Air Quality

4.1.1 Impacts of the Proposed Action

Emissions of PM-10 would be produced as soil is disturbed during proposed construction activities. The US Environmental Protection Agency (EPA) has estimated that fugitive dust emissions from construction activities produce 0.11 tons of PM-10 per acre per month (EPA 1996). Each of the two proposed facilities would involve approximately two weeks of excavation and backfill activities for less than 0.5 acres being disturbed during construction of buried utilities, foundations, and pavement. Fugitive dust emissions of 0.06 tons of PM-10 were therefore calculated for the proposed action. To mitigate emissions of fugitive dust, the construction contractor would be required to keep nearby roads clean; apply water as needed during dry and windy weather; and closely monitor the site during high wind events, for the purpose of dust suppression and reducing the emissions of PM-10 (EM-Assist 2003).

The internal combustion engines of heavy equipment would also generate emissions of PM-10, VOCs, NO_x, and CO. Fugitive emissions from construction activities should be mitigated according to *Utah Administrative Code, Rule R307-205, Emission Standards: Fugitive Emissions and Fugitive Dust*. Good housekeeping practices should be used to maintain construction opacity at less than 20 percent. Haul roads should be kept wet, and any soil that is deposited on nearby paved roads by construction vehicles should be removed from the roads and returned to the site or appropriate disposal area.

Assumptions and estimated air emissions for the construction period are listed in Table 2.

Projected air emissions from operating the engine test cell facility whose primary function would be to test F/A-22 aircraft are presented in Table 3. Projected air emissions from operating the engine test cell facility whose primary function would be to test F-16 aircraft are presented in Table 4.

Each T-10 engine test cell facility would be expected to test approximately 37 engines per month (personal communication, Dave Gange). Assuming each engine test results in a subsequent aircraft flight test (which is a conservative assumption), two new engine test cell facilities would be responsible for generating 888 flights per year on the Hill AFB runway. Compared to the existing 80,000 flights per year, the resulting increase in air emissions from jets in flight would equal approximately one percent.

Table 2: Calculated Heavy Equipment Emissions

Data Assumptions							
Equipment Type	Diesel Emission Factor (lbs/hr)						
	VOC (HC)	CO	NOx	PM10	HAPs	SOx	
Asphalt Paver	0.28	1.24	2.96	0.24	0.05	0.25	
Concrete Truck	0.80	3.55	8.50	0.69	0.15	0.72	
Flat Bed Truck	0.48	1.54	5.29	0.44	0.12	0.49	
Motored Grader	0.83	2.01	5.08	0.53	0.06	0.46	
Scraper	0.33	2.31	4.03	0.58	0.13	0.42	
Track Hoe	0.91	6.65	13.75	1.84	0.26	1.19	
Vibratory Compactor	0.38	1.44	4.31	0.36	0.09	0.46	
Water Truck	1.10	3.58	12.28	1.02	0.28	1.14	
Wheeled Dozer	0.46	1.48	5.08	0.35	0.08	0.49	
Note: VOCs = Hydrocarbons and HAPs = Aldehydes							
Source: Industry Horsepower Ratings and EPA 460/3-91-02							
Construct Each of Two T-10 Engine Test Cell Facilities							
EQUIPMENT TYPE	HOURS OF OPERATION	Diesel Emissions (lbs)					
		VOC	CO	NOx	PM10	HAPs	SOx
Asphalt Paver	40	11.2	49.6	118.4	9.6	2	10
Concrete Truck	30	24.0	106.5	255.0	20.7	4.5	21.6
Flat Bed Truck	8	3.8	12.3	42.3	3.5	1.0	3.9
Motored Grader	40	33.2	80.4	203.2	21.2	2.4	18.4
Scraper	40	13.2	92.4	161.2	23.2	5.2	16.8
Track Hoe	240	218.4	1596.0	3300.0	441.6	62.4	285.6
Vibratory Compactor	24	9.1	34.6	103.4	8.6	2.2	11.0
Water Truck	16	17.6	57.3	196.5	16.3	4.5	18.2
Wheeled Dozer	40	18.4	59.2	203.2	14.0	3.2	19.6
TOTAL ESTIMATED EMISSIONS (lbs)		349.0	2088.3	4583.2	558.8	87.3	405.2
TOTAL ESTIMATED EMISSIONS (tons)		0.17	1.04	2.29	0.28	0.04	0.20

Source of Hours: Discussions With Dave Gange, Hill AFB Facility Engineer

Table 3: Emissions From the Primary F/A-22 Engine Test Cell

Primary F/A-22 Facility					Emission Factors (lb pollutant per 1000 lb fuel)							Emissions (Tons per Year)						
Aircraft	Aircraft Engine	Power Setting	Fuel Flowrate (lb/hr)	Fuel Sulfur (wt%)	NOx	CO	VOC	PM10	SOx	Test Time (minutes per year)	Fuel: 1000 lb per year	NOx	CO	VOC	PM10	SOx		
A-10	TF34-100	Idle	449	0.026	1.35	86.68	20.7	8	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
		Approach	773	0.026	4.02	25.65	1.49	6.19	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
		Intermediate	1516	0.026	6.42	6.28	0.65	8.93	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
		Military	3026	0.026	8.83	4	0.4	2.67	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
F-16	F110-100 (JP-5)	Idle	1044	0.026	5.19	24.08	1.02	1.84	0.52	139	2.42	0.0	0.0	0.0	0.0	0.0		
		Approach	4128	0.026	10.87	4	0.36	0.95	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
		Intermediate	6598	0.026	18.25	2.2	0.19	0.57	0.52	23.5	2.58	0.0	0.0	0.0	0.0	0.0		
		Military	9974	0.026	30.35	2.05	0.62	0.14	0.52	13.5	2.24	0.0	0.0	0.0	0.0	0.0		
		AB-1	16374	0.026	15.55	97.5	69.33	3.34	0.52	13.5	3.68	0.0	0.2	0.1	0.0	0.0		
F-16	F110-129	Idle	1036	0.026	3.19	34.58	2.64	2.61	0.52	139	2.40	0.0	0.0	0.0	0.0	0.0		
		Approach	4956	0.026	11.6	3.85	0.05	1.37	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
		Intermediate	7136	0.026	17.33	2.49	0.01	0.57	0.52	23.5	2.79	0.0	0.0	0.0	0.0	0.0		
		Military	9985	0.026	27.13	2.42	0.54	0.14	0.52	13.5	2.25	0.0	0.0	0.0	0.0	0.0		
		AB-1	16826	0.026	15.08	104.6	64.8	3.34	0.52	13.5	3.79	0.0	0.2	0.1	0.0	0.0		
F/A-22	F-119-PW-100	Idle	1377	0.026	3.0	48.2	6.8	2.49	0.38	556	12.76	0.0	0.3	0.0	0.0	0.0		
		Approach	2740	0.026	6.6	7.9	0.3	2.00	0.38		0.00	0.0	0.0	0.0	0.0	0.0		
		Intermediate	10110	0.026	12.4	2.1	0.5	1.41	0.38	94	15.84	0.1	0.0	0.0	0.0	0.0		
		Military	18612	0.026	19.8	0.8	0	1.12	0.38	54	16.75	0.2	0.0	0.0	0.0	0.0		
		Afterburner	50170	0.026	7.4	16.1	0.2	11.2	0.38	54	45.15	0.2	0.4	0.0	0.3	0.0		
F-35	Modified From the F-119 Used on the F/A-22	Idle		0.026	F-35 results based on proprietary and confidential data, provided by Capt Ryan Andrews of the Joint Strike Fighter Program.					587		0.0	0.2	0.0	0.1	0.0		
		Approach		0.026								100		0.0	0.0	0.0	0.0	0.0
		Intermediate		0.026								57		0.1	0.0	0.0	0.0	0.0
		Military		0.026								57		0.6	0.0	0.0	0.0	0.0
		Afterburner		0.026								57		0.2	0.5	0.0	0.0	0.0
												1.6	1.9	0.3	0.5	0.1		

Sources: USAF emission data and workload estimates (see the project administrative record)

Table 4: Emissions From the Primary F-16 Engine Test Cell

Primary F-16 Facility					Emission Factors (lb pollutant per 1000 lb fuel)							Emissions (Tons per Year)						
Aircraft	Aircraft Engine	Power Setting	Fuel Flowrate (lb/hr)	Fuel Sulfur (wt%)	NOx	CO	VOC	PM10	SOx	Test Time (minutes per year)	Fuel: 1000 lb per year	NOx	CO	VOC	PM10	SOx		
A-10	TF34-100	Idle	449	0.026	1.35	86.68	20.7	8	0.52	186	1.39	0.0	0.1	0.0	0.0	0.0		
		Approach	773	0.026	4.02	25.65	1.49	6.19	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
		Intermediate	1516	0.026	6.42	6.28	0.65	8.93	0.52	32	0.81	0.0	0.0	0.0	0.0	0.0		
		Military	3026	0.026	8.83	4	0.4	2.67	0.52	18	0.91	0.0	0.0	0.0	0.0	0.0		
F-16	F110-100 (JP-5)	Idle	1044	0.026	5.19	24.08	1.02	1.84	0.52	185.5	3.23	0.0	0.0	0.0	0.0	0.0		
		Approach	4128	0.026	10.87	4	0.36	0.95	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
		Intermediate	6598	0.026	18.25	2.2	0.19	0.57	0.52	31.5	3.46	0.0	0.0	0.0	0.0	0.0		
		Military	9974	0.026	30.35	2.05	0.62	0.14	0.52	18	2.99	0.0	0.0	0.0	0.0	0.0		
		AB-1	16374	0.026	15.55	97.5	69.33	3.34	0.52	18	4.91	0.0	0.2	0.2	0.0	0.0		
F-16	F110-129	Idle	1036	0.026	3.19	34.58	2.64	2.61	0.52	185.5	3.20	0.0	0.1	0.0	0.0	0.0		
		Approach	4956	0.026	11.6	3.85	0.05	1.37	0.52		0.00	0.0	0.0	0.0	0.0	0.0		
		Intermediate	7136	0.026	17.33	2.49	0.01	0.57	0.52	31.5	3.75	0.0	0.0	0.0	0.0	0.0		
		Military	9985	0.026	27.13	2.42	0.54	0.14	0.52	18	3.00	0.0	0.0	0.0	0.0	0.0		
		AB-1	16826	0.026	15.08	104.6	64.8	3.34	0.52	18	5.05	0.0	0.3	0.2	0.0	0.0		
F/A-22	F-119-PW-100	Idle	1377	0.026	3.0	48.2	6.8	2.49	0.38		0.00	0.0	0.0	0.0	0.0	0.0		
		Approach	2740	0.026	6.6	7.9	0.3	2.00	0.38		0.00	0.0	0.0	0.0	0.0	0.0		
		Intermediate	10110	0.026	12.4	2.1	0.5	1.41	0.38		0.00	0.0	0.0	0.0	0.0	0.0		
		Military	18612	0.026	19.8	0.8	0	1.12	0.38		0.00	0.0	0.0	0.0	0.0	0.0		
		Afterburner	50170	0.026	7.4	16.1	0.2	11.2	0.38		0.00	0.0	0.0	0.0	0.0	0.0		
F-35	Modified From the F-119 Used on the F/A-22	Idle		0.026	F-35 results based on proprietary and confidential data, provided by Capt Ryan Andrews of the Joint Strike Fighter Program.					680		0.1	0.2	0.0	0.1	0.0		
		Approach		0.026								0.0	0.0	0.0	0.0	0.0		
		Intermediate		0.026								116		0.1	0.0	0.0	0.0	0.0
		Military		0.026								66		0.7	0.0	0.0	0.0	0.0
		Afterburner		0.026								66		0.3	0.6	0.0	0.0	0.0
												1.4	1.5	0.4	0.2	0.1		

Sources: USAF emission data and workload estimates (see the project administrative record)

Space heaters would be required to heat each engine test cell facility during cold weather months, approximately six hours per day, five days per week (personal communication, Rich Trejos). Assuming the heaters would operate 26 weeks per year and have emissions similar to a construction generator, Table 5 presents the calculated emissions due to heating each engine test cell on an annual basis.

Table 5: Emissions From Heating Each Test Cell

Heat Each of Two T-10 Engine Test Cell Facilities							
EQUIPMENT TYPE	HOURS	Diesel Emissions (lbs)					
	PER YEAR	VOC	CO	NO_x	PM₁₀	HAPs	SO_x
Generator	780	15.6	78.0	93.6	15.6	0.0	7.8
TOTAL ESTIMATED EMISSIONS (lbs)		15.6	78.0	93.6	15.6	0.0	7.8

For construction projects under 6 months in duration, no applicability analysis or conformity determination is required. For operating the proposed engine test cell facilities, Hill AFB air quality managers would submit a notification of intent (NOI) to DAQ related to any activities for which a permit modification or modification to an approval order would be required. Hill AFB would not be allowed to operate the new facilities until DAQ concurs that federal and state requirements are being met. Following this existing Hill AFB process would ensure conformity with the Clean Air Act (CAA) by virtue of complying with Utah's state implementation plan (SIP).

4.1.2 Impacts of the Alternate Locations Alternative

Within respect to air quality, the impacts of constructing and operating the engine test cells at the alternate locations would be the same as the predicted impacts for the proposed action.

4.1.3 Impacts of the No Action Alternative

There would be no air quality impacts associated with the no action alternative.

4.1.4 Cumulative Impacts

Construction-related air emissions would be temporary. The cumulative impacts from operating the two proposed engine test cell facilities in conjunction with the existing five engine test cell facilities are presented in Table 6. Operation of all seven facilities would not cause Hill AFB to exceed its currently permitted limit for this activity.

Table 6: Cumulative Engine Testing Emissions Estimates

Cumulative Engine Testing Emissions	Emissions (Tons per Year)				
	NOx	CO	VOC	PM10	SOx
Current Emissions from Hill AFB Engine Testing Operations	30.5	20.3	3.4	2.0	1.0
Predicted Emissions from Primary F/A-22 Facility	1.2	2.0	0.4	0.7	0.0
Predicted Emissions from Primary F-16 Facility	0.9	1.6	0.4	0.4	0.0
Projected Totals With All Facilities Operating	32.6	23.9	4.2	3.1	1.1
Hill AFB Permitted Engine Testing Limit	64.0	48.0	24.0	4.5	8.1

Source: EM-Assist, Hill AFB Air Quality Contractor

Cumulative impacts to air quality associated with operating the engine test cells at the alternate locations would be the same as the predicted impacts for the proposed action. There are no cumulative air quality impacts associated with operation of the no action alternative.

4.2 Solid and Hazardous Wastes

4.2.1 Impacts of the Proposed Action

During the proposed construction activities, no solid wastes would be generated except for minor amounts of construction debris that would be treated as uncontaminated trash. It is possible that equipment failure or a spill of fuel, lubricants, or construction-related chemicals could generate solid or hazardous wastes. In such a case, or if excavated soils exhibit suspicious odors or appearance, the following procedures would apply on Hill AFB.

Hill AFB personnel have specified procedures for handling construction-related solid and hazardous wastes in their engineering construction specifications. The procedures are stated in *Section 01000, General Requirements, Part 1, General, Section 1.24, Environmental Protection*. All solid non-hazardous waste is collected and disposed on a daily basis. Samples from suspect wastes are analyzed for hazardous vs. non-hazardous determination. The suspect waste is safely stored while analytical results are pending. Hazardous wastes are stored at sites operated in accordance with the requirements of 40 CFR 265. The regulations require the generator to characterize hazardous wastes with analyses or process knowledge. Hazardous wastes are eventually labeled, transported, treated, and disposed in accordance with federal and state regulations.

Each proposed engine test cell would be expected to produce regulated solid and liquid waste streams associated with post engine testing cleanup and with drips, leaks, and spills of petroleum products.

For the regulated solid wastes, rags would not be sent out as waste. They would be washed in the base laundry for re-use. Any disposable wipes or sorbent pads would be drummed and disposed as a regulated petroleum waste.

For liquid wastes, contained oil can be burned as a fuel source in the used oil boiler, Hill AFB Building 1703. Off-spec fuel is typically reclaimed or recycled, but in the cases where neither of these is an option, it would be disposed as waste fuel at a permitted disposal facility. Any other liquids (including the contents of oil-water separators discussed in Section 4.3.2) would be collected in containers or sorbent pads, and disposed as a regulated petroleum waste. Related to the potential for a large release of petroleum products, see the surface water discussions in Section 4.3.2.

4.2.2 Impacts of the Alternate Locations Alternative

Within respect to solid and hazardous wastes, the impacts of constructing the engine test cells at the alternate locations would be the same as the predicted impacts for the proposed action.

4.2.3 Impacts of the No Action Alternative

With respect to solid and hazardous wastes, the no action alternative has no impacts.

4.2.4 Cumulative Impacts

Proper handling of solid and hazardous wastes eliminates releases of contaminants to the environment. There are no cumulative solid or hazardous waste impacts associated with the proposed action, the alternate locations alternative, or with the no action alternative.

4.3 Physical Environment

4.3.1 Surface Soils

4.3.1.1 Impacts of the Proposed Action

Construction projects can increase soil erosion. The area of proposed construction is relatively flat and the potential for erosion is therefore small. Hill AFB construction specifications would mitigate any erosion potential that does exist by requiring the contractor to restore the land to its original condition. All areas disturbed by excavation would be backfilled, and then either be covered by pavements or re-planted, re-seeded, or sodded to prevent soil erosion. Preventing soil erosion during construction activities is also required to comply with stormwater pollution prevention rules. If the proposed action were to disturb at least one acre, a stormwater pollution prevention plan would be prepared and implemented prior to initiating any site-disturbing activities.

4.3.1.2 Impacts of the Alternate Locations Alternative

Within respect to surface soils, the impacts of constructing and operating the engine test cells at the alternate locations would be the same as the predicted impacts for the proposed action.

4.3.1.3 Impacts of the No Action Alternative

With respect to surface soils, the no action alternative has no impacts.

4.3.1.4 Cumulative Impacts

There are no cumulative impacts to surface soils associated with the proposed action, the alternate locations alternative, or with the no action alternative.

4.3.2 Surface Water

4.3.2.1 Impacts of the Proposed Action

As discussed in Section 4.3.1.1, surface water (stormwater) pollution prevention would be accomplished by preventing soil erosion during construction activities, and a stormwater pollution prevention plan would be prepared and implemented if site activities were to disturb at least one acre of ground.

Because of the presence of jet fuel and potential fire suppression scenarios while operating the proposed engine test cells, adequate secondary containment and spill response capabilities would be required to prevent contamination of surface water resources. Each of the proposed engine test cell facilities would be served by an oil-water separator, a sanitary sewer connection, and incorporated into the existing Hill AFB *Spill Prevention Control and Countermeasure (SPCC) Plan*.

The floor drains for each engine test cell facility would be connected to an oil-water separator, which under normal operating conditions would trap sediment, fuel, engine oil, and lubricants. Low emulsifying or non-emulsifying soaps would be used in these facilities to minimize the solubility of fuel, engine oil, and lubricants in oil-water separator effluent. All oil-water separators on Hill AFB are inspected four times per year by a base contractor, and are cleaned and maintained as indicated by the quarterly inspection results.

Worst case emergency scenarios include: rupture of a fuel tank containing up to 1,200 gallons of jet fuel; and if a fire were to occur, up to 4,000 gallons of combined fire suppression foam and rinse water. Neither the jet fuel nor the foam-water mixture should be allowed to drain directly to a wastewater treatment plant. To accommodate a potential combined emergency situation for each facility, 5,200 gallons of containment (or other

volume, to be calculated during final engineering design) would be provided upstream of a shutoff valve. Adjacent to the shutoff valve, an access port would be provided to pump contaminated liquids from the secondary containment system. The required containment volume could be satisfied using curbing inside the facility, the oil-water separator, an additional vault, or any combination of these items.

Because the proposed engine test cell facilities would be designed and used for testing aircraft engines mounted on intact aircraft with on-board fuel tanks, an additional external source of fuel might not be required or constructed. External fuel tanks or trailers would only be required if engines were to be tested on stands (not mounted to aircraft and with no other source of fuel). If external fuel tanks or trailers are ever contemplated for either or both of the proposed facilities, adequate secondary containment (possibly for 30,000 gallons of fuel) would be required, and the resulting structures and procedures would be incorporated into the Hill AFB *SPCC Plan*.

4.3.2.2 Impacts of the Alternate Locations Alternative

Within respect to surface water, the impacts of constructing and operating the engine test cells at the alternate locations would be the same as the predicted impacts for the proposed action.

4.3.2.3 Impacts of the No Action Alternative

With respect to surface water, the no action alternative has no impacts.

4.3.2.4 Cumulative Impacts

There are no cumulative impacts to surface water associated with the proposed action, the alternate locations alternative, or with the no action alternative.

4.4 Noise

4.4.1 Impacts of the Proposed Action

Similar to the existing engine test cells, the proposed engine test cells on Hill AFB would provide residual noise levels of approximately 80 dBA or less at a distance of 250 feet from each facility during jet engine testing. On-base workers in close proximity to engine tests would wear protective hearing devices as prescribed and monitored by the Hill AFB bioenvironmental engineers.

For off-base receptors, the noise impacts from the proposed engine test cells were modeled by Robert McKinley. Results the noise modeling efforts indicated that the proposed action would not impact the Hill AFB noise contour map (Figure 8). At Hill AFB, by far the most significant contribution to off-base noise impacts is from aircraft

operations. Operating the engine test cell facilities would have no discernable effect on the off-base noise contour map.

On a short-term basis (a few minutes at a time), off-base receptors would be able to hear the engine tests being performed on the east side of the Hill AFB runway, but these noise levels would be much less than the noise created by the aircraft using this runway on a routine basis.

4.4.2 Impacts of the Alternate Locations Alternative

Within the precision of the noise modeling software, the impacts of constructing the engine test cells at the alternate locations would be the same as for the proposed action.

4.4.3 Impacts of the No Action Alternative

With respect to noise, the no action alternative has no impacts.

4.4.4 Cumulative Impacts

Potential cumulative impacts for noise would be related to operating two additional engine test cell facilities in conjunction with: the five existing engine test cell facilities; existing and upcoming aircraft repair activities within the hangars on the east side of the Hill AFB runway; and existing and future aircraft operations.

Following the noise modeling efforts, Bob McKinley concluded that operating the engine test cell facilities (in conjunction with the existing engine test cell facilities) would have no discernable effect on the off-base noise contour map, and aircraft repair activities within hangars produce much less noise than engine test cell facilities.

As discussed in the air quality section (Section 4.1), each engine test cell facility could be used up to 37 times per month. Assuming each engine test results in a subsequent aircraft flight test (which is a conservative assumption), two new engine test cell facilities would be responsible for generating 888 flights per year on the Hill AFB runway. Compared to the existing 80,000 flights per year, the resulting noise increase would equal approximately one percent.

4.5 Summary of Impacts

The proposed action, an alternative to construct the engine test cell facilities at alternate locations, and the no action alternative were all considered in detail. The proposed action could be implemented with minor air emissions of short term duration. Projected long term air emissions fall within the limits prescribed by the Hill AFB Title V permit. Each proposed engine test cell would be expected to produce regulated solid and liquid waste streams associated with post engine testing cleanup and with drips, leaks, and spills of petroleum products. Appropriate re-use, recycling, and/or disposal opportunities exist for

all of these waste streams. Following the construction phase, backfill and paving operations would prevent erosion of the site. Surface water resources would be protected by preventing soil erosion during construction activities; providing structures to contain and transmit facility liquid effluents; and by implementing SPCC procedures. Potential noise impacts were modeled, and the projected noise levels would be much less than the noise created by the aircraft using the Hill AFB runway on a routine basis.

The impacts of constructing the engine test cells at the alternate locations would be the same as for the proposed action.

No long-term environmental impacts are expected from the proposed action, the alternative to construct the engine test cell facilities at alternate locations, or the no action alternative.

Table 7: Summary Comparison of Alternatives

Issue	<u>Proposed Action</u> Construct the Engine Test Cells and <u>Alternate Locations Alternative</u> (similar impacts)	<u>No Action</u> Do Not Construct the Facilities
Air Quality	Temporary construction-related emissions. Long term air emissions fall within the limits prescribed by the Hill AFB Title V permit.	No impact.
Solid and Hazardous Wastes	Solid and liquid wastes containing petroleum products would all be properly stored, transported, disposed, and/or re-used or recycled.	No impact.
Surface Soils and Surface Water	Construction-related erosion control measures and stormwater permits may be required. Structures would be provided to contain and transmit facility liquid effluents. If external fuel storage is required, additional structures would be required to provide SPCC assurance.	No impact.
Noise	Projected noise levels would be much less than the noise created by the aircraft using the Hill AFB runway on a routine basis.	No impact.

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7.0 REFERENCES

CFR: *Code of Federal Regulations*, US Government Printing Office, Office of the Federal Register (various sections and dates).

DAQ 2003: *State of Utah National Ambient Air Quality Standards, Areas of Non-Attainment and Maintenance (Effective May, 1999)*, Utah Division of Air Quality Website, www.airquality.utah.gov/GRAPHICS/MAPS/non_attn.pdf.

EM-Assist 2003: *Hill Air Force Base Main Base Fugitive Dust Control Plan*, EM-Assist, Inc., 2003.

EPA 1991: *Nonroad Engine and Vehicle Emission Study - Report*, Table 2-07a, US Environmental Protection Agency, 1991.

EPA 1996: *National Air Pollutant Emission Trends, Procedures Document for 1900-1996*, US Environmental Protection Agency, Page 4-285, 1996.

Hill AFB: *Construction Specifications, Section 01000, General Requirements, Part 1, General, Section 1.24, Environmental Protection*, Hill AFB, UT, current version.

Hill AFB 2005: *Hill AFB Environmental Restoration Web Pages*, <http://www.em.hill.af.mil/restoration/map02/ou1.html> and <http://www.em.hill.af.mil/restoration/map02/ou7.html>.

UAC: *Utah Administrative Code*, State of Utah, (various sections and dates).

FINDING OF NO SIGNIFICANT IMPACT

1. NAME OF ACTION: Construct two T-10 engine test cell facilities at Hill Air Force Base (AFB), Utah.

2. DESCRIPTION OF THE PROPOSED ACTION: Hill AFB proposes to accommodate current United States Air Force (USAF) missions by constructing two T-10 engine test cell facilities on Hill AFB.

The proposed action includes all work necessary to construct the two engine test cell facilities to the east southeast of Building 680 and to the northwest of Building 18, Hill AFB. The proposed facilities would be large enough to house all of the required systems and equipment for testing F/A-22, F-16, and A-10 aircraft engines while mounted on an intact aircraft. The facilities would also be capable of testing other types of USAF single engine and twin-engine military aircraft. Features of these all steel facilities include acoustically treated main doors and enclosures; side air intake baffles and inlet air turning vanes to create stable airflow; an exhaust augments and a deflector ramp; a thrust restraint weighing between 70,000 and 100,000 pounds; fuel storage and an above ground fuel supply system; secondary containment for stored jet fuel; and an electronic control system.

3. SELECTION CRITERIA: The following criteria were used to assemble alternatives. The facility that accommodates the Hill AFB Aircraft Maintenance Group's (the group's organizational designation is 309AMXG) engine testing functions should:

- enable on-site testing capability for repaired F/A-22, F-16, and A-10 aircraft;
- provide sufficient space to house the aircraft and all necessary equipment;
- provide capacity to complete future USAF workload requirements; and
- be protective of facilities, human health, and the environment.

4. ALTERNATIVES CONSIDERED OTHER THAN THE PROPOSED ACTION:

An alternative to construct one or both of the engine test facilities on Hill AFB, either to the east of Building 10 or to the south of Building 680 would include the same items as the proposed action.

Under the no action alternative, significant numbers of F/A-22, F-16, and A-10 aircraft would be required to wait in line for testing at other engine test cells on Hill AFB that already operate at or near the capacity of their assigned workloads, resulting in lengthy delays before final delivery of aircraft back into service, and it is predicted that Hill AFB may be unable to provide sufficient capacity for testing repaired F/A-22, F-16, and A-10 aircraft. It is therefore possible that aircraft would be grounded, and mission requirements for sorties would not be met.

Hill AFB program managers eliminated other potential locations for housing the future T-10 engine test cell facilities. Hill AFB is the only USAF facility with the capability or

assignment to repair F/A-22, F-16, and A-10 aircraft. No other building exists on Hill AFB that could accommodate this workload, either in its current condition or by being renovated. The aircraft must be tested intact, before being flown, and are too large to transport intact by highway on trailers.

5. SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS:

a. Proposed Action: This alternative fully satisfies all applicable regulations and provides for accomplishment of mission objectives without significant impacts to human health or the environment. The proposed action could be implemented with minor air emissions of short term duration. Projected long term air emissions fall within the limits prescribed by the Hill AFB Title V permit. Each proposed engine test cell would be expected to produce regulated solid and liquid waste streams associated with post engine testing cleanup and with drips, leaks, and spills of petroleum products. Appropriate re-use, recycling, and/or disposal opportunities exist for all of these waste streams. Following the construction phase, backfill and paving operations would prevent erosion of the site. Surface water resources would be protected by preventing soil erosion during construction activities; providing structures to contain and transmit facility liquid effluents; and by implementing spill prevention control and countermeasure (SPCC) procedures. Potential noise impacts were modeled, and the projected noise levels would be much less than the noise created by the aircraft using the Hill AFB runway on a routine basis. No adverse cumulative environmental impacts are expected.

b. Construct the Facilities at Alternate Locations: The impacts of constructing the engine test cells at the designated alternate locations would be the same as for the proposed action.

c. No Action Alternative: No environmental impacts were identified for the no action alternative.

6. FINDING OF NO SIGNIFICANT IMPACT: Based on the above considerations, a Finding of No Significant Impact (FONSI) is appropriate for this assessment.

Approved by:


HARRY BRIESMASTER III, Colonel, USAF
Commander

Date:

14 Oct 05