Decision Document

for

Site 9, Wastewater Treatment Plant

Naval Air Station Fallon
Fallon, Nevada

Delivery Order 0029

November 2003

ARCHITECT-ENGINEERING SERVICES
ENVIRONMENTAL RESTORATION PROJECTS

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

THE URS TEAM

URS Group, Inc.

White Shield, Inc.

Boateng & Associates

Fisher & Associates, LLC

EnviroIssues

Ballard & Associates

Christianson Communications

Grady & Associates

DECLARATION OF THE DECISION

SITE NAME AND LOCATION

Site 9, Wastewater Treatment Plant
Naval Air Station Fallon
Fallon, Nevada

CERCLIS Identification Number
NV9170022173

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedy for Site 9, the Wastewater Treatment Plant, 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

Based on the following observations and data, No Further Action is required at the Wastewater Treatment Plant (Installation Restoration [IR] Site 9), NAS Fallon, Nevada. Data collected within, adjacent to, and downgradient of Site 9, indicate no contaminant migration from the site. One soil sample collected in 1991, near the former underground storage tank (UST), contained total petroleum hydrocarbons (TPH) at a concentration greater than the state action level of 100 mg/kg. Soil samples collected in 2002 from three additional borings in the immediate area of the 1991 detection did not contain TPH at concentrations greater than the state action level. TPH was not detected in groundwater samples collected in 2002 from the same locations. One of eight groundwater samples contained 1,2,4-trimethylbenzene at a concentration of 19 µg/L, which is 7 µg/L greater than the state action level of 12 µg/L. 1,2,4-trimethylbenzene was not detected at concentrations greater than the reporting limit in six of the seven remaining groundwater samples. Two of eight groundwater samples contained naphthalene at concentrations of 7.4 and 14 µg/L, which are greater than the state action level of 6.2 µg/L. Naphthalene was not detected at concentrations greater than the reporting limit in the remaining six groundwater samples. The soil containing contaminants at concentrations above the state action levels is limited and not in contact with groundwater. Analytical results from groundwater samples collected in the vicinity of the former UST confirm that lateral extent of groundwater contamination from the former UST is limited. It has been over 18 years since the former UST was removed, TPH-P would have had sufficient time to leach to groundwater if present in sufficient quantities. Also removal of the UST eliminated the primary source of TPH to soil.

STATUTORY DETERMINATIONS

The selected remedy for Site 9 is protective of human health and the environment and is in compliance with federal and state applicable or relevant and appropriate requirements (ARARs). Although one soil sample in the area of the former UST contained a TPH concentration above the state action level, supplemental sampling in the immediate area indicates that the volume of contaminated soil is very limited. TPH was not detected in groundwater samples collected from the area of the soil detection. 1,2,4-trimethylbenzene was detected in one of eight groundwater samples at a concentration of 7 µg/L above the state action level. Naphthalene was detected in two groundwater samples at concentrations 1.2 and 7.8 µg/L above state action levels. These groundwater detections do not suggest widespread impacts at the site. The baseline risk assessment concluded that Site 9 poses no risk to human health or the environment. Supplemental sampling further supports this conclusion. The site may be reopened for further evaluation and, if necessary, cleanup, on the basis of newly discovered information that leads the U.S. Navy (Navy) and the Nevada Division of Environmental Protection (NDEP) to determine that the remedy may not be protective of human health and the environment.

SITE NAME AND LOCATION

Site 9, Wastewater Treatment Plant
Naval Air Station Fallon
Fallon, Nevada

CERCLIS Identification Number
NV9170022173

Captain Brad T. Goetsch
Commanding Officer
Naval Air Station Fallon

20 Nov 03
Date

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

25 Nov 03
Date

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ABBREVIATIONS AND ACRONYMS

ARAR	applicable or relevant and appropriate requirement
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
cm/sec	centimeter per second
CRP	community relations plan
EPA	U.S. Environmental Protection Agency
ER, N	Environmental Restoration, Navy
FS	feasibility study
GC	gas chromatograph
HBP PHC	high-boiling-point petroleum hydrocarbons
HI	hazard index
IR	Installation Restoration
LBP PHC	low-boiling-point petroleum hydrocarbons
LD	lower diagonal
MCL	maximum contaminant level
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
PCB	polychlorinated biphenyl
PID	photoionization detector
RAB	Restoration Advisory Board
RI	remedial investigation
SI	site inspection
SVOC	semivolatile organic compound
TDS	total dissolved solids
TPH	total petroleum hydrocarbons

ABBREVIATIONS AND ACRONYMS (Continued)

TPH-E	total petroleum hydrocarbons—extractable
TPH-P	total petroleum hydrocarbons—purgeable
TRC	Technical Review Committee
UST	underground storage tank
VOC	volatile organic compound

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 9, the Wastewater Treatment Plant, at Naval Air Station (NAS) Fallon, in Fallon, Nevada.

This decision document supersedes and replaces the *Draft Final Decision Document, Site 9, the Wastewater Treatment Plant*, dated August 27, 1999. Documents supporting the decision are included in the Administrative Record for the site. Key documents are identified in Section 10.

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. This decision document includes the pertinent elements of Nevada Division of Environmental Protection's (NDEP's) *Requirements for Installation Restoration (IR) Program 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 history of the site that led to conditions observed at the site, 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 9 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 9

- **Section 5—Site Characteristics.** Summarizes the regional, facility, and site-specific characteristics and conditions, including the concentrations and distribution of contaminants and their fate and transport
- **Section 6—Current and Potential Site and Resource Uses.** Discusses the current and potential future uses of the land
- **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 9
- **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.** Lists the sources of information used in preparing this 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 was originally established as a military facility in 1942, when the Civil Aviation Administration and Army Air Corps constructed four airfields in Nevada as part of the Western Defense Program. In 1943, the Navy assumed control of the still-uncompleted facility, and on June 10, 1944, Naval Air Auxiliary Station (NAAS) Fallon was commissioned. The newly commissioned facility provided training, servicing, and support to air groups sent to the facility for combat training. From 1946 to 1951, NAAS Fallon experienced varying but reduced operational status and was eventually turned over to Churchill County and the Bureau of Indian Service.

In 1951, Fallon was used as an auxiliary landing field for NAS Alameda, California, and on October 1, 1953, NAAS Fallon was re-established. From 1945 to 1975, the Air Force also occupied part of the station as part of an early warning radar network. On January 1, 1972, NAAS Fallon was upgraded to its current status of NAS Fallon. NAS Fallon serves as the primary as aircraft weapons delivery and tactical air combat training facility. With the construction of a new runway and additional aircraft maintenance facilities, NAS Fallon's training mission is expected to continue to expand.

2.1 SITE DESCRIPTION

Site 9, the Wastewater Treatment Plant, is in the southeastern 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. Navy is lead agency for site activities, and the Nevada Division of Environmental Protection (NDEP) serves as the lead regulatory agency.

Site 9 is located in the Southeastern portion of the facility, east of the Post–World War II Burial Site (Site 19) and northwest of the Southeast Runway Landfill (Site 18) (Figure 2-2). The Wastewater Treatment Plant is the central wastewater treatment facility at NAS Fallon, and wastewater treatment operations have occurred at Site 9 from 1943 to the present. The Navy does not expect any change in the use of this land or that of the surrounding sites in the foreseeable future.

The Wastewater Treatment Plant receives wastewater including sanitary wastes and minor industrial wastes from basewide operations via the sanitary sewer. The plant consists of treatment basins, sludge drying/evaporation ponds, and sludge and grit disposal areas. The

sludge drying/evaporation ponds are currently used as sludge drying/evaporation beds for the new sequential batch reactor treatment system. The ponds are clay line and are an active facility. The ponds are therefore not part of the IR Program. (Note: The ponds will be closed in accordance with applicable environmental standards and regulations if they are deactivated.) Formerly, a 500-gallon diesel underground storage tank (UST) was located just north of the wastewater treatment building (Building 130). The tank was used to fuel a backup generator. This tank was reported to be leaking at the time of its removal in 1985. Metals, oils, paint wastes, and photographic chemicals are suspected hazardous materials that may have been discharged to the sanitary sewer.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The purpose of the 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, Navy conducted the investigations and assessment activities in three phases:

- Phase I consisted of a preliminary assessment (PA)/site inspection (SI). During Phase I, information was gathered by means of employee interviews, site inspections, and record searches. During a visual inspection of the unnamed drain west of the plant, a diesel-fuel-like product was discovered emanating from the subsurface, presumably from the UST removed in 1985. As a result of this phase of investigation, it was recommended that the Wastewater Treatment Plant be included in a remedial investigation (RI) because of potentially contaminated soils or groundwater in the sludge and grit disposal areas, pond areas, and former UST area.

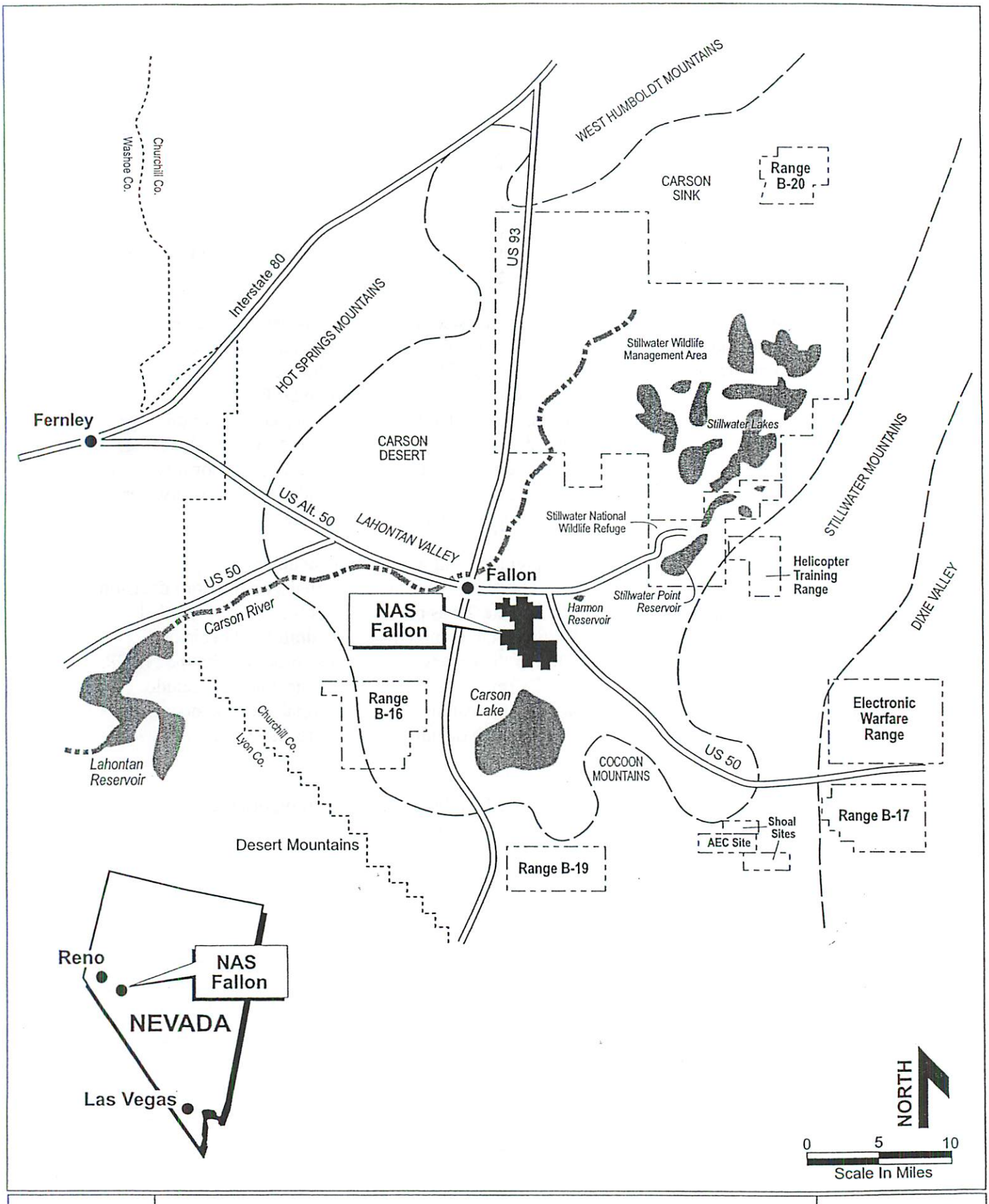
- Phase II consisted of an RI that included a baseline risk assessment conducted in 1994. Ten groundwater test holes, two wells, one piezometer, and seven boreholes were installed/completed during the RI, and soil and groundwater samples were obtained. One soil sample collected from a borehole near the former tank pit contained 260 mg/kg of total petroleum hydrocarbons–purgeable (TPH-P) (which is above the state action level of 100 mg/kg). All other sampling results were below the state action levels. Four surface water samples and one sediment sample were obtained from the unnamed drain to the west of the site. Contaminants detected in the surface water and sediment samples were attributed to the upgradient Site 16. Because of the lack of soil contamination other than that in the former UST pit, the limited extent of soil contamination associated

with the former UST pit, and the low human health risks, no further action was recommended for Site 9 on the basis of the RI results.

- Subsequent to the RI, the NDEP requested that additional characterization be performed at the site. Phase III was conducted to collect additional site characterization data in response to NDEP's request. The scope of the supplemental sampling was negotiated and approved by NDEP. Three direct-push borings on the east, north, and west sides of the former UST location were completed, and soil and groundwater samples were collected from these borings. Soil and groundwater samples were collected from two direct-push borings on the east and south sides of the sludge drying/evaporation ponds, and a groundwater sample was collected from existing monitoring well MW-32.

After the RI report was published, the Navy prepared a draft decision document for Site 9, presenting a decision of No Further Action. The NDEP provided comments on the draft decision document. A draft final decision document for Site 9 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 9 (the Phase III investigation). This decision document, therefore, supersedes and replaces all previous versions.

NAS Fallon is not listed on the National Priorities List therefore NDEP provides regulatory oversight. There have been no enforcement activities at the site.



U.S. NAVY	Figure 2-1 Location Map, NAS Fallon	Delivery Order 0029 NAS Fallon DECISION DOCUMENT SITE 9

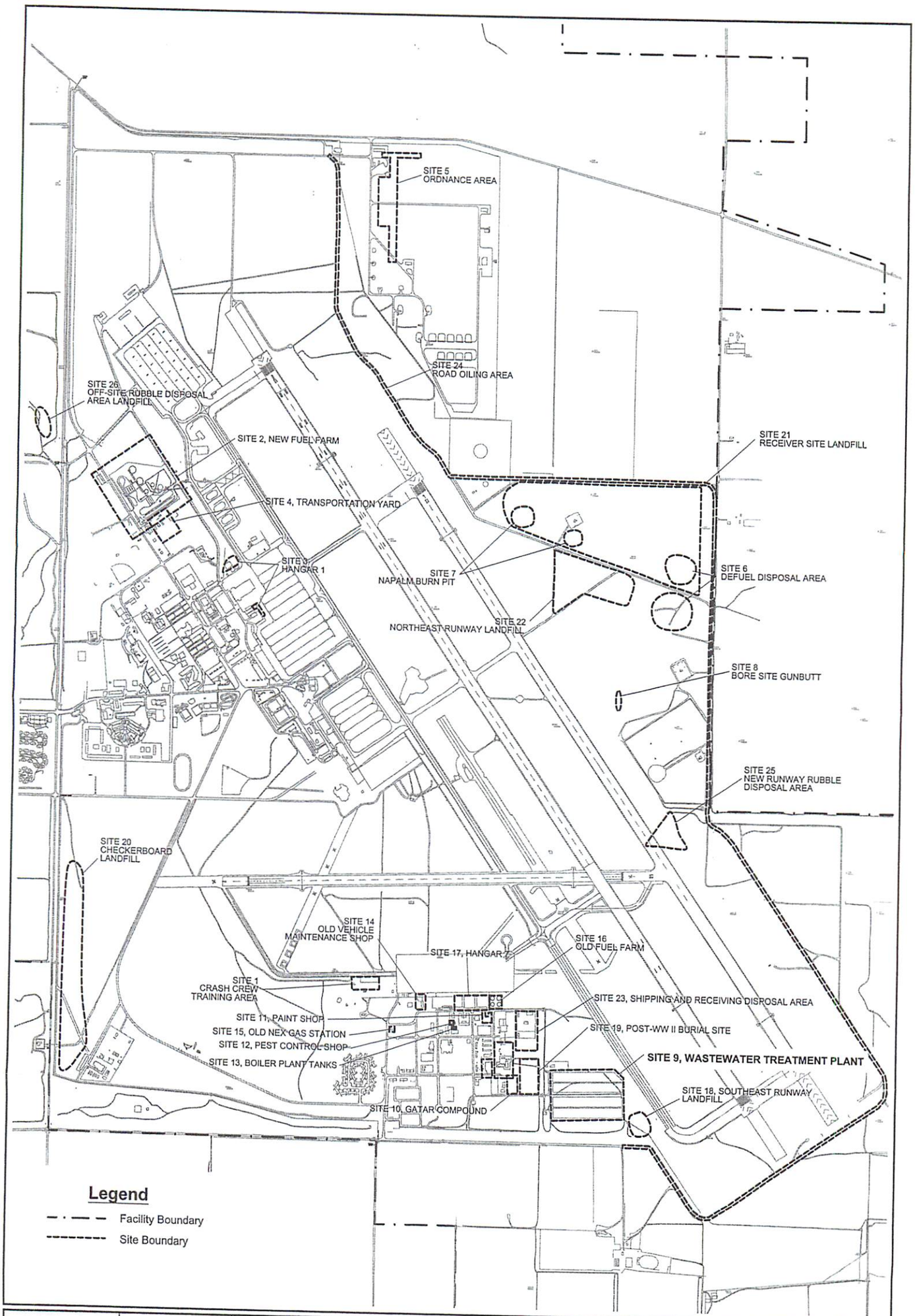


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Figure 2-2
NAS Fallon Facility Map

Delivery Order 0029
NAS Fallon
DECISION DOCUMENT
SITE 9

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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 and awareness regarding the IR Program and to provide comments on proposed actions under the 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 9, 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* on October 3, 2003. Notices were also sent to the RAB Community Co-Chair. A public comment period was held from October 8 through November 7, 2003. In addition, a public meeting was held on October 15, 2003, to present the Proposed Plan to the community. At this meeting, representatives from NAS Fallon and the NDEP presented the Proposed Plan.

4.0 SCOPE AND ROLE OF SITE

There are 27 IR sites at NAS Fallon. The locations of all 27 IR sites are shown on Figure 2-2. Site 1 (Crash Crew Training Area) is located in the southern station area northwest of Site 14. Intrinsic remediation is being implemented at Site 1 to address hydrocarbon and volatile organic impacts. Site 2 (New Fuel Farm) and Site 4 (Transportation Yard) are combined in the RI as Group I Sites and are located in the northwestern portion of the station. A feasibility study will be completed in late 2003 to evaluate alternatives for product recovery and dissolved hydrocarbon impacts at Site 2. Site 3 (Hangar 1) consists of two areas located southeast of the Group I Sites. Site 5 (Ordnance Area) is a no further action site located in the extreme northern portion of the station. Site 6 (Defuel Disposal Area), Site 7 (Napalm Burn Pit), Site 21 (Receiver Site Landfill), and Site 22 (Northeast Runway Landfill) are combined in the RI as Group II Sites and are located in the eastern portion of the station. Site 7 is a no further action site. Alternatives for Sites 21 and 22 are currently being evaluated. Site 8 (Bore Site Gunbutt) is a no further action site located in the eastern portion of the station just south of the Group II Sites. Site 9 (Wastewater Treatment Plant) and Site 18 (Southeast Runway Landfill) are combined in the RI as Group III Sites and are located in the southeastern portion of the station. Site 10 (GATAR Compound), Site 11 (Paint Shop), Site 12 (Pest Control Shop), Site 13 (Boiler Plant tanks), Site 14 (Old Vehicle Maintenance Shop), Site 15 (Old NEX Gas Station), Site 16 (Old Fuel Farm), Site 17 (Hangar 7), Site 19 (Post-WW II Burial Site), and Site 23 (Shipping and Receiving Disposal Area) are combined in the RI as Group IV Sites and are located in the southern portion of the station. Air-sparging is being conducted within the source area of Site 14 to address petroleum hydrocarbon and volatile organic impacts to groundwater at Site 14. Intrinsic remediation is planned for the downgradient extent of the plume originating from Site 14. Intrinsic remediation is also planned for the hydrocarbon plume originating from Site 16. Site 20 (Checkerboard Landfill) is located in the southeastern portion of the station. Site 24 (Road Oiling Area) is a road located along the eastern perimeter of the station. Site 25 (New Runway Disposal Area) is a no further action site located in the along the eastern boundary of the station. Site 26 (Off-Site Rubble Disposal Area Landfill) is a no further action site located along the western border of the station. Site 27 (Diesel Fuel Spill Site) is a no further action site located along the access road to bombing range B-17.

Site 9 is grouped Site 18 (the Southeast Runway Landfill) due to their proximity to one another and the potential for commingled contaminated areas. Site 9 is northwest of Site 18 (Figure 2-2).

The sampling locations used to evaluate Site 9 are as follows:

- Ten auger-boring locations immediately south and southeast of Site 9 from which groundwater samples were collected for qualitative analysis (these locations are sometimes referred to as "groundwater test holes")
- Two permanent monitoring wells also located immediately south and southeast of Site 9 from which soil and groundwater samples were collected
- Seven auger-boring locations near the former tank and in the areas of the sludge and grit disposal areas from which soil samples were collected
- Five direct-push boring locations on the east, north, and west sides of the former UST location and on the east and south sides of the sludge drying/evaporation ponds from which soil and groundwater samples were collected
- One surface water/sediment sampling location in the unnamed drain that flows from north to south along the western boundary of the site
- One surface water sampling location in the lower diagonal (LD) drain at the point where the unnamed drain discharges into the LD drain

The sampling locations used as a basis for the decision for Site 9 are summarized in Table 4-1, along with the gradient relationships to Site 9 and the uses of the data from each location. Table 4-2 provides a chronological summary of quantitative sampling activities.

The 10 groundwater test holes were initially completed specifically to qualitatively evaluate potential contaminant migration from Site 9 and to help site the permanent groundwater monitoring wells. Since no volatile contaminants were detected in the groundwater from the groundwater test holes, installation of the groundwater test holes did not help in siting the permanent groundwater monitoring wells. The permanent groundwater monitoring wells were installed, as originally planned, to evaluate whether contamination was migrating off site. Boreholes BH01 through BH07 were used to assess the presence of contaminants in the soil at the location of the former UST and at the sludge and grit disposal areas. Boreholes 9001 through 9005 were used to assess the presence of contaminants in soil and groundwater at the location of the former UST and immediately downgradient of the sludge drying/evaporation ponds. The

surface water/sediment sampling locations were used to assess the presence of contaminants in the drains adjacent to the site.

Only a limited investigation was performed in the area of the sludge drying/evaporation ponds, because the ponds have not been closed. The ponds will be closed in accordance with applicable environmental standards and regulations if they are deactivated. As a result, the goal of the sludge drying/evaporation pond sampling effort was not to characterize contaminants within the ponds, but to determine whether contaminants have reached the groundwater around the site; characterize the type, extent, and concentration of contaminants in the groundwater; and determine whether contaminants are migrating off site.

Table 4-1
Summary of Data From Sampling Locations Used as Basis of Decision for Site 9, Wastewater Treatment Plant

Sampling Location	Data Type	Data Uses
Locations Within Site 9		
Boreholes BH01–BH07	Quantitative	Quantitative assessment of presence or absence of potential contaminants in soil related to Site 9
Direct-push boreholes 9001–9005	Quantitative	Quantitative assessment of presence or absence of potential contaminants in soil and groundwater related to Site 9
Locations Downgradient of Site 9		
Groundwater test holes 1–10	Qualitative/ screening	Visual inspection for presence or absence of LNAPL on groundwater surface and qualitative assessment of volatile contaminants in groundwater, used to site permanent groundwater monitoring wells.
Wells MW-31 and MW-32	Quantitative	Quantitative assessment of potential contaminants migrating from Site 9
Locations Crossgradient of Site 9		
Surface water/sediment location SW-6/SD-6	Quantitative	Quantitative assessment of presence or absence of potential contaminants in surface water and sediment related to Site 9
Surface water location LD sewer	Quantitative	Quantitative assessment of presence or absence of potential contaminants in surface water related to Site 9

Note:
BH - borehole
LD - lower diagonal
LNAPL - light nonaqueous-phase liquid
MW - monitoring well
SD - sediment
SW - surface water

Table 4-2
Chronological Quantitative Sampling Summary

Sampling Location	Matrix	Sampling Dates	Range of Analyses[a]
MW-31	Soil	3/91	Petroleum hydrocarbons, VOCs, and SVOCs
MW-31	Groundwater	4/91	Petroleum hydrocarbons, BTEX, PCBs, pesticides, VOCs, SVOCs, anions, and metals
MW-32	Soil	3/91	Petroleum hydrocarbons, VOCs, and SVOCs
MW-32	Groundwater	4/91, 4/02	Petroleum hydrocarbons, BTEX, PCBs, pesticides, VOCs, SVOCs, anions, metals, TDS
BH01	Soil	3/91	Petroleum hydrocarbons, VOCs, SVOCs, and metals
BH02	Soil	3/91	Petroleum hydrocarbons, VOCs, SVOCs, and metals
BH03	Soil	4/91	Petroleum hydrocarbons, PCBs, pesticides, VOCs, SVOCs, and metals
BH04	Soil	4/91	Petroleum hydrocarbons, PCBs, pesticides, VOCs, SVOCs, and metals
BH05	Soil	4/91	Petroleum hydrocarbons, PCBs, pesticides, VOCs, SVOCs, and metals
BH06	Soil	4/91	Petroleum hydrocarbons, PCBs, pesticides, VOCs, SVOCs, and metals
BH07	Soil	4/91	Petroleum hydrocarbons, PCBs, pesticides, VOCs, SVOCs, and metals
9001	Soil	4/02	Petroleum hydrocarbons and VOCs
9001	Groundwater	4/02	Petroleum hydrocarbons, VOCs, and TDS
9002	Soil	4/02	Petroleum hydrocarbons and VOCs
9002	Groundwater	4/02	Petroleum hydrocarbons, VOCs, and TDS
9003	Soil	4/02	Petroleum hydrocarbons and VOCs
9003	Groundwater	4/02	Petroleum hydrocarbons, VOCs, and TDS
9004	Soil	4/02	VOCs and SVOCs
9004	Groundwater	4/02	VOCs, SVOCs, metals, and TDS
9005	Soil	4/02	VOCs and SVOCs
9005	Groundwater	4/02	VOCs, SVOCs, metals, and TDS
SW-6	Surface water	8/89, 9/89 (two samples), 10/89	Petroleum hydrocarbons, VOCs, SVOCs, metals, and anions
SD-6	Sediment	8/89	Petroleum hydrocarbons, VOCs, SVOCs, PCBs, pesticides, and metals
LD sewer	Surface water	4/00, 3/01	Petroleum hydrocarbons, VOCs, and TDS

[a]All analyses in the range shown were not necessarily performed on each sampling date.

Notes:
BH - borehole
BTEX - benzene, toluene, ethylbenzene, and xylenes
LD - lower diagonal
MW - monitoring well
PCB - polychlorinated biphenyl
SD - sediment
SVOC - semivolatile organic compound
SW - surface water
TDS- total dissolved solids
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 the 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.

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 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 intersect 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.

The LD drain is approximately 500 feet south of Site 9, and an unnamed drain is located just west of Site 9. The primary source of water in the unnamed drain is backflow from the LD drain during the irrigation season. During rare storm events, stormwater in small ditches may enter the unnamed drain.

5.1.2 Site 9 Physical Setting

Site 9, the Wastewater Treatment Plant, is located in the southeastern portion of NAS Fallon east of the Post–World War II Burial Site (Site 19) and west of the Southeast Runway Landfill (Site 18) (Figure 2-2). Site 9 encompasses approximately 22 acres, extending approximately 800 feet from north to south and 1,200 feet from east to west. Two buildings are located in the northwestern portion of the site. Building 130 houses offices and the lift station (Figure 5-1). Building 128 is the treatment building, which houses various treatment tanks/basins. A 500-gallon diesel UST was located just north of Building 130 until it was removed in 1985. The remainder of the site is covered with bermed, clay-lined sludge drying/evaporation ponds. The grit disposal area (also referred to as the grit chamber disposal pit) is located immediately north of the sludge drying/evaporation ponds, and the sludge disposal area (also known as the Imhoff tank sludge disposal pit) is located east/northeast of Pond No. 2. Wastewater treatment operations have occurred at Site 9 from 1943 to the present. NAS Fallon does not expect any change in the use of this land or that of the surrounding sites in the near future. There are no areas of archaeological or historical significance at Site 9.

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, shadscale, quailbush, greasewood, milkweed, poverty weed, alkali sacaton, rabbitbrush, saltgrass, and alkali seepweed.

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 bats, coyote, kit fox, jackrabbit, deer mouse, 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, carp, bullhead, catfish, sunfish, musk rats, herons, and egrets.

5.2.5 Endangered Animal Species

Federally listed endangered and threatened animal species that may utilize the NAS Fallon and range areas include the 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 of an intermontane valley. The mountains near NAS Fallon are composed primarily of a variety of consolidated igneous, sedimentary, and metamorphic rocks that range in age from Triassic to Quaternary.

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 interfingered 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. 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 5-2.

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 and slightly diagonal to the drainage ditches that cross the facility. 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 in the Wyemaha Formation. The boundary between the shallow and the intermediate aquifer is a relatively impermeable clay layer (Sehoo Formation), 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 northwest corner of the facility. However, NAS Fallon obtains all of its domestic water from this aquifer using deep wells northwest of the facility.

Three monitoring wells penetrating the intermediate aquifer at 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 9 Geology and Hydrogeology

The geologic information for Site 9 was obtained by soil sampling during the installation of monitoring wells MW-31 and MW-32 and soil borings 9001 through 9005 (Figure 5-1). Depth-to-groundwater information was obtained from these wells and borings, as well as from piezometer PZ-9-1. Subsurface investigations at the site were limited to the shallow alluvial aquifer as explained in Section 5.3.2. Wells MW-31 and MW-32 are located downgradient of the site. Soil borings 9001 through 9003 were located in the area of the former UST, and soil borings 9004 and 9005 were located adjacent to the sludge drying/evaporation ponds. Piezometer PZ-9-1 was located within the pond area. Generalized fence diagrams are shown on Figures 5-3 and 5-4.

Monitoring wells MW-31 and MW-32 both penetrated the entire Fallon Formation and the top of the Sehoo Formation (see Figure 5-2 for the generalized stratigraphy in the area of NAS Fallon). The boring for MW-31 was completed to a depth of 20 feet, and the boring for MW-32 was completed to a depth of 15 feet. The aquitard (Sehoo Formation) was generally observed at

depths ranging from 14 to 17 feet bgs. Sand and silty sand were generally encountered in the Fallon Formation above the silt-to-clay aquitard (Sehoo Formation). The majority of the sediments in the Fallon Formation are poorly graded sands that range in size from fine- to coarse-grained, generally becoming finer with depth. Interbedded with these sands are minor silty sands, and, in the case of MW-32, two moderately sorted sands at 4 and 13 feet that are 1-foot thick.

Borings 9001, 9002, and 9003 were located around the former UST excavation in the northwestern portion of the site. Saturated soil was observed at depths of approximately 7 to 10 feet bgs in borings 9001 through 9003. In these locations, depth to groundwater was measured in the direct-push rod, at depths ranging from approximately 6.5 to 9 feet bgs. The saturated zone consisted of a sand with a clay above the sand. The saturated zone was observed at the base of this 2- to 3-foot-thick clay layer (Figure 5-3).

Boring 9004 was located along the eastern edge of Pond No. 3, approximately 75 feet north of the southeastern corner of the pond. Boring 9005 was located along the southern edge of the southernmost sludge drying/evaporation pond (Pond No. 4), approximately 300 feet west of the southeastern corner of the pond. Saturated soil was observed at depths of approximately 7 feet bgs in both borings (9004 and 9005). Depth to water was measured in the push rods at approximately 7 feet bgs. Soil at location 9004 is described as sand with some silt from the ground surface to the total explored depth of 9 feet bgs. A thin clay was recovered from approximately 4 to 4.25 feet bgs. Location 9004 is close to the ponds and may have been regraded as part of the pond construction. Soil at location 9005 is described as sand from 0 to approximately 2.5 feet bgs, followed by clay from 2.5 to 4 feet bgs. Sand with varying amounts of silt was observed from 4 to 9 feet bgs, which is the total explored depth (Figure 5-4).

Groundwater surface elevation contours indicate a gradient and flow direction at Site 9 that are consistent with the regional flow direction, which is to the southeast. The depths to groundwater in wells, soil borings, and the piezometer that were used to evaluate conditions at Site 9 vary seasonally and range from 4 to 8.5 feet bgs. The average hydraulic gradient across the site was approximately 0.0007 in November 2002. Groundwater surface elevation contours for data collected in March and November 2002 are shown in Figures 5-5 and 5-6, respectively.

Wells MW-31 and MW-32 were bail tested in April 1991. Multiple bail tests were conducted at each location. The highest calculated hydraulic conductivity for each well location follows:

- MW-31: 0.49 foot/day, or 1.7×10^{-4} cm/sec
- MW-32: 1.99 feet/day, or 7.0^{-4} cm/sec

Using the bail test data, assuming a porosity of 33 percent and in average hydraulic gradient of 0.0007, the range of groundwater velocities across the site is estimated at 0.4 to 1.5 feet per year. Appendix E of the RI report indicates that bail tests may underestimate the hydraulic conductivity of materials at the facility from 5 to 125 times. Pumping tests were conducted in the area of Site 2, which is shown in Figure 2-2. The lithology in the area of well W-20 (at Site 2) is similar to that observed in the area of Site 9. Hydraulic conductivities derived from pumping tests were estimated at 38.9 to 61.6 feet per day. These estimates are 20 to 30 times higher than the highest bail-test-based estimate of 1.99 feet per day at Site 9, suggesting that groundwater velocity across the site could be as high as 45 feet per year. These velocity estimates are for groundwater and do not necessarily represent contaminant transport velocities, which are usually slower than groundwater velocity. The degree to which contaminant velocity is "retarded" relative to that of groundwater depends on the amount of organic carbon in the saturated formation and the contaminant type. Because of retardation, contaminant velocities are typically lower than groundwater velocities.

5.4 NUMERICAL VALUES FOR COMPARISON TO CONTAMINANT CONCENTRATIONS

Potential contaminants that could have been released as a result of activities at Site 9 include petroleum hydrocarbons, VOCs, SVOCs, and metals. Comparative numerical values for action decisions are provided in the Nevada Administrative Code (NAC), which state the following:

- The "soil state action level" established by NAC 445A.2272 is 100 mg/kg for petroleum substances (typically referred to as total petroleum hydrocarbons [TPH]).

- For contaminants in soil, compare the toxicity characteristics leaching procedure (TCLP)-allowable levels listed in 40 CFR Part 261.24 and the state action level pursuant to NAC 445A.2272 to contaminant concentrations detected during the investigation and/or remedial activities.

- If inhalation, ingestion or dermal exposure is the primary pathway of concern or an applicable level of concentration is not listed in the Toxicity Characteristics Leaching Rule, the presence of a hazardous substance, hazardous waste or a regulated substance in the soil at an appropriate level of concentration that is based on the protection of public health and safety and the environment. The appropriate level of concentration must be determined by the division using the Integrated Risk Information System, adopted by the Environmental Protection Agency, as it existed on October 3, 1996, or an equivalent method chosen by the

division. (Note: The equivalent method is generally assumed by NDEP to be EPA Region 9 Preliminary Remediation Goals [PRGs]).

- Except as otherwise provided by NAC 445A.2272, if more than one action level for soil may be established using the criteria set forth in subsection 1, the most restrictive action level must be used. In no case may the action level be more restrictive than the background concentration of the hazardous substance, hazardous waste or regulated substance.

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

- The presence of 1/2 inch or more of a petroleum substance that is free-floating on the surface of the water of an aquifer, using a measurement accuracy of 0.01 feet (NAC 445A.22735).

- For contaminants in groundwater, compare the maximum contaminant levels (MCLs) listed in the U.S. Environmental Protection Agency (EPA) Drinking Water Regulations and Health Advisories to contaminant concentrations detected during the investigation and/or remedial activities (NAC 445A.22735).

- In the absence of an MCL, a level of concentration equal to the background concentration of a hazardous substance or an appropriate level of concentration that is based on the protection of public health and safety and the environment. The appropriate level of concentration must be determined by the division using the Integrated Risk Information System, adopted by reference in NAC 445A.2272, or an equivalent method approved by the division. (Note: The equivalent method is generally assumed by NDEP to be EPA Region 9 PRGs).

- The action level may be set at a level of concentration equal to the background concentration of a hazardous substance, hazardous waste or a regulated substance, if that level of concentration is greater than the maximum contaminant level for that hazardous substance, hazardous waste, or regulated substance.

The Nevada Administrative Code does not provide an state action level for TPH in groundwater. The Nevada Division of Environmental Protection provided a guidance concentration of 1,000 µg/L in comments to the PA/SI. As a result, 1,000 µg/L has been used consistently as guidance for TPH in groundwater in various reports prepared by the Navy for work conducted at NAS Fallon. For the petroleum constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX), the MCLs for groundwater established by the EPA are 0.005, 1.0, 0.70, and 10.0 mg/L,

respectively. The MCLs for other VOCs, SVOCs, and metals are discussed as appropriate in the following subsections.

In the absence of an MCL for groundwater, the Navy will use EPA Region 9 PRGs as goals. In the absence of a NAC specified state action level for soil, the Navy will use EPA Region 9 PRGs as goals.

The Wastewater Treatment Plant received and continues to receives wastewater including sanitary wastes and minor industrial wastes from basewide operations via the sanitary sewer. Metals, oils, paint wastes, and photographic chemicals (which contain silver and mercury) are suspected hazardous materials that may have been discharged to the sanitary sewer. In addition, a 500-gallon diesel UST that was located just north of the wastewater treatment building (Building 130) was reported to be leaking at the time of its removal in 1985. These types of sources generally result in impacts on the subsurface due to petroleum hydrocarbons, VOCs, SVOCs, and metals.

5.5 NATURE AND EXTENT OF CONTAMINATION

This section first summarizes the data related to Site 9, then discusses in detail (in the following subsections) contaminants in soil and groundwater and the analytical results of the sampling.

TPH was detected in one soil sample at a concentration greater than the state action level. None of the other soil samples collected at the site contained the chemicals of concern (including TPH) at concentrations greater than the state action levels. Contaminant concentrations in groundwater have not exceeded the state action levels for VOCs and SVOCs in any of the samples obtained from the site or downgradient of the site, with the exception of naphthalene and 1,2,4-trimethylbenzene. Naphthalene was detected in two of eight groundwater samples at concentrations of 7.4 and 14 µg/L which are above the state action level of 6.2 µg/L. 1,2,4-Trimethylbenene was detected in one of eight groundwater samples at a concentration of 19 µg/L, which is 7 µg/L above the state action level of 12 µg/L. These observations show that the limited volume of TPH-contaminated soil remaining in place in the area of the former UST has not significantly affected the groundwater. The source of TPH contamination (the former UST) was removed in 1985; therefore, the main source of hydrocarbons to soil has been removed. The arid climate would tend to minimize the potential for future leaching of TPH to groundwater.

Total metals concentrations observed in groundwater at Site 9 fall within the range of naturally occurring background concentrations are not considered to be a result of activities at Site 9.

5.5.1 Qualitative Data From Groundwater Test Holes

Qualitative data was initially collected to assess the presence or absence of volatile contaminants downgradient of the Group III sites, including Site 9. 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.

Ten groundwater test holes were positioned downgradient of Site 9 as shown in Figure 5-1. The groundwater test holes provided screening-level data to assess the presence or absence of volatile contaminants that could be related to Site 9. More specifically, results from the groundwater test holes typically consisted of responses to the question "is contamination present or absent?" Contamination was not found in any of the 10 groundwater test holes downgradient of Site 9 (Figure 5-1).

5.5.2 Quantitative Soil Data

In 1991, soil samples were collected from seven soil borings (BH01 through BH07) and two monitoring wells (MW-31 and MW-32). Two of the soil borings (BH01 and BH02) were drilled near the former location of the UST. Samples were taken from three depth intervals in the these two borings (0 to 2, 3 to 5, and 5 to 7 feet bgs). Three of the soil borings (BH03 through BH05) were drilled in the grit chamber disposal pit, and two of the soil borings (BH06 and BH07) were drilled in the Imhoff tank sludge disposal pit. Samples were taken from two depth intervals in these five borings (0 to 2 and 2 to 4 feet bgs). The monitoring wells were drilled downgradient, south and southeast of the site. Samples were taken from 7 to 9 feet bgs from MW-31 and 5 to 7 feet bgs from MW-32. All of these samples were analyzed for total high-boiling-point petroleum hydrocarbons (HBP PHC) (EPA Method 8015 Modified), total low-boiling-point petroleum hydrocarbons (LBP PHC) (EPA Method 8015/8020), VOCs (EPA Method 8240), and SVOCs (EPA Method 8270). Samples from soil borings BH01 through BH07 were analyzed for metals (EPA Method 6010), and samples from boreholes BH03 through BH07 were analyzed for polychlorinated biphenyls (PCBs) and pesticides (EPA Method 3550/8080).

In 2002, soil samples were collected from five direct-push soil borings (9001 through 9005). Three of the soils borings (9001 through 9003) were located around the former UST excavation. Samples were taken from five depth intervals in these three borings (1 to 1.25, 2.5 to 3, 5 to 7, 7.5 to 9.5, and 10 to 11 feet bgs). One of the borings (9004) was located along the eastern edge of the Settling Pond No. 3. Samples were taken from three depth intervals in this boring (1 to 1.25, 2.5 to 3, and 6 to 7 feet bgs). Boring 9005 was located along the southern edge of the southernmost pond (Pond No. 4). Samples were taken from four depth intervals in this boring (1 to 1.25, 2.5 to 3, 5 to 7, and 7.5 to 9.5 feet bgs). Samples collected from soil borings 9001 through 9003 were analyzed for TPH-P (EPA Method 8015M) and VOCs (EPA Method 8260B). Samples collected from soil borings 9004 and 9005 were analyzed for VOCs (EPA Method 8260B) and SVOCs (EPA Method 8270C). The analytical results for detected analytes from the two soil sampling events are summarized in Tables 5-1 and 5-2.

Detected organic results for soil samples are summarized in Table 5-1. Total HBP PHC was not detected at concentrations above the 10 mg/kg detection limit in any of the 18 samples analyzed for HBP PHC. Total LBP PHC was detected in one sample at a concentration above the 5 mg/kg detection limit. Total LBP PHC was detected in the sample from BH02 (5 to 7 feet bgs) at a concentration of 260 mg/kg, which is above the 100 mg/kg state action level for TPH in soil. TPH-P was detected in 1 of 15 analyzed soil samples (location 9001) at a concentration of 27 mg/kg, which is less than the state action level of 100 mg/kg.

Forty soil samples were analyzed for VOCs. The compounds 1,2-dichloropropane and ethylbenzene were detected in one sample from BH02 at concentrations of 0.002 and 0.01 mg/kg, respectively. Xylenes were also detected in this sample. Using EPA Method 8015/8020, the concentration of xylene in the sample was 1.2 mg/kg. Using EPA Method 8240, the concentration was 0.15 mg/kg. The compound 4-isopropyltoluene was detected in one sample from boring 9001 at a concentration of 0.027 mg/kg. The compound n- butylbenzene was detected in one sample from boring 9001 at a concentration of 0.035 mg/kg. None of the VOCs were detected at concentrations greater than the state action levels (Table 5-1). No other VOCs were detected in soil at concentrations above the detection limits.

Twenty-five soil samples were analyzed for SVOCs. Fluorene, 2-methylnaphthalene, naphthalene, and phenanthrene were detected in one sample from BH02 at concentrations of 1.2, 8.4, 3.9, and 3.5 mg/kg, respectively. None of the SVOCs were detected at concentrations greater than their respective state action levels (Table 5-1). No other SVOCs were detected in soil at concentrations above the reporting limits.

The SVOC bis(2-ethylhexyl)phthalate and the VOCs acetone and methylene chloride were detected in very low concentrations in many of the samples taken during the 1991 sampling event. Methylene chloride and bis(2-ethylhexyl)phthalate were both detected in the method

blank and are therefore considered laboratory contaminants. Acetone is a suspected laboratory contaminant. Because these compounds are either confirmed or suspected laboratory contaminants, they are not included in Table 5-1.

PCBs and pesticides were not detected in any of the analyzed soil samples. Sixteen soil samples were analyzed for metals. Detected metals in soil are summarized in Table 5-2. Two metals, arsenic and iron, were detected at concentrations above PRGs. Arsenic was detected at a concentration above the PRG (0.39 mg/kg) in samples collected from BH01 through BH07, with a maximum detected concentration of 13.6 mg/kg. Iron was detected at a concentration above the PRG (23,000 mg/kg) in samples collected from BH01 and BH02, with a maximum detected concentration of 29,500 mg/kg. However, all metals were detected at concentrations consistent with naturally occurring background concentrations (Table 5-2) and are not considered to be a result of Site 9 activities.

5.5.3 Surface Water and Sediment Sampling

Four surface water samples and one sediment sample were collected in 1989 from the unnamed drain west of Site 9 at location SW-6/SD-6 (Figure 5-1). The surface water samples were analyzed for TPH (EPA Method 418.1), VOCs (EPA Method 624), SVOCs (EPA Method 625), metals (EPA Method 200.7), and anions (EPA Method 429). The sediment sample was analyzed for TPH (EPA Method 418.1), VOCs (EPA Method 8240), SVOCs (EPA Method 8270), PCBs and pesticides (EPA Method 3550/8080), and metals (EPA Method 6010). Petroleum hydrocarbons were detected in one surface water sample at a concentration of 2 mg/L and in the sediment sample at a concentration of 43 mg/kg. Butylbenzylphthalate was also detected in one surface water sample at a concentration of 2 µg/L. The known laboratory contaminants acetone, bis(2-ethylhexyl)phthalate, and methylene chloride were detected in two of the surface water samples and the soil sample.

Two surface water samples were collected from the LD drain at location LD sewer (Figure 5-1), one in 2000 and one in 2001. This sampling location is at the point where the unnamed drain discharges into the LD drain. The surface water samples were analyzed for TPH-extractable (TPH-E) (EPA Method 8015B Modified) and VOCs (EPA Method 8260B). Analysis for total dissolved solids (TDS) (EPA Method 160.1) was performed only during the 2001 sampling event. Petroleum hydrocarbons were not detected in either of the samples.

The petroleum hydrocarbons detected in surface water/sediment samples collected west of Site 9 in 1989 are not believed to be the result of any source of contamination at Site 9. This surface water/sediment sampling location is crossgradient of Site 9. Recent 2000 and 2001 sampling results show no surface water contaminants.

5.5.4 Groundwater Sampling

In April of 1991, groundwater samples were collected from two monitoring wells (MW-31 and MW-32). One sample was obtained from each well and analyzed for total HBP PHC (EPA Method 8015 Modified), total LBP PHC (EPA Method 8015/8020), PCBs and pesticides (EPA Method 608), VOCs (EPA Method 624), SVOCs (EPA Method 625), metals (EPA Method 200.7), and anions (EPA Method 429). In 2002, MW-32 was sampled for TPH (EPA Method 8015) VOCs (EPA Method 8260B), SVOCs (EPA Method 8270C), metals (EPA Method 6010B), and TDS (EPA Method 160.1). MW-31 was not sampled in 2002, because the well was dry. In addition, groundwater samples were obtained from boreholes 9001 through 9005. Samples obtained from boreholes 9001 through 9003 were analyzed for TPH-P (EPA Method 8015 Modified), VOCs (EPA Method 8260B), and TDS (EPA Method 160.1). Samples obtained from boreholes 9004 and 9005 were analyzed for the same analytes as MW-32. A summary of detected analytes in groundwater is provided in Tables 5-3 and 5-4.

Detected organics in groundwater are summarized in Table 5-3. Total HBP PHC was not detected in the two samples collected in 1991. Total LBP PHC was not detected at concentrations above 50 µg/L in the two samples analyzed for LBP PHC. TPH-P was not detected in the three samples analyzed in 2002.

Eight groundwater samples were analyzed for VOCs. The compound 1,2,4-trimethylbenzene was detected in groundwater from borings 9003 and 9004 at concentrations of 2.6 and 19 µg/L, respectively. The sample obtained from 9004, which showed a concentration of 19 µg/L, was 7 µg/L above the state action level of 12 µg/L. Toluene was detected in groundwater from samples obtained from boring 9000 and from MW-32 at concentrations of 1.6 and 2.0 µg/L, respectively. Neither of these detections exceeded the state action level for toluene (1,000 µg/L). The compounds 1,3,5-trimethylbenzene, 2-chlorotoluene, ethylbenzene, m,p-xylenes, o-xylene, and trichloroethene were detected in one sample from either boring 9003 or 9004. Concentrations of these chemicals ranged from 0.74 to 15 µg/L. The detected concentrations for all of these compounds were below these state action levels (Table 5-3). Naphthalene was detected in groundwater from borings 9003 and 9004 at concentrations of 7.4 and 14 µg/L, respectively. Both of these concentrations are slightly above the state action level of 6.2 µg/L. However, naphthalene was not detected in these same two samples when the samples were analyzed for SVOCs using EPA Method 8270C. The detection limit for naphthalene using EPA Method 8270 (SVOCs) was 9.9 µg/L. Five groundwater samples were analyzed for SVOCs, and no compounds were detected above the reporting limit.

Five groundwater samples were analyzed for metals. Concentrations of arsenic, boron, manganese, molybdenum, and vanadium were above the MCLs or PRGs (Table 5-4). Arsenic was detected above the MCL (0.050 mg/L) in all five samples, with a maximum concentration of

1.65 mg/L. Boron was detected in both of the samples analyzed for this metal at concentrations of 15.2 mg/L and 66.9 mg/L. Both of these detections were above the PRG of 7.3 mg/L. Manganese was detected above the PRG (0.88 mg/L) in two of the five samples. The maximum detected manganese concentration was 4.19 mg/L. Molybdenum was detected in both samples analyzed for this metal at concentrations of 0.23 mg/L and 2.07 mg/L. Both of these detections were above the PRG of 0.18 mg/L. Finally, vanadium was detected at a concentration above the PRG (1.260 mg/L) in one of the five samples. However, all metals were detected at concentrations within the range of naturally occurring background concentrations (Table 5-4) and the detected metals concentrations in groundwater are not considered to be a result of Site 9 activities. TDS concentrations ranged from 6,540 to 48,200 mg/L, with an average of 23,700 mg/L. In three of the six samples collected and analyzed for TDS at Site 9, the concentration of TDS exceeded the 10,000 mg/L criterion for potability according to NAC 445A.22725.

5.6 CONTAMINANT FATE AND TRANSPORT

Fate and transport of contaminants is discussed below based on the two potential contributing components at the site; the former UST and the wastewater treatment operations.

5.6.1 Former UST Area

Petroleum hydrocarbons have been detected in one soil sample at a concentration above the state action level in the former UST area. However, the lateral and vertical extent of petroleum contamination is limited based on results of samples from additional boreholes positioned within 5 to 20 feet of the initial TPH detection which did not contain concentrations in excess of the state action level. In fact, only one of these supplemental samples contained TPH at a concentration above the reporting limit. No other contaminants have been detected in soil above the state action levels. Total petroleum hydrocarbons, VOCs, and SVOCs have not been detected in groundwater at concentrations above the state action levels in the area of the former UST. These observations indicate that TPH and petroleum-related compounds have not leached to groundwater at concentrations above state action levels or guidance concentrations. The arid climate would tend to minimize the potential for future leaching of residual petroleum hydrocarbons from soil to groundwater.

The sampling results indicate that soil contamination in excess of the state action levels is limited to an area in the immediate vicinity of the former UST location. A limited A through K evaluation (NAC 445A.227) indicates that the absence of TPH in soil at concentrations above the state action level in boreholes 9001 through 9003 and BH01 confirms that any impacts are localized. The maximum volume of soil with TPH contamination above the state action level is

estimated to be approximately 300 cubic yards, assuming a maximum depth of contamination of 10 feet based on the depth to groundwater. This volume estimate also assumes that all soil within the square created by boreholes 9001 through 9003 and BH01 is contaminated. Hydrocarbons were not detected in soil at concentrations that pose a potential hazard for fire, vapor, or a explosion. The closest building is approximately 20 feet south of the former UST location, outside of the area affected by petroleum hydrocarbons.

The UST was removed in 1985. If contaminants in soil were leaching to groundwater, it would be expected that after 18 years the impacts on the groundwater would be measurable. However, no groundwater contamination above guidance levels or state actions levels has been detected in the vicinity of the former UST (discussed in Section 5.4.5). The low annual precipitation in this area (approximately 5 inches) and the high evaporation rate will likely minimize the potential for future leaching to groundwater. Because site groundwater has not been affected in the 18 years since the date of the known release and the source has been removed, it is highly unlikely that downgradient domestic wells would be affected by the remaining contaminated soils at the location of the former UST. The distance to the closest domestic water well, the May Ranch well located at NAS Fallon, is approximately 1,600 feet south-southwest. The next closest well is approximately 1.3 miles south-southeast of the site, outside the boundary of NAS Fallon. In addition, there are two wells approximately 2 miles southeast of the site, also outside the facility boundary. All of these wells are reportedly screened below the shallow saturated zone of interest at Site 9. Groundwater flow in the zone is to the southeast. As a result, conditions at the former UST site pose no risk of contaminant migration to downgradient receptors, and therefore the site poses no risk to human health.

5.6.2 Wastewater Treatment Operations

Wastewater treatment operations were assessed using RI borings BH-03, BH-04, BH-05, BH-06, BH-07, supplemental sampling locations 9003, and 9004, and wells MW-31 and 32. Naphthalene was detected in two groundwater samples from boreholes 9003 and 9004 at concentrations of 7.4 and 14 µg/L, respectively. The state action level of 6.2 µg/L is the EPA Region 9 PRG for tap water. The VOC 1,2,4-trimethylbenzene was detected in one of eight groundwater samples at a concentration above the state action level. The state action level of 12 µg/L for 1,2,4-trimethylbenzene is also the EPA Region 9 PRG for tap water. The tap water PRG implies a residential use or direct consumption of groundwater at the site. Given that the wastewater treatment facility (under which the impacted groundwater is found) is currently operating and will continue to be operated in to the foreseeable future, this site is an industrial site and is not considered to be a candidate for future residential use. In addition, shallow groundwater is not currently used for domestic purposes at or downgradient of Site 9. The naturally occurring high TDS concentrations will make this shallow groundwater a poor choice for future residential use. Naphthalene was detected in one of 25 soil samples collected from the

site at a concentration below the state action level of 56 mg/kg. Naphthalene was detected in the 1991 soil sample from BH-02 at a concentration of 3.9 mg/kg, which is below the state action level of 56 mg/kg. Since naphthalene was detected in only one of 25 soil samples, it is concluded that there is not a significant source of naphthalene at the site. These observations indicate that the naphthalene detections at Site 9 do not pose a risk of off-site migration and the detected concentrations do not pose a risk to human health. Groundwater flow has consistently been to the southeast, with an average hydraulic gradient of approximately 0.0007. Groundwater flow velocity across Site 9 could be as high as 45 feet per year. Retardation of contaminants in groundwater would result in contaminant velocities slower than the estimated groundwater velocities.

5.7 BASIS FOR DECISION

NAS Fallon has selected No Further Action as the preferred alternative for Site 9 for the following reasons:

- The baseline risk assessment conducted as part of the RI concluded that there are no cancer risks and the hazard indices (HI) due to exposure to site soils for both the current and future exposure scenarios are well below 1.0.

- Post-RI sampling identified no additional contaminants in soil at concentrations above state action levels.

- The baseline human health risk assessment conducted as part of the RI concluded that a quantitative analysis of risk was not necessary for groundwater due to the absence of contamination.

- Although 1,2,4-trimethybenzene and naphthalene were detected in groundwater above state action levels in samples obtained during post-RI sampling, the detections are not considered to pose a risk to human health based on the magnitude of the detections, the current non-residential status of the site, and the low potential for domestic groundwater use.

- The baseline ecological risk assessment conducted as part of the RI concluded that the HIs are below the acceptable value for all animal species and only slightly above the acceptable value for plants. (Note: The calculated risk for plants is based on concentrations of TPH from one soil sample at a depth of 5 to 7 feet. Contamination was not detected in any other samples during the RI.) Due to the

depth of the contamination, the limited extent of contamination, and the location in a disturbed area, impacts on plants are not expected.

- The limited volume of soil containing total petroleum hydrocarbons (TPH) at concentrations above the state action level has not resulted in leaching of TPH to groundwater. The source of TPH to soil has not been present at the site since 1985 when the USTs were removed. The lack of TPH in groundwater at concentrations above the state action level, and in most cases above the reporting limit, suggests that TPH has not resulted in leaching from soil to groundwater at concentrations above the state action level. The arid climate would tend to minimize the potential for future leaching of TPH from soil to groundwater.

- Site 9 is currently the central wastewater treatment facility for NAS Fallon. NAS Fallon does not expect any change in the use of this land or that of the surrounding sites, in the foreseeable future.

In summary, No Further Action is recommended for this site because although some samples exceed state action levels, the baseline risk assessment established that the site does not present a risk to human health or the environment.

Based on these observations, Site 9 does not pose a threat the human health or the environment, and no further action is required.

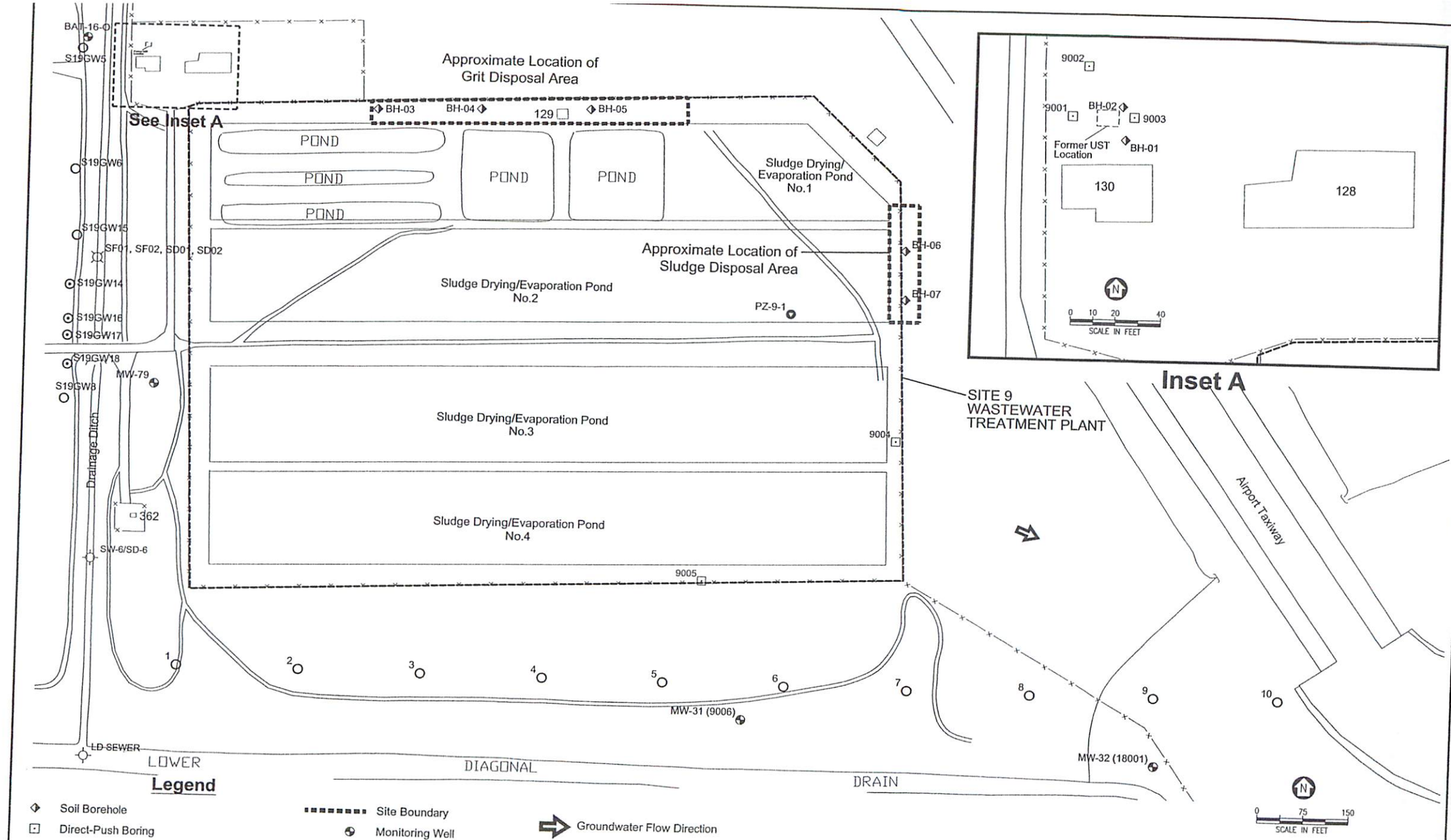

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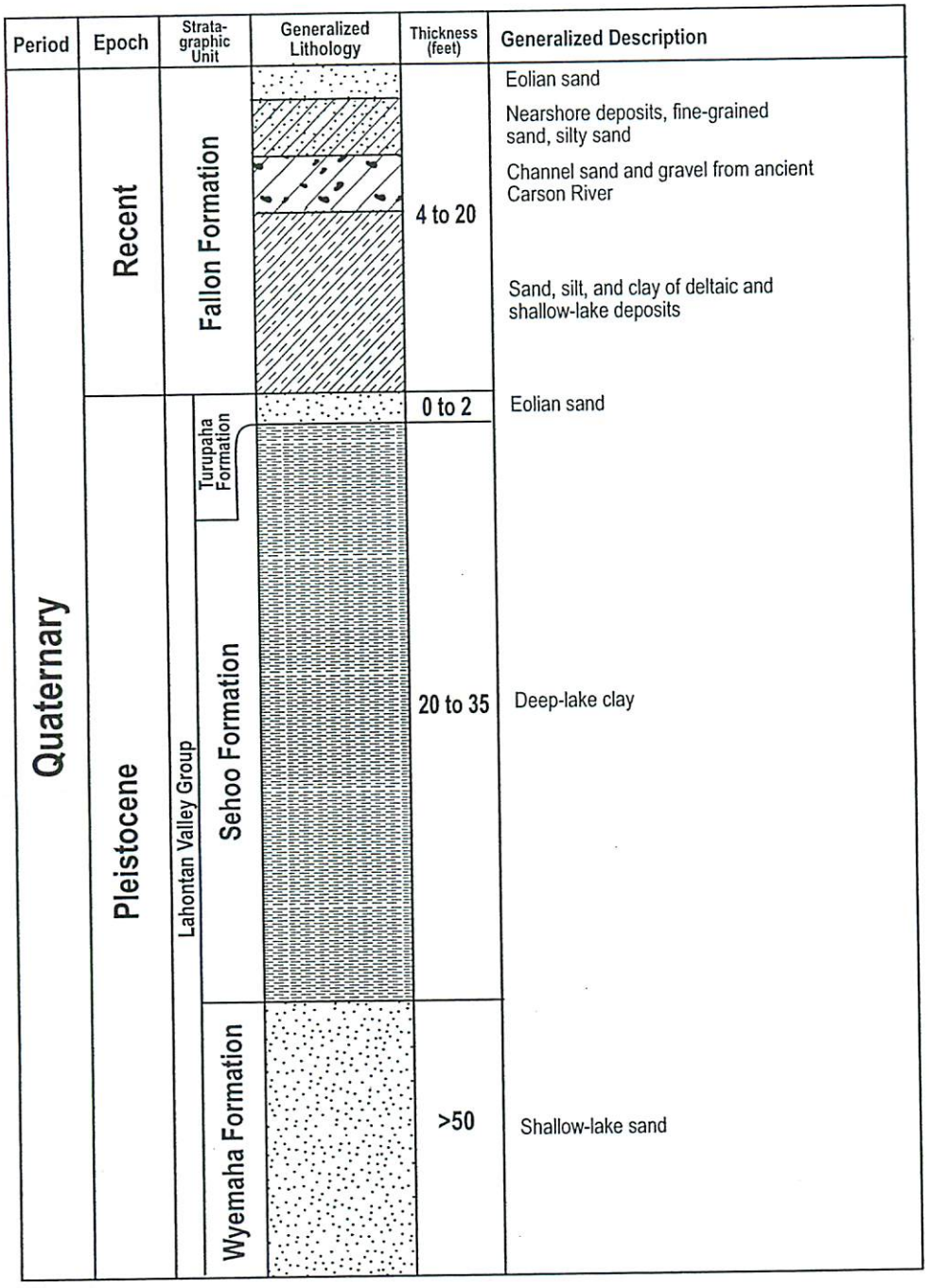
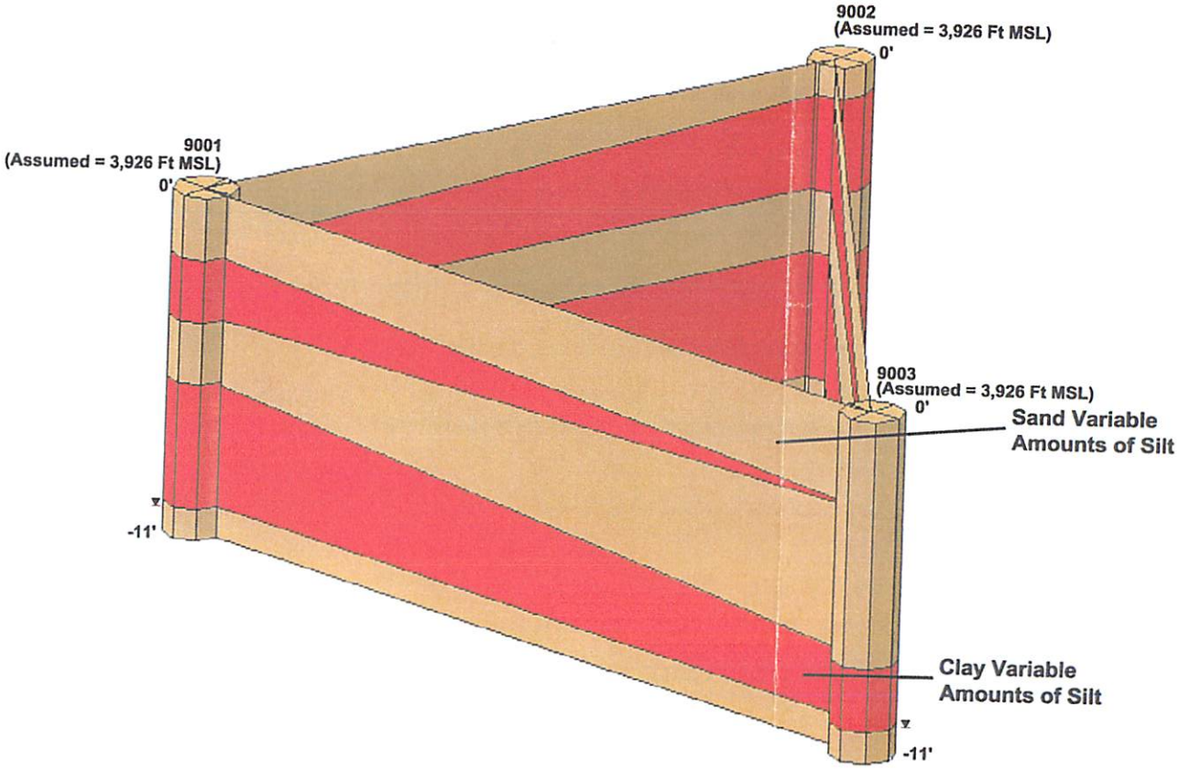
Figure 5-1
Sampling Locations at Site 9,
Wastewater Treatment Plant

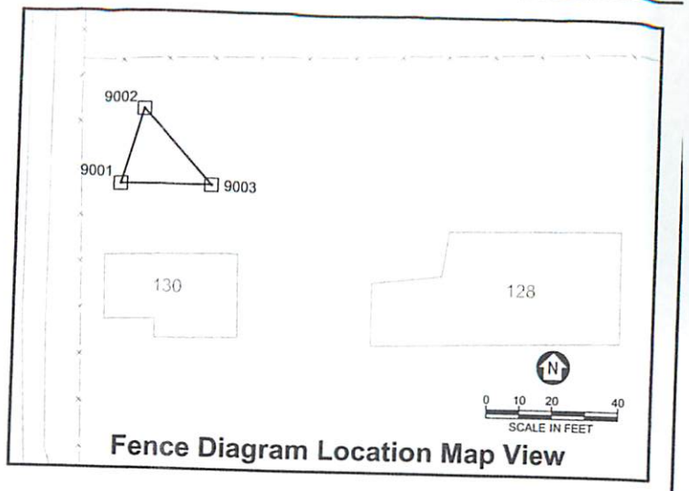


U.S. NAVY

Figure 5-2
Generalized Stratigraphy of NAS Fallon

Delivery Order 0029
NAS Fallon
DECISION DOCUMENT
SITE 9





Fence Diagram Location Map View

Legend

- Depth to Water Measured in Direct-Push Rod (April 2002)
- Direct-Push Boring

Ft - Feet

MSL - Mean Sea Level

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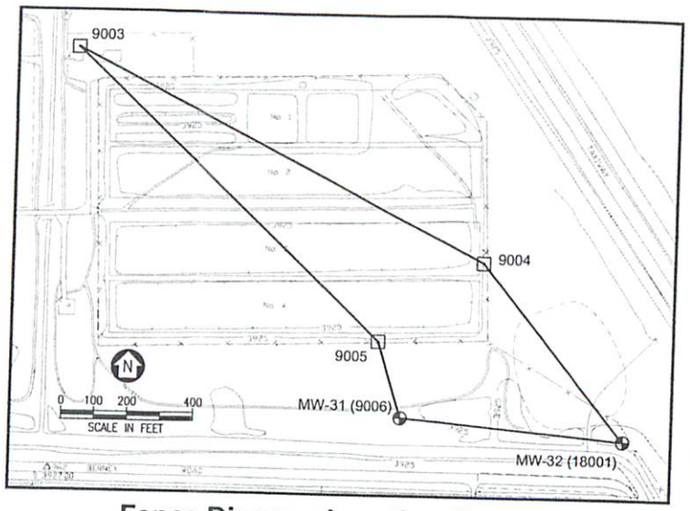
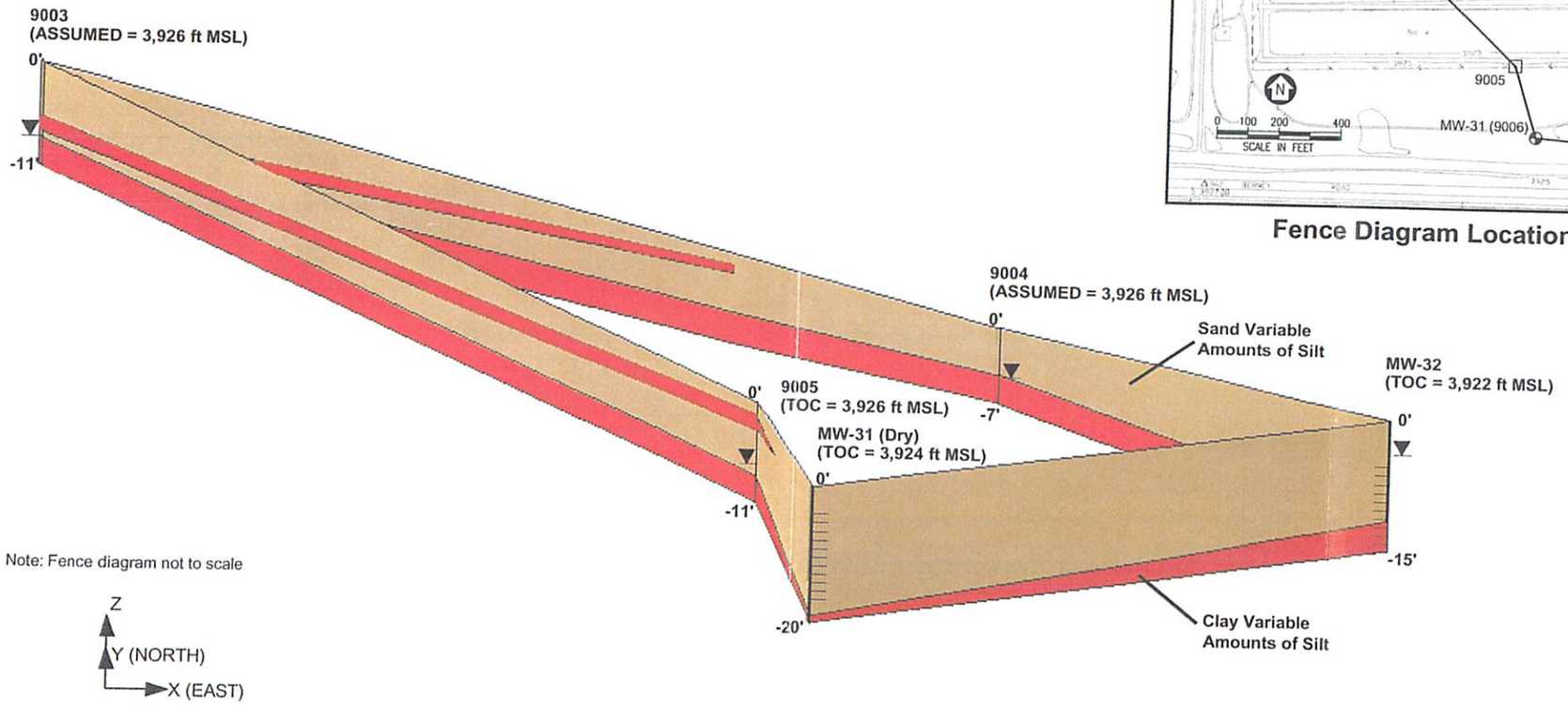
U.S. NAVY	Delivery Order 0029 NAS Fallon DECISION DOCUMENT SITE 9	Scale as Shown	Figure 5-3 Generalized Fence Diagram Former UST Area



Fence Diagram Location Map View



Legend

- Monitoring Well
- Direct-Push Boring
- Ft MSL — Feet Mean Sea Level
- Screen Interval
- Depth to Water Measured in Direct-Push Rod (April 2002) or Well (November 2002)
- TOC — Top of Casing

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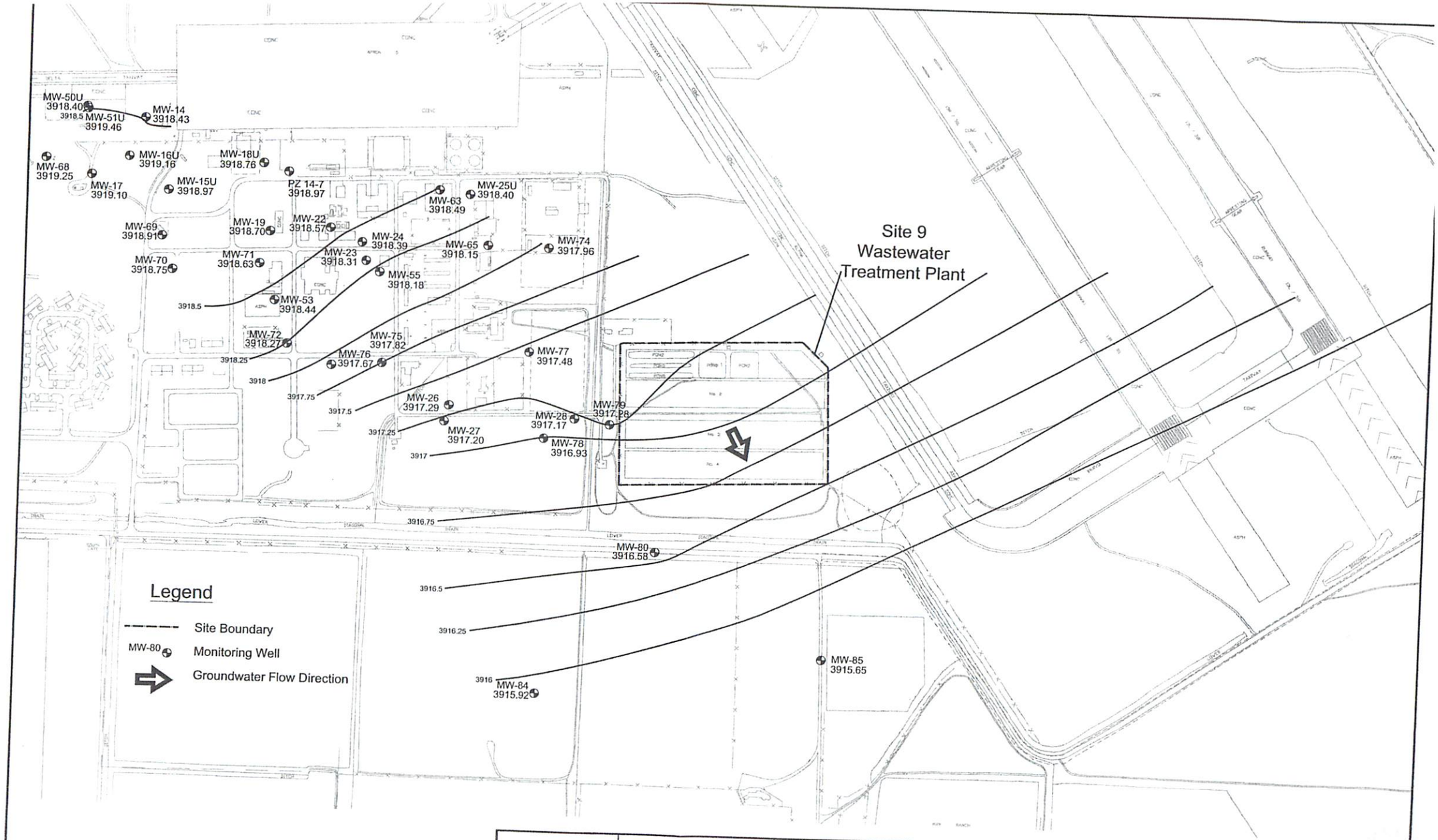
U.S. NAVY	Delivery Order 0029 NAS Fallon DECISION DOCUMENT SITE 9	Scale as Shown	**Figure 5-4** **Generalized Fence Diagram** **Settling Pond Area**



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SITE 9

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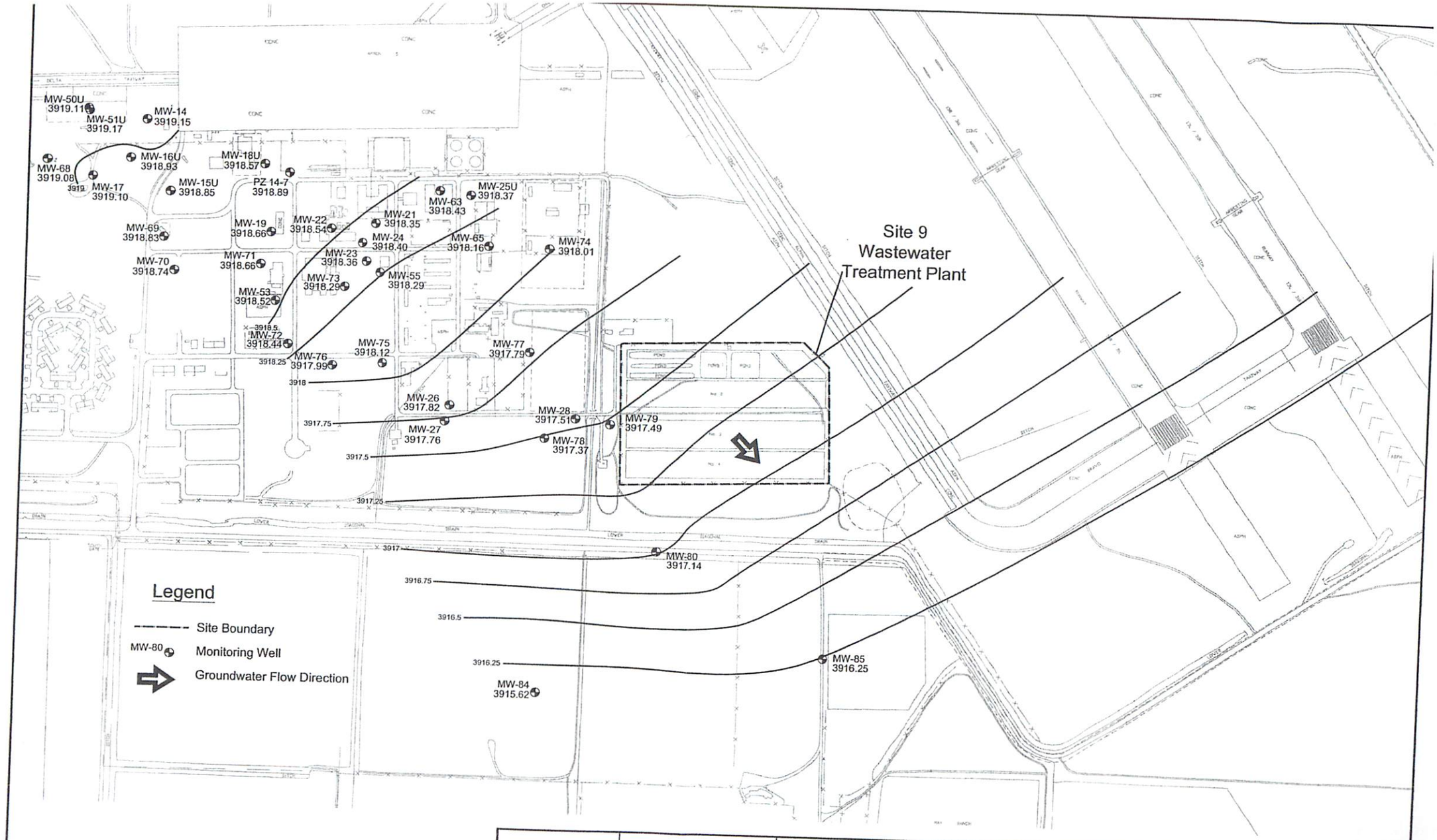
Figure 5-5
Groundwater Surface Elevation Contours, Southern Station Area, March 2002



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U.S. NAVY

Delivery Order 0029
NAS Fallon
DECISION SUMMARY
SITE 9

Figure 5-6
Groundwater Surface Elevation Contours, Southern Station Area, November 2002

Table 5-1
Summary of Detected Organics in Soil Samples From Site 9

Analyte[a]	Unit	No. of Samples Tested	No. of Detections	Minimum Concentration	Average Concentration	Maximum Concentration	Action Level	No. of Detections Greater Than Action Level	Locations With Detections Greater Than Action Level
Petroleum Hydrocarbons									
TPH-purgeable	mg/kg	15	1	27	27	27	100[b]	0	None
LBP PHC	mg/kg	18	1	260	260	260	100[b]	1	BH02 (5 to 7 feet bgs)
Xylenes (total) (Method 8015/8020)	mg/kg	18	1	1.2	1.2	1.2	270[c]	0	None
Volatile Organic Compounds									
1,2-Dichloropropane	mg/kg	40	1	0.002	0.002	0.002	0.34[c]	0	None
Ethylbenzene	mg/kg	40	1	0.01	0.01	0.01	8.9[c]	0	None
4-Isopropyltoluene	mg/kg	40	1	0.027	0.027	0.027	570[c,d]	0	None
n-Butylbenzene	mg/kg	40	1	0.035	0.035	0.035	240[c]	0	None
Xylenes (total) (Method 8240)	mg/kg	40	1	0.15	0.15	0.15	270[c]	0	None
Semivolatile Organic Compounds									
Fluorene	mg/kg	25	1	1.2	1.2	1.2	2,700[c]	0	None
2-Methylnaphthalene	mg/kg	25	1	8.4	8.4	8.4	56[c,e]	0	None
Naphthalene	mg/kg	25	1	3.9	3.9	3.9	56[c]	0	None
Phenanthrene	mg/kg	25	1	3.5	3.5	3.5	2,300[c,f]	0	None

Table 5-1 (Continued)
Summary of Detected Organics in Soil Samples From Site 9

[a]Methylene chloride, acetone, and bis(2-ethylhexyl)phthalate were detected in samples obtained during the remedial investigation and are not reported here. However, these chemicals are either suspected or confirmed laboratory contaminants.
[b] Nevada Administrative Code
[c]EPA Region 9 Preliminary Remedial Goals – residential soil
[d]EPA Region 9 Preliminary Remedial Goal for isopropylbenzene – used as a surrogate for 4-isopropyltoluene
[e]EPA Region 9 Preliminary Remedial Goal for naphthalene – used as a surrogate for 2-methylnapthalene
[f]EPA Region 9 Preliminary Remedial Goal for fluoranthene – used as a surrogate for phenanthrene

Notes:
bgs – below ground surface
LBP PHC - low-boiling-point petroleum hydrocarbons
mg/kg - milligram per kilogram
TPH - total petroleum hydrocarbons

Table 5-2
Summary of Detected Metals in Soil Samples From Site 9

Analyte	Unit	No. of Samples Tested	No. of Detections	Minimum Concentration	Average Concentration	Maximum Concentration	State Action Level or PRG	Naturally Occurring Background	No. of Detections Greater Than PRG	Locations With Detections Greater Than Action Level
Aluminum	mg/kg	16	16	3,540	9,439	20,700	76,00 [a]	1,800 to 20,700	0	None
Arsenic	mg/kg	16	16	3	8	13.6	0.39 [a]	1.1 to 64.2	16	BH01, BH02, BH03, BH04, BH05, BH06, BH07
Barium	mg/kg	16	16	28.9	92	219	5,400 [a]	0.13 to 387	0	None
Beryllium	mg/kg	16	16	0.17	0.33	0.89	150 [a]	0.11 to 1.5	0	None
Boron	mg/kg	16	15	4.3	32	79.5	16,000 [a]	0.0023 to 117	0	None
Calcium	mg/kg	16	16	2,450	7,794	20,200	NE	4.1 to 61,400	NA	NA
Chromium	mg/kg	16	16	4.1	8	14.6	100,000 [a,b]	0.014 to 64	0	None
Cobalt	mg/kg	16	16	4.1	8	15.9	900 [a]	0.0086 to 15.9	0	None
Copper	mg/kg	16	16	9.3	58	225	3,100 [a]	0.0024 to 320	0	None
Iron	mg/kg	16	16	9,260	16,247	29,500	23,000 [a]	5,060 to 29,500	2	BH01, BH02
Lead	mg/kg	16	16	2.6	6	13.7	400 [a]	0.019 to 55	0	None
Lithium	mg/kg	16	16	5.1	19	42.8	1,600 [a]	0.018 to 50.4	0	None
Magnesium	mg/kg	16	16	1,650	5,144	11,300	NE	1.2 to 11,300	NA	NA
Manganese	mg/kg	16	16	120	313	831	1.800 [a]	54.7 to 1,560	0	None
Mercury	mg/kg	16	9	0.02	0.04	0.09	61. [a,c]	0.02 to 1	0	None

Table 5-2 (Continued)
Summary of Detected Metals in Soil Samples From Site 9

Analyte	Unit	No. of Samples Tested	No. of Detections	Minimum Concentration	Average Concentration	Maximum Concentration	State Action Level or PRG	Naturally Occurring Background	No. of Detections Greater Than PRG	Locations With Detections Greater Than Action Level
Molybdenum	mg/kg	16	1	3.5	3.5	3.5	390 [a]	2.5 to 7.5	0	None
Nickel	mg/kg	16	16	3.5	8	16.1	1,600 [a]	0.011 to 23	0	None
Potassium	mg/kg	16	16	843	2,724	5,880	NE	3.09 to 5,880	NA	NA
Silver	mg/kg	16	8	0.67	1	1.30	390 [a]	3 to 140	0	None
Sodium	mg/kg	16	16	7.3	4,226	12,300	NE	7.3 to 13,400	NA	NA
Vanadium	mg/kg	16	16	17.3	36	64.9	550 [c]	0.054 to 74	0	None
Zinc	mg/kg	16	16	35.8	89	258	23,000 [c]	0.88 to 382	0	None

[a]EPA Region 9 Preliminary Remedial Goals – residential soil
[b]Assumes chromium III
[c]Assumes methylmercury

Notes:
mg/kg - milligram per kilogram
NA - not applicable
NE - not established
PRG - preliminary remedial goal

Table 5-3
Summary of Detected Organics in Groundwater Samples From Site 9

Analyte	Units	No. of Samples Tested	No. of Detections	Minimum Concentration	Average Concentration	Maximum Concentration	Action Level[a]	No. of Detections Greater Than Action Level	Locations With Detections Greater Than Action Level
Volatile Organic Compounds									
1,2,4-Trimethylbenzene	µg/L	8	2	2.6	10.8	19	12[a]	1	9004
1,3,5-Trimethylbenzene	µg/L	8	1	5.3	5.3	5.3	12[a]	0	None
2-Chlorotoluene	µg/L	8	1	2.5	2.5	2.5	120[a]	0	None
Ethylbenzene	µg/L	8	1	3.5	3.5	3.5	700[b]	0	None
Naphthalene	µg/L	8	2	7.4	10.7	14	6.2[a]	2	9003, 9004
Toluene	µg/L	8	2	1.6	1.8	2.0	1,000[b]	0	None
m,p-Xylenes	µg/L	8	1	15	15	15	10,000[b]	0	None
o-Xylene	µg/L	8	1	5.1	5.1	5.1	10,000[b]	0	None
Trichloroethene	µg/L	8	1	0.74	0.74	0.74	5[b]	0	None

[a]U.S. Environmental Protection Agency Region 9 Preliminary Remedial Goals – tap water
[b]Maximum contaminant level

Note: µg/L - microgram per liter

Table 5-4
Summary of Detected Metals in Groundwater Samples From Site 9

Parameter	Units	No. of Samples Tested	No. of Detections	Minimum Concentration	Average Concentration	Maximum Concentration	MCL/PRG	Naturally Occurring Background	No. of Detections Greater Than MCL/PRG	Locations With Detections Greater Than Action Level
Metals										
Aluminum	mg/L	5	4	0.048	0.171	0.317	36[a]	0.041 to 1.46	0	None
Arsenic	mg/L	5	5	0.157	0.763	1.65	0.050[b]	0.006 to 21	5	MW-31, MW-32, 9004, 9005
Barium	mg/L	5	5	0.177	0.0355	0.0642	2[b]	0.0068 to 0.66	0	None
Boron	mg/L	2	2	15.2	41.05	66.9	7.3[a]	0.57 to 240	2	MW-31, MW-32
Calcium	mg/L	5	5	5.51	124	277	NE	1.33 to 616	NA	NA
Copper	mg/L	5	5	0.0119	0.0194	0.0254	1.3[c]	0.1 to 0.333	0	None
Iron	mg/L	5	5	0.0194	0.262	0.603	11[a]	0.011 to 3.04	0	None
Lead	mg/L	5	1	0.0091	0.0091	0.0091	0.015[c]	0.002 to 2.39	0	None
Lithium	mg/L	2	2	0.0452	0.189	0.332	0.73[a]	0.028 to 0.875	0	None
Magnesium	mg/L	5	5	4.31	91.2	158	NE	0.97 to 812	NA	NA
Manganese	mg/L	5	5	0.0079	1.2	4.19	0.88[a]	0.002 to 8.95	2	9004, 9005
Molybdenum	mg/L	2	2	0.23	1.15	2.07	0.18[a]	0.023 to 5.2	2	MW-31, MW-32
Potassium	mg/L	5	5	21.3	90	175	NE	5.63 to 487	NA	NA
Selenium	mg/L	5	2	0.0096	0.0129	0.0161	0.05[b]	0.003 to 0.14	0	None
Silver	mg/L	5	1	0.0076	0.0076	0.0076	0.18[a]	0.002 to 0.22	0	None
Sodium	mg/L	5	5	1,040	4,780	9,790	NE	128 to 22,500	NA	NA
Vanadium	mg/L	5	5	0.053	0.247	0.8	0.26[a]	0.007 to 2.6	1	MW-31
Zinc	mg/L	2	2	0.0769	0.113	0.149	11[a]	0.006 to 0.338	0	None

Table 5-4 (Continued)
Summary of Detected Metals in Groundwater Samples From Site 9

Parameter	Units	No. of Samples Tested	No. of Detections	Minimum Concentration	Average Concentration	Maximum Concentration	MCL/PRG	Naturally Occurring Background	No. of Detections Greater Than MCL/PRG	Locations With Detections Greater Than Action Level
Water Quality										
Total dissolved solids	mg/L	6	6	6,540	23,700	48,200	10,000 [d]	NA	NA	NA

[a]U.S. Environmental Protection Agency (EPA) Region 9 Preliminary Remedial Goals – tap water
[b]Maximum contaminant level
[c]EPA action level
[d]Nevada Administrative Code

Notes:
MCL - maximum contaminant level
mg/L - milligram per liter
NA - not applicable
NE - not established
PRG - preliminary remedial goal

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. Site 9 is currently the central wastewater treatment facility for NAS Fallon. NAS Fallon does not expect any change in the use of this land or that of the surrounding sites in the foreseeable future.

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 9 will be subjected to an environmental review. The Environmental Department at NAS Fallon oversees the environmental review process. Relevant projects are reviewed by the Occupational Safety and Health Office, Fire Department, Security Department, the Engineering and Planning Divisions of Public Works, and the Environmental Department. This review process is included in all NAS Fallon planning activities. Information provided by the Environmental Department relates to potential contact with contaminated soil and groundwater as a result of these projects.

7.0 SUMMARY OF SITE RISKS

Site 9 was examined during the baseline human health and ecological risk assessments conducted during the RI. 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.

One historical soil sample located in the area of the former UST contained TPH-P at a concentration of 260 mg/kg, which is above the state action level of 100 mg/kg. The same sample also contained some fuel-related VOCs and SVOCs. Using the concentrations from this soil sample, the risk assessment determined that the site poses no cancer risks for both current and future exposure scenarios. (Note: This soil sample, collected from the site during the RI, contained the highest measurable concentrations of contaminants.) The total risk for the current worker is 2.4×10^{-10}, and for the current trespasser it is 1.91×10^{-10}. The total risk for the future resident is 1.46×10^{-10}. The HIs for human health for both current and future uses were also well below the 1.0. The HI for the current worker is 4.3×10^{-6}, and for the current trespasser it is 8.56×10^{-6}. The HI for the future resident is 9.95×10^{-5}.

Additional soil sampling was performed after the RI and the risk assessment in 2002. During this sampling event, boring 9001 was found to contain 27 mg/kg of TPH-P. Although a new risk assessment was not performed using the data collected in 2002, the conclusions of the risk assessment are still applicable to the site. The concentrations of detected chemicals are so low that incorporating these chemicals into the risk assessment would not have an impact on the total risk for the site.

The same soil sampling data were used to during the baseline risk assessment calculate ecological risks at Site 9. HIs are below the acceptable value of 1 for all animal species. The total HI index for plants is 2.17, slightly above the acceptable HI of 1. The calculated risk for plants is based on concentrations of contaminants from the one historical soil sample at a depth of 5 to 7 feet. Contamination was not detected in any other samples during the RI. Due to the depth of the contamination, the limited extent of contamination, the apparent lack of contaminant migration, and the location in a disturbed and operating area, impacts on plants are not expected.

The results of a limited A through K evaluation (presented in Section 5.4.3) suggest that the volume of soil with concentrations of TPH slightly above the state action level does not pose a threat to groundwater or potential downgradient receptors.

No risk assessment was performed for groundwater at Site 9, because it was determined during the RI that groundwater was not contaminated. Additional sampling performed in 2002 indicated that detections of two contaminants were only slight exceedances of the state action levels for 1,2,4-trimethylbenzene and naphthalene. Therefore, a risk assessment is not necessary for groundwater.

8.0 STATUTORY AUTHORITY FINDING

Historical and recent groundwater sampling has indicated that petroleum hydrocarbons and SVOCs are not present in groundwater at concentrations that exceed the state action levels. The VOC 1,2,4-trimethylbenzene was detected in one of eight groundwater samples at a concentration 7 µg/L above the state action level (EPA Region 9 PRG for tap water) of 12 µg/L. 1,2,4-trimethylbenzene was not detected at a concentration above the reporting limits in the remaining seven groundwater samples collected from the site. Naphthalene was detected in two of eight groundwater samples at concentrations of 1.4 and 7.8 µg/L above the state action level (EPA Region 9 PRG for tap water) of 6.2 µg/L. Naphthalene was not detected above reporting limits in the remaining six groundwater samples collected from the site. No other VOCs were detected at concentrations above state action levels in groundwater. Shallow groundwater is not currently used at NAS Fallon for domestic or industrial purposes. Total dissolved solids were measured at concentrations ranging from 6,540 to 48,200 mg/L with an average measured concentration of 23,700 mg/L. Given the current status of a long-term Navy presence at the station and the total dissolved solids concentrations in the shallow groundwater, the potential for future use of the shallow groundwater at or downgradient of Site 9 for domestic is low. Therefore, there is no current exposure to these chemicals in groundwater and the potential for future exposure is low.

One historical soil sample contained TPH-P at a concentration of 260 mg/kg, which is above the state action level of 100 mg/kg. State action levels were not exceeded in any other soil samples collected in the immediate vicinity of the former UST. Soil samples from three borings located between 5 to 20 feet from the location where TPH-P was detected in soil above state action levels did not contain TPH-P at concentrations above reporting limits. Based on these observations, the lateral extent of soil contamination is very limited. Groundwater samples located in the vicinity of the former UST confirm that TPH-P in soil has not migrated to groundwater. Because it has been over 18 years since the former UST was removed, large volumes of TPH-P would have had sufficient time to leach to groundwater if present. Also removal of the UST eliminated the primary source of TPH to soil. The arid climate would tend to minimize the potential for future leaching of the residual TPH in soil to groundwater. Risks posed by the TPH-P in to human health were found to be acceptable in the baseline human health risk assessment performed as part of the RI. Based on these observations and conditions, current or potential future site conditions do not pose unacceptable risk to human health or the environment. Accordingly, no further action is required at this site.

9.0 DOCUMENTATION OF SIGNIFICANT CHANGES

United States Fish and Wildlife comments to the Draft Decision Document were received by the Navy. Responses to these comments are provided in Appendix A (Responsiveness Summary). The comments and responses resulted in no significant change to the Declaration of the Decision or the Decision Summary.

10.0 BIBLIOGRAPHY

This document was prepared with the use of information contained in the Administrative Record for Site 9, the Wastewater Treatment Plant, 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 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.

Naval Energy and Environmental Support Activity (NEESA). 1988. *Preliminary Assessment/ Site Inspection, Naval Air Station Fallon, Fallon, Nevada.* April 1988.

Nevada Division of Environmental Protection (NDEP). 2000. *NDEP Comments on Draft Final Decision Document, Site 9, Wastewater Treatment Plant.* April 12, 2000.

———. 1999. *Comments on Site 9, Wastewater Treatment Plant, Draft Record of Decision.* February 10, 1999.

———. 1989. *NDEP Comments on Remedial Investigation/Feasibility Study Work Plan.* July 5, 1989.

Oak Ridge National Laboratory (ORNL). 1994. *Naval Air Station Fallon, Remedial Investigation, Remedial Investigation Report, Final.* September 1994.

———. 1992. *Preliminary Site Characterization Summary, Installation Restoration Program, Naval Air Station Fallon, Fallon, Nevada.* January 1992.

———. 1989. *Draft Project Work Plan (WP); Work Plan, Health and Safety Plan (HASP), Community Relations Plan (CRP); for the Evaluation of Potential Environmental Contamination.* January 1, 1989.

———. 1989. *Volume I—Work Plan (WP) for the Remedial Investigation/Feasibility Study (RI/FS).* August 1, 1989.

———. 1989. *Volume II—Health and Safety Plan (HASP) for the Remedial Investigation/ Feasibility Study (RI/FS).* August 1, 1989.

———. 1989. *Volume III—Sampling and Analysis Plan (SAP) for the Remedial Investigation/ Feasibility Study (RI/FS).* August 1, 1989.

———. 1989. *Volume IV—Community Relations Plan (CRP) for the Remedial Investigation/ Feasibility Study (RI/FS).* August 1, 1989.

U.S. Navy. 2001. *Response to NDEP Comments on Draft Final Decision Document, Site 9, Wastewater Treatment Plant, NAS Fallon, Nevada.* April 30, 2001.

———. 1999. *Draft Final Decision Document, Site 9, the Wastewater Treatment Plant, Naval Air Station Fallon.* August 27, 1999.

———. 1998. *Draft Record of Decision, Sites 4, 5, 7, 8, 9, 10, 11, 12, 15, 17, 18, 19, 23, 24, 25, 26, & 27.* June 5, 1998.

APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Notice of the public comment period was published in the *Lahontan Valley News* on October 3, 2003. The public comment period extended from October 8 through November 7, 2003. The public meeting presenting the Proposed Plan was held at the Fallon Convention Center in Fallon, Nevada, on October 15, 2003. As of November 7, 2003, the Navy had public comments from United States Fish and Wildlife (USFW). The comments from the letter are summarized below followed by the Navy's responses. A copy of the letter from USFW dated October 29, 2003 is provided at the end of this section along with USFW concurrence to the responses provided.

RESPONSES TO UNITED STATES FISH AND WILDLIFE COMMENTS

General Comments

Diagonal drain flows along the southern boundary of NAS Fallon and eventually terminates at the Stillwater National Wildlife Refuge, an area of considerable importance to migratory birds in Nevada. Several of the sites proposed for no further action appear to be within one-half mile of Diagonal Drain, with portions of Site 24 paralleling the drain. The groundwater gradient on NAS Fallon flows toward Diagonal Drain. Due to the risks of contamination of Diagonal Drain from various contaminated sites, including infiltration into the drain from contamination of the shallow ground water table, it is essentially important to continue monitoring for various contaminants in groundwater on NAS Fallon for the long term, with emphasis on sampling of groundwater wells near the drain. This type of monitoring would hopefully allow for identification and remediation of contaminant issues in the drain before they affect trust resources. We ask that you inform us and Stillwater National Wildlife Refuge if contaminated groundwater is found in the wells closest to the drain so that we can meet and discuss the possible need for additional sampling, which may include sampling of surface water in the Diagonal Drain.

Response

The Navy appreciates and shares the U.S. Fish and Wildlife's concern regarding the sensitivity of the trust resources downgradient of NAS Fallon. The Navy has a groundwater and surface water monitoring program in place at NAS Fallon and is providing results of the most recent events for U.S. Fish and Wildlife review. The Navy welcomes comments on the current monitoring programs at NAS Fallon and looks forward to working with U.S. Fish and Wildlife to insure that the NAS Fallon monitoring programs are protective of all resources.

Site 9, Wastewater Treatment Plant

We have no concerns specific to this site.

Site 12, Pest Control Shop

We noted that pesticides, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) were present in some groundwater samples. The presence of solvent-like compounds with pesticides could result in increased risk of movement of pesticides in the groundwater. Groundwater sampling in the downgradient monitoring wells is needed in the future to determine if this is occurring.

RESPONSES TO UNITED STATES FISH AND WILDLIFE COMMENTS

General Comments

Diagonal drain flows along the southern boundary of NAS Fallon and eventually terminates at the Stillwater National Wildlife Refuge, an area of considerable importance to migratory birds in Nevada. Several of the sites proposed for no further action appear to be within one-half mile of Diagonal Drain, with portions of Site 24 paralleling the drain. The groundwater gradient on NAS Fallon flows toward Diagonal Drain. Due to the risks of contamination of Diagonal Drain from various contaminated sites, including infiltration into the drain from contamination of the shallow ground water table, it is essentially important to continue monitoring for various contaminants in groundwater on NAS Fallon for the long term, with emphasis on sampling of groundwater wells near the drain. This type of monitoring would hopefully allow for identification and remediation of contaminant issues in the drain before they affect trust resources. We ask that you inform us and Stillwater National Wildlife Refuge if contaminated groundwater is found in the wells closest to the drain so that we can meet and discuss the possible need for additional sampling, which may include sampling of surface water in the Diagonal Drain.

Response

The Navy appreciates and shares the U.S. Fish and Wildlife's concern regarding the sensitivity of the trust resources downgradient of NAS Fallon. The Navy has a groundwater and surface water monitoring program in place at NAS Fallon and is providing results of the most recent events for U.S. Fish and Wildlife review. The Navy welcomes comments on the current monitoring programs at NAS Fallon and looks forward to working with U.S. Fish and Wildlife to insure that the NAS Fallon monitoring programs are protective of all resources.

Site 9, Wastewater Treatment Plant

We have no concerns specific to this site.

Site 12, Pest Control Shop

We noted that pesticides, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) were present in some groundwater samples. The presence of solvent-like compounds with pesticides could result in increased risk of movement of pesticides in the groundwater. Groundwater sampling in the downgradient monitoring wells is needed in the future to determine if this is occurring.

current monitoring programs at NAS Fallon and looks forward to working with U.S. Fish and Wildlife to insure that the NAS Fallon monitoring programs are protective of all resources.

Site 23, Shipping and Receiving Disposal Area

We have no concerns specific to this site.

Site 24, Road Oiling Area

A significant portion of this area is immediately adjacent to Diagonal Drain, thereby increasing risks for contamination of the Drain. Aroclor 1254, a class of polychlorinated biphenyls (PCBs), was detected in soil at one site (i.e., 24000) immediately adjacent to Diagonal Drain. No groundwater sampling was conducted near this site. Therefore, we recommend that additional soil samples (minimum of five locations at more than one depth) be collected along the road where it parallels Diagonal Drain. Furthermore, groundwater sampling should be initially conducted adjacent to site 24000 and at additional sites if PCB contamination is found in soil at additional sites. Future samples should also be analyzed for VOCs and petroleum hydrocarbons due to their presence in some past samples.

Response

Aroclor 1254 was detected in the soil sample from 0.5 feet bgs, at location 24000, at a concentration of 0.96 mg/kg, which is greater than the EPA Region 9 Preliminary Remedial Goal (PRG) for residential soil of 0.22 mg/kg. The soil samples collected from this location at depths of 1 and 2 feet did not contain Aroclor 1254 or any other PCBs at concentrations above the PRG for residential soil. Soil samples collected from the other four sampling locations at the same depths did not contain PCBs at concentrations above reporting limits. The soil PRG takes into account potential risks to groundwater. In addition, PCBs are particularly resistant to mobilization with a strong tendency to remain adsorbed to soil particles.

The Navy appreciates U.S Fish and Wildlife's concern regarding Site 24, however based on the current data, there is no threat to human health or the environment. The Navy will discuss options for surface water monitoring adjacent to location 24000 as part of the station-wide surface water monitoring program. As stated in the Declaration of the Decision for Site 24 (page 1), the site may be reopened for further evaluation and, if necessary, cleanup, on the basis of newly discovered information that leads the U.S. Navy (Navy) and the Nevada Division of Environmental Protection (NDEP) to determine that the remedy may not be protective of human health and the environment.

Summary

We concur with plans for No Further action at each of the sites listed above, with the exception of Site 24, where additional sampling is needed prior to closure. We also strongly recommend the additional monitoring of ground and surface water as outlined above as provided under our discussion of Sites 12 and 17.

Response

PCBs detected in soil samples collected from location 24000 at Site 24 do not extend beyond 0.5 feet below ground surface at concentrations above PRGs for residential soil. The soil PRG for Aroclor 1254 takes into account potential risks to groundwater. Based on station-wide data, groundwater is expected to be at approximately 5 to 7 feet deep in this area of the station. In addition, PCBs are particularly resistant to mobilization with a strong tendency to remain adsorbed to soil particles. Based on these data, Site 24 does not pose a threat to human health or the environment. The Navy will discuss options for surface water monitoring adjacent to location 24000 as part of the station-wide surface water monitoring program. If the surface water monitoring program suggests that PCBs are leaching into the drain, the site will be reopened for further evaluation and, if necessary, cleanup.

With respect to Sites 12 and 17, regular groundwater and surface water monitoring is being conducted on a station-wide basis. Results of the most recent groundwater and surface monitoring events are being provided to U.S. Fish and Wildlife for review.

UNITED STATES DEPARTMENT of the INTERIOR

TAKE PRIDE IN AMERICA

FISH AND WILDLIFE SERVICE
Nevada Fish and Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, Nevada 89502-7147
(775) 861-6300 ~ Fax: (775) 861-6301

October 29, 2003
File No. EC 14.5

File
copy - Joe Farry
Chuck
Ray
Captain G.

Joe Farry, Environmental Protection Specialist
Naval Air Station Fallon
Environmental Department (Code N45F)
4755 Pasture Road, Building 307, 3rd Deck
Fallon, Nevada 89496-5000

Dear Mr. Farry:

We have reviewed information on the proposed plans for No Further Action at Installation Restoration Program Sites at Naval Air Station (NAS) Fallon that was provided at the public meeting on October 15, 2003. We have the following general and specific comments and recommendations in relation to the proposed actions.

General Comments

Diagonal Drain flows along the southern boundary of NAS Fallon and eventually terminates at Stillwater National Wildlife Refuge, an area of considerable importance to migratory birds in Nevada. Several of the sites proposed for no further action appear to be within one-half mile of Diagonal Drain, with portions of Site 24 paralleling the drain. The groundwater gradient on NAS Fallon flows toward Diagonal Drain. Due to the risks of contamination of Diagonal Drain from various contaminated sites, including infiltration into the drain from contamination of the shallow ground water table, it is especially important to continue monitoring for various contaminants in groundwater on NAS Fallon for the long term, with emphasis on sampling of groundwater wells near the drain. This type of monitoring would hopefully allow identification and remediation of contaminant issues in the drain before they affect trust resources. We ask that you inform us and Stillwater National Wildlife Refuge if contaminated groundwater is found in the wells closest to the drain so that we can meet and discuss the possible need for additional sampling, which may include sampling of surface water in the Diagonal Drain.

Specific Comments

Site 9, Wastewater Treatment Plant

We have no concerns specific to this site.

Site 12, Pest Control Shop

We noted that pesticides, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) were present in some groundwater samples. The presence of solvent-like compounds with pesticides could result in the increased risk of movement of pesticides in the groundwater. Groundwater sampling in down-gradient monitoring wells is needed in the future to determine if this is occurring.

Site 17, Hanger 7

The information provided for this site mentions a drainage swale leading from the site to an unnamed drainage ditch east of Site 16. We recommend the collection and analysis of surface water samples from such ditches on NAS Fallon following major precipitation events when water is present in them. We are concerned about the possible transport of contaminants from various sites to Diagonal Drain and eventually to Stillwater National Wildlife Refuge. If past sampling of surface water from such sites has occurred, we would appreciate a copy of the results.

Site 23, Shipping and Receiving Disposal Area

We have no concerns specific to this site.

Site 24, Road Oiling Area

A significant portion of this area is immediately adjacent to Diagonal Drain, thereby increasing risks for contamination of the Drain. Aroclor 1254, a class of polychlorinated biphenyls (PCBs), was detected in soil at one site (i.e., 24000) immediately adjacent to Diagonal Drain. No groundwater sampling was conducted near this site. Therefore, we recommend that additional soil samples (minimum of five locations at more than one depth) be collected along the road where it parallels Diagonal Drain. Furthermore, groundwater sampling should be initially conducted adjacent to site 24000 and at additional sites if PCB contamination is found in soil at additional sites. Future samples should also be analyzed for VOCs and petroleum hydrocarbons due to their presence in some past samples.

Summary

We concur with plans for No Further Action at each of the sites listed above, with the exception of Site 24, where additional sampling is needed prior to closure. We also strongly recommend the additional monitoring of ground and surface water as outlined above as provided under our discussion of Sites 12 and 17.

We appreciate the opportunity to comment on the proposed plans. Please contact me or Stanley Wiemeyer at (775) 861-6300 if you have any questions or would like to meet with us.

Sincerely,

for Robert D. Williams
Field Supervisor

cc:
Nevada Division of Environmental Protection, Bureau of Federal Facilities, Carson City, Nevada
(Attn: Ramon Naranjo)
Project Leader, Stillwater National Wildlife Refuge, Fish and Wildlife Service, Fallon, Nevada

Farry, Joseph A (NASF N45F)
From: Farry, Joseph A (NASF N45F)
Sent: Thursday, November 20, 2003 7:29
To: 'Laurie_Sada@r1.fws.gov'
Cc: Said Seddiki (EFANW) (E-mail); Richard Powell (E-mail); Deverin, Chuck CIV (NASF N45F)
Subject: RE: Draft Decision Documents, Site 24- NAS Fallon Response to FWS Comments

Ms. Laurie Sada and Mr. Damian K. Higgins - USFW

The Navy appreciates you expedited review and attention to our responses and additional documentation. Per Mr. Higgin's response below, the Navy agrees to conduct the additional surface water sampling for PCBs during our annual surface water sampling effort. The Navy will include your office in review of the work plan to ensure that USFW's concerns are addressed.

Joseph A. Farry, PE-IRP Team Leader
NAS Fallon - Environmental Department (N45F)
4755 Pasture Road
Fallon, NV 89496
Phone: 775-426-2772
FAX: 775 - 426-2663
Email: joseph.farry@navy.mil

-----Original Message-----

From: Laurie_Sada@r1.fws.gov [mailto:Laurie_Sada@r1.fws.gov]
Sent: Wednesday, November 19, 2003 14:34
To: Damian_Higgins@r1.fws.gov; Farry, Joseph A (NASF N45F)
Subject: Draft Decision Documents, Site 24- NAS Fallon Response to FWS Comments

<< File: pic26500.gif >>

Joseph - I concur with Damian's recommendations outlined below. I understand that he spoke with you today and that you are willing to work with us to modify your surface water monitoring program to meet our request. Please accept this email as formal notification that you have satisfied our concerns regarding the No Further Action Decision. If you have further questions, please contact me or Damian Higgins of our staff.

Sincerely,

Laurie Sada
Assistant Field Supervisor
Nevada Fish and Wildlife Office
1340 Financial Blvd., Suite 234
Reno, Nevada 89509
Phone: (775) 861-6300
Fax: (775) 861-6301
----- Forwarded by Laurie Sada/RENO/R1/FWS/DOI on 11/19/2003 01:39 PM -----

Damian Higgins

11/19/2003 12:04 PM
To: Laurie Sada/RENO/R1/FWS/DOI@FWS
cc: Stanley Wiemeyer/RENO/R1/FWS/DOI@FWS
Subject: Draft Decision Documents, Site 24- NAS Fallon Response to FWS Comments

Laurie:

I have reviewed the letter from NAS Fallon dated November 13, 2003, that provides responses to our October 29, 2003, comments regarding the No Further Action decision for Sites 9, 12, 17, 23, and 24. In our letter, we concurred with those plans for no further action with the exception of Site 24. We did not concur with the action for site 24 due to concerns regarding the detection of PCB at one location (i.e, 24000) and the potential for adverse impacts to Diagonal Drain and our trust resources down-gradient. Upon reviewing our historical files, associated sampling that has been conducted previously at this site, and the additional monitoring information that you provided on November 17, 2003, it is my recommendation that we concur with no further action at Site 24. My recommendation for this is based upon the following:

1) Recent soil samples at different depths at four other locations at Site 24 did not detect PCB exceeding 0.22mg/kg (EPA Preliminary Remedial Goal);

2) Sampling conducted in 1991 for PCB's and VOC's at Site 24 did not detect these contaminants (Oak Ridge National Laboratory's Preliminary Site Characterization Summary for NAS Fallon Installation Restoration Program, January 1992); and

3) PCB detections in soil at location 24000 appears to be strongly absorbed to soil particles and is not expressed beyond 0.5 feet bgs.

However, as a condition to our concurrence for no further action on Site 24, I recommend that an analysis of surface water in Diagonal Drain be conducted for total PCB's furthest downgradient on NAS Fallon property during the period at which groundwater contributes to surface water flow. This should be done on an annual basis and if PCB is not detected, the sampling can be terminated. Hopefully this sampling may be achieved through their existing surface water monitoring program.

Sincerely,
(Embedded image moved to file: pic26500.gif)

Damian K. Higgins
Environmental Contaminants Biologist

U.S. Fish & Wildlife Service
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