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ENVIRONMENTAL PROTECTION

**Decision Document
for
Site 7, Napalm Burn Pit**

Naval Air Station Fallon
Fallon, Nevada

Delivery Order 0013

March 2002

ARCHITECT-ENGINEERING SERVICES
**ENVIRONMENTAL
RESTORATION PROJECTS**

ENGINEERING FIELD ACTIVITY
NORTHWEST, NAVAL FACILITIES
ENGINEERING COMMAND
CONTRACT NO. N44255-00-D-2476



THE URS TEAM

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DECLARATION OF THE DECISION

SITE NAME AND LOCATION

Site 7, Napalm Burn Pit
Naval Air Station Fallon
Fallon, Nevada

CERCLIS Identification Number
NV9170022173

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy for Site 7, the Napalm Burn Pit, at Naval Air Station (NAS) Fallon, in Fallon, Nevada. This decision is based on information contained in the Administrative Record for the site and is in accordance with the general guidelines of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is also in accordance with Nevada Administrative Code (NAC) 445A.226 through 445A.22755.

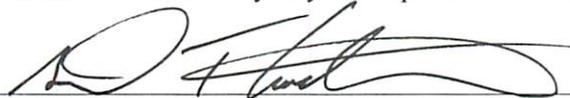
The U.S. Navy selected the remedy and the State of Nevada concurs with the remedy selection.

DESCRIPTION OF THE SELECTED REMEDIES

Site 7 is an alleged napalm burn pit located within Site 21 (the Receiver Site Landfill). Interviews, a review of aerial photographs, and the results of sampling have not established the existence of the napalm burn pit. Hydrocarbon impacts were observed in soil and groundwater; however, these impacts were of limited extent. Accordingly, No Further Action is necessary at the site to protect human health and the environment.

STATUTORY DETERMINATIONS

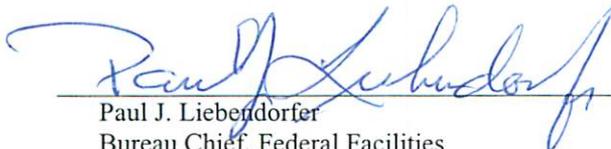
There is no contamination that can be clearly related to Site 7. The conclusions of the baseline risk assessment are that current or potential future site conditions pose no unacceptable risk to human health or the environment. Accordingly, No Further Action is required at this site. Petroleum compounds identified within Site 21 that could potentially be related to Site 7 will be addressed through measures proposed for Site 21. The site may be reopened for further evaluation and if necessary cleanup, based on newly discovered information that leads the Navy and the Nevada Division of Environmental Protection (NDEP) to determine that the remedy may not be protective of human health and the environment.



Captain Brad T. Goetsch
Commanding Officer
Naval Air Station Fallon

17 May 2002

Date



Paul J. Liebenдорfer
Bureau Chief, Federal Facilities
Nevada Division of Environmental Protection

4 June 2002

Date

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ABBREVIATIONS AND ACRONYMS

bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CRP	community relations plan
EPA	U.S. Environmental Protection Agency
ER, N	Environmental Restoration, Navy
FS	feasibility study
GC	gas chromatograph
IR	Installation Restoration
LD	lower diagonal
MCL	maximum contaminant level
µg/kg	microgram per kilogram
µg/L	microgram per liter
mg/kg	milligram per kilogram
mg/L	milligram per liter
NAC	Nevada Administrative Code
NAS	Naval Air Station Fallon
Navy	U.S. Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDEP	Nevada Division of Environmental Protection
NPL	National Priorities List
PA	preliminary assessment
PAH	polycyclic aromatic hydrocarbon
PID	photoionization detector
RAB	Restoration Advisory Board
RI	remedial investigation
SI	site inspection
SVOC	semivolatile organic compound
TCLP	toxicity characteristics leaching procedure
TPH	total petroleum hydrocarbons
TPH-E	total petroleum hydrocarbons—extractable
TPH-P	total petroleum hydrocarbons—purgeable

DECISION DOCUMENT FOR SITE 7
Naval Air Station Fallon
U.S. Navy, Engineering Field Activity, Northwest
Contract No. N44255-00-D-2476
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Abbreviations and Acronyms
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ABBREVIATIONS AND ACRONYMS (Continued)

TRC	Technical Review Committee
VOC	volatile organic compound

DECISION SUMMARY

1.0 INTRODUCTION

This decision summary describes the site-specific factors and analyses that led to the selection of No Further Action as the remedy for Site 7 at Naval Air Station (NAS) Fallon in Fallon, Nevada. The decision summary includes information regarding site background, the nature and extent of contamination, current and potential site and resource uses, and the assessment of human health and environmental risks. It also describes the involvement of the public throughout the process.

Site 7, referred to as the Napalm Burn Pit, is one of 21 potentially contaminated sites identified during a preliminary assessment/site inspection (PA/SI) performed at NAS Fallon in 1988. Site 7 is believed to have been located geographically within the boundaries of Site 21. This decision document pertains only to Site 7. Separate decision documents will be prepared for each of the other sites at NAS Fallon, including Site 21.

This decision document supercedes and replaces the *Draft Final Decision Document, Site 7, Napalm Burn Pit, Naval Air Station Fallon*, dated August 27, 1999. Documents supporting the decision are included in the Administrative Record for the site. Key documents are identified in Section 9.

The format and organization of this decision document are based on U.S. Environmental Protection Agency's (EPA's) *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, dated July 1999. The content of this decision document includes the pertinent elements of Nevada Division of Environmental Protection's (NDEP's) *Requirements for IRP Decision Documents*, transmitted in a letter dated December 30, 1998. This decision document is organized as follows:

- **Declaration of the Decision.** Functions as the abstract and formal authorizing signature page for the decision document
- **Section 1—Introduction.** Summarizes the purpose and organization of the decision summary portion of the decision document, identifies the site to which the decision document pertains, and clarifies the relationship of this decision document to previous versions of the decision document

- **Section 2—Site Name, Location, Description, and History.** Identifies and describes the site, provides location and property ownership information, and summarizes the site history that led to contamination as well as previous investigation activities
- **Section 3—Community Participation.** Documents community participation activities throughout the decisionmaking process, references the “responsiveness summary” in Appendix A, and describes the location and availability of the Administrative Record
- **Section 4—Scope and Role of Site.** Discusses Site 7 in relation to other sites at NAS Fallon, and identifies when and where monitoring or remedial activities at other sites influence, or are influenced by, monitoring or remedial activities at Site 7
- **Section 5—Site Characteristics.** Summarizes the regional, facility, and site-specific characteristics and conditions, including concentrations and distribution of contaminants
- **Section 6—Current and Potential Site and Resources Uses.** Discusses the current and potential future uses of the land and resources and summarizes the land use controls applying to the site
- **Section 7—Summary of Site Risks.** Discusses risks due to contamination present at the site
- **Section 8—Statutory Authority Finding.** States the conclusion that no further action is necessary at Site 7
- **Section 9—Documentation of Significant Changes.** Describes the changes made to this decision document on the basis of comments received during the public comment period
- **Section 10—Bibliography.** Provides a list of references used in preparing the decision document

2.0 SITE NAME, LOCATION, DESCRIPTION, AND HISTORY

NAS Fallon is located in west-central Nevada, approximately 6 miles southeast of the city of Fallon and 70 miles east of the city of Reno (Figure 2-1). NAS Fallon currently serves primarily as an aircraft weapons delivery and tactical air combat training facility. The Navy is expected to maintain NAS Fallon in the foreseeable future as it has for the past 50 years.

2.1 SITE DESCRIPTION

Site 7, the Napalm Burn Pit, is in the northeastern portion of NAS Fallon (Figure 2-2). The site's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Identification Number is listed as NV9170022173. NAS Fallon is the lead agency for site activities, and the NDEP serves as the lead regulatory agency. Funding for all activities related to this site was obtained under the Environmental Restoration, Navy (ER,N) account.

There are two suspected locations for Site 7, both of which are unused, open land. NAS Fallon does not expect any change in the use of this land, or that of the surrounding Site 21 in the near future. During interviews conducted in 1988 as part of the PA/SI, several NAS Fallon personnel indicated that Site 7 had been used from the early 1960s to 1983 as a napalm burn pit. Site 7 is presumed to have been located in one of two possible areas within Installation Restoration (IR) Site 21 (Figures 2-2 and 2-3). One subsequent interviewee from NAS Fallon recalled napalm burning being conducted in the area of what is now Site 1 and not at Site 7. Based on these interviews, it is probable that napalm burning was conducted at Site 7. Other sources of information such as aerial photographs and analytical results from sampling have not established a precise location for the Napalm Burn Pit.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The purpose of the U.S. Navy's (Navy's) IR Program is to identify, assess, characterize, and clean up or control contamination from past hazardous material spills and waste disposal activities at Navy and Marine Corps facilities. As part of the IR Program, NAS Fallon conducted the following investigations:

- The PA/SI constituted Phase I of three investigation/assessment phases conducted at the site. During Phase I, information was gathered by means of employee interviews, site inspections, record searches, and laboratory analysis of a limited

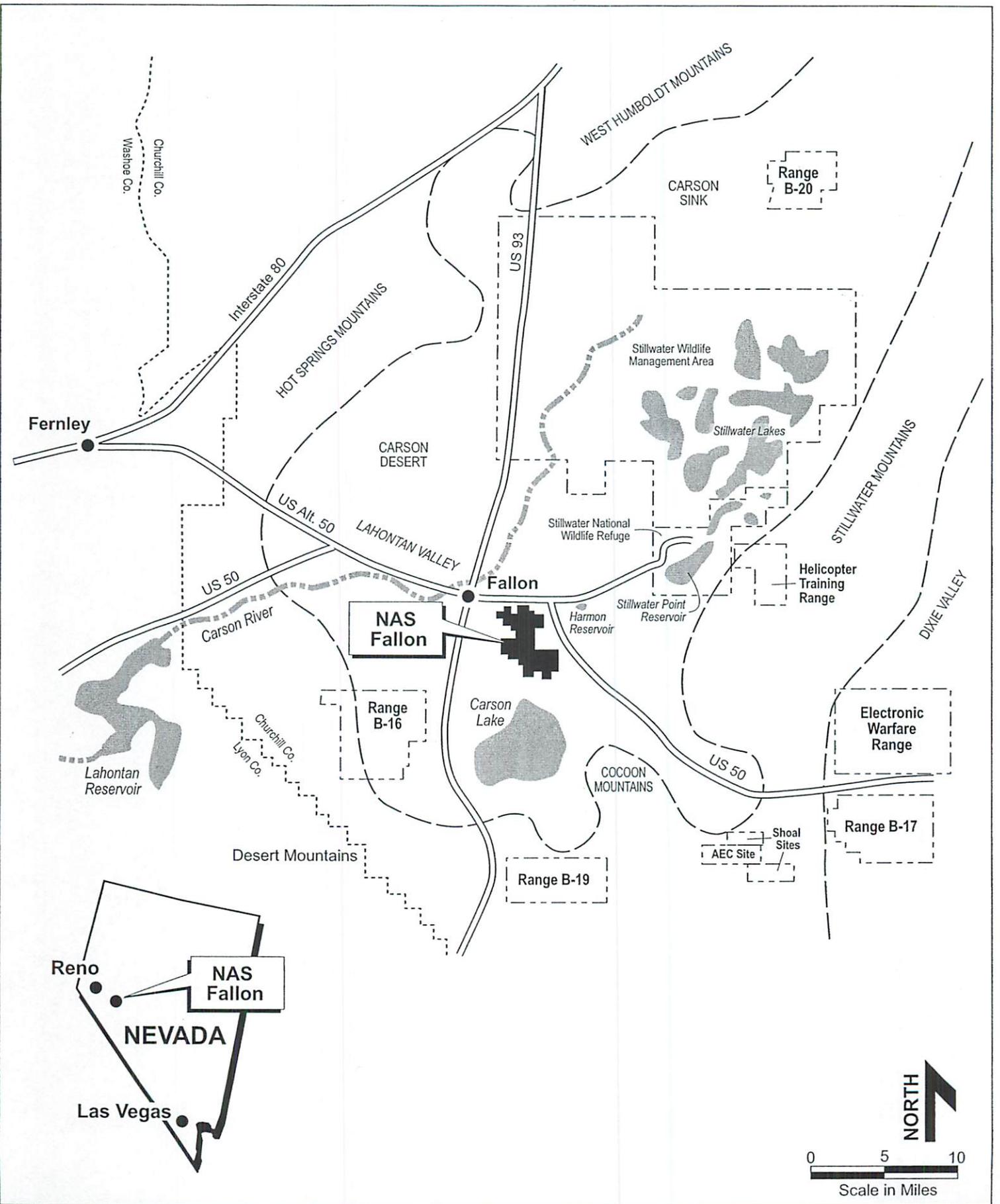
number of samples. During the PA/SI interviews, several NAS Fallon personnel indicated that napalm burning was conducted in the area now suspected as Site 7. Burning was apparently conducted by placing napalm canisters in a pit, where they were axed open, saturated with diesel fuel, and ignited. One interviewee later indicated that he believed napalm burning was conducted at what is now Site 1, rather than at Site 7.

- Phase II consisted of remedial investigation (RI) that included a baseline risk assessment conducted in 1994. The RI concluded there was no threat to human health or the environment; therefore, the recommendation was No Further Action.
- Subsequent to the RI, the NDEP requested that additional characterization be performed at the site. In 1998 and 1999, the third and final phase of activities at this site was conducted as part of the additional characterization scheduled for IR Site 21. Since the alleged locations of Site 7 were presumably within the Site 21 footprint (Figure 2-3), groundwater and soil samples to further characterize Site 7 were obtained from the two possible locations as part of the Site 21 characterization (Figure 2-3).

After the RI was published, the Navy prepared a draft decision document for Site 7 presenting a decision of No Further Action. The NDEP provided comments on the draft decision document. A draft final decision document for Site 7 was prepared, and the NDEP provided comments on the draft final document. Responses to comments on the draft final decision document were presented to the NDEP. During the review and response process with the NDEP, the NDEP and the Navy agreed to substantially revise the decision document and to include additional data collected after the preparation of the August 1999 draft final decision document for Site 7. This version, therefore, supersedes and replaces all previous versions.

In February 12, 1996, the EPA determined that NAS Fallon should not be listed on the National Priorities List (NPL); therefore, the EPA is not involved in the review of IR Program activities at NAS Fallon.

The NDEP is the state lead regulatory agency responsible for protection and enhancement of the environment of the State of Nevada. The NDEP Bureau of Federal Facilities reviews and comments on NAS Fallon's IR Program response actions.



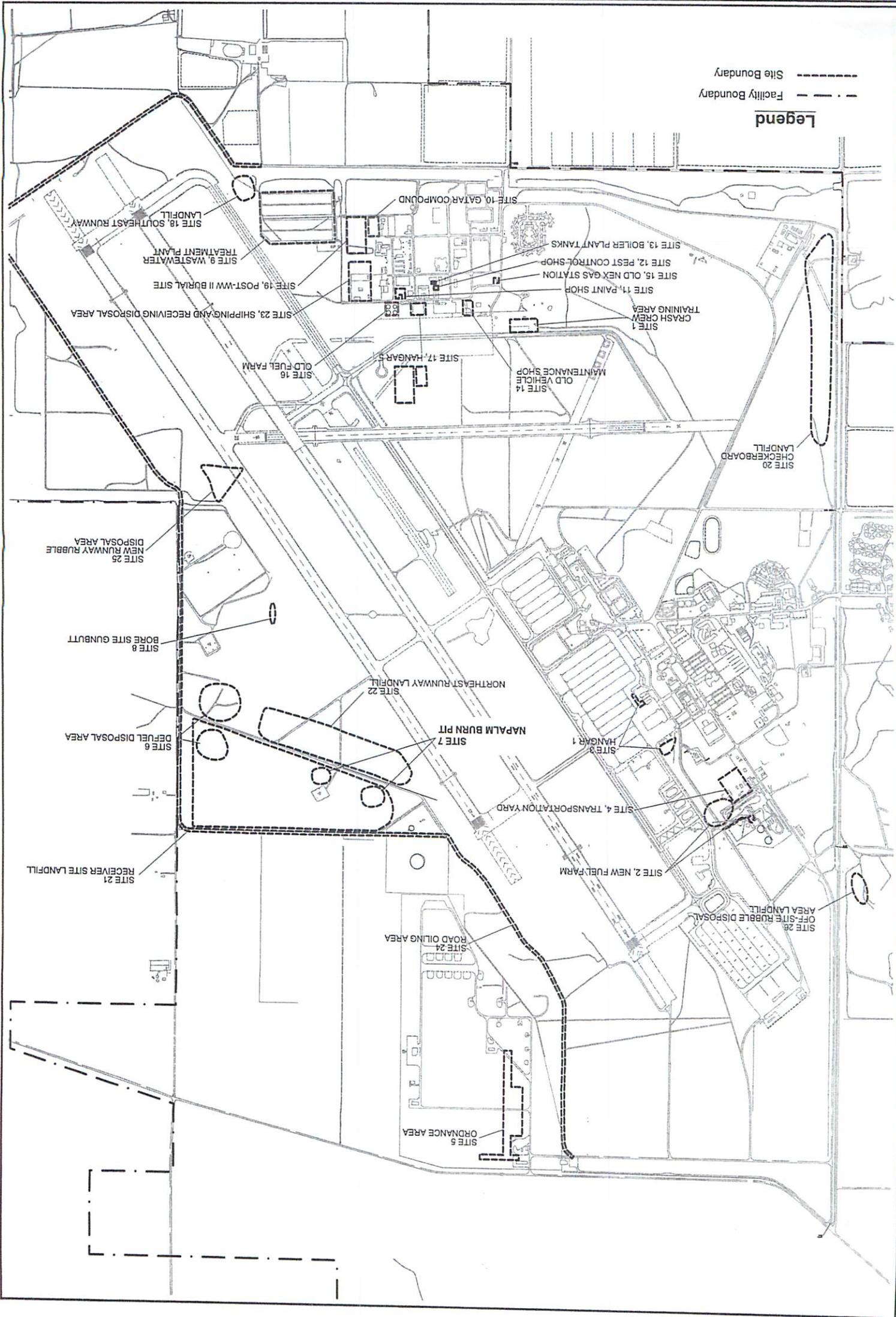
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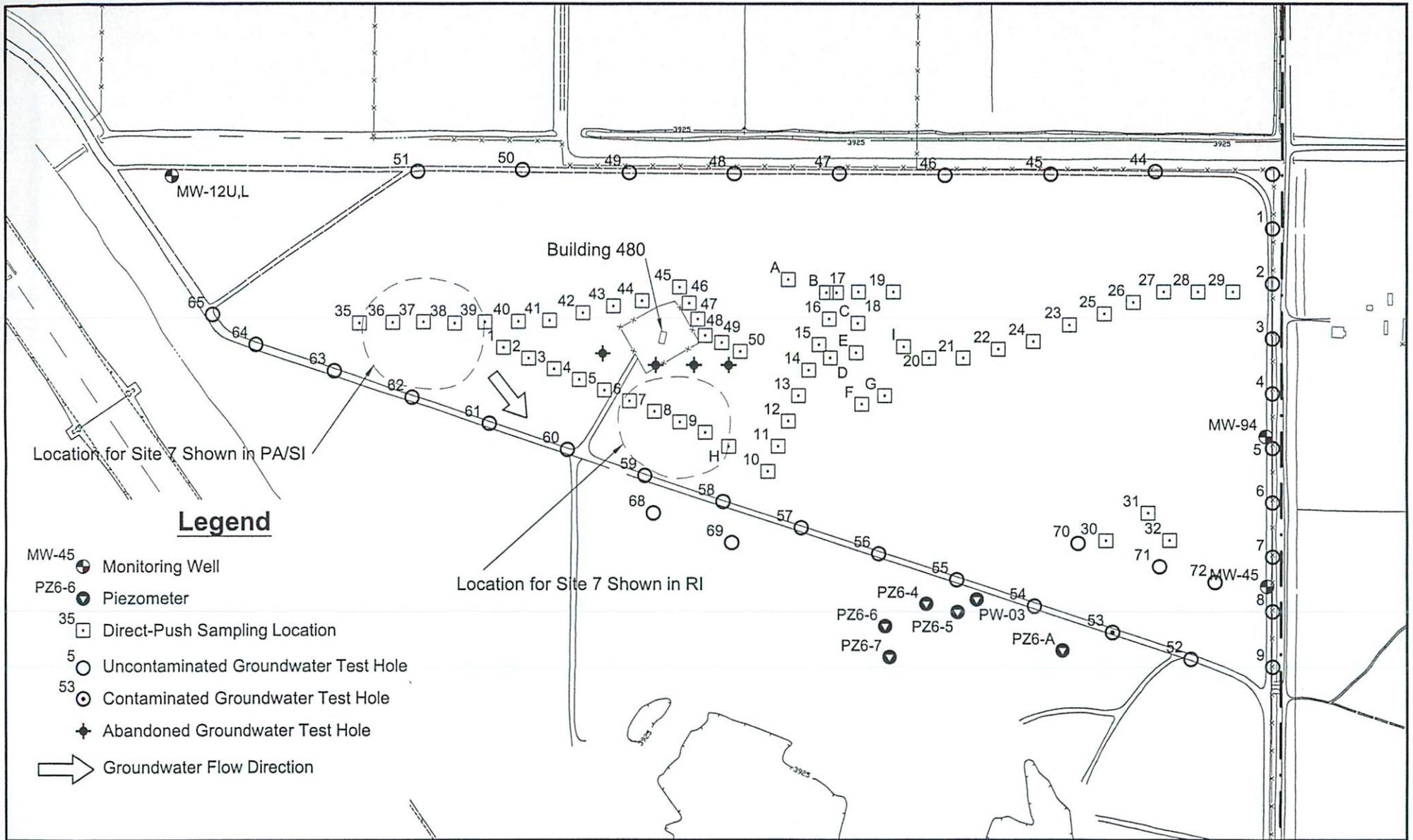


Figure 2-2
NAS Fallon Facility Map

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SITE 7

Legend
--- Site Boundary
- - - Facility Boundary





Legend

- MW-45 Monitoring Well
- PZ6-6 Piezometer
- 35 Direct-Push Sampling Location
- 5 Uncontaminated Groundwater Test Hole
- 53 Contaminated Groundwater Test Hole
- Abandoned Groundwater Test Hole
- Groundwater Flow Direction

U.S. NAVY

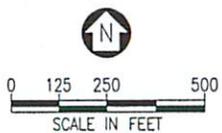


Figure 2-3
Sampling Locations in the Vicinity of Site 7,
Napalm Burn Pit

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 NAS Fallon
 DECISION DOCUMENT
 SITE 7

3.0 COMMUNITY PARTICIPATION

Community participation is being carried out under a community relations plan (CRP) drafted pursuant to Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). In 1989, a Technical Review Committee (TRC) was formed in an effort to increase community participation in and awareness of the IR sites and proposed actions under NAS Fallon's IR Program. The TRC consisted of state and local regulatory representatives and NAS Fallon personnel. The TRC met in June 1989 to discuss potential requirements for future PA/SI or RI and feasibility study (FS) activities at NAS Fallon. This meeting provided an opportunity for the regulatory agencies to comment on and provide input to the proposed IR Program at NAS Fallon.

In August 1994, a Restoration Advisory Board (RAB) was established to replace the TRC. The RAB meets once a year and consists of members originally on the TRC and representatives from the local community.

All documents associated with this site, such as the PA/SI report, the RI report, the CRP, and the Proposed Plan for Site 7, were made available to the public in the Administrative Record at NAS Fallon (Fallon, Nevada), the Churchill County Public Library (Fallon, Nevada), the University of Nevada Reno Library (Reno, Nevada), and at the Engineering Field Activity, Northwest, Offices (Poulsbo, Washington). The notice of the availability of these documents was published in the *Lahontan Valley News/Fallon Eagle Standard* on February 12 and 13, 2002. Notices were also sent to individuals on the RAB mailing list. A public comment period was held from February 14 to March 16, 2002. In addition, a public meeting was held on February 21, 2002, to present the Proposed Plan to a community audience that was broader than that which had already been involved at the site. At this meeting, representatives from NAS Fallon and the NDEP presented the Proposed Plan. The plan for No Further Action was not altered as a result of public comments.

4.0 SCOPE AND ROLE OF SITE AND RESPONSE ACTION

As indicated in various previous documents, which are available in the Administrative Record, Site 7 is grouped with three other sites due to their proximity to one another and the potential for commingled contaminated areas (Figure 2-2). The sites, referred to as "Group II Sites," are IR Site 6 (Defuel Disposal Area), Site 7 (Napalm Burn Pit), 21 (Receiver Site Landfill), and Site 22 (Northeast Runway Landfill). Site 7 lies within the boundaries of Site 21. An alleged northern portion of Site 6, the Defuel Disposal Area, also lies within the boundaries of Site 21, near the southeast corner. The remaining portion of Site 6 is located immediately south of the southeast corner of Site 21. Site 22 lies immediately south of the western two-thirds of Site 21. Because Site 7 is located within the boundaries of Site 21 and upgradient of Sites 6 and 22, many of the sampling results obtained from these sites are also relevant to Site 7.

Sampling locations in the vicinity of Site 7 include the following:

- Auger-boring sampling locations along the perimeter of Site 21 (Site 7 is within Site 21). Auger-boring sampling was conducted at these locations from which groundwater samples were collected for qualitative analysis (these locations are referred to as "groundwater test holes"). Data collected from groundwater test holes were not of adequate quality for quantitative assessment of the site and were not used for quantitative site assessment. Data collected from groundwater test hole locations were used only as a qualitative tool for decisions on where to site permanent wells or conduct further quantitative evaluations.
- Direct-push sampling locations within the boundaries of Site 21, including suspected locations of Site 7, from which soil and groundwater samples were collected for quantitative analysis.
- Permanent monitoring wells upgradient (MW12U&L) and downgradient (PW03, MW45, and MW94) of Site 21 (Site 7 is within Site 21). Wells MW12U and MW12L are located approximately 800 feet upgradient of the westernmost suspected Site 7 location. Wells PW03 and MW45 are located approximately 1,000 and 1,700 feet, respectively, downgradient of the easternmost suspected Site 7 location. Well MW94 is located approximately 1,900 feet downgradient and slightly crossgradient of the easternmost suspected Site 7 location.
- Piezometers in the area of Sites 7 and 21.

For clarity, the sampling locations used as a basis for the decision for Site 7 are summarized in Table 4-1, along with the sampling date and information about the use of the data collected from each location.

NAS Fallon has selected No Further Action as the preferred alternative for Site 7 for the following reasons:

- The baseline risk assessment conducted as part of the RI concluded there was no threat to human health or the environment.
- Subsequent sampling confirmed that in the two possible locations of Site 7, there are no potential contaminants of concern (these are identified in Section 5) at concentrations greater than regulatory action levels.
- Groundwater and soil samples obtained from, and downgradient of, the alleged pit locations have consistently failed to indicate an impact associated with napalm burning at the site. Sampling locations and analytical results are described in Section 5.
- Information obtained during the initial interviews about napalm burning at this site was refuted by later documentation. Reviews of other sources of information including aerial photographs have not confirmed napalm burning at the suspected locations.

**Table 4-1
 Summary of Data From Sampling Locations Used as
 Basis of Decision for Site 7, Napalm Burn Pit**

Sampling Location	Data Type	Sampling or Measurement Dates	Data Uses
Locations Within the Area for Site 7 Shown in Preliminary Assessment/Site Inspection			
Direct-push sampling locations 36 through 39	Concentrations of TPH, VOCs, SVOCs, and metals in soil and groundwater samples	September to October 1998	Direct assessment of presence or absence of potential contaminants in groundwater related to Site 7 at this alleged location.
Locations Within the Area for Site 7 Shown in Remedial Investigation			
Direct-push sampling locations 6 through 9 and H	Concentrations of TPH, VOCs, SVOCs, and metals in soil and groundwater samples	September to October 1998 1999 (Station H)	Direct assessment of presence or absence of potential contaminants in groundwater related to Site 7 at this alleged location.
Other Group II Locations That Provide Vicinity Data Relevant to Site 7			
Groundwater test holes 1 through 22 and 44 through 76	Qualitative—presence or absence of VOCs in headspace	March 1991	Qualitative assessment of volatile contaminants migrating from Site 21 as a whole, including potential Site 7 contaminants. Used to choose locations for quantitative sampling.
Piezometers PZ6-4 through PZ6-7 and PZ6-A	Depth to groundwater	Periodically April 1991 to present	Depth to groundwater measurements were collected periodically at a subset of the piezometers and monitoring wells installed around the Group II sites, including Site 7. These data were used to establish groundwater flow direction and gradient.
Permanent monitoring wells MW12U, MW12L, MW45, MW94, and PW03	TPH, BTEX, SVOCs, and metals concentrations in groundwater samples Depth to groundwater	Periodically July 1990 through November 1999	Quantitative assessment of petroleum contaminants migrating from Site 21 as a whole, including potential Site 7 contaminants. Not all of the wells listed were sampled during every sampling event. The decision for No Further Action is supported by (not based solely on) results provided by these wells.
Direct-push sampling locations 1 through 5, 10 through 19, 35, and 40 through 50	Concentrations of TPH, VOCs, SVOCs, and metals in soil and groundwater samples	September to October 1998	Because the location of Site 7 was never firmly established, data from these locations allow an assessment of presence or absence of contaminants in groundwater that could indicate the presence of Site 7 at a location within Site 21 other than the two alleged to date.
Direct-push sampling locations A through G and I		1999	

Notes:
 BTEX - benzene, toluene, ethylbenzene, and total xylenes
 SVOC - semivolatile organic compound
 TPH - total petroleum hydrocarbons
 VOC - volatile organic compound

5.0 SITE CHARACTERISTICS

This section summarizes the characteristics and conditions of the region, the facility, and the site. It describes the physical and ecological setting, climate, surface water patterns, and geology and hydrogeology, as well as the nature and extent of contamination and the fate and transport of chemicals of concern.

5.1 PHYSICAL SETTING

5.1.1 Physical Setting of Facility

NAS Fallon lies on a broad, flat alluvial plain in the southern Carson Desert referred to as the Lahontan Valley. The Carson Desert is part of the Basin and Range geological province. Carson Lake, a series of ditches and small marshes, is a few miles south of the facility. The Stillwater Lakes, a chain of small lakes, ponds, and marshes, extend for 20 miles south of the Carson Sink in the northern half of the Carson Desert (Figure 2-1). Carson Lake and the Stillwater Lakes are two wetland areas that serve as an important stopover for migratory birds during the spring and fall. Recent drought years have caused the Stillwater Lakes to shrink from approximately 100,000 acres of wetlands in 1983 to 4,000 acres of wetlands in 1991.

The Carson Desert is a hydrologically closed depression that forms the sink for the Carson River. The entire area is in the rain shadow of the Sierra Nevada Mountains; consequently, precipitation is about 5 inches per year. About 80 percent of the Carson Desert surface consists of the Carson River floodplain, with the rest composed of playas and alluvial fans. The surface soils are enriched with salts and cations such as arsenic, lithium, mercury, and molybdenum that have been transported to the basin by the river and have been concentrated as a result of evaporation of ancient Lake Lahontan.

The Carson River, augmented by the Truckee River via the Truckee Canal (part of the Newlands Irrigation Project), provides more than 95 percent of all surface runoff received by the Carson Desert. Much of the area around the facility is irrigated; several irrigation ditches deliver water, and drainage canals remove excess water. The drainage canals generally intersect the shallow water table aquifer and drain excess water from the farmland.

There are two major drainage canals at NAS Fallon:

- The “lower diagonal (LD) drain,” the alignment of which is along the southwestern edge of the facility and east along the southern boundary of the facility proper
- The “LD #1 drain,” which crosses onto the facility just north of Site 2, (the New Fuel Farm), drains to the east from the west side of the facility, and then drains to the south

The most important distinction between the irrigation ditches and the drainage canals (drains) is that the drains are intended to accept discharge of shallow groundwater as well as surface water and to conduct the water away from the drained areas. Conversely, the irrigation ditches deliver water to the fields. In the process of carrying off excess surface water and shallow groundwater, the drains remove minerals or salts leached from the farmland. The drains carry water southeastward to Carson Lake and northeastward to the Harmon and Stillwater Point Reservoirs.

5.1.2 Physical Setting and Aerial Photographs of Site 7

The location of Site 7 within Site 21 has never been established; therefore, this description of the physical setting often refers to Site 21 in general. Site 7 is typically shown in figures as encompassing a roughly circular area approximately 280 feet in diameter, representing a potential size for the napalm burn pit mentioned by employees in initial interviews conducted during the PA/SI. Site 7 is variously shown as being located south of the fenced compound surrounding Building 480 and west of this compound within the boundaries of Site 21.

The entire area of Site 21, including the purported locations for Site 7, is unpaved. The surface consists of bare earth, scrub vegetation, and dirt roads. There are no surface water bodies at Site 21. The area of Site 21 is roughly triangular in shape and is bounded by paved roadways (Figure 2-3) and by the main air station boundary to the east. The LD #1 drain borders Site 21 to the north (Figure 2-3). There are no areas of archaeological or historical importance at Site 21.

Aerial photographs taken in 1954, 1962, 1964, 1968, and 1974 covering the possible location of Site 7 were reviewed for evidence of the napalm burn pit. There is no overt evidence of the burning of any substance at Site 21 as a whole (that is, no active smoke plumes, no jagged lines indicating a fire line). However, the scale and resolution of these photographs limit their interpretation. As far back as 1954, roads and modified land are apparent in the photographs, mostly at the extreme west end of Site 21. Structures and vehicles are apparent on the west end

of Site 21 beginning in the 1962 photograph. Circular features that could potentially indicate a burn pit are most apparent in the 1968 and 1974 photographs. However, these features could as easily be burial pits or depressions with standing water. A circular feature is apparent in the central portion of Site 21 in nearly all of the photographs. This feature could be a natural depression, a long-standing dump site, a large burn pit, or all three.

These photographs were determined to be inconclusive in terms of evidence that napalm burning was conducted at Site 7.

5.2 ECOLOGY

5.2.1 Vegetation

NAS Fallon was originally a greasewood community typical of alkali valley bottom lands, portions of which have since been irrigated and used as pasture. Typical plants for this area include saltbush, pickleweed, halogeton, greasewood, milkweed, poverty weed, alkali goldenbush, rabbitbrush, saltgrass, and sorghum.

The flat, alkali bottom lands making up the southern portion of the Carson Sink currently receive sufficient irrigation return flow and Carson River water to be recognized as a wetland habitat, especially for waterfowl. Vegetation typical of these areas includes bullbush, cattail, pondweed, widgeon grass, muskgrass, and coontail. Cottonwoods and willows occupy portions of the banks of various ponds, ditches, and drains.

5.2.2 Endangered and Threatened Plant Species

No endangered or threatened plant species designated by the state or federal government are known or likely to occur in the region.

5.2.3 Wildlife

Terrestrial wildlife in the region consists of species adapted to the desert or dependent on wetlands. About 67 species of mammals inhabit the area. Mountain ranges in the region, outside of the area of human impact, support large mammals such as mountain lions and mule deer. Common mammals of the area include coyote, black-tailed hare, jackrabbit, deer mouse, antelope, ground squirrel, and kangaroo rat.

More than 252 species of birds have been recorded regionally. Upland game birds of the desert are the ring-necked pheasant, sage grouse, the introduced chukar partridge, quail, and mourning dove. A variety of raptors and songbirds are also present.

The Stillwater National Wildlife Management Area, 7 miles east of NAS Fallon, and Carson Lake, 4 miles south of NAS Fallon, support the two largest concentrations of waterfowl and shorebirds in the state. Important game birds include canvasbacks, whistling swans, and Canada geese. Nongame species include the American avocet, black-necked stilt, white-faced ibis, and dowitchers.

5.2.4 Aquatic Life

The drains at NAS Fallon may be inhabited by mosquito fish, bullhead, catfish, and sunfish.

5.2.5 Endangered Animal Species

Federally listed endangered and threatened animal species that may utilize the NAS Fallon and range areas include the peregrine falcon and the southern bald eagle. These species are most likely to be found hunting the wetland portions of the area but may occasionally be seen elsewhere. The nearest breeding habitat is to the northwest, outside the boundaries of the NAS Fallon facility.

5.3 GEOLOGY AND HYDROGEOLOGY

5.3.1 Regional and Facility Geology

The area within and surrounding NAS Fallon consists geomorphically of an intermontane valley. The mountains near NAS Fallon are composed primarily of a variety of consolidated igneous, sedimentary, and metamorphic rocks that range from Triassic to Quaternary in age.

The Basin and Range faulting that occurred during the Cenozoic Era probably formed the bedrock surface below the valley fill sediments. This formation of the intermontane valley was accompanied by deposition of valley-fill sediments on the floor to depths of several thousand feet. Sediment composing the valley fill was derived from three primary sources:

- Upstream valleys of the Carson River drainage
- Upstream valleys of the Humbolt River basin
- Mechanical weathering of consolidated rocks within the Carson Desert itself

It appears that most of the valley-fill sediments in and around NAS Fallon were transported into the valley by the ancestral Carson River.

The depositional character of the valley-fill sediments at NAS Fallon was greatly influenced by the presence of the ancient Lake Lahontan, a Quaternary-age lake that was subject to numerous cycles of advancement and retreat. Regional climatic changes caused dramatic oscillations of lake stages and shorelines throughout the Pleistocene Epoch. Subsurface stratigraphic evidence also suggests the existence of pre-Quaternary-age lakes in the valley. The pluvial influences on sediment deposition were extensive and probably varied during the greater part of Cenozoic time.

The alternating influences of wave action, standing water, flowing water, and wind on the sediment transported into the valley by the Humbolt and Carson Rivers resulted in a complex sequence of interfingering and interbedded deposits of fluvial, deltaic, lacustrine, and eolian deposits.

Previously published descriptions of these deposits were generally confirmed during the installation of monitoring wells across the facility. However, the highly transmissive, coarse-grained deposits were found to be both laterally and vertically discontinuous because of the nature of deposition. Below the upper 20 feet of interbedded coarse-grained and fine-grained deposits, a laterally continuous bed of fine-grained silts and clays forms an aquitard, providing a natural barrier to the downward migration of groundwater and contaminants.

A generalized geologic cross section showing the stratigraphy beneath NAS Fallon is provided in Figure 5-1.

5.3.2 Regional and Facility Hydrogeology

Abundant groundwater is present in the valley-fill sediments and the underlying volcanic strata of the Carson Desert as a result of the closed nature of the hydrologic basin and the remnants of

Pleistocene Lake Lahontan that once covered the entire area. Groundwater occurs in three principal aquifer systems: (1) a shallow alluvial aquifer, (2) intermediate and deep alluvial aquifers, and (3) a basalt aquifer.

The shallow, water-table aquifer occupies the alluvium from near the ground surface to about 25 feet below ground surface (bgs). Many residents living outside of the city of Fallon have shallow wells in this aquifer, which are used for domestic water, livestock watering, and irrigation. The shallow aquifer is composed of many interconnected zones of varying permeability, ranging from highly transmissive channel sands to less-transmissive silty clay floodplain and lake deposits. The water quality is generally poor because the water has a high concentration of dissolved solids; however, freshwater recharge from the surface-water irrigation system helps maintain water quality in some parts of the valley.

Reports of regional water quality in the shallow alluvial aquifer and irrigation return flows contain information on the range of concentrations of various metals and anions. This information is summarized in the *Preliminary Site Characterization Summary*. Although the concentrations of these constituents vary considerably, there is a trend of increasing concentrations toward discharge areas at the Stillwater Lakes and Carson Lake. Concentrations of many trace metals exceed various criteria for the protection of aquatic life and crops, effect levels for fish reproduction, and limits for the propagation of wildlife. For example, background concentrations of boron in surface water often exceed the effect level for fish reproduction of 200 µg/L, and concentrations of arsenic in groundwater and surface water often exceed the Nevada criterion for the protection of aquatic life of 40 µg/L and the drinking water standard of 50 µg/L.

The regional groundwater flow direction is to the east and southeast toward Grimes Point. The velocity of the regional groundwater flow has been estimated to be 35 feet per year. The site-specific groundwater flow velocities from numerous aquifer tests are highly variable.

Intermediate and deep alluvial aquifers are present beneath the shallow alluvial aquifer. The boundary between the shallow and the intermediate aquifer is a relatively impermeable clay layer, approximately 20 feet thick. The water in the intermediate and deep aquifers is generally of better quality than the water in the shallow aquifer. The boundary between the intermediate and deep aquifers is defined primarily on the basis of water quality, rather than the presence of a physical boundary. Water quality in the intermediate and deep alluvial aquifers generally improves with depth.

The deep alluvial aquifer extends to approximately 2,200 feet bgs near the center of the basin. The basalt aquifer lies within the intermediate and deep alluvial aquifers at a depth of approximately 600 feet bgs, within an approximately 4-mile radius around Rattlesnake Hill, a small volcanic cone that outcrops just north of the city of Fallon. The basalt aquifer is the only source of municipal domestic water in the area and is recharged from the intermediate and deep alluvial aquifers. The basalt aquifer is not present beneath NAS Fallon, except possibly in the extreme northeast corner of the facility. However, NAS Fallon derives all of its domestic water from this aquifer utilizing deep wells northeast of the facility.

Three monitoring wells penetrating the intermediate aquifer on the facility indicate a head difference of about 5 to 9 feet between the shallow unconfined aquifer and the intermediate confined aquifer. The head is higher in the intermediate aquifer, indicating artesian conditions that retard or preclude downward migration of groundwater at the facility. Because of this upward hydraulic gradient, investigations at the facility have focused on the shallow water-table aquifer, with three widely spaced wells drilled into the intermediate aquifer.

5.3.3 Site 7 Geology and Hydrogeology

The geologic information for the Group II sites (including Site 7) was obtained by soil sampling during the installation of monitoring wells MW12L, MW12U, MW45, MW46, MW47, MW48, MW49, MW57, MW58, MW94, and PW03, and piezometers PZ6-1 through PZ6-7 and PZ6-10. Note that some of these wells are located outside the boundaries of the figures used for this document (Figures 2-3 and 5-2). Monitoring wells MW12U and MW12L were installed as upgradient wells for the Group II sites. Monitoring wells MW45, MW57, MW94, and PW03 were installed near the downgradient perimeter of Site 21 and represent the downgradient wells closest to the alleged locations of Site 7. The piezometers and monitoring wells MW46, MW47, MW48, MW49, and MW58 were installed to the south of the eastern portion of Site 21 to investigate contamination associated with Site 6. These wells provide geologic data in the general vicinity of Site 7.

The monitoring wells listed in the previous paragraph typically penetrated the entire Fallon Formation and from 3 to 8 feet of the Seho Formation (see Figure 5-1 for the generalized stratigraphy in the area of NAS Fallon). Well MW12L fully penetrated the Seho Formation and reached its total depth in the Wyemaha Formation. The upper 20 feet of the sediments were found to represent nearshore deposition of silts and silty clays interbedded with silty clays and clays of ancient Lake Lahontan (the Fallon Formation). The contact between the Fallon Formation, representing the nearshore deposits, and the deeper lake clay deposits of the Seho Formation, is somewhat higher in the stratigraphic column near the Group II sites relative to

other areas at NAS Fallon. This contact was interpreted in boring logs as shallow as 7 feet bgs, but more typically near 14 feet bgs. The relatively shallow depth for this contact leads to the conclusion that this area is located near the margins of the last advancement of Lake Lahontan.

Monitoring wells MW12U, MW45, MW46, MW47, MW48, MW49, and PW03 were used to evaluate the shallow alluvial aquifer. Well MW12L was installed in the intermediate alluvial aquifer to determine the effect of hydraulic parameters on contaminant transport. The static head of MW12L is approximately 7 feet higher than that of adjacent well MW12U, which is completed in the shallow aquifer, providing direct evidence of an upward hydraulic gradient between these aquifers. Hydraulic conductivities based on bail-slug tests ranged from 0.3 feet per day in MW47 to 6.8 feet per day in MW48. An evaluation of pumping test data from well PW03 resulted in an estimated linear groundwater velocity of 4.5 feet per year, which is consistent with the type of sediments found beneath the Group II sites.

Elevations of the water table indicate a gradient and flow direction consistent with the regional flow direction, which is to the southeast. This flow direction was confirmed during the RI by an evaluation of data from the colloidal borescope. Depth to groundwater at the Group II Sites varies seasonally and ranges from 3.5 to 11 feet bgs.

5.4 NATURE AND EXTENT OF CONTAMINATION

This section first discusses numerical values appropriate for comparison to measured concentrations of contaminants in soil and groundwater and then discusses the results of the investigations conducted in the vicinity of Site 7.

The analytical results for soil and groundwater samples collected in the vicinity of Site 7 are summarized in Tables 5-1 and 5-2 and provided in more detail in Appendix B. Because Site 7 is located within Site 21, the data summaries include all of the Site 21 analytical data for potential Site 7 contaminants of concern in soil and groundwater. The data are summarized below and discussed in detail in the following subsections.

Within Site 21 as a whole, 53 soil samples were collected and analyzed for petroleum hydrocarbon constituents. Table 5-1 shows that ethylbenzene was detected in two soil samples, total xylenes in three soil samples, total petroleum hydrocarbon—extractable (TPH-E) as diesel in two soil samples, TPH-E as oil in two soil samples, and TPH-E as jet fuel in one soil sample. Within Site 21 as a whole, 62 groundwater samples were collected and analyzed for petroleum hydrocarbon constituents. Table 5-2 shows that ethylbenzene was detected in one groundwater

sample, total xylenes in two groundwater samples, TPH-E as oil in one groundwater sample, and TPH-E as jet fuel in two groundwater samples. TPH-E as diesel was not detected in any of the groundwater samples.

TPH-E (diesel, jet fuel, and oil ranges) was detected in 5 of 53 soil samples, with only 2 samples displaying concentrations greater than the action level of 100 mg/kg. Only one of these samples was collected from within a suspected Site 7 location (direct-push location 38). If significant napalm burning occurred at either of the suspected Site 7 locations, it resulted in no significant soil impacts regardless of the napalm composition (gasoline, diesel, jet fuel, or heavy oil). TPH-E (jet fuel and oil ranges) was detected in 3 of 62 groundwater samples, with only 1 sample displaying a concentration slightly greater than the action level of 1 mg/L in a suspected Site 7 location (direct-push location 38). These results suggest that napalm burning at either of the Site 7 locations did not result in significant soil contamination that could act as a source of groundwater contamination, and napalm burning did not result in significant groundwater contamination regardless of the composition of napalm burned at the site. Therefore, if napalm was burned at either of the two suspected Site 7 locations, impacts to the site are extremely limited and pose no threat to human health or the environment.

Other potential contaminants of concern for Site 7, including styrene, polycyclic aromatic hydrocarbons (PAHs) (especially naphthalene), and lead, were either not detected at Site 21 or detected at concentrations below regulatory action levels. Aluminum was detected in groundwater at most of the sampling locations within Site 21. However, as discussed below, the aluminum concentrations were within the range detected throughout NAS Fallon.

5.4.1 Numerical Values for Comparison to Contaminant Concentrations

Guidance from the NDEP states the following:

- For contaminants in groundwater, compare the maximum contaminant level (MCLs) listed in the EPA Drinking Water Regulations and Health Advisories to contaminant concentrations analyzed during investigation and/or remedial activities.
- For contaminants in soil, compare the toxicity characteristics leaching procedure (TCLP) allowable levels listed in 40 Code of Federal Regulations (CFR) Part 261.24 and the state action level pursuant to Nevada Administrative Code (NAC) 445A.2272 to contaminant concentrations analyzed during investigation and/or remedial activities.

- If contaminated soil is to be left in place, provide an A through K analysis pursuant to NAC 445A.227.

Contaminants that could have been released during the burning of napalm bombs with the use of diesel fuel for ignition are primarily petroleum hydrocarbons (because of incomplete combustion of the napalm and diesel fuel). Other contaminants include lead (from the petroleum used in the napalm), PAHs (especially naphthalene from the combustion and breakdown of petroleum products), aluminum (from the aluminum soap often used in the past to jelly gasoline to make napalm), and styrene (from polystyrene, a compound used more recently to jelly gasoline to make napalm).

The "soil action level" established by NAC 445A.2272 is 100 mg/kg for petroleum substances. The action level recommended by the NDEP for total petroleum hydrocarbons (TPH) in groundwater at NAS Fallon is 1.0 mg/L. This action level is considered by NAS Fallon to be provisional. For the petroleum constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX), the MCLs established by the EPA for groundwater are 0.005, 1.0, 0.70, and 10.0 mg/L, respectively.

As discussed in the following subsections, PAHs including naphthalene (which are included on the list of semivolatile organic compounds [SVOCs]) were not detected in soil or groundwater at Site 7, or all of Site 21. Because of this lack of detection, no rigorous effort has been made to establish numerical values for allowable concentrations of PAHs at the site.

5.4.2 Qualitative Data From Groundwater Test Holes

As discussed in Section 4, qualitative data was initially collected to assess the presence or absence of volatile contaminants in the general vicinity of the Group II sites, including Site 7. Sampling locations were then selected for quantitative analysis of soil and groundwater samples on the basis of the qualitative results and the regional groundwater flow direction. The sampling locations from which qualitative data were collected were called "groundwater test holes"; they consisted of hollow-stem auger borings from which one-time groundwater samples were collected. Each groundwater test hole was screened with the use of a hand-held photoionization detector (PID) to analyze the air space of the open boring. Then a groundwater sample was collected from the boring, and an aliquot of air from the headspace above the groundwater sample was analyzed with the use of a portable field gas chromatograph (GC). The generated data consisted of "presence or absence" indicators including detect or nondetect records for each

instrument at each sampling location. The rationale and methodology for sampling from the groundwater test holes is described in detail in Appendix C of the RI report.

The groundwater test hole data relevant to Site 7 are shown in Figure 5-2, which indicates by symbol type at each groundwater test hole location whether volatile contaminants were present or absent during sampling. The groundwater test holes provided screening-level data to assess the presence or absence of volatile contaminants that could be related to past napalm burning and could be migrating from Site 21 as a whole (which includes Site 7).

One of the groundwater test holes (number 53) located along the southeastern perimeter of Site 21 indicated the presence of volatile contaminants, and substantial additional investigation was subsequently conducted in this area. The contaminants found in this area were assessed as being associated with Site 6, not Site 7. The alleged locations for Site 7 are near neither Site 6 (including the alleged northern portion of Site 6 shown in Figure 2-2) nor the southeastern portion of Site 21 in general. Groundwater test holes along the perimeter of Site 21 near the alleged locations of Site 7 (including test holes numbered 57 to 63 and 68 to 69) did not indicate the presence of volatile contaminants in groundwater.

Although not definitive data, the groundwater test hole results provide a qualitative indication that at the time of sampling, volatile contaminants were not likely migrating from the portions of Site 21 that were suspected Site 7 locations. Given that results from the groundwater test holes were qualitative, the No Further Action decision is based on results of the quantitative direct-push sampling effort discussed in Section 5.4.5. The groundwater test hole results were used primarily to assess future quantitative sampling locations and provide only qualitative support to the No Further Action decision.

5.4.3 Piezometer and Other Groundwater Elevation Data

Piezometers and permanent monitoring wells have been installed at all of the sites under investigation at NAS Fallon. Groundwater elevation data from these piezometers and monitoring wells have been used to establish the regional groundwater flow direction and gradient beneath the facility. The difference between piezometers and monitoring wells is that the primary use of piezometers is the collection of groundwater level data, with the occasional collection of samples for laboratory analysis. Monitoring wells are typically used for both purposes.

At Site 7, the groundwater elevation data from monitoring wells and piezometers in the vicinity were used to assess which groundwater test holes might be contaminated if the napalm burn pit had existed and caused contamination. These data were also used to assess which of the existing

wells, installed to evaluate conditions relative to Site 21 as a whole, were most appropriately placed to evaluate the potential for migration of potential contaminants from Site 21 as a whole (including Site 7). Historical data from the selected wells were then reviewed to complete the assessment. Some of the wells were not ideally positioned relative to Site 7. However, analytical results for groundwater samples collected from these wells were used to further support the No Further Action decision, which was based on laboratory-reported analytical results from direct-push sampling (discussed in Section 5.4.5).

Representative groundwater elevation contours interpolated on the basis of water level measurements in June 1991 are shown in Figure 5-2. Water level data have been tabulated in the RI and subsequent progress reports.

5.4.4 Permanent Monitoring Wells

The locations of permanent monitoring wells in the vicinity of Site 7 were selected on the basis of the groundwater flow direction and the qualitative data from the groundwater test holes. Because Site 7 is located within Site 21 and the precise location of Site 7 is speculative, permanent monitoring wells relevant to Site 7 are located at the upgradient and downgradient boundaries of Site 21. Permanent downgradient monitoring wells were placed immediately south of the southeastern portion of Site 21 and along the eastern perimeter of Site 21. These locations were chosen because the groundwater flow beneath Site 21 is to the southeast and because the groundwater test holes in the area identified potential contamination only in the area of Site 6, which is alleged to be partially within the southeastern portion of Site 21.

The upgradient and downgradient monitoring wells were used to assess whether Site 21 as a whole (including Site 7) was causing contamination of groundwater beyond the boundaries of Site 21. Groundwater monitoring wells considered most relevant to Site 7 include MW12U and MW12L, PW-03, MW45, and MW94. Wells MW12U and MW12L are located approximately 800 feet upgradient of the westernmost suspected Site 7 location. Wells PW03 and MW45 are located approximately 1,000 and 1,700 feet, respectively, downgradient of the easternmost suspected Site 7 location. Well MW94 is located approximately 1,900 feet east (downgradient and slightly crossgradient) of the easternmost suspected Site 7 location. There is not a permanent monitoring well positioned directly downgradient of the westernmost suspected Site 7 location. However, given the lack of a precise location for Site 7 and the contention that napalm burning was thought to have first occurred over 30 years ago, these locations are considered adequate to assess the potential for off-site migration of potential contaminants (if present) from the easternmost suspected Site 7 location. The decision for No Further Action is supported by (not

based solely on) results provided by these wells. The decision for No Further Action is also based on results of direct-push sampling conducted in 1998 and 1999 (Section 5.4.5) at the site.

Beginning in 1990 and periodically through November 1999, groundwater samples were collected for analysis from the five monitoring wells most relevant to Site 7. Not all five of the wells were sampled during all sampling events. Data generated by the periodic sampling of monitoring wells relevant to Site 7 are included in Appendix B and shown in Figure 5-2.

Wells MW12U and MW12L were sampled in July 1990, and the samples were analyzed for TPH-E. TPH-E was not detected in either sample at a concentration above the laboratory reporting limit. TPH-E was also not detected in a sample collected from well MW12U in April 1991.

Well MW45 was sampled in April 1991 and August 1991, and the samples were analyzed for BTEX, TPH-E, and total petroleum hydrocarbons—purgeable (TPH-P). None of these compounds was detected in either sample at a concentration above the laboratory reporting limits. This well was sampled in September 1996 for BTEX, SVOCs, and select metals. BTEX and SVOCs were not detected at concentrations above the laboratory reporting limits. This sample was not analyzed for the metals particularly relevant to Site 7, aluminum and lead.

Well MW94 was sampled in September 1996 and September 1997, and the samples were analyzed for BTEX, TPH-E, SVOCs (1996 sample only), and select metals. No TPH-E, BTEX compound, or SVOC was detected in either sample at a concentration above the laboratory reporting limits. Neither sample was analyzed for aluminum in either sample; however, the September 1997 sample was analyzed for lead, which was not detected at a concentration above the laboratory reporting limit.

Well PW03 was sampled in December 1991, September 1997, and November 1999, and the samples analyzed for BTEX and TPH-E. The September 1997 sample was also analyzed for metals. Except for total xylenes in the December 1991 sample, no BTEX compound or TPH-E was detected at a concentration above the laboratory reporting limits in these samples. The concentration of total xylenes in the December 1991 sample was reported as 2 µg/L. The MCL established by the EPA for total xylenes in groundwater is 10,000 µg/L. Lead was not detected at a concentration above the laboratory reporting limit, and the samples were not analyzed for aluminum.

5.4.5 Direct-Push Sampling Within Site 21 in Area of Site 7

In 1998 and 1999, soil and groundwater samples were collected within Site 21, in areas that encompass those thought to include Site 7. The analytical results from these samples supplement the data presented in the draft final decision document for Site 7 dated August 1999. These two sampling events were conducted with the use of a direct-push sampling rig. The results of the sampling are summarized in this decision document and reported in more detail in *Site 21—Receiver Site Landfill, 1998 and 1999 Groundwater and Soil Analysis Results*.

The sampling efforts conducted in 1998 and 1999 included 59 locations within the Receiver Site Landfill (Site 21), 9 of which were near or within areas alleged to include the Napalm Burn Pit (Site 7), as identified in the PA/SI and the RI. The alleged locations of Site 7 are south of the fenced compound surrounding Building 480 and west of this compound (Figure 5-2).

Groundwater and soil samples were collected from 53 of the direct-push locations, and groundwater samples only were collected at the other 6 locations. Most of the soil and groundwater samples were analyzed for TPH, volatile organic compounds (VOCs), SVOCs, pesticides, and metals, and some of the samples were analyzed for a subset of these chemicals. The results of these sampling efforts are included in Appendix B, and detected chemicals are shown in Figure 5-2. Laboratory reports are available in the report *Site 21—Receiver Site Landfill, 1998 and 1999 Groundwater and Soil Analysis Results*.

Petroleum Hydrocarbons

Petroleum hydrocarbons (as TPH or BTEX) were detected in soil or groundwater at 8 of the 59 direct-push sampling locations. Three of these locations were within the alleged locations of Site 7: sampling locations 36, 38, and 39 (Figure 5-2). At location 36, TPH-E in the jet fuel range was detected in the groundwater sample at a concentration of 580 $\mu\text{g/L}$. In this sample, the concentration of ethylbenzene was 11 $\mu\text{g/L}$, and the concentration of total xylenes was 4.9 $\mu\text{g/L}$. These concentrations are below the relevant regulatory limits discussed in Section 5.4.1. Petroleum hydrocarbons were not detected in soil at location 36.

At location 38, TPH-E was detected in soil at 250 mg/kg as jet fuel and 10 mg/kg as diesel fuel. This concentration of TPH-E as jet fuel exceeds the NDEP soil action level of 100 mg/kg. TPH-E as jet fuel was also detected in groundwater at location 38, at a concentration of 1.9 mg/L, which is just above the NDEP groundwater action level of 1 mg/L. BTEX compounds were not detected in the soil and groundwater samples from location 38.

At location 39, TPH-E was not detected in soil and groundwater at a concentration above the laboratory reporting limits of 10 mg/kg and 500 µg/L, respectively. However, ethylbenzene and total xylenes were detected in groundwater at 21 µg/L and 189 µg/L, respectively. These concentrations are below the relevant regulatory limits discussed in Section 5.4.1.

Volatile Organic Compounds

VOCs other than BTEX that were detected in soil and groundwater at direct-push sampling locations within Site 21 included trichlorofluoromethane, 1,1-dichloroethene, 1,1,1-trichloroethane, and trichloroethene. These VOCs are not associated with napalm or diesel fuel and were generally detected at sampling locations that were not in the two possible locations for Site 7.

Semivolatile Organic Compounds

SVOCs that were detected in soil and groundwater included butylbenzylphthalate and phenol, neither of which are associated with napalm or diesel fuel.

Lead and Aluminum

The average lead concentration in soil samples collected from the direct-push sampling locations was 3.9 mg/kg, with a maximum of 19 mg/kg. The averages in the two areas alleged for the location of Site 7 were 5.0 mg/kg (at sampling locations 36 through 39 [Figure 5-2]) and 3.6 mg/kg (at sampling locations 6 through 9). During the RI, analyses were performed for metals on samples collected from many of the sites under investigation at NAS Fallon. The facility-wide metals data included in the RI show a range of lead concentrations in soil (where concentrations were above the detection limits) of 0.82 to 38.70 mg/kg. The lead concentrations in soil from the alleged areas of Site 7, and for Site 21 as a whole, are within the range of lead concentrations typically found in soil throughout the facility.

Lead was not detected at a concentration above the laboratory reporting limit of 5 µg/L in groundwater samples from any of the direct-push sampling locations that were analyzed for lead.

The average aluminum concentration in soil samples collected from the direct-push sampling locations was 8,120 mg/kg, with a maximum of 15,000 mg/kg. The averages in the two areas alleged for the location of Site 7 were 11,225 mg/kg (western location, at sampling locations 36 through 39) and 8,525 mg/kg (eastern location, at sampling locations 6 through 9). The facility-wide metals data included in the RI show a range of aluminum concentrations in soil (where concentrations were above the laboratory reporting limits) of 2,020 to 20,700 mg/kg. The

aluminum concentrations in soil from the alleged areas of Site 7, and for Site 21 as a whole, are within the range of aluminum concentrations typically found in soil throughout the facility.

The average aluminum concentration in groundwater samples collected from the direct-push sampling locations was 0.156 mg/L, with a maximum of 0.750 mg/L. The averages in the two alleged areas of Site 7 were 0.162 mg/L (western location, at sampling locations 36 through 39) and 0.105 mg/L (eastern location, at sampling locations 6 through 9). The facility-wide metals data included in the RI show a range of aluminum concentrations in groundwater (where concentrations were above the detection limits) of 0.042 to 1.460 mg/L. The results of aluminum concentrations in groundwater from the alleged areas of Site 7, and for Site 21 as a whole, are within the range of aluminum concentrations typically found in groundwater throughout the facility. The average aluminum concentrations in areas alleged to include Site 7 are below the secondary MCL for aluminum in groundwater of 0.2 mg/L.

5.5 CONTAMINANT FATE AND TRANSPORT

Site 7, the Napalm Burn Pit, may have been located in the south-central or southwest portion of Site 21 (the Receiver Site Landfill). Residual contamination, if present, would be expected to be found adhered to near-surface soil in the area of the burn pit, and potentially in groundwater downgradient of the burn pit. The direction of groundwater flow in the area of Site 7 is to the southeast.

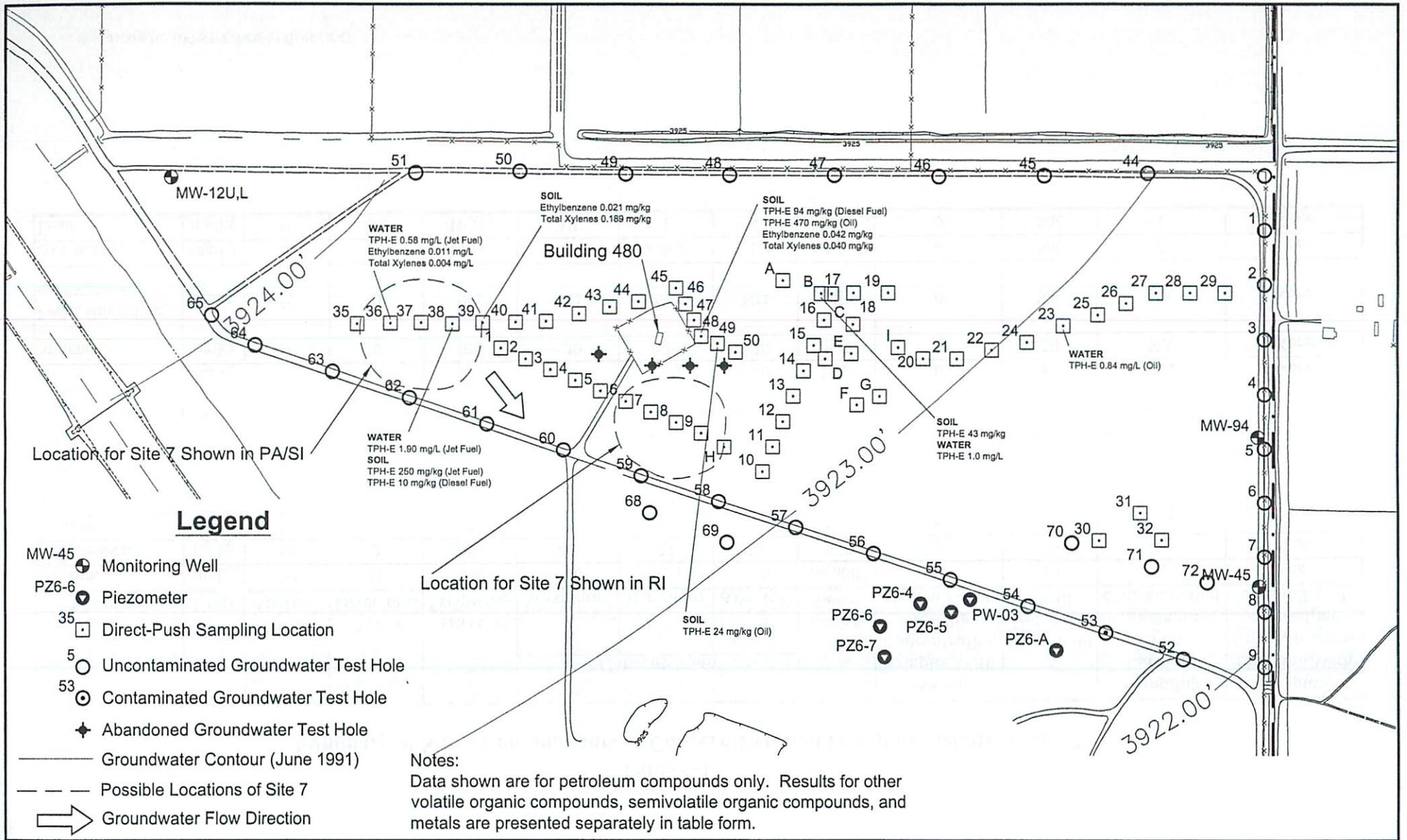
If Site 7 existed and caused contamination of soil, petroleum contamination would have been present in soil samples collected during the direct-push sampling in 1998 and 1999—most likely at locations 6 through 9, 36 through 39, or H. Petroleum hydrocarbons were not detected at concentrations above laboratory reporting limits in soil samples from locations 6 through 9; they were detected in soil samples from locations 38 and 39 (see Section 5.4.4). Only the TPH-E concentration in soil at location 38 exceeded the NDEP soil action level of 100 mg/kg. This TPH-E was identified as jet fuel, not diesel fuel or gasoline.

If Site 7 existed and caused contamination of groundwater, detection of petroleum contamination would be expected in samples from groundwater test holes, permanent monitoring wells, or direct-push sampling locations near or downgradient of the burn pit. Such locations could include groundwater test holes 52 through 64, 68, and 69; wells PW03 and MW45; and direct-push sampling locations 6 through 9, 36 through 39, and H. The only groundwater test hole of this group that contained volatile contaminants was number 53, where the contamination has been associated with Site 6. Samples from well MW45 have not contained detectable petroleum

hydrocarbons. The only petroleum compound detected in well PW03 was total xylenes in the sample from December 1991, at a concentration well below the MCL. Two of the direct-push sampling locations (36 and 38) near an alleged location for Site 7 contained detectable concentrations of petroleum hydrocarbons. The TPH-E concentration found at one of these locations (number 38 with a TPH-E concentration of 1.9 mg/L) exceeded the provisional NDEP groundwater action level of 1 mg/L. This TPH-E was identified as jet fuel, not diesel fuel or gasoline.

It is possible that the detections of petroleum compounds in the area of direct-push sampling locations 36 through 39 indicate that this is the location of Site 7, as suggested in the PA/SI. However, it is equally likely that the detections of petroleum hydrocarbons in this area represent localized areas of petroleum hydrocarbon contamination from debris buried in the Receiver Site Landfill (Site 21) that is unrelated to napalm burning. Waste reportedly disposed of within the Receiver Site Landfill included jet petroleum No. 5, diesel fuel, and gasoline. Jet fuel was the only contaminant detected at concentrations above regulatory action levels in the two possible locations for Site 7. Napalm is generally manufactured using gasoline or diesel fuel. However, local variations can include jet fuel. Results from soil and groundwater samples collected within the two suspected locations for Site 7 indicate that if significant napalm burning occurred at either of the suspected Site 7 locations, it did not result in significant soil contamination that could act as a source of groundwater contamination, and napalm burning did not result in significant groundwater contamination regardless of the composition of napalm (gasoline, diesel, jet fuel, or heavy oil) burned at the site. Therefore, if napalm was burned at either of the two suspected Site 7 locations, impacts to the site are extremely limited and pose no threat to human health or the environment.

Quaternary					
Period	Epoch	Stratigraphic Unit	Generalized Lithology	Thickness (feet)	Generalized Description
Quaternary	Pleistocene	Lahontan Valley Group		0-2	Eolian sand
		Wyemaha Formation	Sehoo Formation		
	Recent	Fallon Formation		4-20	Eolian sand Near-shore deposits, fine-grained sand, silty sand Channel sand and gravel from ancient Carson River Sand, silt, and clay of deltaic and shallow-lake deposits
		Wyemaha Formation	[Stippled pattern]	>50	Shallow-lake sand



U.S. NAVY

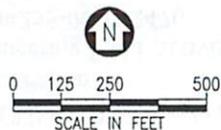


Figure 5-2
Summary of Data From Sampling Locations
in the Vicinity of Site 7, Napalm Burn Pit

Delivery Order 0013
 NAS Fallon
 DECISION DOCUMENT
 SITE 7

Table 5-1
Summary of Site 7 Contaminants of Concern Detected in Soil in Vicinity of Site 7

Chemical	Units	No. of Analyses	No. of Detections	Detection Frequency	Concentration			Action Level	No. of Samples With Concentration Exceeding Action Level	Maximum Detection Limit	Sampling Location With Maximum Concentration	Sampling Location With Concentrations Exceeding Action Level
					Maximum ^a	Minimum ^a	Average ^a					
Benzene	µg/kg	50	0	0%	<20	<20	<20	10,000 ^b	0	20	NA	None
Ethylbenzene	µg/kg	50	2	4%	42	21	32	NE	0	20	48	None
Toluene	µg/kg	50	0	0%	<20	<20	<20	NE	0	20	NA	None
Total xylenes	µg/kg	50	3	6%	189	22	106	NE	0	20	39	None
TPH-E	mg/kg	53										
As diesel	mg/kg		2	4%	94	10	52	100 ^c	0	10	48	None
As oil	mg/kg		2	4%	470	24	247	100 ^c	1	10	48	48
As jet fuel	mg/kg		1	2%	250	250	250	100 ^c	1	10	38	38
TPH-P	mg/kg	3	0	0%	<40	<40	<40	100 ^c	0	40	NA	None
Styrene	µg/kg	50	0	0%	<20	<20	<20	NE	0	20	NA	None
PAHs (including naphthalene)	µg/kg	50	0	0%	ND	ND	ND	NE	0	NR	NA	None
Aluminum	mg/kg	50	50	100%	15,000	2,400	8,120	NE	0	NR	2	None
Lead	mg/kg	50	50	100%	19	1	4	NE	0	NR	1	None

Table 5-1 (Continued)
Summary of Site 7 Contaminants of Concern Detected in Soil in Vicinity of Site 7

^a Maximum, minimum, and average concentration of the chemical detected in all samples

^b 40 CFR Part 261.24, 20 Times Rule

^c Nevada Administrative Code

Notes:

< - less than

% - percent

µg/kg - microgram per kilogram

mg/kg - milligram per kilogram

NA - not applicable

ND - not detected at concentration above the laboratory reporting limit, which was not reported

NE - not established

NR - not reported

PAH - polycyclic aromatic hydrocarbon

TPH-E - total petroleum hydrocarbons—extractable

TPH-P - total petroleum hydrocarbons—purgeable

Table 5-2
Summary of Site 7 Contaminants of Concern Detected in Groundwater in Vicinity of Site 7

Chemical	Units	No. of Analyses	No. of Detections	Detection Frequency	Concentration			Action Level	No. of Samples With Concentration Exceeding Action Level	Maximum Detection Limit	Sampling Location With Maximum Concentration	Sampling Location With Concentrations Exceeding Action Level
					Maximum ^a	Minimum ^a	Average ^a					
Benzene	µg/L	53	0	0%	<1	<1	<1	5 ^b	0	1	NA	None
Ethylbenzene	µg/L	53	1	2%	11	11	11	700 ^b	0	1	36	None
Toluene	µg/L	53	0	0%	<1	<1	<1	1,000 ^b	0	1	NA	None
Total xylenes	µg/L	53	2	4%	4.9	2	3.5	10,000 ^b	0	1	36	None
TPH-E	µg/L	62										
As diesel	µg/L		0	0%	<500	<500	<500	1,000 ^c	0	500	NA	None
As oil	µg/L		1	2%	840	840	840	1,000 ^c	0	500	23	23
As jet fuel	µg/L		2	3%	1,900	580	1240	1,000 ^c	1	500	38	38
TPH-P	µg/L	53	0	0%	<500	<500	<500	1,000 ^c	0	500	NA	None
Styrene	µg/L	45	0	0%	<1	<1	<1	100 ^b	0	1	NA	None
PAHs (including naphthalene)	µg/L	42	0	0%	ND	ND	ND	NE	0	NR	NA	None
Aluminum	mg/L	31	28	90%	0.75	0.06	0.16	NE	0	0.05	3	Most direct-push sampling locations
Lead	mg/L	33	0	0%	<0.005	<0.005	<0.005		0	0.005	NA	None

Table 5-2 (Continued)
Summary of Site 7 Contaminants of Concern Detected in Groundwater in Vicinity of Site 7

^a Maximum, minimum, and average concentration of the chemical detected in all samples

^b Maximum contaminant level

^c Nevada Division of Environmental Protection provisional

Notes:

< - less than

% - percent

µg/L - microgram per liter

mg/L - milligram per liter

NA - not applicable

ND - not detected at concentration above the laboratory reporting limit, which was not reported

NE - not established

NR - not reported

PAH - polycyclic aromatic hydrocarbon

TPH-E - total petroleum hydrocarbons—extractable

TPH-P - total petroleum hydrocarbons—purgeable

6.0 CURRENT AND POTENTIAL SITE AND RESOURCE USES

NAS Fallon currently serves primarily as an aircraft weapons delivery and tactical air combat training facility. The Navy is expected to maintain NAS Fallon in the foreseeable future as it has for the past 50 years. Both of the alleged locations of Site 7 are unused, open land. NAS Fallon does not expect any change in this land use or in the use of the surrounding Site 21, in the near future.

Land-use controls have also been established for former landfill sites at NAS Fallon as part of the facility Master Plan. The Master Plan for NAS Fallon includes a discussion of all potentially contaminated areas in the IR Program and their locations. Any future construction projects conducted at Site 7 will be subjected to an environmental review. The Natural Resources branch of the Environmental Office at NAS Fallon oversees the environmental review process. Projects are reviewed by the Occupational Safety and Health Office, Fire Department, Security Department, the Engineering and Planning Divisions of Public Works, and the Compliance and IR branches of the Environmental Office. This process is included in all NAS Fallon planning activities. Information provided by the IR branch relates to potential contact with contaminated soil and groundwater as a result of these projects.

7.0 SUMMARY OF SITE RISKS

The analytical results from sampling have not confirmed the presence of the Napalm Burn Pit. Therefore, it is unclear whether Site 7 ever existed. The baseline risk assessment and the results of subsequent sampling activities indicated that there were no identifiable exposure pathways or receptors for Site 7. This being the case, there is no quantifiable risk posed by Site 7 to human health or the environment. Consequently, the preferred alternative is No Further Action.

Nonetheless, Site 21 was examined during the human health and ecological baseline risk assessments. Exposure pathways associated with possible contamination were evaluated in both soil and groundwater. In addition, surface water and sediment in two drains were evaluated as sitewide risk units. Site 1 and the Group IV sites were the only two locations at NAS Fallon that were at risk for exposure in the future. Site 7 and Site 21 are not part of either of these sites; they are part of the Group II sites.

Current human exposure to contaminated soil is possible only for construction workers at sites that are inside the security fences or have only subsurface contamination. No current or future exposure is plausible at landfills that are covered with clean overburden because excavation activities would be subject to restrictions, during the environmental review (as described in Section 6). Possible exposure routes for the exposure scenarios evaluated are incidental ingestion of, dermal contact with, and inhalation of volatile organics and/or fugitive dust from contaminated soil. Using maximum concentrations in site soil, cancer risk levels and hazard index numbers were well below the point of concern at the Group II sites.

For the ecological baseline risk assessment, groundwater was assessed only in terms of potential phytotoxic effects and only as a contingency in the event that native shrubs recolonize the sites in the future. It was assumed that no direct or indirect exposure of animal receptors (via the food chain) to contaminated groundwater occurs. Again, the only sites posing any threat were Site 1 and the Group IV sites.

The ecological baseline risk assessment for contaminated soil was also evaluated as it relates to ecological receptors. Contaminated soils were evaluated only for invading plant species, vagrant rodents, and three raptors (peregrine falcon, golden eagle, and red-tailed hawk). The exposure pathways evaluated for the rodent were direct exposures due to incidental ingestion of, dermal contact with, and inhalation of volatile organics and/or fugitive dust from surface soil; and indirect exposures to surface and subsurface soils via the food chain (plant and invertebrate ingestion). The exposure pathways evaluated for raptors included only indirect exposures to

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surface and subsurface soils via the food chain (bird and rodent ingestion). Using the current maximum soil concentrations for all exposure point concentrations, the hazard index values for soil were below the point of concern at the Group II sites.

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8.0 STATUTORY AUTHORITY FINDING

There is no contamination that can be clearly related to Site 7. The conclusion of the baseline risk assessment was that current or potential future site conditions pose no unacceptable risk to human health or the environment. Accordingly, no further action is required at this site.

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9.0 DOCUMENTATION OF SIGNIFICANT CHANGES

No comments were received by the Navy during the public comment period; therefore, no changes were made after the public comment period.

10.0 BIBLIOGRAPHY

This document was prepared with the use of information contained in the Administrative Record for Site 7, Napalm Burn Pit, NAS Fallon, Nevada. The Administrative Record is available at the Churchill County Public Library in Fallon, Nevada; at the University of Nevada Reno Library in Reno, Nevada; at NAS Fallon; and at the Engineering Field Activity, Northwest, Offices in Poulsbo, Washington. The primary documents used as sources of the information contained in this decision document are listed below.

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APPENDIX A

Responsiveness Summary

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RESPONSIVENESS SUMMARY

Notice of the public comment period was published in the *Lahontan Valley News/Fallon Eagle Standard* on February 12 and 13, 2002. The public comment period extended from February 14, 2002, through March 16, 2002. The public meeting presenting the Proposed Plan was held at the Agricultural Center in Fallon, Nevada, on February 21, 2002. As of March 19, 2002, the Navy had received no public comments.

APPENDIX B

Data Summary Tables

Table B-1
Summary of Chemicals Detected in Groundwater Samples
From Monitoring Wells at Site 7, Napalm Burn Pit

Sampling Location	Chemical	Concentration (µg/L)						
		7/90	4/91	8/91	12/91	9/96	9/97	11/99
MW12L	TPH-E	ND						
MW12U	TPH-E	ND	ND					
MW45	Benzene		ND	ND		ND		
	Ethylbenzene		ND	ND		ND		
	Toluene		ND	ND		ND		
	Total xylenes		ND	ND		ND		
	TPH-E		ND	ND				
	TPH-P		ND	ND				
	SVOCs					ND		
	Arsenic					3,500		
	Barium					160		
	Boron					100,000		
	Chromium					19		
MW94	Molybdenum					670		
	Vanadium					1,100		
	Benzene					ND	ND	
	Ethylbenzene					ND	ND	
	Toluene					ND	ND	
	Total xylenes					ND	ND	
	TPH-E					ND	ND	
	SVOCs					ND		
	Antimony						15	
	Arsenic					1,900	600	
	Barium					440	ND	
	Beryllium						ND	
	Boron					60,000	11,000	
	Chromium					31	ND	
	Lead						ND	
	Molybdenum					420	ND	
	Nickel					41	ND	
Selenium						ND		
Vanadium					1,000	1300		
PW03	Benzene				ND		ND	<5
	Ethylbenzene				ND		ND	<5
	Toluene				ND		ND	<5
	Total xylenes				2		ND	<5

Table B-1 (Continued)
Summary of Chemicals Detected in Groundwater Samples
From Monitoring Wells at Site 7, Napalm Burn Pit

Sampling Location	Chemical	Concentration (µg/L)						
		7/90	4/91	8/91	12/91	9/96	9/97	11/99
PW03 (Cont.)	TDS						35,180,000	
	Antimony						ND	
	TPH-E				ND		ND	<500
	Arsenic						4,300	
	Barium						280	
	Beryllium						2.4	
	Boron						17,000	
	Chromium						ND	
	Lead						ND	
	Molybdenum						1,400	
	Nickel						50	
	Selenium						ND	
Vanadium						970		

Notes:

Blank cell indicates no analysis for this chemical at the particular location on the date shown.

< - not detected at a concentration greater than the laboratory reporting limit shown

µg/L - microgram per liter

ND - not detected at a concentration greater than the laboratory reporting limit shown in original laboratory report

SVOC - semivolatile organic compound

TDS - total dissolved solids

TPH-E - total petroleum hydrocarbons—extractable

TPH-P - total petroleum hydrocarbons—purgeable

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Table B-2 (Continued)
 Summary of Chemicals Detected in Soil and Groundwater Samples During Push-Probe Sampling in 1998 and 1999 at Site 7, Napalm Burn Pit

Sampling Location	Sampling Date	Sample Depth (feet bgs)	Depth of Water Table (feet bgs)	Matrix	TPH-E by Method 8015 (mg/L in water; mg/kg in soil)	TPH-P by Method 8015 (mg/L in water; mg/kg in soil)	Volatile Organic Compounds by Method 8240 or 8260 (µg/L in water; µg/kg in soil)	Semi-volatile Organic Compounds by Method 8270 (µg/L in water; µg/kg in soil)	Metals by Method 6010 (mg/L in water; mg/kg in soil)									
									Aluminum	Antimony	Arsenic	Beryllium	Chromium	Lead	Nickel	Selenium	Vanadium	
17	09/25/98	6 to 8 8 to 10	7.5	Soil Water	<10 <0.50	<0.50	<20 <1.0*	ND ND	7,600 0.21	<0.3 0.033	3.9 2.9	<0.3 <0.005	6.6 <0.005	3.5 <0.005	8.3 <0.005	<0.3 0.017	<0.3 0.017	24 1
18	09/25/98	6 to 8 8 to 10	7.66	Soil Water	<10 <0.50	<0.50	<20 (TCE) <20	ND ND	7,000 0.19	0.032 <0.3	2.8 1.5	<0.3 <0.005	3.2 7.3	4 4	9.2 <0.005	<0.3 <0.005	<0.3 <0.005	34 0.007
29	09/29/98	6 to 8 7.42 to 9.42	6.08	Soil Water	<10 <0.50	<0.50	<1.0* <20	ND ND	6,400	<0.3	1.1	<0.3	5.1	7	4.1	<0.3	<0.3	25
28	09/29/98	9 to 11 11 to 13	?	Soil Water	<10 <0.50	<0.50	<20 <1.0*	ND ND	8,900	<0.3	1.5	<0.3	7	7.8	3.1	<0.3	<0.3	28
27	09/29/98	9 to 11 13 to 15	11.84	Soil Water	<10 <0.50	<0.50	<20 45 (TCE)	ND ND	11,000	0.5	3	0.7	7.8	8.1	4.4	<0.3	<0.3	32
19	10/08/98	7 to 9 9 to 11	7	Soil Water	<10 <0.50	<0.50	<20 14 (TCE)	ND ND	13,000	0.5	4	0.7	5	5	1.5	<0.3	0.064	26
20	10/08/98	6 to 8 8 to 10	8	Soil Water	<10 <0.50	<0.50	<20 <1.0*	ND ND	3,400	0.5 0.037	3.5 6	<0.3 <0.005	<0.005	<0.005	<0.005	<0.005	0.039	2
21	10/09/98	7 to 9 9 to 11	7.68	Soil Water	<10 <0.50	<0.50	<20 <1.0*	ND ND	0.07 0.1	0.039 0.5	6.2 4.6	<0.005 0.6	7.4	9	9	<0.3	0.032	1.9
21 DUP	10/09/98	7 to 9 8 to 10	7	Soil Water	<10 <0.50	<0.50	<20 <1.0*	ND ND	11,000	0.028 <0.3	4.8 7.3	<0.005 0.4	0.008	6.7	4.6	<0.3	0.068	1.7
22	10/09/98	7 to 9 8 to 10 10 to 12	9	Soil Water	<10 <0.50	<0.50	<20 <1.0*	ND ND	0.2	0.021	6.1	<0.3	7.4	6.5	3.1	7	<0.3	21
23	10/11/98	?	?	Water	0.84 (OH)	<0.50	<20	ND	6,500	<0.3	3.7	<0.3	5.4	2.6	7.6	<0.3	<0.3	20
25	10/11/98	7 to 9 8 to 10	8.42	Soil Water	<10 <0.50	<0.50	<20 <1.0*	ND ND	6,700	<0.3	4.2	<0.3	6.2	2.5	8	<0.3	<0.3	25
26	10/11/98	11 to 13	10	Soil	<10	<0.50	<20	ND	7,100	<0.3	2.4	0.3	6.6	3.3	5.4	<0.3	0.045	2.2
24	10/12/98	6 to 8 8 to 10	6.5	Water	<10 <0.50	<0.50	<20 <1.0*	ND ND	7,400	<0.3	6	<0.005	0.008	<0.005	<0.005	<0.005	0.12	2.2
30	10/12/98	4 to 6 7 to 9	6.33	Water	<10 <0.50	<0.50	<1.0* <1.0*	ND ND	0.11 0.08	0.014 0.014	6.1 3.7	<0.005 0.3	0.012	5.6	3.8	<0.3	6	2.2
30 DUP	10/12/98	4 to 6	?	Water	<0.50	<0.50	<20	ND	7,300	0.5	0.009	<0.005	0.005	<0.005	<0.005	<0.005	0.034	0.63
32	10/12/98	4 to 6 6 to 8	5	Soil Water	<10 <0.50	<0.50	<1.0*	ND	0.09	0.009	4.9	<0.005	0.005	0.005	<0.005	<0.005	<0.005	0.034

Table B-2 (Continued)
 Summary of Chemicals Detected in Soil and Groundwater Samples During Push-Probe Sampling in 1998 and 1999 at Site 7, Napalm Burn Pit

Sampling Location	Sampling Date	Sample Depth (feet bgs)	Depth of Water Table (feet bgs)	Matrix	TPH-E by Method 8015 (mg/L in water)	TPH-P by Method 8015 (8260) (mg/L in water; mg/kg in soil)	Volatile Organic Compounds by Method 8240 or 8260 (µg/L in water; µg/kg in soil)	Semi-volatile Organic Compounds by Method 8270 (µg/L in water; µg/kg in soil)	Metals (mg/L in water; mg/kg in soil)										
									Aluminum	Antimony	Arsenic	Beryllium	Chromium	Lead	Nickel	Selenium	Vanadium		
31	10/12/98	4 to 6	9.58	Soil	<10	<0.50	<20	ND	5,200	<0.3	1.6	<0.3	4.9	2.5	3.9	<0.3	12		
		8 to 10		Water	<10	<0.50	<20	ND	3,100	<0.3	2.1	<0.3	3.5	1.8	3.5	<0.3	16		
34	10/13/98	3 to 5	7	Water	<10	<0.50	<20	ND	5,100	<0.3	2.7	<0.3	4.1	2.7	7	<0.3	18		
		7 to 9		No free water	<10	<0.50	<20	ND	9,700	<0.3	7.7	0.4	6.9	4.7	9.4	<0.3	27		
33	10/13/98	3 to 5	7	Soil	<10	<0.50	<20	ND	10,000	<0.3	4.8	0.4	7.2	3.2	8.5	<0.3	1.6		
		8 to 10		No free water	<10	<0.50	<20	ND	10,000	<0.3	4.6	<0.005	0.013	<0.005	0.018	0.025	1.6		
35	10/13/98	8 to 10	7.84	Water	<10	<0.50	<20	ND	0.3	0.021	4.6	<0.005	0.013	<0.005	0.018	<0.3	29		
		9 to 11		Soil	<10	<0.50	<20	ND	12,000	<0.3	5.4	0.5	7	4.5	10	<0.3	1.8		
36	10/13/98	8 to 10	6.08	Water	0.58 (Jet fuel)	<0.50	11 (Ethylbenzene) 3 (m,p-Xylenes) 1.9 (o-Xylene)	ND	<0.05	0.019	4.7	<0.005	0.015	6.9	9.5	<0.3	28		
		9 to 11		Water	<10	<0.50	<20	ND	13,000	<0.3	3.8	0.7	8	<0.005	0.007	0.011	1.9		
37	10/13/98	8 to 10	6.08	Soil	<10	<0.50	2.1 (Trichlorofluoromethane)	ND	0.12	0.023	4.8	<0.005	0.015	<0.005	0.007	<0.3	31		
		9 to 11		Water	<10	<0.50	<20	ND	9,900	<0.3	6.1	0.4	7.4	5.2	12	<0.3			
38	10/13/98	6 to 8	7.33	Soil	250 (Jet fuel) 10 (Diesel fuel)	<0.50	1.2 (Trichlorofluoromethane) 2.1 (Ethylbenzene) 1.30 (m,p-Xylenes) 59 (o-Xylene)	3,100 (Phenol)	8,500	<0.3	4.1	<0.3	6.5	4.4	23	<0.3	21		
		8 to 10		Water	<10	<0.50	<20	ND	8,500	<0.3	4.3	<0.005	0.01	<0.005	0.012	0.02	1.7		
39	10/14/98	6 to 8	7.58	Soil	<10	<0.50	<1.0*	ND	0.13	0.013	4	0.5	4.6	14	<0.3	30			
		9 to 11		Water	<10	<0.50	<20	ND	3,400 (Phenol)	12,000	<0.3	4	8.5	4.6	6	<0.3	18		
40	10/14/98	9 to 11	7.84	Soil	<10	<0.50	<1.0*	3,000 (Phenol)	5,400	<0.3	2.4	<0.3	4.8	2.4	6	<0.3	0.81		
		6 to 8		Water	<10	<0.50	<20	ND	1,200 (Phenol)	5,400	<0.3	2.4	<0.005	0.011	<0.005	<0.005	<0.3	22	
41	10/14/98	7 to 9	8.16	Soil	<10	<0.50	22 (Trichlorofluoromethane)	ND	<0.05	0.007	4.1	<0.005	0.011	1.8	4.5	<0.3			
		9 to 11		Water	<10	<0.50	<20	ND	860 (Phenol)	4,200	<0.3	2.6	<0.3	5.8	1.8	13	<0.3	19	
42	10/14/98	6 to 8	8	Soil	<10	<0.50	<1.0*	800 (Phenol)	6,400	<0.3	3.4	<0.3	5.2	4.2	11	<0.3	22		
		9 to 11		Water	<10	<0.50	<20	ND	800 (Phenol)	6,400	<0.3	3.4	<0.3	5.2	4.2	11	<0.3		
43	10/14/98	6 to 8	7.75	Water	<10	<0.50	<20	ND	7,200	<0.3	7.9	<0.3	5.6	2.6	11	<0.3			
		9 to 11		Soil	<10	<0.50	<20	ND	7,200	<0.3	7.9	<0.3	5.6	2.6	11	<0.3			
44	10/14/98	6 to 8	7	Water	<10	<0.50	<20	ND	12,000	<0.3	4.5	0.3	12	3.2	11	<0.3			
		9 to 11		No free water	<10	<0.50	<20	ND	12,000	<0.3	4.5	0.3	12	3.2	11	<0.3			
45	10/15/98	6 to 8	8	Water	<10	<0.50	<20	ND	12,000	<0.3	4.5	0.3	12	3.2	11	<0.3			
		9 to 11		Soil	<10	<0.50	<20	ND	12,000	<0.3	4.5	0.3	12	3.2	11	<0.3			
46	10/15/98	6 to 8	8	Water	<10	<0.50	<20	ND	12,000	<0.3	4.5	0.3	12	3.2	11	<0.3			
		7 to 9		Soil	<10	<0.50	<20	ND	12,000	<0.3	4.5	0.3	12	3.2	11	<0.3			

Table B-2 (Continued)
 Summary of Chemicals Detected in Soil and Groundwater Samples During Push-Probe Sampling in 1998 and 1999 at Site 7, Napalm Burn Pit

Sampling Location	Sampling Date	Sample Depth (feet bgs)	Depth of Water Table (feet bgs)	Matrix	TPH-E by Method 8015 (mg/L in water; mg/kg in soil)	TPH-P by Method 8015 (8360) (mg/L in water; mg/kg in soil)	Volatile Organic Compounds by Methods 8240 or 8260 (µg/L in water; µg/kg in soil)	Semivolatile Organic Compounds by Method 8270 (µg/L in water; µg/kg in soil)	Metals by Method 6010 (mg/L in water; mg/kg in soil)										
									Aluminum	Antimony	Arsenic	Beryllium	Chromium	Lead	Nickel	Selenium	Vanadium		
46	10/16/98	9 to 11	8	Water	<10		<1.0 ^a	ND	ND	12,000	<0.3	3.9	0.4	8.6	3.8	14	<0.3	29	
		7 to 9	7	Water	<0.50		<2.0	ND	ND	0.21	0.016	4.4	<0.005	0.009	<0.005	<0.005	0.04	1.4	
47	10/16/98	8 to 10	7	Soil	94 (Diesel fuel) 470 (Oil)		42 (Ethylbenzene) 40 (m,p-Xylenes)	ND	ND	11,000	<0.3	6.4	0.3	7.3	4.6	7.1	<0.3	28	
		6 to 8	7	Soil			<2.0	ND	ND	0.2	<0.005	3.9	<0.005	<0.005	<0.005	0.008	0.021	1.1	
48	10/21/98	No free water		Water	24 (Oil)			ND	ND										
		6 to 8	7.5	Water	<0.50		<1.0 ^a	ND	ND										
49	10/21/98	9 to 11		Soil	<10		<1.0 ^a	ND	ND										
		6 to 8	7.92	Water	<0.50		<2.0	ND	ND										
50	10/21/98	9 to 11		Water	<20 to 40 µg/kg ^b														
		6 to 8	9.58	Soil	<10		<5 to 10 µg/L ^b												
A	07/16/99	11 to 13		Water	<0.50		<20 to 40 µg/kg ^b												
		6 to 8	8.08	Soil	43		<5 to 10 µg/L ^b												
B	07/16/99	9 to 11		Water	1.0		<20 to 40 µg/kg ^b												
		8 to 10	8.24	Soil	<10		<5 to 10 µg/L ^b												
C	07/18/99	9 to 11		Water	<0.50		<5 to 10 µg/L ^b												
		8 to 10	9.92	Water	<0.50		<5 to 10 µg/L ^b												
D	07/18/99	10 to 13		Water	<0.50		53 (TCB)												
		11 to 13	10	Water	<0.50		<5 to 10 µg/L ^b												
E	07/18/99	8 to 10		Water	<0.50		<5 to 10 µg/L ^b												
		6 to 8	5.75	Water	<0.50		<5 to 10 µg/L ^b												
F	07/18/99	10 to 12		Water	<0.50		<5 to 10 µg/L ^b												
		6 to 8	6	Water	<0.50		<5 to 10 µg/L ^b												
G	07/18/99	10 to 12		Water	<0.50		<5 to 10 µg/L ^b												
		6 to 8	8.16	Water	<0.50		<5 to 10 µg/L ^b												
H	07/18/99	10 to 12		Water	<0.50		<5 to 10 µg/L ^b												
		6 to 8	8.16	Water	<0.50		<5 to 10 µg/L ^b												
I	09/14/99	10 to 12		Water	<0.50		<5 to 10 µg/L ^b												
		6 to 8	8.16	Water	<0.50		<5 to 10 µg/L ^b												

^aThis laboratory reporting limit applies to all volatile organic compounds except for dichloromethane, which has a laboratory reporting limit of 2.0 µg/L.
^bLaboratory reporting limits varied within the range shown.

DECISION DOCUMENT FOR SITE 7
Naval Air Station Fallon
U.S. Navy, Engineering Field Activity, Northwest
Contract No. N44255-00-D-2476
Delivery Order 0013

Table B-2 (Continued)
Summary of Chemicals Detected in Soil and Groundwater Samples During Push-Probe Sampling in 1998 and 1999 at Site 7, Napalm Burn Pit

Notes:
Blank cell indicates no analysis for this chemical at the particular location on the date shown
< - not detected at a concentration greater than the laboratory reporting limit shown
? - depth to water or depth of water sample collection could not be determined in the field
bgs - below ground surface
DCE - dichloroethene
µg/kg - microgram per kilogram
µg/L - microgram per liter
mg/kg - milligram per kilogram
mg/L - milligram per liter
ND - not detected at a concentration greater than the laboratory reporting limit shown in original laboratory report
TCA - trichloroethane
TCE - trichloroethene
TPH-E - total petroleum hydrocarbons—extractable
TPH-P - total petroleum hydrocarbons—purgeable