DOE/EA-1494

Preapproval Draft Environmental Assessment for Activities Using Biological Simulants and Releases of Chemicals at the Nevada Test Site

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office

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1 **ACRONYMS AND ABBREVIATIONS**

ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
BAPC	Bureau of Air Pollution Control
BLM	Bureau of Land Management
CDC	Centers for Disease Control and Prevention
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWC	Chemical Weapons Convention
DHHS	U.S. Department of Health and Human Services
DHS	U. S. Department of Homeland Security
DNWR	Desert National Wildlife Range
DoD	U. S. Department of Defense
DOE	U.S. Department of Energy
DTRA	Defense Threat Reduction Agency
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMG	Emergency Management Guide
EMS	Environmental Management System
EPA	U. S. Environmental Protection Agency
ES&H	Environment, Safety, and Health
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FONSI	Finding of No Significant Impact
FR	Federal Register
HAP	Hazardous air pollutants
HAZMAT	Hazardous Materials
HSC	HAZMAT Spill Center
HS&DD	Homeland Security and Defense Division
IDLH	Immediately Dangerous to Life or Health
ISMS	Integrated Safety Management System
mph	Miles per hour
NAAQS	National Ambient Air Quality Standards
NARAC	National Atmospheric Release Advisory Center
NEPA	National Environmental Policy Act
NIOSH	National Institute of Occupational Safety and Health
NNSA/NSO	National Nuclear Security Administration Nevada Site Office
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTS	Nevada Test Site
NTTR	Nevada Test and Training Range
OP	Operating Permit
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
REL	Recommended exposure limit
ROD	Record of Decision

SOP	Standard Operating Procedure
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time-weighted average
USDA	U. S. Department of Agriculture
WMD	Weapons of mass destruction

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GLOSSARY

This glossary lists in alphabetical order many of the terms used in the EA and their definitions.

aerosol – a dispersion of very fine colloidal particles suspended in the air or in some gas.

agent – see biological agent and chemical agent.

anaerobic – able to live and grow without air or free oxygen, such as certain bacteria.

anthrax – an infectious disease of cattle, sheep, etc. which can be transmitted to humans.

bacteriophage – a virus that infects bacteria.

biological agent – a pathogenic micro-organism and any naturally occurring, genetically manipulated, or synthesized component of biological origin that is capable of causing:

- Death, disease, or other biological malfunction in humans, animals, or plants
- Deterioration of food, water, equipment, or supplies

biological simulant – a biological substance, or microorganism that shares at least one physical or biological characteristic of a biological agent, has been shown to be non-pathogenic, and can be used for biological defense testing to replace the agent under study.

biosafety level – a category developed by the Centers for Disease Control and Prevention that consists of combinations of laboratory practices and techniques, safety equipment, and laboratory facilities. Each combination is specifically appropriate for the operations performed, the documented or suspected routes of transmission of the infectious agents, and for the laboratory function or activity.

chemical agent – a chemical substance which is intended for use in military operations to kill, seriously injure, or incapacitate persons through its physiological effects. Excluded from consideration are riot control agents, chemical herbicides, smoke, obscurants, and flame retardants.

chemical simulant – a chemical substance that shares at least one characteristic of a chemical agent but with a reduced physiological effect.

Chemical Weapons Convention – international treaty that bans the production, acquisition, stockpiling, transfer, and use of chemical weapons for offensive measures. The CWC does not prohibit the manufacture and use of small amounts of chemical agent for defensive testing purposes.

half-life (lives) – (biology) The length of time it takes for half of a given substance deposited in a living organism to be metabolized or eliminated (chemistry). The time required for a given chemical reaction to affect half of the reactants present.

hazardous air pollutants (HAPs) – HAPs are pollutants, identified by Congress, which present or may present a threat of adverse effects to human health and/or the environment. HAPs are regulated under Section 112 of the Clean Air Act. As of January 1, 1999, 188 air pollutants were listed as HAPs.

Immediately Dangerous to Life or Health Condition (IDLH) – NIOSH defines IDLH as a situation that poses a threat of exposure to airborne contaminants when that exposure is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.

low concentration release – for purposes of this EA, any release of chemicals that comply with the criteria described in Section 2.1.5.2 Chemical Release Criteria.

pathogen – any biological organism capable of producing disease, especially a living microorganism.

Permissible exposure limits (PELs) – OSHA time-weighted average concentrations that must not be exceeded during any 8-hour work shift for a 40-hour workweek.

personal protective equipment (PPE) – protection equipment that prevents injury, sustains life, and allows for continued operational capability in environments that would be potentially hazardous to human health. Equipment may include protective masks and clothing used by individual soldiers and/or civilians.

range – area equipped for practice in shooting at targets. In this meaning, also called target range.

Recommended exposure limits (RELs) – NIOSH time weighted average concentrations for up to a 10-hour workday during a 40-hour work week.

scoping – an early and open process for determining the scope of issues to be addressed in an EIS and for identifying the significant issues related to a proposed action. The process requires appropriate public participation.

simulant – see biological simulant and chemical simulant.

Short term exposure limits (STELs) – an OSHA or NIOSH 15-minute time weighted average that cannot be exceeded at any time during the workday.

suspended aerosols – Biological simulants that have been treated to remove their surface charge. Because of the lack of a surface charge these particles tend to drift in the atmosphere longer than nontreated material. See also aerosols.

Threshold limit value (TLV) – the amount of chemical in the air established by the American Conference of Industrial Hygienists that almost all healthy adult workers are predicted to be able to tolerate without adverse effects. There are three types:

- TLV-TWA(TLV-Time-Weighted Average), which is averaged over the normal eight-hour day/forty-hour workweek.

- TLV-STELs are 15-minute exposures that should not be exceeded for even an instant. It is not a stand-alone value but is accompanied by the TLV-TWA. It indicates a higher exposure that can be tolerated for a short time without adverse effect as long as the total time weighted average is not exceeded.

- TLV-C or Ceiling limits are the concentration that should not be exceeded during any part of the working exposure.

EXECUTIVE SUMMARY

This Draft Environmental Assessment (EA) documents an analysis of the potential effects of a proposal by the U.S. Department of Energy (DOE), National Nuclear Security Administration Nevada Site Office (NNSA/NSO), to conduct tests and experiments involving the release of biological simulants and low concentrations of chemicals at various locations within the Nevada Test Site (NTS). "Low concentration" for a particular release is defined as the release meeting the criteria established in Section 2.1.5.2 of this EA. NNSA anticipates approximately 5 to 20 test series per year. Additionally, the Proposed Action would modify the release parameters under which the HAZMAT Spill Center (HSC) currently operates. No construction, permanent land disturbance, or land use changes would occur with implementation of the Proposed Action or the alternatives. No more than two new employees would be required.

There are two action alternatives to the Proposed Action; neither would fully meet the NNSA purpose and need although both would partially meet it. One alternative is to release only biological simulants and the other alternative is for chemical releases only. The No Action Alternative is to continue NTS and HSC operations as they are currently. NNSA issued a Notice of Intent to prepare an EA on October 1, 2003. The formal scoping period ran from October 1, 2003, through October 31, 2003. Public scoping meetings were held on October 15, 2003 in Las Vegas, Nevada, and on October 16, 2003, in Pahrump, Nevada.

NTS occupies approximately 1,375 square miles (880,000 acres) in southern Nevada, approximately 65 miles northwest of Las Vegas, making it one of the largest restricted-access areas in the United States. This site is surrounded on three sides by more than 3 million acres of land withdrawn from the public domain for a military gunnery range (Nevada Test and Training Range) and a protected wildlife range (Desert National Wildlife Range).

Following the terrorist attacks of September 11, 2001 there was a recognized need for more operational testing, contamination and decontamination testing, forensics testing, personal protective equipment (PPE) testing, enclosed environment detection and decontamination training, and counter-terrorism training as they relate to biological or chemical agents. DOE and NNSA activities, as well as Work for Others activities at the NTS are anticipated to focus on addressing these needs. A critical step in the development of detection instrumentation, decontamination techniques, and operational methods is to conduct tests, experiments, and training in scenarios that are as realistic as possible. The NTS provides a remote, secure setting, facilities, infrastructure, terrain and other features that accurately simulate the kinds of environments that could be encountered in the "real world." In addition to the terrain, facilities and capabilities available at the NTS, the ability to release chemicals and biological simulants is required to meet these national security needs. Thus, NNSA/NSO is proposing to develop release parameters for six biological simulants and to augment the existing chemical release parameters in order to conduct such testing and training.

The Proposed Action and Alternatives would not expose personnel to biological simulants or chemicals during normal operations.

Six biological species have been proposed as appropriate simulants for biological agents. They are:

- *Bacillus subtilis* var. *niger* - a common soil bacterium that is not classified as pathogenic.

> *Bacillus subtilis* var. *niger* is no longer a recognized name, and at least some of these isolates are now called *B. atrophaeus*. *B. globigii* is no longer a recognized name, and at least some of these now are called *B. subtilis* (but not *B. subtilis* var. *niger*).

- *B. thuringiensis* - a naturally occurring soil bacterium, some varieties of which are used as microbial insecticides, that is not toxic to humans or most non-target species.

- *Clostridium sporogenes* - a bacterium found in soil, and as normal flora in the lower intestinal tract of humans.

- *Erwinia herbicola* - a biological control agent against fire blight on apple and pear trees and a normal component of bacterial systems

- Bacteriophage MS2 - a bacterial virus that only targets bacteria and would not be expected to affect human health.

- Noninfectious (killed) Influenza A Virus – a noninfectious (killed) Influenza A Virus used to track infectious influenza viruses. It has no adverse human health effects.

These organisms are not typically classified as human pathogens and were selected based on their documented lack of toxicity to healthy humans. Releases would be conducted in areas and under conditions that would preclude exposure of non-involved workers and the public. Sufficient time would be allowed between biological simulant releases conducted in the same area for the recovery of natural resources.

Suspended aerosols of biological simulants could be released, and could disperse beyond NTS boundaries. However, given the low concentrations that would be released and rapid dispersion, the biological simulants would not be expected to be detected or differentiated from concentrations of naturally-occurring organisms outside of the NTS boundaries.

A chemical release conducted under the restrictions of this EA would have to meet these release criteria:

- The permitted chemical concentrations during a test would be the most conservative among the Occupational Safety and Health Administration (OSHA), National Institute of Occupational Safety and Health (NIOSH), and American Conference of Governmental Industrial Hygienists, Inc. (ACGIH) limits.

- Chemical concentrations would not exceed Immediately Dangerous to Life and Health (IDLH) concentrations beyond 100 meters from the release point. This zone would be classified as an exclusion zone for all non-involved workers, personnel without appropriate PPE and training, and a need to be present.

- Chemical concentrations would not exceed the short term exposure limit (STEL) value beyond 300 meters from the release point. Non-involved workers would be excluded from this zone.

- Chemical concentrations would not exceed the more conservative of the permissible exposure level (PEL), NIOSH recommended exposure limits (REL), or threshold limit values (TLV) beyond 500 meters from the release point.

- Chemicals released within the HSC's authorized release boundaries would be required to meet the standards for human occupational exposures to hazardous materials. However, chemical releases would not be required to meet the existing HSC predominant wind direction criteria if the test documentation can demonstrate that the release concentrations do not exceed the PEL, REL, or TLV values at the HSC's authorized release boundaries.

- No chemical would be considered for release that has cumulative, long-term persistence in the environment, unless it can be demonstrated that the chemical would be completely contained,

neutralized, or cleaned up at the conclusion of the test.

- Sufficient time would be allowed between chemical tests conducted in the same area to permit the recovery of natural resources.

- For non-static release points (e.g., moving truck and aircraft release) the exclusion zone would be based on the total area subject to release and measured from any point along the travel corridor.

Environmental Effects of the Proposed Action

Land Use

For the Proposed Action and each Action Alternative, releases could occur anywhere on the NTS provided that the site met release criteria. After materials were released, affected land would be monitored and if necessary, remediated. No impacts to land use are expected.

Cultural Resources

Cultural resources located on the NTS include archaeological sites, architectural or engineering features, and Native American religious or sacred places. Prior to any release the proposed site and surrounding environs would be evaluated for the presence or probability of undiscovered sites. Impacts to significant cultural resource sites would be avoided to the extent feasible. Unavoidable impacts to significant cultural sites would be mitigated.

Water Resources

There are no perennial streams or naturally occurring surface water bodies at NTS. There are a number of springs on NTS, but flow from the springs travels only a short distance before evaporating or infiltrating into the ground. Additionally, there are manmade waste disposal ponds and open reservoirs for industrial water. Past biological material releases into Cambric ditch and two sewage systems have occurred. One of the releases was designed to detect long-term residual material. No evidence of persistence of biological materials or adverse environmental effects was observed. Any impacts to surface water would be of short duration. Because of the depth of the water table beneath the NTS and the small quanity of chemicals that would be used, it is unlikely that there would be any impacts to groundwater. However, if materials with long-term persistence in the environment were released they would be monitored and, if necessary, cleaned up; therefore, there would be no impacts to groundwater. No chemical releases to water resources are proposed.

Soil Resources

The average amount of area (soil) potentially impacted by a release is less than one acre. The potential contamination of soils would be considered as part of the release approval process. Suitable clean-up plans, if contamination were expected, would be required before approval of the test. No long-term impacts to soil resources or geology would be expected.

Air Resources

Chemical releases and possibly biological simulant releases would be subject to provisions of the NTS Air Quality Operating Permit. Releases could include biological simulants that act like suspended aerosols. Suspended aerosols could move off the NTS site, however, due to the low concentrations released and the wide dispersal area, the biological simulants' concentrations would not increase the concentrations of particulate matter above background levels outside the NTS boundaries. No impacts to air quality standards would be expected to occur outside of NTS.

Ecological Resources

Prior to a release, the proposed release site would be surveyed by qualified biologists to ensure that no species of special interest or sensitive habitat would be adversely affected. Particular care would be taken to ensure the

Federally-threatened desert tortoise would not be adversely affected by any release. An approved post-release monitoring plan would be developed to specifically address the biological simulant or chemical released. Plants and animals in any given area would typically not be exposed to multiple releases and therefore, better able to recover from any adverse impacts. The release of some chemicals could adversely affect individuals of non-protected animal or plant species or temporarily degrade habitat in the immediate area of the release, however, human activity in the area around the release site would cause larger species to flee the area and smaller species to seek shelter. The release of *B. thuriengensis* could result in mortality for a small number of insects, such as flies or moths in the immediate proximity of the release. No release would be conducted that would adversely affect the population of a species commonly found in the area or adversely affect an individual of a federal- or state-protected species.

Socioeconomics

At most, two additional employees could be required. No impacts to the local economy, regional employment, housing or community services would occur.

Transportation

Biological materials and chemicals used at NTS would be received from offsite sources. Most of these shipments would be of very small quantities. All of these shipments of biological simulants and chemicals, both to and from the NTS would be conducted in accordance with applicable U.S. Department of Transportation regulations.

Human Health and Safety

The health and safety of NTS workers is protected by adherence to the requirements of federal and state law, DOE orders, and the plans and procedures of each organization performing work on the NTS. In addition, workers are protected from the specific hazards associated with their jobs by training, monitoring, personal protective equipment, and administrative controls. Contact with chemical or biological test materials could occur primarily during test preparation, post-test evaluation, and site clean-up. Personal protective equipment would be used in accordance with test plan guidance and Material Safety Data Sheet recommendations. Potential worker exposure levels would be restricted by the appropriate regulatory limits (e.g., OSHA, NIOSH, etc.).

During releases, administrative and access controls, and area monitoring would prevent exposures to involved and non-involved workers and the general public. No impacts to NTS involved or uninvolved workers or the public from injury or illness would be expected.

Waste Generation

The releases would generate primarily sanitary solid waste that would be disposed of in the NTS Area 23 landfill. This landfill has excess capacity; therefore, disposal of the Proposed Action's sanitary solid waste would have minimal impact. Waste biological simulants would be managed as sanitary solid waste and disposed of in the NTS Class II landfill. If hazardous waste was generated it would be shipped offsite to a permitted commercial facility for treatment/disposal. Wastewater could result from decontamination activities and water-borne release tests. Decontamination could generate small amounts of wastewater that would be added to NTS's wastewater lagoon system. The impact from decontamination wastewater would be negligible. Instantaneous (explosive) releases would be designed so that all explosive material would be detonated, leaving no explosive waste material. However, in the event that explosive material remained once the release was completed, the explosive waste would be treated or disposed at a permitted commercial facility or at NTS's permitted explosive waste treatment facility. Remaining explosive waste could also be detonated as part of the release cleanup activities. No impacts to the waste disposal capabilities of NTS would be expected.

Environmental Effects of Alternative Actions

Two alternatives considered either the release of biological simulants or the release of low concentrations of chemicals, respectively. The potential effects from either alternative would be similar to those of the Proposed Action, but smaller. None of the consequences described for chemical releases would occur under the biological release alternative. None of the consequences described for biological simulant releases would occur under the chemical release alternative. There would be no release to waterways under the chemical release alternative. Under either of these alternatives the NTS/NSO national security mission would not be fully implemented.

NTS's baseline operations and management in support of its national security mission would not change under the No Action Alternative.

Biological releases would not occur. Chemical releases would continue to occur at the HSC under existing parameters. Military and first responder training and equipment development would not be fully realized.

CHAPTER 1.0 PURPOSE AND NEED FOR ACTION

This Draft Environmental Assessment (EA) documents an analysis of the potential effects of a proposal by the U.S. Department of Energy (DOE), National Nuclear Security Administration Nevada Site Office (NNSA/NSO), to conduct tests and experiments involving the release of low concentrations of chemicals and biological simulants at various locations within the Nevada Test Site (NTS). The analysis has been conducted in compliance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA as found in 40 Code of Federal Regulations (CFR) Parts 1500-1508 and DOE's NEPA implementing procedures published in 10 CFR 1021. The purpose of an EA is to provide the federal decision-makers with sufficient evidence and analysis to determine whether to prepare an Environmental Impact Statement (EIS) or issue a Finding of No Significant Impact (FONSI). Based on the analysis contained in this EA, NNSA will either issue a FONSI and proceed with the selected action or prepare an EIS.

1.1 Introduction

This Chapter provides the objectives of this EA, background information that will aid the reader in understanding the purpose and need for the Proposed Action, the Purpose and Need statement, the public involvement process to date, and concludes with a summation of the EA scope.

The objectives of the EA are to:

- Describe the purpose and need for NNSA action
- Describe the Proposed Action and reasonable alternatives that satisfy the purpose and need for NNSA action
- Describe baseline environmental conditions at NTS
- Analyze the potential direct, indirect, and cumulative effects to the existing environment from implementation of the Proposed Action or an alternative
- Compare the effects of the Proposed Action with those of the other alternatives, including the No Action Alternative

Additionally, the EA process provides environmental information that can be used to develop mitigation measures, if necessary, to avoid or minimize adverse effects on the quality of the human environment and natural ecosystems should NNSA decide to proceed with the release of low concentrations of chemicals and biological simulants. Monitoring requirements that would verify that impacts to the environment were minimal are also identified. Ultimately, the goal of NEPA is to provide adequate information to NNSA so its decisions are based on an understanding of environmental consequences and therefore include actions necessary to protect, restore, or enhance the environment.

1.2 Background

Location

The NTS occupies approximately 1,375 square miles (approximately 880,000 acres) in southern Nevada (Figure 1-1), making it one of the largest restricted-access areas in the United States. This remote site is surrounded on three sides by more than 3 million additional acres of land withdrawn from the public domain for a military gunnery range (Nevada Test and Training Range, formerly known as Nellis Air Force Range) and a protected wildlife range (Desert National Wildlife Range [DNWR]). The NTS is approximately 65 miles northwest of Las Vegas. Numerous offices, laboratories, and support

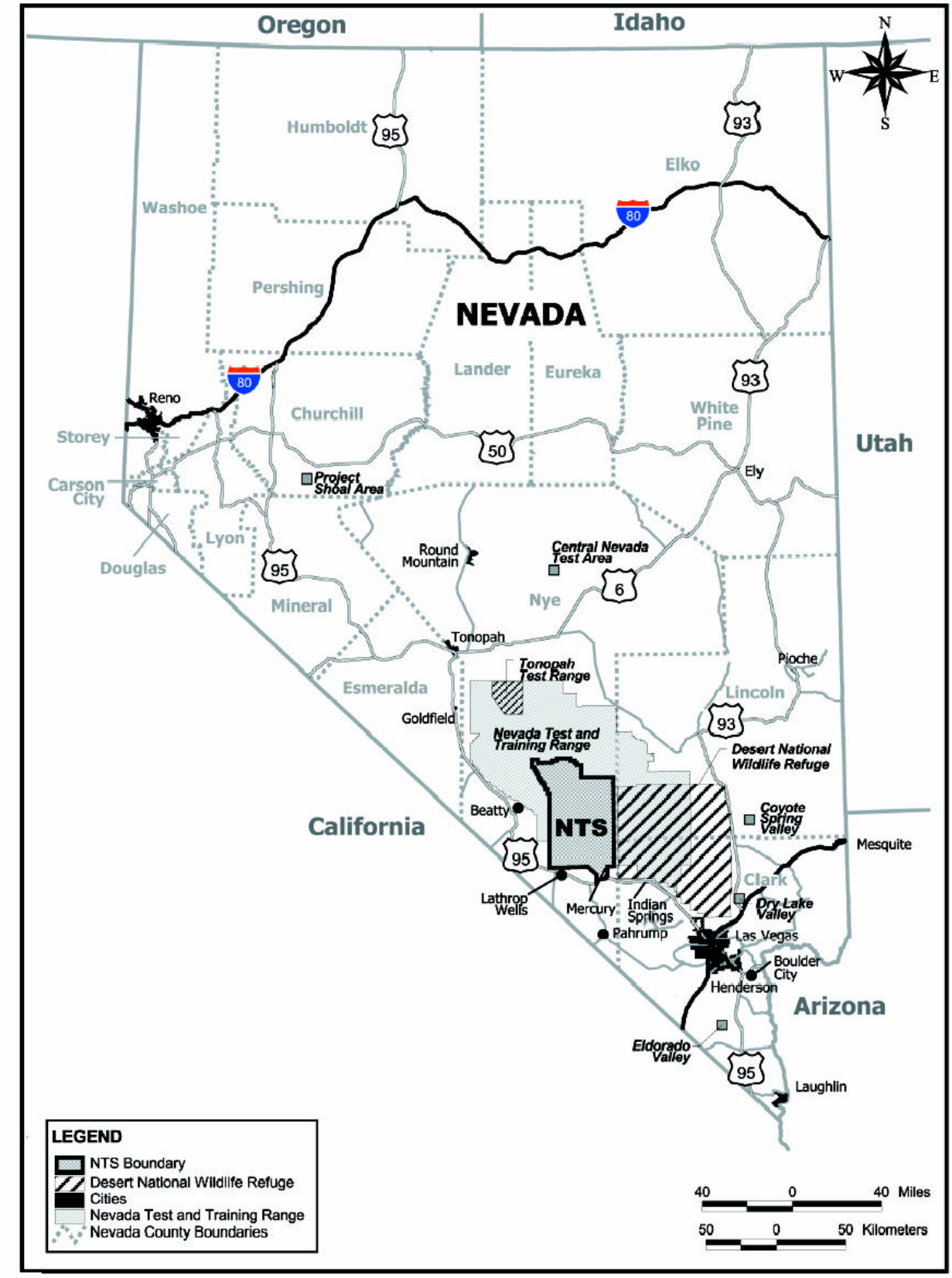

Figure 1-1. NTS Location

buildings are spread across the NTS. NTS areas and key facilities are shown on Figure 1-2.

Missions and Activities

NNSA enabling legislation describes the Congressionally-authorized responsibilities of the agency. These include [d]etecting the proliferation of weapons of mass destruction worldwide" (50 U.S.C. 2405). A part of the NNSA mission is to develop, demonstrate, and deliver technologies and systems to improve domestic defense capabilities and, ultimately, to save lives in the event of a chemical or biological attack. NNSA is responsible for national programs to detect proliferation of, and to reduce and counter threats from weapons of mass destruction (nuclear, biological, and chemical weapons [WMD]).

Currently activities supported by NNSA/NSO to combat terrorism fall into three major categories: (1) training and exercises, (2) testing and evaluation, and (3) applied technologies. These activities support programs within DOE and NNSA, as well as cost-reimbursable "Work for Others." Work for Others encompasses non-DOE and non-NNSA sponsored work performed in support of other federal agencies, state and local governments, universities, institutions, and commercial firms, that is compatible with NNSA mission work and that cannot reasonably be performed by the private sector.

Training and exercise activities develop responses to WMD environments and events and increase the operational readiness of military units. The NTS is a charter member of the National Domestic Preparedness Consortium, and is designated as the National Center for Exercise Excellence by the Department of Justice, Office for Domestic Preparedness (now under Department of Homeland Security [DHS]). As such, NNSA/NSO works with the DHS to implement the national WMD response-training program. Training and exercise services provide classes and field drills to identify, respond to, avoid, enter into, decontaminate, mitigate, collect samples, and advise on a WMD event. Hands-on drills/exercises occur in existing radioactive contaminated areas and areas simulating WMD contamination. This training is provided to federal, state and local agencies and emergency response organizations. Recently, other federal agencies that respond to, or need to be aware of WMD situations, such as the U.S. Customs Service, the Federal Bureau of Investigation, the National Guard Civil Support Teams, the U.S. Marine Corps Chemical and Biological Incident Response Force, and emergency medical teams, have been provided training and exercise services. Courses are developed and executed to fit specific agency requirements for training.

Testing and evaluation programs provide consistent and reliable independent services which support research, development, and laboratory and field-testing evaluations, of emerging and commercially available equipment and technologies. Testing and evaluation projects are conducted for DOE/NNSA, DoD, DHS, intelligence agencies, and other federal and state agencies, and private companies.

NNSA laboratories develop and apply technical solutions to national security and counter terrorism requirements. Specialties include nuclear materials science, surveillance and technology development, remote sensing science and technology, counterterrorism sciences and technology, data and communications technologies, and diagnostics systems development and operation. Types of testing and evaluation activities that can occur are:

- WMD Test and Evaluation: test and evaluate equipment, technology and integrated systems; provide logistical and operations support for tests and evaluations in laboratory and field conditions. Figure 1-2. NTS Areas and Key Facilities

- Defense Systems Testing, Evaluation and Training: Support DoD in the development, demonstration, and evaluation of procedures, equipment, technologies and weapons systems for demilitarization and unexploded ordnance support; contained burn/contained detonation experiments;

explosives experimentation; advanced weapons simulation and diagnostics; operational and live-fire tests; evaluation and effects assessments; hardened and deeply buried target detection and defeat; instrumented targets and ordnance platforms; and battle damage assessments.

- Hazardous Materials Spills, Testing, and Training: use controlled releases of hazardous chemicals for the purpose of equipment, technology and hazardous materials research, development, testing, and training.

- Hard/Buried/Critical Target Detection, Defeat, and Defeat Assessment: research, test and evaluate methods, equipment, technologies and weapons systems to detect, defeat, and neutralize hard/buried/critical targets.

- Intelligence and Counter Terrorism Technologies Testing: develop sensors and detection systems, pre-field operational testing; develop and confirm techniques, tactics and procedures; explosives diagnostics and render safe methods; develop investigative forensics technology; and provide proof-of-concept demonstrations for security and monitoring systems.

- Environmental Clean-up and Prediction Technology: develop air dispersion models, test decontamination technologies, evaluate material degradation/persistence in the environment, etc.

NTS EIS

As the federal agency charged with operating and managing the NTS, DOE published the Final EIS for the Nevada Test Site and Off-Site Locations in the State of Nevada (DOE 1996a). The Record of Decision (ROD) for the NTS EIS stated: "The DOE Nevada Operations Office Work for Others Program will continue to be an important aspect of Nevada Test Site related activities. These ongoing activities primarily involve the Department of Defense, the Defense Special Weapons Agency (now Defense Threat Reduction Agency [DTRA]), and other federal agencies. The primary focus of these activities is treaty verification, nonproliferation, counter-proliferation, demilitarization, and defense related research and development." The ROD also states: "Other defense related research and development activities include tests and training exercises employing weaponry, such as small arms, artillery, guns, aircraft, armored vehicles, demolitions, rockets, bazookas, and air-dropped armaments, as well as a variety of electronic imagery and sensory technologies, including, but not limited to, infrared lasers and radar. It is expected that these types of experiments and tests would take place in appropriately zoned areas of the Nevada Test Site and would be compatible with surrounding land use" (DOE 1996b**)**.

In accordance with DOE NEPA Implementing Procedures (10 CFR 1021), NNSA/NSO conducted a 5-year review of the NTS EIS. That review was documented in *Supplement Analysis for the Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada* (DOE 2002a). Based on that analysis, NNSA determined that the NTS EIS continues to adequately address the environmental impacts of activities being conducted and anticipated at the NTS.

Previous NTS Release EAs

One of the NTS missions is to provide the capability to conduct chemical release tests to assess risks from accidental releases of hazardous materials, provide data on sensor development and provide first responder training (DOE 2002b). Since 1981 chemical releases have been conducted at the HAZMAT Spill Center (HSC) in Area 5 of the NTS (Figure 1-2). Six EAs and associated FONSIs have been prepared for activities conducted at the HSC. Proposed actions analyzed in the six EAs included the following:

- Construction and operation of a temporary small-scale test facility

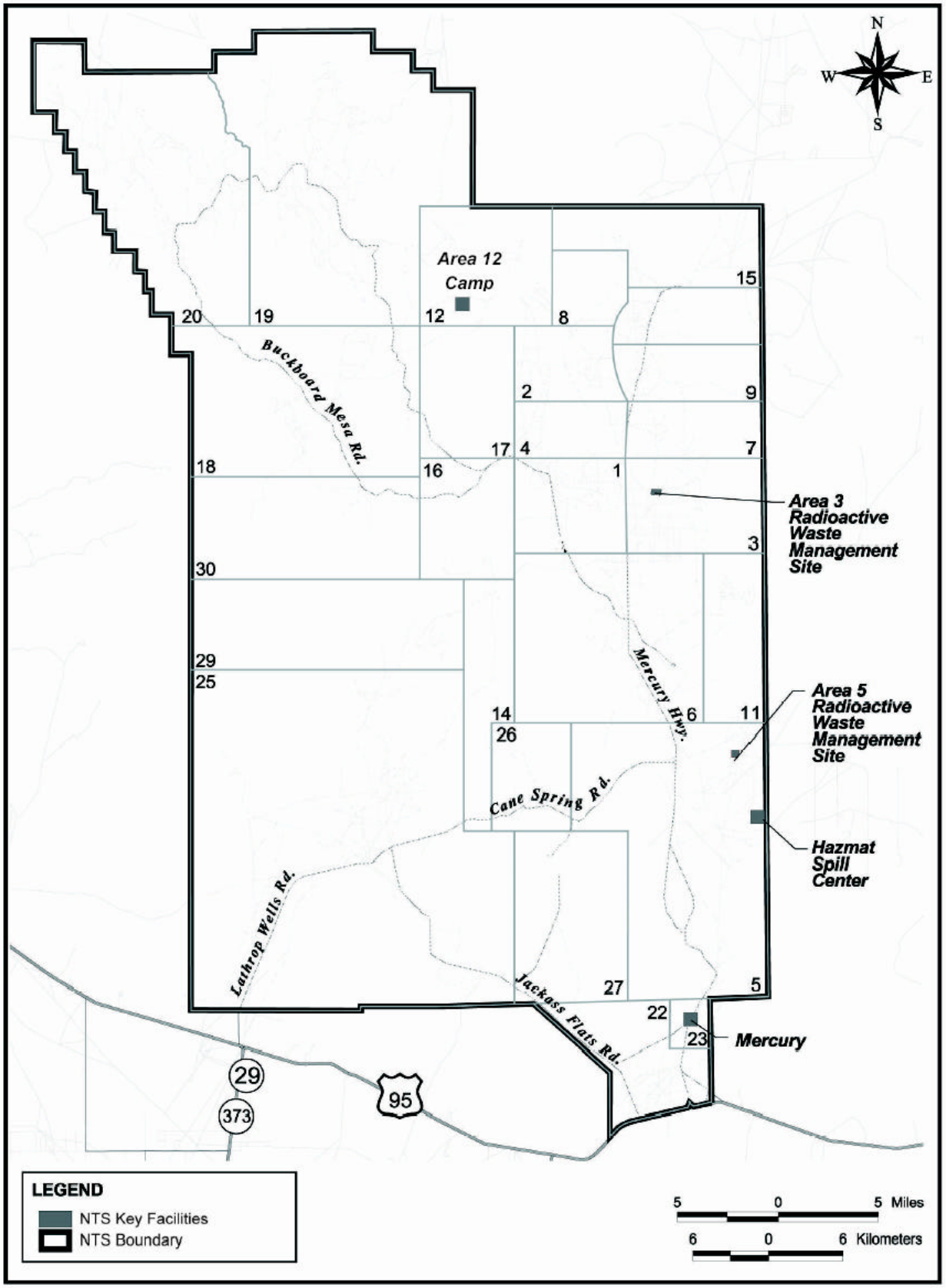

Figure 1-2. NTS Areas and Some Key Facilities

- Identification of chemicals to be released
- Establishment of geographic concentration zones and release durations
- Establishment of general limits for environmental exposures from planned hazardous and toxic materiel releases

The analysis in each EA supported a FONSI determination.

The September 2002 EA for the HSC referenced use of a bacteria (*Bacillus thuringiensis*) that would be used in streambed transport and effluent studies within a man-made waterway, Cambric Ditch (DOE 2002b).

1.3 Purpose and Need

The NTS has been the site of much work relating to national security and combating terrorism as addressed in the NTS EIS (DOE 1996a) and its ROD. Training and exercises, including military operational readiness and response to WMD events and testing, evaluation and development of technology have been conducted at the NTS under the auspices of the ROD. The United States requires the capability at all levels of government to respond decisively and in a coordinated manner to the threat of terrorism and its consequences. The NTS is a large, restricted access, and remote location, ideal for classified operations and exercises; has a long history of safely conducting high-hazard work of all kinds; has realistic environments and test beds for training, exercises, and experimentation; has applied technology laboratories that develop counter-terrorism technologies for the field; and has strong relationships with key agencies involved in combating terrorism.

Following the terrorist attacks of September 11, 2001 there was a recognized need by DOE, NNSA, and many other federal agencies and the military for increased levels of operational testing, contamination and decontamination testing, forensics testing, PPE testing, enclosed environment detection and decontamination training, and counter-terrorism training as they relate to biological and chemical agents. A critical step in development of detection instrumentation, decontamination techniques, and operational methods is to conduct tests, experiments, and training in scenarios as close-to-real as possible. The NTS provides a remote and secure setting, facilities, infrastructure, terrain, and other features that accurately simulate the kinds of environments that could be encountered in the "real world."

As part of its role in national security, and in support of national counterterrorism and counterproliferation goals, NNSA/NSO proposes to provide facilities, infrastructure and support at the NTS for tests, experiments, and training that require releases of biological simulants and low concentrations of chemicals.

1.4 Public Involvement

Public involvement in the NEPA process is critical for informing the public about proposed actions, and ensuring any public concerns are given adequate consideration and analysis. Public involvement activities are conducted pursuant to NEPA, as amended (42 U.S.C. 4321 et seq.) in accordance with the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), DOE NEPA Implementing Procedures (10 CFR 1021) and guidance in *Effective Public Participation Under the National Environmental Policy Act* (DOE 1998). Public participation for this EA includes scoping activities, and public review and expressed comment on the draft EA.

Scoping Process

NNSA provided the public a notice of intent (NOI) to prepare an EA and hold public scoping meetings. NNSA issued the NOI to prepare the EA via a press release to numerous media providers in Nevada on October 1, 2003. Public notices also were posted in the Las Vegas Review Journal and the Pahrump Valley Times. The public scoping process ensures consideration of the full range of issues and alternatives that should be evaluated in the NEPA analysis and helps identify the potential for significant environmental impacts. To this

end, the NNSA/NSO invited interested parties, the public, and government agencies to comment on the proposed action and those issues and alternatives which should be considered. The formal scoping period ran from October 1, 2003, through October 31, 2003.

Public scoping meetings were held on October 15, 2003 in Las Vegas, Nevada, and on October 16, 2003, in Pahrump, Nevada. Comments were submitted by letter or on scoping meeting comment response forms by the public and government agencies. Every comment received was given equal weight in the scoping process. In addition to public scoping, the NNSA/NSO coordinated with various federal, state, and local agencies. These consultations are summarized in Section 5.1 of this EA.

Twenty-five members of the public attended the Las Vegas scoping meeting and seven attended at Pahrump. Fifteen comments were received at the two scoping meetings. Ten written comments were submitted to the NNSA/NSO. Overall, the comments from the public were favorable concerning the proposed action. One commentor expressed concern about potential environmental consequences that could occur as a result of the proposed action, including a concern that the increased activities could result in migration of radioactive contamination from the site, a concern for elderly persons and those with chronic diseases who might be exposed should accidental releases occur, and consideration that the population has been shifting to northwest Las Vegas (closer to the NTS). Other comments received during the scoping meeting supported the proposed action, lamented the lack of publicity, expressed concern that DOE would do what it wanted regardless of public input, and a general interest in the NEPA process.

Public Review and Comment on the Preapproval Draft EA

The preapproval draft EA has been released to the public for a 30-day review and comment period. Comments received on the draft EA will be reviewed and the final EA will be modified, as needed, to address public and agency comments. A summary of the comments received will be incorporated into the final EA.

Organization of This EA

The EA is presented in six chapters. This Chapter provided background information and describes the purpose and need. Chapter 2 discusses each of the alternatives. Chapter 3 describes the affected environment and the environmental consequences of each action alternative. Chapter 4 describes mitigation measures and monitoring requirements. Chapter 5 addresses statutes, regulations and other requirements applicable to the proposed action and the action alternatives. Chapter 6 lists the references cited in the EA. Appendix A includes the consultation letters received by NNSA from state and federal agencies, and Appendix B describes the federal and state statutes, regulations and restrictions that would apply to the proposed action or the action alternatives.

CHAPTER 2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action and the alternatives to the Proposed Action. The NNSA's Proposed Action is the release of biological simulants and low concentrations of chemicals at various NTS locations (Section 2.1). Alternative 2 is the release of biological simulants at various NTS locations (Section 2.2) and Alternative 3 is the release of chemicals in low concentrations at various NTS locations (Section 2.3). Alternatives 2 and 3 would only partially meet the NNSA purpose and need. The No Action Alternative (Section 2.4) would continue NTS operations as they are currently. It would not meet NNSA's purpose and need.

It is important to note that NNSA/NSO has conducted chemical releases at the HSC since 1981. The Proposed Action and one of the action alternatives described in this EA would modify some of the chemical release parameters at the HSC as they apply to low concentration releases. The HSC will continue to operate under its existing EA for larger chemical releases that cannot meet the criteria for low concentration releases as defined in this EA.

Information in this chapter, when combined with analyses provided in Chapter 3.0, Affected Environment and Environmental Consequences, meets the EA goal of informing decision-makers and the public about NTS operations and potential impacts associated with the proposed release of biological simulants and chemicals.

The Proposed Action and Alternatives would not expose uninvolved personnel to biological simulants or chemicals during normal operations. Only project personnel with appropriate training and PPE would handle biological simulants or chemicals or be allowed at the release site. The release of biological simulants would not include bioengineered organisms. All proposed releases would be conducted in accordance with the International Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological and Toxic Weapons and Their Destruction.

NTS's large size, remote location, and extensive infrastructure offer a practical test, technology development, and training site. NNSA/NSO is proposing to expand existing services to current and new customers and is increasingly serving the needs of non-DOE customers. Customers include all military branches of the U.S. Department of Defense (DoD), National Aeronautics and Space Administration, U.S. Department of Justice, state and local first responders, private entities, and academia requiring test, technology development and training services. Both DOE and non-DOE customers are requesting NNSA/NSO support for tests and training events related to new military and terrorist threats, and first responder training. The Proposed Action would enable NNSA/NSO to effectively respond to the requirements of their current and diversifying mission.

Many of the proposed events would be classified in the interests of national security. Training or testing events typically would be classified because of the equipment or procedure being used or tested and not because of the biological simulants or chemicals proposed for use.

2.1 Proposed Action - Release of Biological Simulants and Low Concentrations of Chemicals at Various NTS Locations

NNSA/NSO proposes two categories of releases – biological simulants and chemicals. Based on scientific information regarding potential effects to human and ecological receptors, NNSA/NSO has determined that six microorganisms used as simulants for biological agents would provide adequate source material for its customers and are proposing them for use. It is important to understand that these organisms are considered non-infectious in healthy humans. NNSA/NSO does not know which specific chemicals could

be required for testing or training. Therefore, rather than compile an exhaustive list of possible chemicals that could be released, NNSA has developed detailed criteria for chemical release events that would be protective of the environment, workers and the public.

Both biological simulants and chemicals could be released at a variety of locations and structures within NTS. Releases would take advantage of existing facilities and infrastructure, and NTS terrain to simulate a particular geography or area of interest. Locations such as Areas 5, 12, 16, and 25 are of particular value (Figure 1-2). Structures, such as Test Cell C in Area 25, could be used to simulate emissions characteristic of a chemical factory. Existing tunnels could be used as mock subway facilities or to simulate a covert chemical or biological weapons production factory. The NTS also has a variety of terrains typical of arid lands in many parts of the world. Conducting releases in the various terrains would provide data on how to best search for and identify releases in similar locations elsewhere.

The Proposed Action would result in the modification of the release parameters under which the HSC currently operates as specified in the 2002 EA (DOE 2002b). Chemical releases would still be required to stay within the HSC's authorized release boundaries (Figure 2-1) and meet the standards for human occupational exposures to hazardous materials. However, chemical releases would not be required to meet the existing HSC predominant wind direction criteria if the test documentation demonstrates that release concentrations do not exceed the PEL, REL, or TLV values at the HSC's authorized release boundaries. In addition to chemicals the HSC could also be used as a release site for biological simulants.

NNSA anticipates approximately 5 to 20 events per year of the type addressed in this EA. NNSA/NSO would ensure that tests, experiments, and training conducted as part of the proposed action would use low concentrations of chemicals. The chemicals used may simulate a chemical weapon or may be an expected emission/effluent from a chemical weapons production facility or other process or facility type of interest. In no case would a chemical prohibited by the Chemical Weapons Convention be used. Biological simulants as defined in this EA would be used to mimic the behavior but not the effect of higher risk biological agents that might be used in a weaponized form by terrorists or other potential adversaries.

2.1.1 Support Activities

Biological simulant and chemical releases would support the following types of activities:

- Contamination and Decontamination Testing – Test decontaminants, decontamination equipment, tactics, techniques, and procedures for their effectiveness, or to determine the ability of equipment to withstand repeated biological/chemical contamination and decontamination.

- Forensics Testing – Testing would support analysis of potential biological and chemical threats identified by military or first responders.

- Operational Testing - Field-testing the performance and reliability of biological and chemical detection, identification, and early warning defense equipment. Testing would be designed to study the effects of weather conditions on droplet size, dispersion patterns, equipment operation, decontamination procedures, or material penetration into equipment.

- Personal Protective Equipment (PPE) Testing – Testing would determine the effectiveness of PPE under different conditions.

- Counter-Terrorism Training – Testing newly developed biological or chemical defense detection and protection equipment for use by the military or first responders for potential terrorist incidents. Training would include:

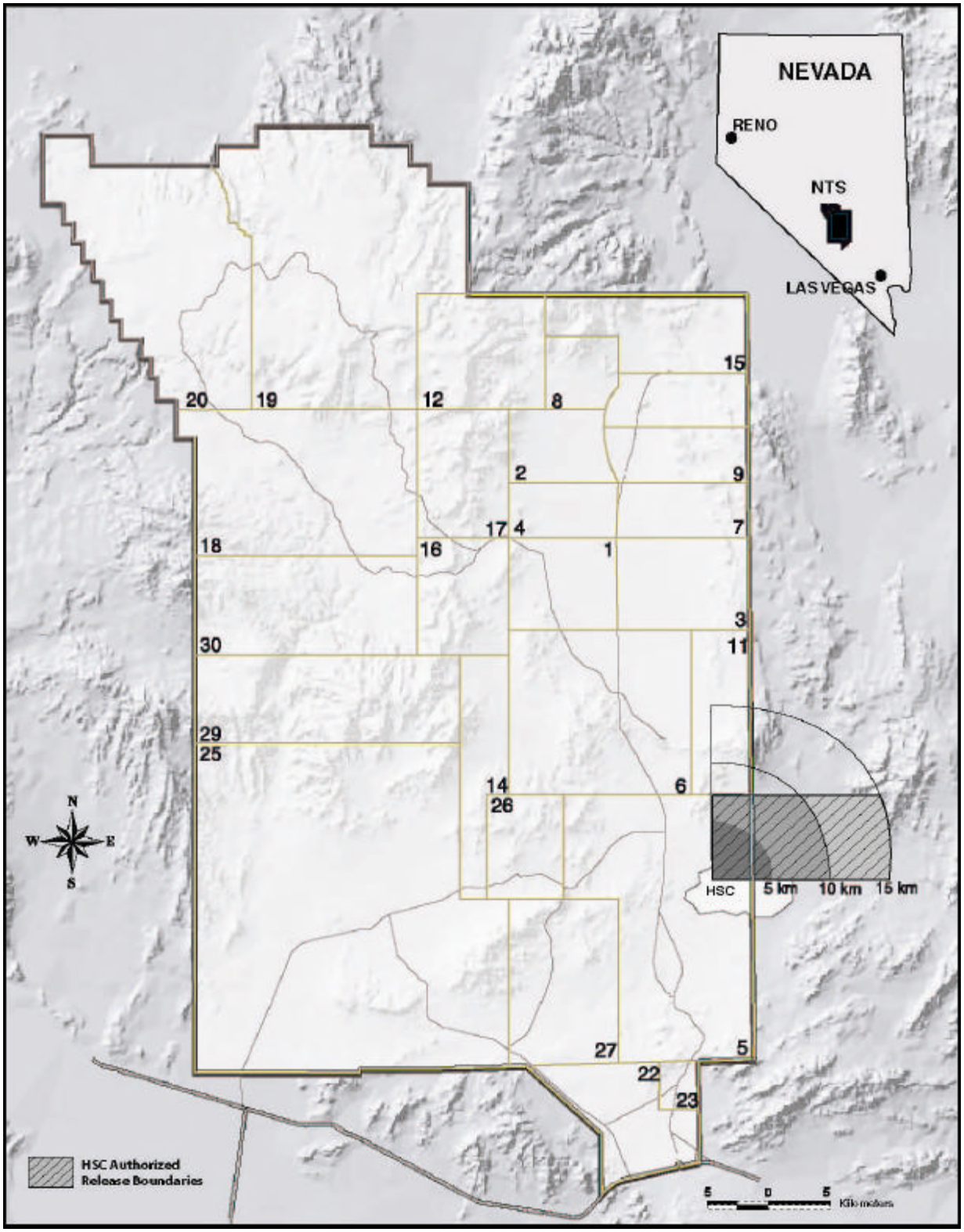

Figure 2-1. HSC Authorized Release Boundaries for Modified Wind Direction Parameter, in Relation to Existing HSC Geographic Impact Zones

- techniques, tactics, procedures and operational issues.

- Enclosed Environment Detection and Decontamination Training – Training the military or first responders in biological/ chemical detection and decontamination techniques and procedures within facilities.

- Environmental Clean-up and Prediction Technology: develop air dispersion models, test decontamination technologies, evaluate material degradation/persistence in the environment, etc.

2.1.2 Release Scenarios

Potential release scenarios and examples of a condition a release test could simulate would be:

- Stack Release – Portable plume generators would release the material of interest out of a facility stack. This scenario would mimic a clandestine biological or chemical laboratory.

- Building/Tunnel Release – The material of interest would be released inside a building or tunnel. The release would simulate a contaminated facility or subway.

- Open Pan/Ground Spill Release – Releases would occur from ground level in an open environment to simulate a deliberate release of biological or chemical material in open-air conditions or a spill event.

- Water-Borne Release – Releases would be directly into a man-made water body. Only biological simulants would be released to imitate waste products from a clandestine laboratory or deliberate contamination of a waterway. Chemicals would not be released into a water body.

- Instantaneous Release – The entire inventory of material would be released in an explosive event. An instantaneous release would simulate a terrorist action or an accident.

- Ground Transportation Release – Release would occur from a moving vehicle, simulating a deliberate release or a transportation accident.

- Aircraft Releases – Releases would occur from an aircraft to simulate a real release from an aircraft.

2.1.3 Test Series

A test series is defined as a unique effort undertaken to achieve customer objectives with defined start and end points. A release is a discrete activity within a test series that may involve dispersal of biological simulants or chemicals into the environment via one of the release scenarios described in Section 2.1.2. The purpose of a test series would be to successfully conduct one or more releases in order to achieve customer objectives. A release could be a one-time single-point event or multiple releases from a single or multiple points. Training and exercises, while not precisely a test or experiment would be considered "test series" for the purposes of this EA. The release(s) would not exceed pre-determined maximum concentration(s) within defined concentration zones radiating outward from the release point and within a defined time period. Multiple releases or release sites for the same biological simulants or chemical for the same purpose within a defined temporal period and conducted by the same customer would be considered a single test series. However, the customer would be required to model each release location separately and cumulatively with the other release point(s) concentrations/quantities. Potential human health and safety and ecological impacts would be evaluated from each single release point and collectively from all release points. Should other test series occur within the same temporal period with geographic overlap, each customer would evaluate the effects of all test series collectively. Acceptable meteorological conditions would be determined by modeling

prior to each release unless worst-case modeling had already identified acceptable conditions for a test series.

2.1.4 Test Process Planning and Management

To ensure each test series would be properly planned and managed by the customer, and that potential environmental impacts were considered, customer test process planning and management would be evaluated by NNSA. Test and training plans would be developed with consideration of environmental impacts. These considerations would include impacts from setup activities, test activities, chemical or biological release choices, cleanup activities, or other test or training related activities that could potentially adversely impact the environment. A test series generally includes:

- Planning
- Preparation, including environmental review
- Testing
- Test closure and reporting

Planning

Before any test could begin, NNSA would require a Test Plan from the customer. This document would provide information and data regarding test planning and preparation. The planning phase for the NNSA would begin when NNSA staff received the Test Plan from the customer, which would identify the test parameters. The Test Plan would include, but not be limited to:

- Test objectives
- Test design
- Biological simulant(s) or chemical(s) to be used
- Proposed location(s) of the test
- Safety and environmental documentation
- Release modeling

The role of the existing NNSA Safety Review Panel (Panel) that reviews all test events at the HSC would be expanded to also evaluate proposals for the releases considered in this EA. The current Panel would be augmented with appropriate expertise such as bacteriologists, virologists, ecologists, and modelers. Prior to any release the customer would be required to submit the Test Plan to the Panel for review. Only after review and approval of the Test Plan by the Panel would the customer be allowed to conduct a release. The Panel would have the authority to deny, approve, or recommend modification to the customer based on human health, safety, and environmental protection considerations. The Panel has as part of its' formal charter a defined process and criteria for release approval.

The charter also considers the potential use of biological materials not specifically addressed in this EA. If the proposed biological material met the release criteria specified in this EA, then the release could be covered by a categorical exclusion. If the analysis in this EA was determined to be inadequate for the proposed biological material then either an EA or an EIS would be prepared. No release of biological materials would occur prior to issuance of either a FONSI or ROD for materials that do not meet the release criteria presented in this EA.

The NTS test planning process requires the development, review, and approval of a test plan for each proposed test to ensure that the potential human health and environmental impacts are identified. The final test plan would include guidelines and procedures that must be followed during the test to protect worker safety and safeguard the public and the environment. After environmental review, if it is determined that adverse impacts to the environment could occur, the test procedure or materials used must be altered or an appropriate mitigation strategy developed, or the approval of the release would be denied.

Modeling done in support of the releases would be an important component of the Test Plan approval process and would provide NNSA assurance that the release would meet the test criteria. The models used to determine biological simulant or chemical concentration and dispersion would be selected by the customer. The customer would be responsible for modeling the meteorological conditions at the time of release to ensure compliance with all release criteria. Model results would be designed to be conservative and would not be predictive. Thus, the model would overestimate the concentration and distribution of the release material, ensuring protection of human health and the environment and that the release criteria defined in Section 2.1.5 would be met. The modeling data provided by the customer would undergo an independent review if deemed necessary by NNSA/NSO. In some cases additional modeling by an independent source could be conducted. For example, independent modeling of specified chemical releases from the HSC is currently performed at the University of Arkansas.

Preparation

The preparation phase would include activities such as:

- Pre-operational data review
- Completion of safety and environmental requirements
- Pre-release safety survey
- Transport and installation of test support equipment at the test site(s)
- Operational readiness inspection
- Test readiness review
- Notification and coordination with applicable federal and state agencies, if required

Approval of the test plan and successful completion of the operational readiness inspection and the test readiness review by NNSA would indicate successful completion of the preparation phase of the test process.

Testing

Testing would be the actual release event and follow-up analysis. The testing phase of the process would be complete when the test objectives, as defined in the Test Plan, were achieved or the test terminated.

Test Closure and Reporting

The test closure and reporting phase of the test process would begin when the test was completed. During this phase the test series sponsor would be responsible for such things as equipment decontamination and removal, removal of excess chemicals/biological sample materials, site monitoring and restoration, waste disposal in compliance with federal and state regulations, and submittal of all required data, as identified in the Test Plan, to the NNSA.

2.1.5 Release Criteria

NNSA would establish the release criteria for any test series. No release would be permitted that would jeopardize human health and safety or result in a significant impact to the environment without approved mitigation. Prior to a release, the proposed release site would be evaluated to ensure no species of special interest or sensitive ecological parameters would be adversely affected by the release, and documentation would be prepared to support the evaluation. A post-release monitoring requirement would be developed to specifically evaluate the potential long-term effects from a release. A release would not be approved if there was a reasonable potential for long-term persistence in the environment unless the customer submitted plans to remediate the release site after the test series was completed.

2.1.5.1 Biological Release Criteria

An understanding of the terms “biological agent” and “biological simulant” is essential to

understand the proposed biological release criteria.

The term biological agent is used in the EA to mean a pathogenic microorganism or any naturally-occurring, genetically-manipulated, or synthesized component of biological origin that is capable of causing:

- Death, disease, or other biological malfunction in humans, animals, or plants

- Deterioration of food, water, equipment, or supplies

The term biological simulant is used in the EA to mean a biologically-derived substance or microorganism that shares at least one physical or biological characteristic of the biological agent it is simulating, that has been shown to be non-pathogenic, and that can replace the biological agent in testing. Biological simulants are intended to mimic the behavior of potentially more lethal or severely debilitating biological agents that may be used in warfare or by terrorist organizations. For example, *Bacillus thuringiensis* is a naturally-occurring soil bacterium that is used commercially as a microbial insecticide. *B. thuringiensis* is an excellent simulant for the bacterium that causes anthrax.

Six species have been selected as appropriate simulants for biological agents (see Table 2-1). These organisms are not typically classified as human pathogens and were selected based on their documented lack of toxicity to healthy humans. However, very little information is available on acceptable concentrations of these biological simulants in an occupational setting. Occupational exposure limit data could be found only for *Bacillus subtilis* var. *niger*, which identifies an American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV)-Ceiling(s) limit of 0.00006 mg/m^3 (NIOSH 2000). However this concentration is considered too restrictive for the proposed action evaluated in this EA and poses difficulties in sampling and evaluation. The Occupational Safety and Health Administration (OSHA) provides guidance for "particulates not otherwise regulated" in 29 CFR §1910.1000, Air Contaminants. This regulation lists an 8-hour time weighted average (TWA) of 15 mg/m^3 for total dust and 5 mg/m^3 for respirable dust. No ceiling or short-term exposure limits are provided. In the absence of more definitive organism-specific data, the 5 mg/m^3 limit would be the controlling limit for concentrations at the outer perimeter of the release site for the release of biological simulants (see Section 2.1.5.2 Chemical Release Criteria for definitions of release site perimeters and threshold criteria). Allowable concentrations for the other proposed biological simulants would be reviewed and approved by NNSA/NSO and the Safety Panel (through the use of appropriate experts). This would allow the limits to be adjusted as new data became available and could either lower or raise the allowable concentrations at the compliance boundary. The National Institute of Occupational Safety and Health (NIOSH) *Pocket Guide to Chemical Hazards (*DHHS 1997) discusses immediately dangerous to life or health (IDLH) values relative to the *NIOSH Respirator Decision Logic* (DHHS 1987). For respirator selection criteria, IDLH values are equivalent to concentrations 2000 times the OSHA permissible exposure limit (PEL) or NIOSH recommended exposure limit (REL). Applying the same criteria to biological simulants as to chemical releases, yields concentrations of biological simulants in the exclusion area that could approach 10^4 mg/m^3 or 2000 times the OSHA TWA, as long as the concentration diminishes to the 5 mg/m^3 level at the outer perimeter. Releases would be in low concentrations in isolated areas where non-involved workers and the public would not be allowed. Sufficient time would be allowed between test series conducted in the same area to permit the recovery of natural resources.

Biological simulants released within the HSC's authorized release area, illustrated in Figure 2-1, would be required to meet applicable requirements for human health and safety. At the boundary of the authorized release area, concentration of biological simulants released at the HSC would not exceed 5 mg/m^3.

Table 2-1. Biological Simulants

***Bacillus subtilis* var. *niger* (formerly *Bacillus globigii*)**

B. subtilis is a common cylindrical spore-forming soil microorganism that is not classified as pathogenic and contributes to nutrient cycling. *B. subtilis* var. *niger* has historically been used as a biological tracer, designed to test susceptibility to chemical or biological warfare agents. *B. subtilis* is noninfectious and characterized as a National Institute of Health/U. S. Centers for Disease Control and Prevention BioSafety Level 1 (on a scale of 1 to 4) bacterium. *B. subtilis* var. *niger* is regulated under the Toxic Substances Control Act (TSCA) for the purposes of application as a pesticide.

Bacillus thuringiensis

B. thuringiensis is a naturally occurring soil bacterium, several varieties of which are used as microbial insecticides. *B. thuringiensis* is considered ideal for pest management because of its specificity to pests and because of its lack of toxicity to humans or the natural enemies of many crop pests (EXTOXNET 1996). *B. thuringiensis* is considered a General Use Pesticide, classified as EPA toxicity class III – slightly toxic (on a scale of IV to I, I being the highest toxicity class). Particular strains of *B. thuringiensis* can be used to control particular insects, including mosquitoes, moths, butterflies, beetles, blackflies, midges, and boll weevil. Approximately 150 insects are known to be susceptible to *B. thuringiensis. B. thuringiensis* is regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for the purposes of application as a pesticide. *B. thuringiensis* is considered to be non-toxic to humans and animals, other than some species of insects (EXTOXNET 1996).

Clostridium sporogenes

Clostridium is a genus of anaerobic (anaerobic organisms grow in the absence of oxygen; in fact, oxygen may even kill them) spore-forming bacteria in the family Bacillaceae. In the American Society for Microbiology's Manual of Clinical Microbiology 8th ed., *C. sporogenes* is listed as the third most frequent *Clostridium* species found in soil, and as normal flora in the lower intestinal tract of humans. It is found worldwide, particularly in areas where contaminated soil is likely. The mode of introduction for this bacterium is through a wound. Hosts for this bacterium include humans and animals with reservoirs including intestines, soils, and animal feces.

***Erwinia herbicola*, (also known as *Pantoea glomerans*)**

E. herbicola is a vegetative, non-spore stage of phytopathogenic bacteria highly effective as a biological control agent against *E. amylovora*, the cause of fire blight on apple and pear trees. *E. herbicola* is considered a fungicide where it acts to colonize and consume the same resources as plant pathogens. It is considered a normal flora in a bacterial system, often living in the guts of organisms (similar to *Escherichia coli* [*E. coli*]). *E. herbicola* is regulated under FIFRA for the purposes of application as a fungicide and is considered harmless to humans within the normal context as a vegetative stage of bacteria.

Bacteriophage MS2

A bacteriophage is a bacterial virus. It belongs to a class of virus that infects only bacteria. MS2 is host-specific and capable of infecting only F+ or "male" *E. coli* bacteria. It is part of a group of small RNA phages, which are used to study viral attachments to host cells, genetic control and virus assembly. Bacteriophage MS2 has been used as an aerosol viral simulant for assessing viral protection in the development of battlefield evacuation systems. As a surrogate human virus, Bacteriophage MS2 only targets bacteria and would not be expected to affect human health.

Noninfectious (killed) Influenza A Virus

Noninfectious (killed) Influenza A Virus is used to track/trace what occurs when infectious influenza viral agents are released. There are no adverse human health effects.

Biological simulants that have been treated to remove their surface charge, referred to in this EA as suspended aerosols, would be considered for use in any of the release scenarios. When the charge is removed from biological organisms, releases can result in longer suspension times in the atmosphere. Therefore these biological simulants could disperse beyond the NTS boundaries, especially during an aircraft release. Release customers and NNSA have not identified a model to address aircraft releases nor do they have a model that addresses suspended aerosols. NNSA/NSO occasionally uses the National Atmospheric Release Advisory Center (NARAC) to support their modeling activities. NARAC studies incidents involving a wide variety of hazards, including nuclear, radiological, chemical, and biological. Customers or NNSA could request NARAC support for biological modeling. If necessary, NNSA/NSO could assume a worst-case approach and model an aircraft release using a point source model close to the ground which would probably overestimate air concentrations available to humans or animals. The potential dispersion of suspended aerosols is even more difficult to model. However given the low concentrations that would be released, the biological simulants would not be expected to be distinguishable from background concentrations outside of the NTS boundaries. In the absence of a suitable model, bio-aerosols would be treated as gases with no settling. This would result in a conservative estimate of airborne concentrations at a distance.

Biological releases would be evaluated and approved or disapproved based on whether the release meets the general release criteria stated above.

2.1.5.2 Chemical Release Criteria

Chemical releases could include simulants or the actual chemical of interest. A chemical release would have to meet the chemical release criteria stated below.

Occupational exposure to chemicals is addressed in 29 CFR §1919.100, General Industry Air Contaminant Standard. The requirements identified in this standard represent legal limits that may not be exceeded under any conditions. In addition to the OSHA requirements, additional information related to occupational chemical exposures is contained in the NIOSH *Pocket Guide to Chemical Hazards* (DHHS 1997) and the ACGIH Guide to Occupational Exposure Values (ACGIH). These two documents are in general agreement with OSHA requirements, although differences do exist.

The ACGIH is an organization of industrial hygiene and occupational health and safety professionals. The ACGIH developed, as guidelines, TLVs and Biological Exposure Indices to assist in the control of health hazards. They were not developed for use as legal standards and ACGIH® does not advocate their use as such. However, it is recognized that in certain circumstances individuals or organizations may wish to make use of these recommendations or guidelines as a supplement to their occupational safety and health program.

Limits for chemical exposures drawn from each of the three sources are presented using slightly different terminology. The following is a brief description of these terminologies.

OSHA

The OSHA PELs are TWA concentrations that must not be exceeded during any 8-hour work shift for a 40-hour workweek. A TWA is an individual's average airborne exposure in any 8-hour work shift of a 40-hour workweek, and shall not be exceeded. A STEL represents a 15-minute TWA exposure and cannot be exceeded at any time during the workday. OSHA ceiling concentrations must not be exceeded during any part of the workday; if instantaneous monitoring is not feasible, the ceiling must be assessed as a 15-minute TWA exposure. In addition, there are a number of substances that have PEL ceiling values that must not be exceeded, except for a maximum peak over a specified period (e.g., a 5-minute maximum peak in any 2 hours).

OSHA defines IDLH concentrations as follows:

- "An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere" (29 CFR 1910.120).

NIOSH

The NIOSH RELs are TWA concentrations for up to a 10-hour workday during a 40-hour workweek. A STEL is a 15-minute TWA exposure that should not be exceeded at any time during the workday. A ceiling REL should not be exceeded at any time.

The current NIOSH definition for an IDLH is a situation "that poses a threat of exposure to airborne contaminants when that exposure is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." It is also stated that the purpose of establishing an IDLH is to "ensure that the worker can escape from a given contaminated environment in the event of failure of the respiratory protection equipment." Furthermore, NIOSH identifies parameters for defining an IDLH-type concentration in the absence of a defined value to include concentrations 2000 times the OSHA PEL or NIOSH REL.

ACGIH

ACGIH has developed TLVs that are in most cases analogous to PELs and RELs. A TLV is the concentration of chemical in the air that almost all healthy adult workers are predicted to be able to tolerate without adverse effects. There are three types:

- TLV-TWA is averaged over the normal 8-hour day/40-hour workweek.

- TLV-STELs are 15-minute exposures that should not be exceeded for even an instant. It is not a stand-alone value but is accompanied by the TLV-TWA. It indicates a higher exposure that can be tolerated for a short time without adverse effect as long as the total time weighted average is not exceeded.

- TLV-C limits are the concentrations that should not be exceeded during any part of the working exposure.

The ACGIH has not developed guidance on IDLH atmospheres.

Criteria

Chemical releases would be governed under the following criteria:

- The occupational chemical exposure values would draw on values available from OSHA, NIOSH, and ACGIH. Values for chemicals considered for testing would be obtained from each of the appropriate references and the most conservative values would be used. However, because the OSHA values are legal requirements, in no cases would a less restrictive recommendation be used in place of an OSHA limit. Recommended values that are more conservative than OSHA values could be used. If any questions exist concerning which values should be used, the OSHA values will be used by default.

- Chemical concentrations would not exceed IDLH concentrations beyond a radius of 100 meters (328 feet). This zone would be classified as an exclusion zone for all non-involved workers, personnel without appropriate PPE and training, or a need to be present.

- Chemical concentrations would not exceed STEL values beyond 300 meters (1,000 feet) from the release point. Non-involved workers would be excluded from this zone.

- Chemical concentrations would not exceed the more conservative of the PEL, REL, or TLV values beyond 500 meters (1,640 feet).

- Chemicals released within the HSC's authorized release boundaries (Figure 2-1) would be required to meet the standards for human occupational exposures to hazardous materials. However, chemical releases would not be required to meet the existing HSC predominant wind direction criteria if the test documentation can demonstrate that the release concentrations do not exceed the PEL, REL, or TLV values at the HSC's authorized release boundaries.

- No chemicals would be considered for release that have cumulative, long-term persistence in the environment, unless the customer can demonstrate that the materials would be completely contained, neutralized, or cleaned up.

- Sufficient time would be allowed between chemical releases test series conducted in the same area to permit the recovery of natural resources.

- For non-static release points (moving trucks or aircraft releases) the exclusion zone would be based on the total area subject to release and measured from any point along the travel corridor.

2.1.6 Emergency Management

NNSA/NSO has a comprehensive and integrated emergency management system to ensure an effective and efficient response to emergencies at NTS. The Consolidated Emergency Management Plan (DOE 2003a) specifies the implementing procedures for all elements of the emergency response organization. The NNSA/NSO Homeland Security and Defense Division (HS&DD) would be notified of the presence and storage locations of biological simulants and chemicals. Accident analysis for the on-site transportation and storage (either at a central warehouse, temporary storage location, or at the proposed release site) of biological simulants or chemicals would be modeled by the NNSA/NSO HS&DD. NNSA/NSO uses appropriate and approved models to perform analyses of accident/ emergency consequences. The accidental and instantaneous release of the entire inventory of interest would be modeled as the worst-case scenario.

NTS maintains meteorological measurement and modeling capabilities to determine atmospheric transport and dispersion of materials released into the atmosphere during an accident. Accidental release modeling is conducted by NNSA/NSO for chemical materials that are onsite. All modeling analyses are conducted in accordance with guidance and procedures specified in the DOE Emergency Management Guide (EMG) (DOE 1997).

Modeling results are used to define emergency action levels, emergency planning zones, and identify other critical information such as environmental receptors. Additionally, the modeling results are used to develop timely, initial consequence assessments of emergency situations to ensure that the consequence assessment provides representative results for making decisions to protect workers and the general public.

The NNSA/NSO currently uses the Emergency Prediction Information Code (EPIcode®) model to address accident scenarios involving releases of chemical materials that are kept onsite. EPIcode® is used in emergency planning and response for a fast risk assessment and estimate of the concentrations resulting from the release of chemical materials. EPIcode® is intended for use as a screening tool for initial assessment of emergency situations. The model is applicable for distances of 0.1 to 30 km (0.06 to 18.5 miles) from the source. EPIcode® contains a library of approximately 600 chemical substances; some biological agents, and additional chemicals can be added to the database. EPA has used this model, however, many models are available and appropriate for use. DOE has identified over 90 atmospheric models that could be used.

2.2 Alternative 2 - Release Of Biological Simulants at Various NTS Locations

The description of biological simulants release criteria and processes would be the same as described in the Proposed Action. However,

there would be fewer total test series because this alternative would exclude the release of low concentrations of chemicals at the NTS, except at the HSC. The NNSA/NSO national security missions to develop, test and evaluate technology to combat terrorism, develop equipment and systems; and train our nation's responders and military units would not be fully implemented.

2.3 Alternative 3 - Release of Chemicals in Low Concentrations at Various NTS Locations

The description of the chemical release criteria and processes would be the same as described in the Proposed Action, however, there would be fewer total test series. Releases to waterways would not occur. This alternative would exclude the release of biological simulants at the NTS and would therefore result in fewer total tests than the Proposed Action. The NNSA/NSO national security missions to develop, test and evaluate technology to combat terrorism; develop equipment and systems; and train our nation's responders and military units would not be fully implemented.

2.4 No Action Alternative

Pursuant to NEPA and CEQ regulations, the No Action Alternative must be considered. Under this alternative, NTS's baseline operations and management in support of its national security mission would not change. Chemical releases would continue to occur at the HSC under the current criteria. In general, the range of military and first responder training and equipment development would not be fully realized.

CHAPTER 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Methodology

A sliding scale approach (DOE 1993) is the basis for the analysis of potential environmental and socioeconomic effects in this EA. Specific aspects of the Proposed Action and alternatives have a greater potential for causing an environmental effect than others; therefore, they are discussed in greater detail than those aspects of the action that have little potential for effect. For example, implementation of the Proposed Action would entail development and evaluation of human health and safety standards; thus, this topic is addressed in greater detail than is socioeconomics, which would be little affected.

Impacts from Alternatives 2 and 3 were analyzed by comparing their actions to the Proposed Action. Because Alternatives 2 and 3 together comprise the Proposed Action, impacts associated with Alternative 2 or 3 individually would be smaller than impacts associated with the proposed action. Differences in impacts between the Proposed Action and Alternatives 2 and 3 are included in Sections 3.3 and 3.4, respectively.

No Action is discussed in Section 3.5, and Cumulative Impacts are discussed in Section 3.6.

All potential impacts in each resource category would be within the bounds of impacts evaluated in the 1996 NTS EIS (DOE 1996a).

3.2 Alternative 1 – Biological Simulant and Chemical and Releases (Proposed Action)

Historically, environmental research, counter proliferation and nonproliferation activities at the NTS have included tests and experiments designed to detect evidence of the production, storage or use of biological and chemical agents and weapons by other countries. On several occasions, the NTS has supported tests and experiments involving the use and release of small quantities of non-pathogenic biological materials. Locations where these activities have taken place include the Cambric Ditch in Area 5, the Area 12 Camp, and the Mercury Sewage Lagoons in Area 23. Non-radioactive hazardous chemicals have been released primarily at the HSC in Area 5.

For the Proposed Action, test release events (test series) may occur anywhere on the NTS provided that they meet the criteria specified in Section 2.1.5 and have prior approval of the Safety Review Panel.

The following sections describe the NTS environment and environmental impacts that could occur if the Proposed Action (described in Section 2.1) were implemented.

3.2.1 Land Use, Visual Resources, and Noise

3.2.1.1 Affected Environment

NTS is located on approximately 1,375 square miles (879,990 acres) in southern Nye County, Nevada, in a transition area between the Mojave Desert and the Great Basin. The topography of the site consists of a series of north-south-oriented mountain ranges separated by broad, low-lying valleys and flats. The area surrounding NTS is unpopulated to sparsely populated desert and rural land. Federal lands surround NTS, with the Nellis Air Force Range Complex located on the north, east, and west, and U.S. Bureau of Land Management lands on the south and southwest. Beyond the Federal lands surrounding NTS, principal land uses in Nye County in the vicinity of the site include mining, grazing, agriculture, and recreation. Rural communities located within the vicinity of NTS include Alamo, 69 km (43 miles) to the northeast; Pahrump, 42 km (26 miles) to the south; Beatty, 26 km (16 miles) to the west and Amargosa Valley, 5 km (3 miles) to the south.

Las Vegas, located in Clark County is about 105 km (65 miles) to the southeast (DOE 2003b).

Major sources of noise at NTS include equipment and machines, blasting and explosives testing, and aircraft. The acoustic environment in areas adjacent to NTS can be classified as either uninhabited desert or small rural communities. Generally wind is the predominant noise source. Noise at the site boundaries from most sources on the NTS is barely distinguishable from background.

3.2.1.2 Environmental Consequences to Land Use

After materials have been released, affected land would be monitored, remediated, if necessary, and returned to its original use. No construction, land disturbance, or permanent land use changes would be associated with the Proposed Action, therefore this alternative would not adversely affect land use.

3.2.1.3 Environmental Consequences to Visual Resources

No construction, permanent land use, or building changes would be associated with the Proposed Action. Effects to the visual environment would result from travel to and from the release site, placement of temporary equipment, and activities as the release site. Any effects would be minor, temporary and cease once the test series was complete. Test series, estimated at 5 to 20 per year, and associated activates, would not be distinguishable from other NTS activities. No visual impacts would be perceived by the public.

3.2.1.4 Environmental Consequences from Noise

Noise impacts from chemical and biological simulant release activities are expected to be similar to those from existing operations on the NTS except that there would be an increase in the frequency. Noise impacts would be minimal.

3.2.2 Socioeconomics

3.2.2.1 Affected Environment

Ninety-seven percent of NTS employees reside in Nye (7 percent) or Clark (90 percent) counties. Between 1990 and 2000 the Nevada population grew 66.3 percent; Nye County grew 82.7 percent and Clark County grew 85.6 percent. Population growth in Nevada is expected to exceed average national trends for the foreseeable future. The growth in Clark County is expected to slow, but remain well above national averages. In 2001 per capita income was $24,968 in Nye County and $28,992 in Clark County, compared to a Nevada average of $30,128. Unemployment in Nye and Clark Counties in 2001 was 5.5 percent (BEA 2003).

3.2.2.2 Environmental Consequences

No construction personnel would be required as no construction would be required. No additional operations personnel would be required initially. As many as two additional employees could be hired in approximately 5 years. There would be a slight increase in the number of customer representatives and technical personnel associated with tests that would travel to the area and utilize hotels, restaurants, and related businesses. Implementation of the Proposed Action would have imperceptible impacts on the local economy, employment, housing, and community services.

3.2.3 Cultural Resources

3.2.3.1 Affected Environment

Cultural resources are prehistoric or historic sites, buildings, structures, districts, objects, or places considered to be important to a culture or community. Cultural resources located on the NTS include archaeological sites, architectural or engineering features, and Native American religious or sacred places. Federal legislation requires agencies to consider the effect of proposed projects on cultural resources that are considered eligible for listing on the National Register of Historic Places (NRHP).

To date, more than 400 cultural resource investigations have been conducted on the NTS. Approximately 4 percent of the NTS has been investigated, mostly by 100 percent coverage pedestrian surveys, with some data recovery excavation and Native American ethnographic consultation. A total of almost 2,200 cultural resources have been recorded; of those nearly half are eligible for inclusion on the NRHP listing of historic properties. Ninety-six percent of the resources are prehistoric, with the remainder either historic, recent significant, unknown, or multi-component (DOE 1999; DOE 2000; DOE 2002c; FAA 2000).

3.2.3.2 Environmental Consequences

Impacts to cultural resources could include physical destruction, visual intrusions, and contamination of cultural materials. Physical destruction could occur from ground disturbance associated with travel off existing roads, temporary use of undeveloped land as a staging area for storage of equipment and supplies, and clean-up activities. Additionally, contamination of resources by chemicals or biological simulants could occur as a result of the releases. Contamination of archaeological materials, specifically organic materials such as carbon, plant, and animal remains, could affect the materials and the information they contain, resulting in an adverse impact to the resource. Contamination of a site such that it could not be investigated further would decrease the information potential of the resource. Finally, contamination of religious or sacred resources likely would impact their "sacredness". However, prior to any release the proposed site and surrounding environs would be evaluated for the presence or probability of undiscovered sites. Areas containing significant cultural resources would be avoided, if possible, during activities that could affect those resources. If a potentially significant cultural resource were considered unavoidable, NNSA/NSO would consult with the Nevada State Historic Preservation Officer and the Advisory Council on Historic Preservation, as appropriate, to identify protective or mitigative measures. Workers associated with release activities would be briefed to avoid off-road driving, and on the importance of cultural resources and historic preservation. For these reasons, impacts to cultural resources from implementation of the Proposed Action would be minimal.

3.2.4 Water Resources

3.2.4.1 Affected Environment

NTS is located within a closed hydrographic basin that covers much of Nevada (see Section 3.2.5). There are no perennial streams or naturally occurring surface water bodies at NTS. Precipitation at NTS is low, ranging from approximately 10 cm (4 in) on Frenchman Flat (DOE 2002b) to 23 cm (9 in) at the higher elevations (DOE 1996a). Much of the runoff from snowmelt and precipitation quickly infiltrates rock fractures or surface soils, or is lost by evapotranspiration. Some runoff is carried down alluvial fans in arroyos, or drains into playas where it may stay for weeks as an ephemeral lake. Runoff in the eastern half of NTS collects in the playas at Frenchman Flat and Yucca Flat. In the northeastern area of NTS, runoff drains off the site and onto the Nevada Test and Training Range Complex. In the western half and southernmost part of NTS, runoff is carried off towards the Amargosa Desert (DOE 2003b). There are a number of springs on NTS, but flow from the springs travels only a short distance before evaporating or infiltrating into the ground. Additionally, there are manmade waste disposal ponds and open reservoirs for industrial water at the NTS.

Groundwater beneath NTS exists in three groundwater subbasins of the Death Valley Basin flow system. The depth to groundwater varies from about 79 m (260 ft) below the land surface in the extreme northwest part of the site, and about 160 m (525 ft) below land surface in Frenchman and Yucca Flats, to more than 610 m (2,000 ft) under upland portions of Pahute Mesa. Groundwater flows generally south and southwest with flow rates that are quite variable, ranging from 2 to 200 m (7 to 660 ft) per year (DOE 2003b).

Groundwater is the only local source of potable water on NTS. Drinking water at NTS is

provided by 9 potable water wells. For remote areas not connected to an NTS drinking water system, water is transported to the area by permitted water haul trucks (DOE 2003c) or supplied as bottled water. (DOE 2003b).

There are no National Pollutant Discharge Elimination System (NPDES) permits for the NTS, as there are no wastewater discharges to onsite or offsite surface waters. Discharges of wastewater are regulated by Nevada under the Nevada Water Pollution Control Law. Additional discussion of wastewater management is included in Section 3.1.12, Waste Management.

Bacillus thuringiensis was introduced into the unlined Cambric ditch in 1998. Post-test monitoring identified no observable effects or environmental degradation. In 1999 and 2000 *B. thruringiensis* and *B. subtilis* var. *niger* (also known as *B. globigii*) were introduced into two sewage systems, one in Area 12 and the other in Area 23. There were no observed effects on the operation of the sewage systems. The sewage lagoons provide a natural treatment process. One of the tests was to detect long-term residual material. There was no evidence of persistence of either organism, and no environmental effects were observed (Pergler 2004). No chemicals have been deliberately introduced into the NTS sewage system or NTS surface waters (Pergler 2004).

3.2.4.2 Environmental Consequences

No significant impacts to water resources are expected as a consequence of the Proposed Action. Although there may be an increase in water use, the increase would be slight compared to total water use at the NTS and well within the bounds of water resource impacts evaluated in the 1996 NTS EIS (DOE 1996a).

Biological simulants could be released into an existing man-made ditch as part of stream transport studies. However, most liquid releases would be to lined sewage lagoons or ponds. Any liquid releases to the environment would be evaluated as part of the test plan, and no releases would be permitted that would harm human health or safety, protected species or wildlife populations. No materials with long-term persistence in the environment would be released unless residual material remaining in the environment after completion of the test series were cleaned up; therefore, there would be no impacts to groundwater.

No chemical releases to water resources are proposed.

3.2.5 Geology and Soils

3.2.5.1 Affected Environment

Geology

The NTS is within the southern part of the Great Basin. The NTS is generally characterized by more or less regularly spaced, generally north-south trending mountain ranges separated by alluvial basins that were formed by faulting. There are three primary valleys on the NTS; Yucca Flat, Frenchman Flat, and Jackass Flats. The alluvium- and tuff-filled valleys are rimmed mainly by Precambrian and Paleozoic sedimentary rocks and Cenozoic volcanic rocks.

The relief of the NTS ranges from less than 1,000 m (3,280 ft) above sea level in Frenchman Flat and Jackass Flats to about 2,339 m (7,675 ft) on Rainier Mesa and about 2,199 m (7,216 ft) on Pahute Mesa.

The geology of the NTS consists of a thick section (more than 10,597 m [34,768 ft]) of Paleozoic and older sedimentary rocks, locally intrusive Cretaceous granitic rocks, a variable assemblage of Miocene volcanic rocks, and locally thick deposits of postvolcanic sands and gravels that fill the present day valleys (DOE 1996a).

The geologic conditions that could affect the stability of the ground and infrastructure at NTS, including volcanic activity, seismic activity (earthquakes), slope stability, surface subsidence, and soil liquefaction are well described in the NTS EIS (DOE 1996a). These conditions do not influence the decisions being

made through this EA and, therefore, are not described further in this document.

Soils

In general, the soils of the NTS are similar to those of surrounding areas. According to the NTS EIS (DOE 1996a), the soils of the southern NTS reflect the mixed alluvial sediments upon which they form. In general, soils texture is gradational from coarse-grained soils near the mountain fronts to fine-grained soils in the playa areas of the Yucca Flat and Frenchman Flat. Most soils are underlain by a hardpan of caliche. Soil loss through wind and water erosion is a common occurrence throughout the NTS and surrounding areas. None of the soil series in southwestern Nye County are considered prime farmland (EBS 1999).

3.2.5.2 Environmental Consequences

The scope of past, current, and expected impacts to geology and soils at the NTS established in the NTS EIS (DOE 1996a) was extensive. The average amount of soil expected to be impacted by a test series is less than one acre. The amount of soil impact associated with the Proposed Action would be within the envelope of impacts evaluated in the NTS EIS.

The potential contamination of soils by either chemical or biological materials would be considered as part of the decision matrix associated with deciding whether a test should be performed. Suitable clean-up procedures, if required, would be added to each test protocol before approval of the test. Impacts to soil or geology resources from implementation of the Proposed Action would be minimal.

3.2.6 Air Resources

3.2.6.1 Affected Environment

Climate and Meteorology

Annual precipitation at NTS ranges from approximately 10 cm (4 in) to 23 cm (9 in) including snow accumulation. Snow accumulations are sporadic, lasting only a few days in the southern portions of the NTS but several weeks on the higher plateaus in the north. Precipitation in the summer, primarily in July and August, is largely the result of isolated thunderstorms. A tropical storm occasionally will move northeastward from the coast of Mexico, bringing heavy precipitation during September or October.

Elevation influences temperatures at NTS, resulting in a wide range of temperatures. The annual average temperature in the NTS area is 19°C (66°F). Monthly average temperatures range from 7°C (44°F) in January to 32°C (90°F) in July. Relative humidity ranges from 11 percent in June to 55 percent in January and December (DOE 2003b).

Average annual wind speeds and direction vary with location. At higher elevations on Pahute Mesa, the average annual wind speed is 4.5 meters per second (m/s) (10 mph). The prevailing wind direction during winter months is north-northeasterly, and during summer months winds are southerly. In Yucca Flat the average annual wind speed is 3 m/s (7 mph). The prevailing wind direction during winter months is north-northwesterly, and during summer months is south-southwesterly. At Mercury, the average annual wind speed is 4 m/s (8 mph) with northwesterly prevailing winds during winter months, and southwesterly prevailing winds during summer months. Wind speeds in excess of 27 m/s (60 mph), with gusts up to 48 m/s (107 mph), may be expected to occur once every 100 years (DOE 2003b).

Severe weather in the region includes occasional thunderstorms, lightning, tornadoes, and sandstorms. Severe thunderstorms may produce large amounts of precipitation that continues for an hour or so and may create a potential for flash flooding. Few tornadoes have been observed in the region, and they are not considered significant events.

Regulatory Compliance

The Clean Air Act of 1970, as amended, is intended to protect and enhance the quality of the nation's air resources and to promote the

public health and welfare and productive capacity of its population. The United States Environmental Protection Agency (EPA) sets National Ambient Air Quality Standards (NAAQS) for pollutants harmful to public health and the environment. Six criteria pollutants (carbon monoxide, nitrogen dioxide, lead, ozone, sulfur dioxide, and particulate matter) are evaluated under the NAAQS. NTS is located in the Nevada Intrastate Air Quality Control Region. Ambient air quality at NTS is not currently monitored for criteria pollutants or hazardous air pollutants, with the exception of radionuclides. Elevated levels of ozone or particulate matter may occasionally occur because of pollutants transported into the area or because of local sources of fugitive particulates. Ambient concentrations of other criteria pollutants (sulfur dioxide, nitrogen oxides, carbon monoxide, and lead) are low because there are no large sources of these pollutants nearby (DOE 2003b). The region is classified as an attainment area for all six criteria pollutants.

The nearest Prevention of Significant Deterioration (PSD) Class I areas to NTS are the Grand Canyon National Park, 208 km (130 mi) to the southeast, and the Sequoia National Park, 169 km (105 mi) to the west southwest.

The Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Air Pollution Control (BAPC) has primacy over air quality programs in Nye County (Nevada Revised Statutes 445B.100 through 445B.825, inclusive, and Nevada Revised Statutes 486A.010 through 486A.180, inclusive). The BAPC oversees releases of all regulated pollutants currently covered under several NTS Air Quality Operating Permits (OP). The HSC is regulated under a separate Class II air quality operating permit. Emissions are regulated by placing restrictions on operating hours and production amounts and by imposing opacity limits and recordkeeping and reporting requirements. In 1999, the HSC received a conditional waiver for the opacity limits, due to the nature of its operations (DOE 2003b). A new NTS Class II Air Quality Operating Permit is expected to be issued in the near future, which will combine all NTS permits, including the one governing the HSC, into a single permit. Once the new permit is issued, different opacity requirements may be specified.

A BAPC letter, dated October 17, 2003, concerning the "Notification of Intention to Prepare an Environmental Assessment (EA)" for the Proposed Action, is included in Appendix A. The BAPC requires that opacity concerns be addressed in the release of any simulants including non-pathogenic and chemical simulants (Appendix A). The BAPC stipulates that planned releases outside the boundaries of the HSC would require an application for modification of the NTS OP. In addition, the BAPC states that there are concerns that the releases could potentially adversely affect areas outside the boundaries of the NTS (e.g., Desert National Wildlife Refuge and the Nellis Test and Training Range).

3.2.6.2 Environmental Consequences

Biological simulants and chemical releases, as defined in the Proposed Action, would be subject to release criteria developed as part of the NTS Air Quality OP. Releases would not occur unless the meteorological conditions at the release site were appropriate for the biological or chemical releases. Climatic conditions, wind direction, surface meteorological conditions and air dispersion characteristics would be modeled prior to any releases of chemical or biological simulants. Releases would be designed to be in compliance with the proposed release criteria. In addition, all Nevada Class II OP requirements, including submittal of a test plan before the planned test, monitoring and recording quantities of test chemicals and emissions, submittal of final analysis of each chemical release test to the BAPC, and notification to the BAPC within 24 hours of any malfunction or upset of the test process that results in an emission above allowable limits, would be adhered to strictly (DOE 2002b).

When the charge is removed from biological organisms, releases can result in longer suspension times for the particles in the atmosphere. Aerosols are minute particles

suspended in the atmosphere Suspended aerosols have a potential to move off the NTS site. However, due to the low concentrations of biological simulants that would be released and their wide dispersal, the biological simulants are not expected to be distinguishable from background levels outside NTS boundaries. No impacts to air quality standards are predicted to occur beyond the NTS boundaries.

3.2.7 BIOLOGICAL RESOURCES

Terrestrial Resources

NTS is in the transition zone between the Mojave Desert and the Great Basin Desert. As a result, it has a diverse and complex mosaic of plant and animal communities representative of both deserts, as well as some communities common only in the transition zone between them. This transition zone extends to the east and west far beyond the boundaries of NTS. Thus, the range of almost all species found onsite also extends beyond the site, and there are few rare or endemic species present.

Mojave Desert plant communities are found at elevations below approximately 1,200 m (4,000 ft) in Jackass Flats, Rock and Mercury Valleys, and Frenchman Flat. Creosote bush (*Larrea tridentata*) is the visually dominant shrub and is associated with a variety of other shrubs, including white bursage (*Ambrosia dumosa*) at NTS, depending on soil type and elevation. Two plant communities are unique to the transition zone. The first, which occurs at elevations from approximately 1,200 to 1,500 m (4,000 to 5,000 ft), is dominated by blackbrush (*Coleogyne ramosissima*). The second occurs in the bottom of enclosed Frenchman and Yucca Flats basins, where trapped winter air is too cold for typical Mojave Desert plants. The most abundant shrubs in these areas include three species of wolfberry (*Lycium* spp.). Little or no vegetation grows on the playas in these basins. Plant communities typical of the Great Basin Desert occur at elevations generally above 1,500 m (5,000 ft). Communities dominated by saltbush (*Atriplex* spp.), rabbitbrush (*Chrysothamnus* spp.), sagebrush (*Artemisia* spp.), and pinion pine (*Pinus monophylla*)/sagebrush occur with increasing elevation. Over 700 plant taxa have been found at NTS.

Three hundred thirty-three species of terrestrial vertebrates have been recorded at NTS, including 60 species of mammals, 239 species of birds, and 34 species of reptiles. Typical Mojave Desert species found at the site include kit fox (*Vulpes macrotis*), Merriam's kangaroo rat (*Dipodomys merriami*), desert tortoise (*Gopherus agassizii*), chuckwalla (*Sauromalus obesus*), western shovelnose snake (*Chionactis occipitalis*), and sidewinder rattlesnake (*Crotalus cerastes*). Typical Great Basin Desert species include Townsend's ground squirrel (*Spemophilus townsendii*), Great Basin pocket mouse (*Perognathus parvus*), mule deer (*Odocoileus hemionus*), northern flicker (*Colaptes auratus*), scrub jay (*Aphelocoma coerulescens*), Brewer's sparrow (*Spizella breweri*), western fence lizard (*Sceloporus occidentalis*), and striped whipsnake (*Masticophis taeniatus*). About 40 wild horses (*Equus caballus*) live on the northern part of NTS (DOE 2001).

Large carnivorous birds such as the turkey vulture (*Cathartes aura*) and rough-legged hawk (*Buteo lagopus*), and carnivorous mammals such as the long-tailed weasel (*Mustela frenata*) and bobcat (*Lynx rufus*) are ecologically important groups on the site. A variety of migratory birds have been recorded at NTS (DOE 2003b).

Wetlands

Twenty-four springs or seeps are known at NTS, most of which support wetland vegetation such as cattail (*Typha latifolia*), sedges (*Carex* spp.), and rushes (*Juncus* spp.). It is likely that these would constitute wetlands as defined under Section 404 of the Clean Water Act (CWA).

One newly identified wetland, an historic borrow pit that catches water in large enough quantities and for long enough periods of time to sustain wetland vegetation, has been identified (DOE 2003b).

Aquatic Resources

Known natural water sources on NTS are 24 springs or seeps, 4 tanks (natural rock depressions that catch and hold surface runoff), and intermittent playas. Man-made impoundments on NTS, which are scattered throughout the eastern half of the site, support three introduced species of fish: bluegill (*Lepomis macrochirus*), goldfish (*Carassius auratus*), and golden shiner (*Notemigonus crysoleucas*). Eighty-one species of plants and 138 species of animals (not all of which are aquatic species) have been documented at or near aquatic sites on NTS (DOE 2003b). Water holes, both natural and manmade, are important to many species of wildlife.

Threatened and Endangered Species

No Federally-listed endangered species are known to inhabit the NTS. The only federally-listed threatened species at NTS is the Mojave Desert population of the desert tortoise. Desert tortoises are found throughout the southern one-third of the site (Figure 3-1). The abundance of tortoises at NTS is low to very low compared to other areas within the range of this species. NTS contains less than 1 percent of the total desert tortoise habitat of the Mojave Desert population (DOE 2003b).

3.2.7.1 Environmental Consequences

Prior to a release, the proposed release site would be evaluated to ensure that no species of special interest or sensitive habitat would be adversely affected by the release, and documentation would be prepared to support the evaluation.

Prior to the release, a site-walkover would be conducted by qualified biologists to ensure that no species of special interest were present. Particular care would be taken to ensure that desert tortoises are not present within the area of potential impact. If desert tortoises were present, they would be relocated to an area of suitable habitat outside of the potential impact area.

Species of special interest include, but are not limited to, certain species of bats and burrowing owls. If these species were found inhabiting an area where they could be adversely impacted by a proposed release, NNSA/NSO would develop mitigation measures to protect the animals or move the release site to avoid impacts.

As discussed in Chapter 2, NNSA intends to manage the program such that the proposed releases would occur in different areas. Flora and fauna in any given area would typically not be exposed to multiple releases and therefore, better able to recover from any adverse impacts. However, activities associated with locating ground-based equipment would affect some vegetation resources. The proposed activities are expected to occur in habitats that are well represented at the local and regional levels, and thus the spatially-limited effects would minimally impact the habitat type. Natural succession of colonizing species following releases of chemicals or biological simulants is expected to prevent permanent vegetation disturbance. The release of some chemicals could adversely affect individuals of non-protected animal or plant species or temporarily degrade habitat in the immediate area of the release; however human activity in the area around the release site prior to the release would cause larger species to flee and smaller species to seek shelter. The release of *B. thuriengensis* could result in mortality of a small number of insects, such as flies or moths in immediate proximity of the release. No release would be conducted that would adversely affect the population of a species commonly found in the area, or adversely affect an individual of a federal- or state-protected species.

Potential ecological impacts would be evaluated from each single release point and collectively from all release points. Should other test series occur within the same time period with geographic overlap, the synergistic effects of these test series would be evaluated.

1

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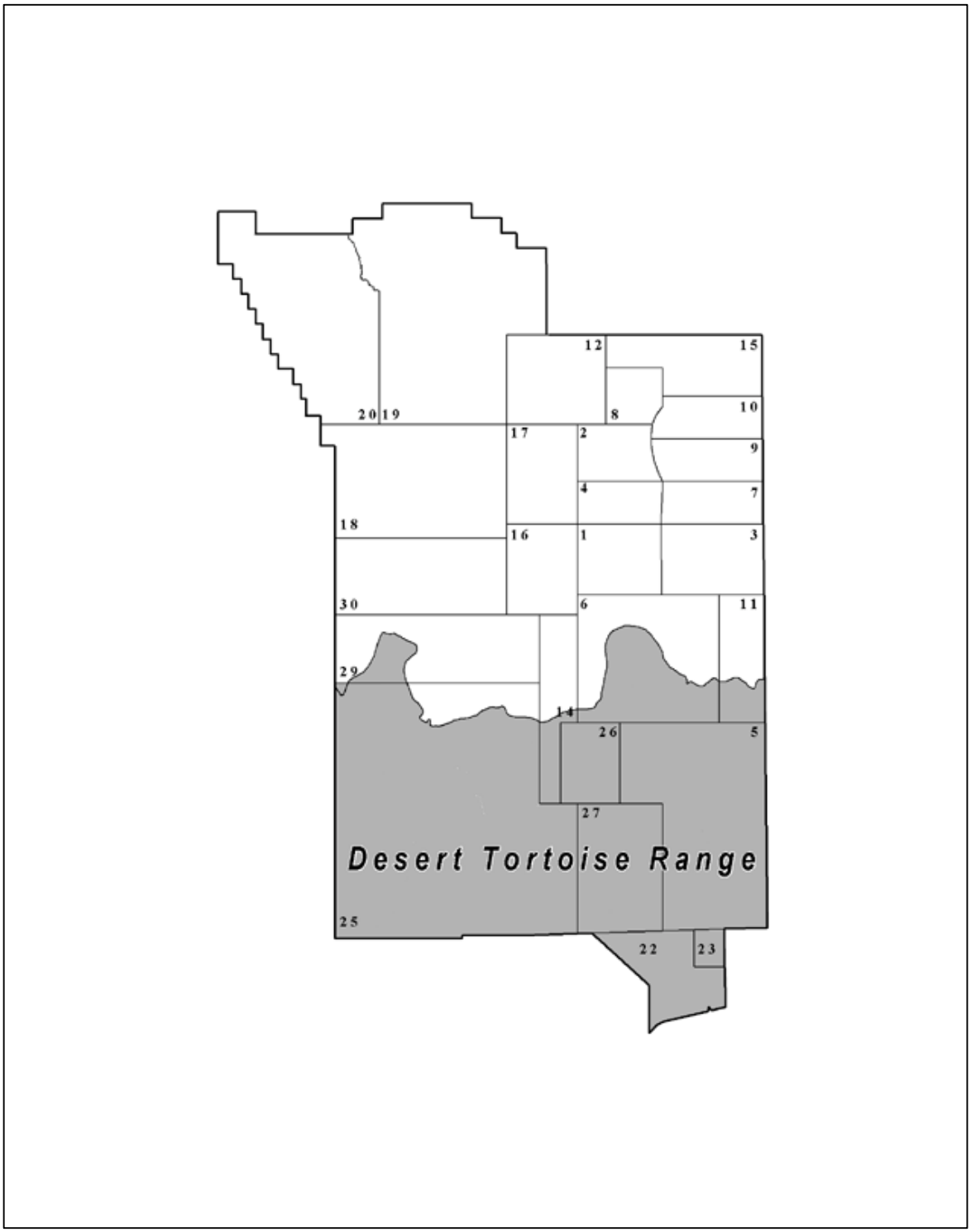

Figure 3-1. Desert Tortoise Range at Nevada Test Site

Test series that would include the release of chemicals or biological simulants that could persist in the environment for more that a few weeks would require a remediation plan to be developed and implemented. Depending on the severity of the contamination and impacts to habitat, remediation could include reclamation of the site using plant species native to the area.

B. thuringiensis and *Erwinia herbicola* are bacteria that are regulated pesticides, and are consequently subject to federal and state laws. If proposed application methodology and rates of these two biological simulants are different from those approved by the EPA, an exemption or permit(s) may be required. Any release of *B. thuringiensis* or *E. herbicola* would be accomplished according to Section 5 of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

3.2.8 Traffic and Transportation

3.2.8.1 Affected Environment

Regional Transportation Infrastructure

NTS is approximately 65 miles northwest of Las Vegas, Nevada (Figure 1-1). The route to NTS from many locations from the east goes through the Las Vegas metropolitan area. Interstate highway I-15 passes through Las Vegas in a southwest northeast direction. A beltway, Clark County 215/I-215, is being constructed to encircle all but the east side of Las Vegas. The Mercury interchange on U.S. 95 provides the principal access into NTS. Completion of a new bridge (planned for 2006) for U.S. 93 across the Colorado River, just south of Hoover Dam, and the new Clark County 215/I-215 around Las Vegas would simplify the routing to and from NTS.

Local Traffic Conditions

Ninety-five percent of all commuters and shipments to NTS arrive from the Las Vegas area on U.S. 95, a four-lane highway from Las Vegas to the Mercury interchange. Traffic is light and free flowing once clear of Las Vegas. Commuters, however, can experience gridlock within the beltway, especially at the interchanges of U.S. 93, U.S. 95, I-15, and I-515. With approximately 3,800 employees, the NTS contribution to the traffic congestion in Las Vegas is minimal.

Hazardous Waste and Materials Transportation

The term "hazardous" as used in this section is the same as that defined by the U.S. Department of Transportation, which is a substance or material determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported. This definition would include radioactive and other materials or wastes not considered hazardous by the Resource Conservation and Recovery Act (RCRA).

Materials and chemicals used at NTS are shipped there from offsite sources across the country. Biological materials, explosives, fuels, corrosives, compressed gas, radioactive calibration sources, special nuclear material, and depleted uranium are examples of such materials. Most of these shipments are of very small quantities that arrive by mail, express carriers, or delivery vans and trucks. Some items, such as fuels, arrive in bulk quantities by common carrier. Common carriers transporting shipments to the NTS are required to comply with all applicable regulations governing the materials in transit. It is not expected that the number of shipments nor the materials being transported would exceed the bounds of the transportation study and identified potential impacts in the NTS EIS (DOE 1996a).

The waste disposal facilities at NTS are not permitted to receive any non-radioactive RCRA-hazardous waste. Therefore, all non-radioactive RCRA waste, including potentially ignitable, corrosive, toxic, reactive, or other wastes designated as RCRA hazardous, is shipped to offsite permitted facilities for treatment and disposal. Hazardous waste is shipped under constraints imposed by the U.S. Department of Transportation.

3.2.8.2 Environmental Consequences

Traffic

The Proposed Action would incur no additional NTS commuters for the first 5 years. After 5 years two additional employees could be added. The numbers of shipments of hazardous chemicals and biological simulants would be approximately 5 to 20 per year. These incremental shipments are not sufficient to have any impact on the current traffic.

Transportation

Other than traffic impacts, transport of biological simulants and chemicals could only affect public health if the materials were released by some incident such as a traffic accident. Shipments of chemicals and biological materials to and from the NTS would be conducted in full compliance with all applicable laws and regulations. These laws and regulations are designed to ensure to the extent feasible, the safe transportation of hazardous materials. Waste shipments within the NTS would be small in number and volume and within the bounds of the current baseline.

3.2.9 Human Health and Safety

3.2.9.1 Affected Environment

It is the policy of NNSA to operate NTS in a manner that protects the health and safety of employees and the public, preserves the quality of the environment, and prevents property damage. Environment, safety and health (ES&H) are priorities in the planning and execution of all work activities at NTS. It is also the policy of NTS to comply with applicable ES&H laws, regulations, and requirements; and with directives promulgated by DOE regarding occupational safety and health.

NNSA requires work at the NTS to be performed according to the safety and health requirements of OSHA as codified in 29 CFR Parts 1910 and 1926. DOE Orders also provide direction for worker safety and health programs.

To integrate the activities of a number of contractors and NTS users and to avoid discontinuities in the health and safety program, NTS operates under standard operating procedures (SOPs) for DOE facilities. The relevant procedures include the following:

- 5401 Environment, Safety, and Health Coordination Responsibilities
- 5409 Management of Hazardous Materials and Hazardous Wastes
- 5410 Industrial Hygiene
- 5412 Explosive Safety
- 5415 Safety and Fire Responsibilities

NNSA/NSO has implemented an Integrated Safety Management System (ISMS) in accordance with DOE Procedure 450.4 to "…systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment." The ISMS is a systematic approach to defining the scope of work; identifying, planning, and performing work that provides for early identification of hazards; and identifying associated control measures for hazardous mitigation or elimination. The ISMS process also forms the basis for work authorization and provides for both internal and external assessment through a continuous feedback and improvement loop that identifies both failures and successes and incorporates lessons learned into subsequent activities.

The health and safety of NTS workers is protected by adherence to the requirements of federal and state law, DOE orders, and the plans and procedures of each organization performing work on the NTS. A program of self-assessment for compliance with these requirements is conducted by contractors and by NNSA/NSO. In addition, workers are protected from the specific hazards associated with their jobs by training, monitoring the workplace environment, using appropriate PPE, and using administrative controls to limit their exposures to radioactive or

chemical pollutants. Worker access to areas of the NTS with working conditions requiring special hazard control is restricted through the use of signs, barriers, and fences, as appropriate.

Visitors to the NTS, including individuals and tour groups, are subject to essentially the same safety and health requirements as workers. Safety briefings are provided as appropriate (e.g., tunnel entry), PPE is provided when necessary, and radiation dosimeters may be issued along with badges as part of the visitor-control process. Secondary access control is provided when necessary for safety or security reasons. Visitor access to areas of the NTS where working conditions require special hazard controls (e.g., the HSC) is restricted through the use of signs, fences, or barricades.

The potential for activities at the NTS to impact the health and safety of the general public is minimized by a combination of the remote location of the NTS, the sparse population surrounding it, and a comprehensive program of administrative and design controls.

3.2.9.2 Environmental Consequences

The NTS EIS (DOE 1996a) contains an analysis of NTS workforce injuries and illnesses. Under the proposed action no additional impacts to injury and illness categories would be expected.

General health and safety protocols for NTS personnel are detailed in DOE regulations and site and facility SOPs. During release tests, the primary means of personnel protection would consist of administrative and access control to the test area, personnel clear zones, and the use of PPE.

With the potential exception of the instantaneous release scenario, operations workers would not be exposed to noise levels higher than the acceptable limits specified by OSHA in its noise regulations (DOE 2003b). Workers would be protected from high noise through implementation of existing hearing protection programs to minimize noise impacts on workers.

Contact with chemical and biological test materials would occur primarily during test preparation, post-test evaluation, and site clean-up. Concentrated test materials are generally eye, skin, and respiratory irritants and potentially toxic via various pathways. PPE would be used in accordance with test plan guidance and Material Safety Data Sheet recommendations.

During the tests, administrative and access controls and area monitoring would prevent exposures to involved and non-involved workers and the general public. Chemical concentrations within the exclusion area (100-meter radius from the release point) could exceed IDLH concentrations. At the 100 meter radius (exclusion area) boundary chemical concentrations would be limited to at or below IDHL stated concentration. Access and administrative controls would prevent personnel from entering the exclusion area until chemical concentrations were reduced to the required occupational levels defined in the test plan. No impacts to involved workers would occur during these operations.

Chemical concentrations within the buffer area (from the 100 meter radius to the 300 meter radius) would be limited to below the IDHL for the chemical of concern. At the 300-meter radius boundary, chemical concentrations would be limited to at or below STEL concentrations. Access and administrative controls would prevent personnel from entering the exclusion areas until the chemical concentrations were reduced to the required occupational levels defined in the test plan. There would be no impacts to workers and members of the public.

Chemical concentrations at the buffer area perimeter (300 meters from the release point) would not exceed the more conservative of the PEL, REL, or TLV values for the chemical of concern. Access and administrative controls for personnel entering the buffer area during tests would provide adequate protective measures for worker exposure control. Under these conditions, there would be no impacts to involved and non-involved workers and members of the public.

The biological simulants identified for use under the proposed action are described in Table 2-1. These biological organisms are not typically classified as human pathogens. However, some pathogenicity has been demonstrated in immuno-depressed individuals for *B. subtillis* var. *niger*. Some of the simulants are commercially available as pesticides (*B. thuringiensis*) or fungicides (*E. herbicola*). *E. herbicola* has been associated with allergic alveolitis in humans and identified as a causative agent in Grain Handler's Lung. *Clostridium sporogenes* is a benign microorganism in the environment. No reports in the literature suggest that *C. sporogenes* is a pathogen of humans, animals or plants. The remaining biological simulants do not represent human pathogenic risks.

With appropriate administrative, access and test controls in place, there would be no impact to involved and non-involved workers and members of the public.

3.2.10 Environmental Justice

3.2.10.1 Affected Environment

Under Executive Order 12898, DOE is responsible for identifying and addressing disproportionately high and adverse impacts on minority or low-income populations. Minority persons are those who identify themselves as Black or African American; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; or another non-white race; or persons of Hispanic or Latino ethnicity. Persons whose incomes are below the federal poverty threshold are designated low-income.

At NTS, the 80-km (50 mi) radius includes portions of Clark, Nye, and Lincoln Counties in Nevada and a portion of Inyo County, California. In 2002, minority populations comprised 30.9 percent of the U.S. population, and the same percentage of the Nevada population. The percentage of minority populations in the area surrounding the NTS is greater than that in the United States or Nevada; however, the minority populations in the area are concentrated in the Las Vegas metropolitan area, outside the 80-km (50 mi) impact area (DOE 2003b).

Low-income populations comprised 12.4 percent of the U.S. population, based on 1999 income, and 10.5 percent of the Nevada population. Within the counties surrounding NTS, 10.8 percent of the population lives below the poverty level (DOE 2003b).

3.2.10.2 Environmental Consequences

The Proposed Action would have minimal or no adverse impacts on any resource area therefore, no disproportionately high and adverse impacts to minority or low-income communities would occur.

3.2.11 Site Infrastructure

3.2.11.1 Affected Environment

Infrastructure at NTS consists of transportation (roads, railroads, and airports) and utilities. Utility infrastructure comprises electricity and fuel (natural gas, liquid fuels, and coal).

NTS has 1,127 km (700 mi) of roads, with 644 km (400 mi) paved (DOE 2003b). NTS has no railway connection (DOE 2002c). NTS has two airstrips and has ready access to several additional airports in the area, including McCarran International Airport in Las Vegas and the onsite Desert Rock Airport that is capable of landing and taking off jet aircraft (DOE 2003b).

Electric power is supplied to the NTS under contracts with the Nevada Power Company and Western Area Power Administration (Valley Electric Cooperative).

Fuels used at the NTS consist of unleaded gasoline, JP-8 aviation fuel, and diesel fuels.

3.2.11.2 Environmental Consequences

Existing infrastructure at facilities or areas associated with the Proposed Action are sufficient. No new infrastructure would be required.

3.2.12 Waste Management

3.2.12.1 Affected Environment

This section describes the types of waste that are generated at NTS and the NTS waste management activities and capabilities. NTS manages the following types of waste: transuranic, low-level radioactive, mixed (both radioactive and hazardous), hazardous, sanitary solid, and medical. No mixed, radioactive, or polychlorinated biphenyls waste would be generated as part of the proposed action.

Hazardous Waste

NTS stores hazardous waste onsite prior to shipping it to a permitted commercial facility for treatment/disposal. NTS received its RCRA permit for storage in 1995 and renewed it in 2000. NTS is also permitted to treat certain explosive hazardous wastes.

Sanitary Solid Waste

NTS has three landfills permitted for the disposal of sanitary solid waste (nonhazardous). The Hydrocarbon Disposal Site in Area 6 and the Area 9 U10c Disposal Site are permitted as Class III (industrial solid waste) landfills. Hydrocarbon-contaminated materials are disposed in the hydrocarbon landfill, and inert debris (such as construction and demolition debris) is disposed in the Area 9 landfill. The third landfill is a Class II (municipal solid waste) landfill in Area 23 that receives sanitary solid and regulated asbestos waste. In a recent NEPA analysis (DOE 2002a), DOE concluded that the projected waste volumes through 2011 would consume less than 20 percent of the available sanitary waste disposal capacity at NTS and that the projected waste volumes through 2011 would consume about 12 and 14 percent of the Area 6 and 9 landfills, respectively.

Medical Waste

The medical services provided for employees at NTS generate a small amount of medical waste each year. This waste is managed in accordance with applicable requirements and disposed of at offsite permitted facilities

Biological Waste

NTS does not use biological products that would result in waste that would have to be managed separately from solid waste.

Wastewater

Wastewater at the NTS is disposed of either in one of 16 septic systems located throughout the site or in one of two lagoon systems located in Areas 23 and 6. The septic systems, which receive sanitary sewage only, have capacities of 750 to 5000 gallons per day (Soong 2001). The average daily flow at the lagoons, which receive sanitary sewage and industrial wastewater, is less than 40,000 gallons per day (Soong 2001). Sludge removed from the systems is disposed in the Area 23 sanitary landfill or the Hydrocarbon Disposal Site, depending on hydrocarbon content. At areas not serviced by a permanent wastewater system, portable sanitary units are provided.

3.2.12.2 Environmental Consequences

The release scenarios for chemicals and biological simulants testing would generate primarily sanitary solid waste. Some hazardous waste could be generated if a chemical that exhibits one or more hazardous characteristics or is listed as hazardous by EPA is used in a test. A chemical could be the test substance itself or a carrier solvent for the test chemical or the biological simulant.

The tests are not expected to generate radioactive wastes, however, if tests were conducted in areas with radioactive materials or contamination, radioactive waste potentially could be generated. The potential for generating radioactive waste would be evaluated during test planning.

Wastes would be composed of empty containers, measuring devices, testing equipment, PPE, test props, and decontamination wastewater. The water-borne and instantaneous-release scenarios

could also generate wastewater and explosive waste, respectively. In addition, if cleanup of a release area were required, cleanup wastes could include contaminated soil and vegetation.

Hazardous Waste

Chemicals that result in hazardous waste would be managed in the same manner as the hazardous wastes currently generated. If review of the proposed test plan identified a hazardous waste that NTS currently is not authorized to manage, a revised notification of regulated waste activity and RCRA Part A permit application, if necessary, would be provided. However, if a proposed test included a material not currently listed on the RCRA Part A permit, NNSA/NSO would require the customer to remove any excess from the NTS. If it became necessary to generate a hazardous waste during one of the tests, it would be accumulated at the generation area or transferred to the RCRA-permitted storage facility in Area 5, if the waste type is authorized under the RCRA permit, prior to shipping offsite for treatment and/or disposal. Given this existing accumulation and storage practice and availability of offsite permitted treatment and disposal facilities, the impact on the NTS storage facility and offsite treatment and disposal facilities from hazardous waste resulting from the proposed action is expected to be negligible.

Instantaneous (explosive) release tests would be designed so that all explosive material would be detonated, leaving no explosive waste material. However, in the event that explosive material remained once the test was completed, the explosive waste would be handled as an emergency situation and be treated in place, following consultation and approval of the Nevada Division of Environmental Protection.

Biological Waste

The proposed biological simulants would be unlikely to cause illness in humans or animals and could be managed as ordinary sanitary solid waste.

Sanitary Solid Waste

Sanitary solid waste generated by the proposed action would be disposed of in the Area 23 landfill. This landfill has available capacity because only about 20 percent of its capacity is projected to be used for disposal of current NTS waste streams through 2011. Therefore, disposal of the Proposed Action's sanitary solid waste is expected to have minimal impact.

If cleanup of test areas is required, contaminated soil and vegetation could require disposal. NTS Class III landfills, the Hydrocarbon Disposal Site in Area 6 and the U10c Disposal Site in Area 9, could be used for disposal of wastes compatible with their permits. These landfills have available capacity; therefore, only minimal impact would be expected.

Wastewater

Wastewater could result from decontamination activities and water-borne release tests. Decontamination would be limited to non-disposable equipment, generating small amounts of wastewater compared to the average daily flow at NTS wastewater treatment systems. Wastewater from decontamination activities would be added to NTS wastewater at the Area 23 or Area 6 lagoon system. As discussed in Section 3.2.12.1, the average daily flow at the Area 23 lagoon system is less than 40,000 gallons per day. The impact from decontamination wastewater would be negligible.

3.3 Alternative 2 - Release of Biological Simulants at Various NTS Locations

The potential effects from the release of biological simulants analysis presented in Section 3.2 (Proposed Action) would be the same under this alternative. However, there would be no release of low concentrations of chemicals. Thus, there would be fewer total test series events and none of the consequences specified under the Proposed Action for chemical releases. NNSA/NSO's national security mission activities related to developing, testing and evaluating technology, equipment

and systems to combat terrorism, and NNSA/NSO support of Work for Others activities, including training our nation's first responders and military units to respond to weapons of mass destruction events, would not be fully implemented..

3.4 Alternative 3 - Release of Chemicals in Low Concentrations at Various NTS Locations

The potential effects from the release of chemicals in low concentrations analysis presented in Section 3.2 (Proposed Action) would be the same under this alternative. However, there would be no release of biological simulants. Thus, there would be fewer total test series events and none of the consequences from biological simulant releases addressed under the Proposed Action. One release scenario, release to waterways, would not occur. NNSA/NSO's national security mission activities related to developing, testing and evaluating technology, equipment and systems to combat terrorism, and NNSA/NSO support of Work for Others activities, including training our nation's first responders and military units to respond to weapons of mass destruction events, would not be fully implemented.

3.5 Alternative 4 - No Action Alternative

Under this alternative, NTS's baseline operations and management in support of their National Security and Work for Others missions would not change and there would be no change in the current conditions with respect to human health and safety and the environment. Chemical releases would continue to occur at the HSC under existing release criteria. NNSA/NSO's National Security mission activities related to developing, testing and evaluating technology, equipment and systems to combat terrorism, and NNSA/NSO support of Work for Others activities, including training our nation's first responders and military units to respond to weapons of mass destruction events, would not be fully implemented.

3.6 Cumulative Effects

Cumulative effects are the consequences of multiple impacts, each of which could be insignificant, but when taken together, become potentially significant. Cumulative effects analyzed for the Proposed Action include impacts to soil, water resources, biological resources, air, cultural resources, and human health and safety.

The tests and experiments using biological simulants and releases of chemicals comprising the Proposed Action would consist of a series of tests, each designed to have no measurable effect on the environment. The test procedures would require that the frequency and duration of test releases be low enough to avoid cumulative impacts. A recovery period would be specified between tests of such a magnitude that they could have an effect on plants or animals. This procedure ensures that the capacity of the environment to recover is not exceeded.

Most of the test materials released would be volatile or degrade quickly in the environment, and would not accumulate in the soil. Neither plants nor animals accumulate such materials in their body tissues; therefore, effects would be limited to acute exposures. Test materials with the potential to accumulate in soil, water, plants, animals, or humans would not be released to the environment if there were a reasonable potential for long-term persistence in the environment, unless the release site underwent remediation after the test series was completed. The total quantity of repeated releases of test materials would not cause a measurable increase in air pollution in areas where the public has access. The test materials would disperse rapidly, therefore there would be no cumulative effect to air resources.

A formal biological monitoring program to identify any impacts from activities at HSC has been in place since 1996. To date, no noticeable cumulative effects to biota have been noted (DOE 2003c). The monitoring plan includes field surveys to determine test impacts on plants and animals and to verify that the HSC program complies with pertinent state and federal

environmental protection legislation. NTS biologists are tasked to review chemical release test plans to determine if field monitoring along the treatment transects is required for each test as per the monitoring plan criteria. Since 1996, the majority of chemical releases at the HSC use such small quantities that downwind test-specific monitoring has not been necessary (DOE 2003c).

Areas with radioactive contamination from past atomic bomb testing would be avoided when possible, because of the potential to re-entrain radioactive soil or dust into the air. However, in the unlikely event that contaminated soil were to be disturbed, the maximum air concentration of Plutonium-240 has been estimated at 1,000 times less than protective guidelines (DOE 1986).

Much of the NTS has undergone some level of ground disturbance, some of which has resulted in impacts to cultural resources. The potential impacts to cultural resources that could occur as a result of the Proposed Action would be additive to these effects, but by themselves would be minimal. The Proposed Action would be accomplished in accordance with federal laws and regulations, and DOE implementing regulations and policies, thereby avoiding, reducing, or mitigating any potential impacts.

Biological simulants could be released as suspended aerosols and could travel beyond the NTS boundaries. However, given that the biological simulants were selected because of their documented lack of toxicity to healthy humans, their low release quantities, and that their concentrations would be non-detectable beyond the NTS boundaries, no impacts to the public would be expected. All other biological releases would remain on-site and not affect involved and non-involved workers or members of the public. No impacts from chemical releases to involved and non-involved workers or members of the public were identified for either individual tests or cumulatively. Therefore, there are no cumulative impacts to human health and safety.

CHAPTER 4.0
MITIGATION MEASURES
MONITORING REQUIREMENTS

As indicated in Chapter 3, no adverse environmental impacts have been identified for the action alternatives; therefore, no mitigation measures are required. Rather than mitigating environmental consequences, the action alternatives would incorporate restrictions, criteria, monitoring, and other elements that are protective of the environment into the planning, preparation, and testing phases to avoid environmental consequences. These elements are summarized in Table 4-1.

NNSA recognizes the need for monitoring for environmental consequences from the proposed testing program. Therefore, NNSA would expand the NTS Ecological Monitoring and Compliance Program to include monitoring and assessment of NTS ecological systems for impacts attributable to the testing program. If adverse impacts were identified, test activities in the area would be suspended until appropriate mitigation measures could be implemented.

Table 4-1. Environmental protection elements incorporated into the action alternatives.

Applied During the Planning Phase

- Develop a test plan that includes modeling of candidate chemicals and biological simulants to determine release amounts and rates that do not exceed the release criteria set forth in this EA (Section 2.1.5)
- Review proposed release sites by NNSA/NSO to ensure that the following criteria are met:
  a. A release would not adversely affect populations of species commonly found in the area or adversely affect an individual of a Federal- or state-protected species.
  b. A release would not adversely affect the known springs and seeps that serve as important sources of water for wildlife
  c. A release site would not be used repeatedly if there was evidence that the biological resources could not recover from the repeated impacts
  d. Avoid areas with radioactive contamination when possible. If it is necessary to conduct a release of chemicals or biological simulants in a radioactive contamination area, develop and implement a plan to eliminate or reduce to the extent feasible re-entrainment of radioactive soil or dust into the air.
- Evaluate proposed release site(s), including an ecological survey to ensure that no species of special interest and no sensitive habitat would be adversely affected by the release.
- Review proposed release site(s) against cultural resource inventory and conduct cultural resource surveys of any previously unsurveyed potentially affected areas. Consult with the Nevada State Historic Preservation Officer and, if applicable, the Advisory Council on Historic Preservation, to develop appropriate mitigation for any significant cultural resource sites that cannot be avoided.
- Develop a post-release monitoring plan, as necessary, to identify if unanticipated adverse impacts are occurring. The monitoring plan would assess each single release point and all release points collectively. The monitoring plan would also ensure compliance with the NTS air permit monitoring requirements.
- Establish suitable clean-up procedures if test plans or NNSA/NSO's review of the test plan indicated the need for remediation.
- Establish PPE and training requirements for use during handling and release of chemicals or biological simulants.
- Delineate administrative control areas and their associated exposure limits and monitoring requirements to ensure those exposure limits are maintained.
- Establish acceptable meteorological conditions for the release site, based on modeling, that ensures exposure limitations and other release criteria would be met.
- Review potential contribution of proposed release to cumulative impacts, with consideration given to optimizing test frequencies to prevent cumulative effects.
- Evaluate the synergistic effects of test if other test series occur within the same time period with geographic overlap.

Applied During the Preparation and Testing Phases

- Off-road travel would be planed, based on input from qualified biologist, to reduce damages to habitat and would be limited to that required to set up testing infrastructure, plume tracking equipment, and recovery activities.
- Personnel would be briefed not to harm, harass, or collect plants or animals.
- Personnel would be briefed on the importance of cultural resources and historic preservation.
- Evacuations and roadblocks would be established prior to each test to protect employees and the public.
- Immediately prior to release a site-walkover would be conducted to ensure that no species of special interest were present and to frighten away birds and large mammals.

CHAPTER 5.0
STATUTES, REGULATIONS, CONSULTATIONS, AND OTHER REQUIREMENTS

5.1 Consultations and Coordination

NNSA consulted federal agencies that have jurisdiction by law or special expertise and state and local agencies authorized to develop and enforce environmental standards. This section summarizes consultations and coordination with federal and state agencies.

The coordination and consultations with federal, state and local agencies began with the NOI issued on October 1, 2003 (see Section 1.4). In response to the NOI, Nevada's Department of Conservation and Natural Resources, Division of Environmental Protection, and the U. S. Department of the Interior, Fish and Wildlife Service, Nevada Fish and Wildlife Office sent comments. These letters are attached to this EA in Appendix B.

Presentations concerning the EA and the Proposed Action have been made to the following local and state agencies:

- Nevada Office of the Bureau of Land Management (BLM), February 4, 2004 -- Attendees included local representatives of BLM, Fish and Wildlife Service, U.S. Air Force, Nevada Department of Wildlife, Nevada Division of Environmental Protection, NNSA/NSO, Bechtel Nevada, and TetraTech, Inc.

- Joint Military Affairs Committee Meeting, February 12, 2004 – Attendees included representatives from the U.S. Air Force, U.S. Army, U.S. Army Corps of Engineers, U.S. Navy, Nevada National Guard, Army National Guard, the State of Nevada Clearinghouse, Nevada Division of State Lands, Nevada Division of Environmental Protection, BLM, Fish and Wildlife Service, Nevada Committee on Economic Development, Nevada Division of Water Resources, Nevada State Historic Preservation Office, Congressman Gibbons, Senator Ensign, and NNSA/NSO.

- Department of Conservation and Natural Resources, Division of Environmental Protection, February 17, 2004 – Attendees included representatives from the Nevada Division of Environmental Protection (including the Bureau of Air Quality Planning, Bureau of Air Pollution Control, Bureau of Federal Facilities, and Bureau of Waste Management), Nevada Health Division, Inter-Tribal Council of Nevada, Nevada Committee on Economic Development, Nevada Division of State Lands, Nevada Division of Water Resources, Nevada Department of Administration Budget and Planning Clearinghouse, Bechtel Nevada, TetraTech, Inc., and NNSA/NSO.

- Bureau of Land Management, Tonapah, March 5, 2004 – Attendees included representatives from the BLM Tonopah Field Station, Nevada Department of Wildlife, Nye County, Esmeralda County, Bechtel Nevada, and NNSA/NSO.

- Nye County, March 16, 2004 – NNSA/NSO provided a briefing on the status of preparation of the EA for the Nye County Commissioners in Pahrump, NV. In addition to the Commissioners, attendees included Nye County staff, members of the public, and the news media. The briefing was reported in the Las Vegas Sun and Pahrump Valley Times.

5.2 Pertinent Federal and State Statutes, Regulations and Restrictions

Regulatory requirements were screened for applicability to the action alternatives. This section identifies the major laws, regulations,

executive orders, DOE and NNSA orders, and other pertinent guidelines that may apply to the proposed action and the other action alternatives. Appendix B provides brief descriptions of the applicable statutes and regulations and a discussion of how NNSA/NSO complies with those regulations. In addition, this section discusses a requirement that is not applicable and the rationale for determining that it does not apply to the action alternative.

5.2.1 Requirements Pertinent to the Action Alternatives

The action alternatives concern the procurement, transport, storage, use, release, and disposal of non-pathogenic biological simulants and of low concentrations of various chemicals at the NTS. The use and release points for both the non-pathogenic biological simulants and the low concentration chemicals could be at various locations on the site. Requirements apply to each of these actions: procurement, transport, storage, use, release into the environment, and disposal and cleanup. The requirements serve to protect workers, nearby communities, and environmental, natural, and cultural resources.

5.2.2.1 General Requirements

Some of the requirements are generally applicable to the action alternatives, not just to a specific action such as transport. These requirements include:

- National Environmental Policy Act
- Archaeological Resources Protection Act
- National Historic Preservation Act
- Native American Graves Protection and Repatriation Act
- American Indian Religious Freedom Act
- Executive Order 13175, Consultation and Coordination with Indian Tribal Governments
- DOE Order 1230.2, American Indian Tribal Government Policy
- DOE Policy 141.1, DOE Management of Cultural Resources
- Executive Order 12898, Environmental Justice

5.2.2.2 Requirements Applicable to Procurement, Transport, Storage, and Use

The requirements that are potentially applicable to the procurement, storage, and use of biological simulants and chemicals include, depending on the type and quantity:

- Toxic Substances Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act
- Hazardous Materials Transportation Regulations
- Emergency Planning and Community Right-to-Know Act
- Occupational Health and Safety Act
- Noise Control Act
- DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees

5.2.2.3 Requirements Applicable to Environmental Release

The requirements that are potentially applicable to the release into the environment of biological materials and chemicals include:

- Clean Air Act
- Nevada Air Pollution regulations
- Clean Water Act

- State of Nevada Sewage Disposal Regulations
- Emergency Planning and Community Right-to-Know Act
- Endangered Species Act
- State of Nevada Regulations Protecting Native Vegetation
- Fish and Wildlife Conservation Act
- Migratory Bird Treaty Act
- National Wildlife Refuge System Administration Act
- DOE Order 450.1, Environment Protection Program

5.2.2.4 Requirements Applicable to Disposal

The requirements that are potentially applicable to the disposal of biological materials and chemicals and derived waste from unused or used biological materials and chemicals include:

- Resource Conservation and Recovery Act
- Solid Waste Disposal Act
- Nevada Solid Waste Disposal Regulations
- Hazardous Materials Transportation Regulations

5.2.2 Requirements Not Applicable to the Action Alternatives

The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107–188) was reviewed for applicability. Title II of Public Law 107–188, ''Enhancing Controls on Dangerous Biological Agents and Toxins'' (Sections 201 through 231), provides for the regulation of certain biological agents and toxins by the U.S. Department of Health and Human Services (Subtitle A, Sections 201–204) and the U.S. Department of Agriculture (Subtitle B, Sections 211–213), and provides for interagency coordination between the two departments regarding overlap agents and toxins (Subtitle C, Section 221). For the U.S. Department of Health and Human Services, the Centers for Disease Control and Prevention (CDC) has been designated as the agency with primary responsibility for implementing the provisions of the Act; the Animal and Plant Health Inspection Service is the agency fulfilling that role for the U.S. Department of Agriculture (USDA). The USDA must establish by regulation a list of biological agents and toxins that have the potential of a severe threat to animal or plant health or to animal or plant products. The CDC must also establish a similar list for those that post a severe threat to human health. The biological agents and toxins that appear on the USDA and CDC lists include such pathogens as Ebola virus, various hemorrhagic fever viruses, botulinum neurotoxin, Bovine Spongiform Encephalopathy agent, Foot and Mouth Disease virus, Smallpox virus, and *Bacillus anthracis*, which causes anthrax.

The non-pathogenic biological simulants that could be used under the action alternatives do not pose a severe risk to human, animal, or plant health as do the biological agents and toxins on the CDC and USDA lists. As long as the non-pathogenic biological simulants do not appear on the list of select agents and toxins list, Public Law 107-188 is not applicable.

5.2.3 Regulatory Permits

Current environmental permits for the NTS are presented annually in the NTS Annual Site Environmental Report. The latest listing is found in the Nevada Test Site Annual Site Environmental Report for Calendar Year 2002 (DOE 2003d), available online at http://www.nv.doe.gov/.

CHAPTER 6.0 REFERENCES

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APPENDIX A

CONSULTATION LETTERS

1

ALLEN BIAGGI, *Administrator*

(775) 687-4670

Administration
Facsimile 687-5856

Water Pollution Control
Facsimile 687-4684

Mining Regulation and Reclamation
Facsimile 684-5259

STATE OF NEVADA
KENNY C. GUINN
Governor

R. MICHAEL TURNIPSEED, *Director*

Waste Management
Corrective Actions
Federal Facilities

Air Pollution Control
Air Quality Planning
Water Quality Planning

Facsimile 687-6396

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL PROTECTION

333 W. Nye Lane, Room 138
Carson City, Nevada 89706

October 17, 2003

Mr. William C. Suiter
NEPA Document Manager
National Nuclear Security Administration
Nevada Operations Office
P. O. Box 98518
Las Vegas, NV 89193-8518

Re: Notification of Intention to Prepare an Environmental Assessment (EA)

Dear Mr. Suiter:

The Nevada Division of Environmental Protection, Bureau of Air Pollution Control (BAPC) has received the referenced notification and offers the following comments for consideration in preparing the EA.

- All releases of regulated pollutants must be covered under the Nevada Test Site (NTS) Air Quality Operating Permit (OP).
- Opacity concerns must be addressed in the release of any simulants, including non-pathogenic and chemical simulants.
- BAPC has formally informed NNSA (letter, Elges to Hoar, dated June 5, 2003) that any planned releases outside the bounds of the HSC would require an application for modification of the NTS OP.
- BAPC has concerns with expanding the scope of the current Hazardous Spill Center EA (DOE/EA-0864, September 2002). This document is referenced in the current Draft NTS OP. Given the current usage of interferents and types of chemicals which may be released from HSC and allowing greater wind angles and wind speeds than currently allowed may adversely impact areas outside the boundaries of the NTS (eg., Desert National Wildlife Refuge and the Nellis Test and Training Ranges).
- The referenced EA must address potential modifications to the NTS OP, impacts of planned releases to locations outside the boundaries of the NTS and releases of regulated pollutants (including PM_{10}) and opacity.

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- The location of each planned release must be evaluated and included as part of the complete EA, as the NTS has varied terrain and surface meteorological conditions, and therefore, air dispersion characteristics.

If you have any questions or comments feel free to call Matthew A. DeBurle, of my staff, at (775) 687-9391, or me at (775) 687-9337.

Sincerely,

Mehrdad Moghimi
Permitting Supervisor,
Bureau of Air Pollution Control

MM/mad

CERTIFIED MAIL # 7002 2410 0005 6673 4603

cc: Kenneth Hoar, Director, Environment, Safety & Health Division, NNSA
Michael Skougard, Functional Manager for Environmental Compliance, NNSA
Mike Elges, Chief, Air Pollution Control
Paul Liebendorfer, Chief, Bureau of Federal Facilities

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502
(775) 861-6300 ~ Fax: (775) 861-6301

TAKE PRIDE IN AMERICA

October 30, 2003
File No. DOE 7

Mr. William C. Suiter, NEPA Document Manager
National Nuclear Security Administration
Nevada Site Office
Post Office Box 98518
Las Vegas, Nevada 89193

Subject: Notice of Intention to Prepare an Environmental Assessment for Proposed Biological Materials Activities at the Nevada Test Site, Clark County, Nevada

Dear Mr. Suiter:

This responds to your letter dated October 1, 2003, requesting scoping comments from interested agencies and parties on the Notice of Intention to prepare an Environmental Assessment (EA) for proposed biological materials activities, including testing, experiments, training, release of chemicals, and other related actions. Our comments are provided under the authorities of the National Environmental Policy Act of 1969, as amended, the Endangered Species Act of 1973, as amended (Act), and the Migratory Bird Treaty Act of 1918, as amended.

Based on the limited amount of information provided in your letter dated October 1, 2003, we may have serious concerns regarding adverse effects or impacts of the proposed activities to the federally threatened desert tortoise (*Gopherus agassizii*) (Mojave population), migratory bird species, and sensitive species in the State of Nevada. Information regarding sensitive species in Nevada can be obtained from the State of Nevada's Natural Heritage Program website at www.heritage.nv.gov or by contacting the State agency at 1550 East College Parkway, Suite 137, Carson City, NV 89706, (775) 687-4245. Direct and indirect effects from the proposed activities to the desert tortoise, migratory birds, and sensitive species in Nevada should be fully considered and evaluated in the EA. For example, it would be important to know specific details on the various biological materials, including their persistence in the exposed environment, to assist in determining potential effects to these species.

During project planning, measures should be included to avoid or minimize adverse impacts to all of these species. If it is determined by your agency that a listed species may be affected by the proposed activities, then section 7 consultation should be initiated pursuant to 50 CFR § 402.14.

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Mr. William C. Suiter File No. DOE 7

Please ensure that the draft EA will be made available to our agency for comments. If you have any questions regarding this correspondence, please contact Amy LaVoie in our Southern Nevada Field Office at (702) 515-5230.

Sincerely,

for Robert D. Williams
Field Supervisor

APPENDIX B

FEDERAL AND STATE STATUES, REGULATIONS AND RESTRICTIONS

This appendix provides very brief descriptions of the applicable statutes and regulations, and of how NNSA/NSO would meet the requirements if the proposed action was implemented.

General Requirements

National Environmental Policy Act of 1969, 42 United States Code (U.S.C.) 4321, enacted by Public Law (Pub. L.) No. 91-190 as amended

The National Environmental Policy Act (NEPA) of 1969 establishes a policy promoting awareness of the environmental consequences of major federal activities on the environment and consideration of the environmental impacts during the planning and decision making stages of a project. The CEQ and DOE promulgated regulations for implementing NEPA (40 CFR 1500-1508, and 10 CFR 1021, respectively). DOE Order 451.1B, National Environmental Policy Act Compliance Program, establishes DOE internal requirements and responsibilities for implementing the NEPA and the CEQ and DOE-promulgated regulations. This EA was prepared in accordance with NEPA requirements.

Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa-470ll, enacted by Pub. L. No. 96-95 as amended

The Archaeological Resources Protection Act of 1979 protects archaeological resources located on U.S. public lands and American Indian lands, including sites under DOE control.

National Historic Preservation Act as amended (16 U.S.C. 470 et.seq.)

The National Historic Preservation Act, as amended, provides that sites with significant national historic value be placed on the *National Register of Historic Places*. No permits or certifications are required under the Act. However, if a particular federal activity could impact an historic property, consultation with the Advisory Council on Historic Preservation will usually generate a Memorandum of Agreement, including stipulations that must be followed to minimize adverse impacts.

Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001)

This law directs the Secretary of Interior to assume responsibility for repatriation of federal archaeological collections and collections held by museums receiving federal funds that are culturally affiliated with Native American Tribes. Major actions to be taken under this law include (1) establishing a review committee with monitoring and policy-making responsibilities; (2) developing regulations for repatriation, including procedures for identifying lineal descent or cultural affiliation needed for claims; (3) overseeing museum programs designed to meet the inventory requirements and deadlines of this law; and (4) developing procedures to handle unexpected discoveries of graves or grave goods during activities on federal or tribal lands.

American Indian Religious Freedom Act of 1978, 42 U.S.C. 1996 et seq., enacted by Pub. L. No. 95-341

The American Indian Religious Freedom Act of 1978 is a policy statement intended to reaffirm American Indian rights regarding religious freedom. The purpose of the Act is to ensure that American Indians have access to and protection for physical locations and resources that are sacred and sometimes required for the practice of American Indian religious rites and ceremonies.

Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments)

This Order establishes regular and meaningful consultation and collaboration with tribal officials in developing federal policies. It also requires each federal agency to have an answerable process to ensure meaningful and timely input by tribal officials in developing Federal policies and other activities that have tribal implications (65 FR 67249).

DOE Order 1230.2, American Indian Tribal Government Policy

This Order provides guidance for consulting and coordinating with Indian tribal governments in compliance with federal statutes and regulations. The policy directs all DOE officials, staff, and contractors regarding fulfilling trust obligations and responsibilities arising from Departmental actions that may potentially affect American Indians' or Alaska Natives' traditional, cultural, and religious values and practices; natural resources; and treaties and other federally recognized and reserved rights.

DOE Policy 141.1, DOE Management of Cultural Resources

This policy ensures that DOE and NNSA programs integrate cultural resource management into their missions and activities, and raises the awareness of the importance of the Department's cultural resource-related legal and trust responsibilities. The policy directs that all DOE programs and missions will be implemented in a manner consistent with federal statutes, regulations, orders, DOE Orders, and implementation guidance protecting cultural resources.

Executive Order 12898 (Environmental Justice)

This Order directs federal agencies to achieve environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions. The order creates an Interagency Working Group on environmental justice and directs each federal agency to develop strategies within prescribed time limits to identify and address environmental justice concerns.

Requirements Applicable to Procurement, Transport, Storage, and Use

Toxic Substances Control Act of 1976, 15 U.S.C. 2601, et seq., enacted by Pub. L. No. 94-469 as amended

The Toxic Substances Control Act (TSCA) of 1976 regulates all chemical applications not specifically exempted in the Act. Language in the Act has been interpreted to include microorganisms (i.e., bacteria, fungi, protozoa, microscopic algae, and viruses). TSCA also covers other biologically derived substances, such as chemicals extracted from plants or animals. The applications that are exempted involve food, drugs, cosmetics, animal drugs and feed additives, and pesticides. In addition, national defense activities for which the President has granted a waiver are also exempted.

Under TSCA, the EPA has the authority to prohibit or limit the manufacture, import, processing, distribution in commerce, use, or disposal of a chemical when it is found to pose an unreasonable risk of injury to human health or the environment. It also requires manufacturers, processors, and users who become aware of a substantial threat from a chemical to immediately notify EPA.

Federal Insecticide, Fungicide, and Rodenticide Act of 1972, 7 U.S.C. 136, enacted by Pub. L. No. 92-516 as amended

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1972 establishes an extensive regulatory system for controlling the sale, distribution, and application of pesticides. Various strains of microorganisms are registered microbial pesticides, including *B. thuringiensis* and *E. herbicola*, which are proposed for release as biological simulants. FIFRA requires that pesticides be labeled in an approved manner and makes it unlawful for anyone to use the pesticide in a manner inconsistent with its labeling. Labeling may also include recommendations for disposal. Other provisions provide for certification of pesticide applicators, and regulations to promote safe storage and disposal.

However, Section 5 of FIFRA, and its associated regulations (40 CFR 172) allows for some experimental uses of pesticides. Some of the experimental uses require the issuance of an Experimental Use Permit.

NNSA/NSO would consult EPA regarding use of a registered pesticide for experimental purposes and apply for an Experimental Use Permit as needed. NNSA/NSO would also follow applicable manufacturer recommendations regarding application and disposal.

Hazardous Materials Transportation Regulations

Transport of hazardous materials, substances, and wastes are governed by U.S. Department of Transportation and EPA regulations. These regulations may be found in 49 CFR 100-178, 10 CFR 71, and 40 CFR 262, respectively.

U.S. Department of Transportation regulations contain requirements for identification of a material as hazardous. These regulations may refer to the EPA regulations for identification of material. However, U.S. Department of Transportation hazardous material regulations govern the hazard communication (for example, marking, hazard labeling, vehicle placarding, and emergency response telephone number) and transport requirements (such as required entries on shipping papers or on the EPA waste manifest).

EPA regulations pertaining to hazardous waste transportation are found in 40 CFR Part 262. These regulations deal with the use of the EPA waste manifest, which is the shipping paper used when transporting RCRA hazardous waste.

DOE issued Order 460.1B, "Packaging and Transportation Safety" and Order 460.2, "Departmental Materials Transportation and Packaging Management" addressing the transportation of hazardous materials.

Emergency Planning and Community Right-to-Know Act of 1986, 42 U.S.C. 11001, enacted by Pub. L. No. 99-499

This act was included as Title III of the Superfund Amendments and Reauthorization Act. Under Subtitle A of this Act, Federal facilities, including those owned by the NNSA, provide various information, such as inventories of specific chemicals used or stored and releases that occur from these sites, to the state Emergency Response Commission and to the local Emergency Planning Committee to ensure that emergency plans are sufficient to respond to unplanned releases of hazardous substances.

In addition, under Subtitle B of the Act, material safety data sheet reports, emergency and hazardous chemical inventory reports, and toxic chemical release inventory reports must be provided to appropriate Federal, state, and local authorities.

Occupational Safety and Health Act of 1970, 29 U.S.C. 657, et seq., enacted by Pub. L. 91-596

The Occupational Safety and Health Act (OSHA) of 1970 establishes the authority for assuring, so far as possible, safe and healthful working conditions for employees. OSHA regulations establish specific standards telling employers what must be done to achieve a safe and healthful working environment. DOE emphasizes compliance with these regulations at its facilities and prescribes through DOE orders the Occupational Safety and Health Act standards that contractors shall meet as applicable to work at government-owned, contractor-operated facilities.

Noise Control Act of 1972, 42 U.S.C. 4901-4918, enacted by Pub. L. 92-574 as amended.

The Noise Control Act of 1972, as amended, directs all federal agencies to carry out, "to the fullest extent within their authority," programs within their jurisdictions in a manner that furthers a national policy of promoting an environment free from noise that jeopardizes

health and welfare. Any explosive releases would be conducted in compliance with the Act.

DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees

The Order establishes the framework for an effective worker protection program that will reduce or prevent injuries, illnesses, and accidental losses by providing NNSA federal and contractor workers with a safe and healthful workplace. The Order addresses construction safety, fire protection, industrial hygiene, and other areas. The Order calls for compliance with ACGIH *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices* (most recent edition), when ACGIH TLVs are lower (more protective) than OSHA PELs. (When ACGIH TLVs are used as exposure limits, DOE operations shall nonetheless comply with the other provisions of any applicable OSHA-expanded health standard.)

Requirements Applicable to Environmental Release

Clean Air Act, 42 U.S.C. 7401, enacted by Pub. L. No. 90-148 as amended

The Clean Air Act, as amended, is intended to "protect and enhance the quality of the nation's air resources so as to promote the public health and welfare and the productive capacity of its population." Section 118 of the Clean Air Act, as amended, requires that each federal agency with jurisdiction over any property or facility that might discharge air pollutants, such as the NNSA, comply with "all federal, state, interstate, and local requirements" with regard to the control and abatement of air pollution.

The law requires EPA to establish national primary and secondary ambient air quality standards as necessary to protect public health, with an adequate margin of safety, from any known or anticipated adverse effects of a regulated pollutant (42 U.S.C. 7409). EPA sets standards for the regulated pollutants, which include particulate matter. The proposed release tests that generate aerosols would have to comply with current particulate matter standards.

The Clean Air Act also requires establishment of standards for emission of hazardous air pollutants (42 U.S.C. 7412). In addition, the Clean Air Act requires specific emission increases to be evaluated to prevent a significant deterioration in air quality (42 U.S.C. 7470). To comply with these requirements, the EPA issued National Emission Standards for Hazardous Air Pollutants that establishes limits of materials such as radioactivity, asbestos, beryllium, and mercury (40 CFR 61). Prior to approval of test plans, the hazardous air pollutant standards applicability would be determined and means for compliance established as necessary.

The Clean Air Act requires each state to develop implementation plans to control air pollution and air quality in that state and submit them for approval to EPA. Under EPA regulations, the State of Nevada has been delegated authority under the Clean Air Act to maintain the Primary and Secondary National Ambient Air Quality Standards (40 CFR 52, Subpart N), to issue permits under the Prevention of Significant Deterioration (40 CFR 52.683), and to enforce performance standards for new stationary sources.

Nevada Air Pollution regulations:

Nevada Administrative Code: Chapter 445B, Air Controls; Air Pollution:

Sections 287-366, Permits to Construct and Operating Permits

Sections 339-351, Toxic or Hazardous Air Contaminants

Sections 354-357, Visible Emissions

Sections 360-367, Emissions of Particulate Matter

Sections 381-395, Miscellaneous

These regulations implement both state and federal clean air statutes, and identify the requirements for permits for each air pollution source (unless it is specifically exempted) as well as ongoing monitoring requirements. The State of Nevada issued an air quality permit for the entire NTS. The permit is due to be renewed and discussions between NNSA and the State of Nevada are ongoing. Releases carried out under the action alternatives would be conducted in accordance with the air quality permit in effect at the time.

Clean Water Act of 1977, 42 U.S.C. 1251, et seq. enacted by Pub. L. No. 95-917 [amendments to the Federal Water Pollution Control Act of 1972]

The Clean Water Act of 1977, which amended the Federal Water Pollution Control Act, was enacted to "restore and maintain the chemical, physical, and biological integrity of the Nation's water." The Clean Water Act prohibits the "discharge of toxic pollutants in toxic amounts" to navigable waters of the United States. Section 313 of the Clean Water Act, as amended, requires all branches of the federal government engaged in any activity that might result in a discharge or runoff of pollutants to surface waters to comply with federal, state, interstate, and local requirements.

Nevada Administrative Code: Chapter 444, Sanitation: Sections 750-840, Sewage Disposal

This regulation establishes the standards, regulations, permits, and requirements for septic tanks and other sewage disposal systems for single-family dwellings, communities, and commercial buildings. NNSA would comply with their wastewater treatment permit when using the existing NTS facilities for treatment of wastewater generated by the action alternatives as well as water borne release tests that involve sewage lagoons.

Endangered Species Act of 1973, 16 U.S.C. 1531-1543, enacted by Pub. L. No. 93-205 as amended

The Endangered Species Act of 1973, as amended, is intended to prevent the further decline of endangered and threatened species and to restore these species and their habitats. The U.S. Departments of Commerce and Interior jointly administer the Act. Section 7 of the Act requires consultation to determine whether endangered and threatened species are known to have critical habitats onsite or in the vicinity of the proposed action. NTS conducts biological surveys as part of its Ecological Monitoring and Compliance Program. The surveys have identified the presence of the threatened desert tortoise. Section 3.2.7.2 discusses how impacts to the desert tortoise would be avoided under the proposed action.

Nevada Administrative Code: Chapter 527, Protection and Preservation of Timbered Lands, Trees, and Flora

This regulation provides for the broad protection of indigenous flora. Those plants, declared to be threatened with extinction, are placed on Nevada's list of fully protected species. A permit is required before engaging in any activities that could result in the removal or destruction of any plant on the list or disturbance of any management area established for a listed plant.

Fish and Wildlife Conservation Act of 1980, 16 U.S.C. 2901, enacted by Pub. L. No. 96-366 as amended

The Fish and Wildlife Conservation Act of 1980 encourages all Federal entities (in cooperation with the public) to protect and conserve the nation's fish and wildlife. NTS's Ecological Monitoring and Compliance Program is designed to ensure compliance with laws and regulations related to plants, animals, and ecosystems.

Migratory Bird Treaty Act of 1918, 16 U.S.C. 703, et seq., 40 Stat. 755

The Migratory Bird Treaty Act of 1918 governs the taking, killing, or possession of migratory birds. The Act prohibits the harm of any migratory birds, their nests, or eggs without authorization by the Secretary of the Interior. Over 20 bird species that are protected under the Act are known to occur just in the Frenchman Flat portion of NTS. NTS conducts biological surveys at part of its Ecological Monitoring and Compliance Program. The surveys identify the presence of breeding birds and identify mitigation actions necessary to comply with the Migratory Bird Treaty Act. The existing Biological Monitoring Plan for the HSC is used to document the activity of birds and the presence of their nests within a downwind impact zone associated with tests preformed at the HSC, either before and after each test, each series of tests, or quarterly each year depending upon the materials and quantities being tested. This same approach and existing protocols would be used for the action alternatives.

National Wildlife Refuge System Administration Act of 1966, 42 U.S.C. 668dd, enacted by Pub. No. 91-135 as amended

The National Wildlife Refuge System Administration Act of 1966 provides guidelines and directives for the administration and management of all lands within the system, including "wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas." The Act forbids a person to knowingly disturb or injure vegetation or kill vertebrate or invertebrate animals, their nests, or eggs on System lands unless permitted by the Secretary of the Interior. The nearest boundary of the Desert National Wildlife Range (DNWR) is approximately 5 km (8 miles) downwind of NTS's HSC where some biological materials or chemicals could be released under the action alternatives. Releases from other NTS locations could also be in close proximity of the DNWR. The Biological Monitoring Plan developed in 1996 will continue to be used to verify that tests conducted as part of the action alternatives do not result in downwind air concentrations of toxic chemicals that could harm biota on the DNWR.

DOE Order 450.1, Environmental Protection Program

The Order strives to implement sound stewardship practices that are protective of the air, water, land, and other natural and cultural resources impacted by DOE/NNSA operations and by which DOE/NNSA cost effectively meets or exceeds compliance with applicable environmental; public health; and resource protection laws, regulations, and DOE/NNSA requirements. This objective must be accomplished by implementing Environmental Management Systems (EMSs). An EMS is a continuing cycle of planning, implementing, evaluating, and improving processes and actions undertaken to achieve environmental goals. These EMSs must be part of ISMS established pursuant to DOE P 450.4, Safety Management System Policy.

Requirements Applicable to Disposal

Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, enacted by Pub. L. No. 94-580 as amended

The Resource Conservation and Recovery Act (RCRA) was enacted to ensure the safe and environmentally responsible management of hazardous and nonhazardous solid waste, and to promote resource recovery techniques to minimize waste volumes. Regulations issued by EPA under RCRA set forth a comprehensive program to provide "cradle to grave" control of hazardous waste by requiring generators and transporters of hazardous waste, as well as owners and operators of treatment, storage, and disposal facilities, to meet specific standards and procedures. Hazardous waste is defined under RCRA as a waste that poses a potential hazard to human health or the environment when improperly treated, stored, or disposed.

Hazardous Waste and Solid Waste Amendments Act of 1984, 42 U.S.C. 6901, enacted by Pub. L. No. 98-616

The Hazardous Waste and Solid Waste Amendments Act of 1984 are amendments to RCRA that authorize regulations or require that regulations be promulgated on waste minimization, land disposal of hazardous wastes, and underground storage tanks.

Nevada hazardous and solid waste regulations:

Nevada Administrative Code: Chapter 444, Sanitation:

Sections 842-8746, Facilities for the Management of Hazardous Waste

Sections 8752-8788, Program for Reduction of Hazardous Waste

These regulations establish fees, variances, restrictions, and permits and adopt EPA waste management regulations, 40 CFR 260 to 270 as a part of the Nevada Administrative Code.

Nevada Administrative Code: Chapter 444, Sanitation:

Sections 570-748, Solid Waste Disposal

This regulation sets forth the definitions, methods of disposal, collection and transportation standards, and classification of landfills. The regulation also addresses the disposal of special wastes including sewage sludge, septic tank pumpings, and medical wastes.

Hazardous Materials Transportation Regulations

U.S. Department of Transportation regulations addressing hazardous waste are discussed above.

The transportation of infectious substances and biological materials is also addressed in the regulations. The U.S. Department of Transportation uses the World Health Organization (WHO) risk group classifications in identifying infectious substances and biological products that are subject to its Federal transportation regulations (49 CFR 173). The transportation regulations do not apply to Risk Group 1 substances; these wastes can be managed as sanitary solid wastes. The biological simulants to be used in the tests or experiments are classified as Risk Group 1 by the WHO.