
3.9 Water Resources

No Action Alternative

Under the No Action Alternative, the 1999 Congressional land withdrawal of 201,933 acres from public domain (Public Law 106-65) would expire on November 5, 2021, and military training activities requiring the use of these public lands would cease. Expiration of the land withdrawal would terminate the Navy's authority to use nearly all of the Fallon Range Training Complex's (FRTC's) bombing ranges, affecting nearly 62 percent of the land area currently available for military aviation and ground training activities in the FRTC.

Alternative 1 – Modernization of the Fallon Range Training Complex

Under Alternative 1, the Navy would request Congressional renewal of the 1999 Public Land Withdrawal of 202,864 acres, which is scheduled to expire in November 2021. The Navy would request that Congress withdraw and reserve for military use approximately 618,727 acres of additional Federal land and acquire approximately 65,153 acres of non-federal land. Range infrastructure would be constructed to support modernization, including new target areas, and expand and reconfigured existing Special Use Airspace (SUA) to accommodate the expanded bombing ranges. Implementation of Alternative 1 would potentially require the reroute of State Route 839 and the relocation of a portion of the Paiute Pipeline. Public access to B-16, B-17, and B-20 would be restricted for security and to safeguard against potential hazards associated with military activities. The Navy would not allow mining or geothermal development within the proposed bombing ranges or the Dixie Valley Training Area (DVTA). Under Alternative 1, the Navy would use the modernized FRTC to conduct aviation and ground training of the same general types and at the same tempos as analyzed in Alternative 2 of the *2015 Military Readiness Activities at Fallon Range Training Complex, Nevada, Final Environmental Impact Statement* (EIS). The Navy is not proposing to increase the number of training activities under this or any of the alternatives in this EIS.

Alternative 2 – Modernization of Fallon Range Training Complex with Managed Access

Alternative 2 would have the same withdrawals, acquisitions, and SUA changes as proposed in Alternative 1. Alternative 2 would continue to allow certain public uses within specified areas of B-16, B-17, and B-20 (ceremonial, cultural, or academic research visits, land management activities) when the ranges are not operational and compatible with military training activities (typically weekends, holidays, and when closed for maintenance). Alternative 2 would also continue to allow grazing, hunting, off-highway vehicle (OHV) usage, camping, hiking, site and ceremonial visits, and large event off-road races at the DVTA. Additionally under Alternative 2, hunting would be conditionally allowed on designated portions of B-17, and geothermal and salable mineral exploration would be conditionally allowed on the DVTA. Large event off-road races would be allowable on all ranges subject to coordination with the Navy and compatible with military training activities.

Alternative 3 – Bravo-17 Shift and Managed Access (Preferred Alternative)

Alternative 3 differs from Alternative 1 and 2 with respect to the orientation, size, and location of B-16, B-17, B-20 and the DVTA, and is similar to Alternative 2 in terms of managed access. Alternative 3 places the proposed B-17 farther to the southeast and rotates it slightly counter-clockwise. In conjunction with shifting B-17 in this manner, the expanded range would leave State Route 839 in its current configuration along the western boundary of B-17 and would expand eastward across State Route 361 potentially requiring the reroute of State Route 361. The Navy proposes designation of the area south of U.S. Route 50 as a Special Land Management Overlay rather than proposing it for withdrawal as the DVTA. This Special Land Management Overlay would define two areas, one east and one west of the existing B-17 range. These two areas, which are currently public lands under the jurisdiction of BLM, would not be withdrawn by the Navy and would not directly be used for land-based military training or managed by the Navy.

Environmental Impact Statement

Fallon Range Training Complex Modernization

Table of Contents

3.9	WATER RESOURCES.....	3.9-1
3.9.1	METHODOLOGY	3.9-1
3.9.1.1	Region of Influence	3.9-1
3.9.1.2	Regulatory Framework	3.9-1
3.9.1.3	Approach to Analysis	3.9-3
3.9.1.4	Public Concerns.....	3.9-5
3.9.2	AFFECTED ENVIRONMENT	3.9-6
3.9.2.1	Overview	3.9-6
3.9.2.2	Bravo-16.....	3.9-12
3.9.2.3	Bravo-17.....	3.9-14
3.9.2.4	Bravo-20.....	3.9-20
3.9.2.5	Dixie Valley Training Area	3.9-25
3.9.2.6	Special Use Airspace Area.....	3.9-29
3.9.3	ENVIRONMENTAL CONSEQUENCES	3.9-29
3.9.3.1	No Action Alternative	3.9-29
3.9.3.2	Alternative 1: Modernization of the Fallon Range Training Complex	3.9-30
3.9.3.3	Alternative 2: Modernization of Fallon Range Training Complex and Managed Access.....	3.9-44
3.9.3.4	Alternative 3: Bravo-17 Shift and Managed Access (Preferred Alternative)	3.9-45
3.9.3.5	Proposed Management Practices, Monitoring, and Mitigation	3.9-62
3.9.3.6	Summary of Effects and Conclusions.....	3.9-63

List of Figures

FIGURE 3.9-1: NEVADA WATER LAW: OBTAINING WATER RIGHTS	3.9-4
FIGURE 3.9-2: BASINS WITHIN THE REGION OF INFLUENCE	3.9-9
FIGURE 3.9-3: TYPICAL GROUNDWATER FLOW PATTERNS FOR MOUNTAIN BLOCKS WITH DIFFERENT PERMEABILITY.....	3.9-10
FIGURE 3.9-4: HYDROGRAPHIC LANDSCAPE REGIONS WITHIN B-16 UNDER ALTERNATIVES 1 AND 2	3.9-13
FIGURE 3.9-5: WATER RIGHTS WITHIN B-16 UNDER ALTERNATIVES 1 AND 2	3.9-15
FIGURE 3.9-6: WATER WELLS WITHIN B-16 UNDER ALTERNATIVES 1 AND 2.....	3.9-16
FIGURE 3.9-7: HYDROGRAPHIC LANDSCAPE REGIONS WITHIN B-17 UNDER ALTERNATIVES 1 AND 2	3.9-17
FIGURE 3.9-8: WATER RIGHTS WITHIN B-17 UNDER ALTERNATIVES 1 AND 2	3.9-18
FIGURE 3.9-9: WATER WELLS WITHIN B-17 UNDER ALTERNATIVES 1 AND 2.....	3.9-19
FIGURE 3.9-10: HYDROGRAPHIC LANDSCAPE REGIONS WITHIN B-20 UNDER ALTERNATIVES 1 AND 2	3.9-21
FIGURE 3.9-11: WATER RIGHTS WITHIN B-20 UNDER ALTERNATIVES 1 AND 2	3.9-22
FIGURE 3.9-12: WATER WELLS WITHIN B-20 UNDER ALTERNATIVES 1 AND 2.....	3.9-23
FIGURE 3.9-13: DVTA HYDROGRAPHIC LANDSCAPE REGIONS WITHIN THE DVTA UNDER ALTERNATIVES 1 AND 2	3.9-26
FIGURE 3.9-14: WATER RIGHTS WITHIN THE DVTA.....	3.9-27
FIGURE 3.9-15: WATER WELLS WITHIN THE DVTA	3.9-28
FIGURE 3.9-16: CASE-BY-CASE EVALUATION OF THE DISPOSITION OF WATER RIGHTS.....	3.9-32
FIGURE 3.9-17: B-16 HYDROLOGICAL LANDSCAPE REGIONS FOR ALTERNATIVE 3.....	3.9-47

FIGURE 3.9-18: WATER RIGHTS WITHIN B-16 FOR ALTERNATIVE 3	3.9-48
FIGURE 3.9-19: WATER WELLS WITHIN B-16 FOR ALTERNATIVE 3	3.9-49
FIGURE 3.9-20: HYDROLOGICAL LANDSCAPE REGIONS WITHIN B-17 UNDER ALTERNATIVE 3	3.9-50
FIGURE 3.9-21: WATER RIGHTS WITHIN B-17 FOR ALTERNATIVE 3	3.9-51
FIGURE 3.9-22: WATER WELLS WITHIN B-17 FOR ALTERNATIVE 3	3.9-52
FIGURE 3.9-23: B-20 HYDROLOGICAL LANDSCAPE REGIONS WITHIN B-20 FOR ALTERNATIVE 3	3.9-55
FIGURE 3.9-24: WATER RIGHTS WITHIN B-20 FOR ALTERNATIVE 3	3.9-56
FIGURE 3.9-25: WATER WELLS WITHIN B-20 FOR ALTERNATIVE 3	3.9-57
FIGURE 3.9-26: HYDROLOGICAL LANDSCAPE REGIONS WITHIN THE DVTA UNDER ALTERNATIVE 3	3.9-59
FIGURE 3.9-27: WATER RIGHTS WITHIN THE DVTA FOR ALTERNATIVE 3	3.9-60
FIGURE 3.9-28: WATER WELLS WITHIN THE DVTA FOR ALTERNATIVE 3	3.9-61

List of Tables

TABLE 3.9-1: HLRs WITHIN AREAS B-16, B-17, B-20, AND THE DVTA	3.9-11
TABLE 3.9-2: SUMMARY OF EFFECTS FOR WATER RESOURCES	3.9-63

3.9 Water Resources

This discussion of water resources includes surface waters (streams, floodplains, and playas) and groundwater (confined and unconfined aquifers), along with climate factors that contribute to hydrologic conditions. This section summarizes any potential contamination of surface waters and groundwater resources.

3.9.1 Methodology

3.9.1.1 Region of Influence

The region of influence for water resources is the project footprint of the Fallon Range Training Complex (FRTC) land assets (i.e., proposed acquisition and requested withdrawal) and any other area that could be directly or indirectly impacted due to any of the alternatives. For example, if a surface or subsurface hydrological connection exists between areas within the project footprint and outside of the project footprint, the waters outside of the footprint would be analyzed as part of the region of influence. There are no changes proposed to land withdrawal, training activities, public access, or construction on B-19. Therefore, B-19 is not discussed further and would be maintained as discussed in the *2015 Military Readiness Activities at Fallon Range Training Complex, Nevada Final Environmental Impact Statement* (U.S. Department of the Navy, 2015a).

3.9.1.2 Regulatory Framework

The United States (U.S.) Department of the Navy (Navy) has established water resource policies to ensure its compliance with federal regulations. The State of Nevada manages water resources within its jurisdiction and administers the Clean Water Act (CWA) and Safe Drinking Water Act within its borders, in accordance with state water resources regulations. Chapter 1 (Purpose of and Need for the Proposed Action) describes the following regulations that are relevant to the regulatory requirements concerning water resources:

- CWA
- Safe Drinking Water Act
- Resource Conservation and Recovery Act
- Executive Order 11990 (Protection of Wetlands)
- Executive Order 11988 (Protection of Floodplains)

The CWA regulates discharges to Waters of the United States. Waters of the United States are defined as (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries under Section 404 of the CWA, as amended, and are regulated by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE). The CWA requires that the State of Nevada establish a Section 303(d) list to identify impaired waters and establish Total Maximum Daily Loads (TMDLs) for the sources causing the impairment. There are no designated Waters of the U.S. on the expansion areas, although the Diagonal Drains (waterbodies around the main base) are considered Waters of the U.S. Wetlands are currently regulated by the USACE under Section 404 of the CWA as a subset of all “Waters of the United States.”

The State of Nevada National Pollutant Discharge Elimination System stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb 1 acre or more to obtain coverage under a National Pollutant Discharge Elimination System Construction

Stormwater General Permit for stormwater discharges to Waters of the U.S. (permit NVR100000). Coverage under this general permit requires preparation of a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan (SWPPP) that is implemented during construction. As part of the 2010 Final Rule for the CWA, titled *Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category*, activities covered by this permit must implement non-numeric erosion and sediment controls and pollution prevention measures.

Activities that result in the dredging or filling of Waters of the United States, including wetlands, are regulated under Sections 401 and 404 of the CWA. The USACE established the Section 404 Nationwide Permit (NWP) 14 to efficiently authorize common linear transportation project activities that do not significantly impact Waters of the United States, including wetlands. For “Linear Transportation Projects” (e.g., roads, highways, and road improvements such as those presented in the Proposed Action), the discharge cannot cause the loss of greater than 0.5 acre of waters of the United States. In addition, the permittee must submit a pre-construction notification to the USACE district engineer prior to commencing the activity if (1) the loss of Waters of the United States exceeds 0.1 acre or (2) there is a discharge in a special aquatic site, including wetlands. Each water of the United States is assessed individually.

The USACE also established Section 404 NWP 12 to efficiently authorize construction, maintenance, repair, and removal of utility lines and associated facilities in Waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of Waters of the United States for each single and complete project. The definition of “utility line” is any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and internet, radio, and television communication. This NWP also authorizes the construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal Waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of non-tidal Waters of the United States.

Section 438 of the Energy Independence and Security Act establishes stormwater design requirements for development and redevelopment projects. Under these requirements, federal facility projects larger than 5,000 square feet must “maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.” In addition, the Navy utilizes Unified Facilities Criteria 3-210-10, Low Impact Development, which provides technical criteria, technical requirements, and references for the planning and design of applicable Department of Defense projects to comply with stormwater requirements.

State of Nevada Water Law

As established by Nevada Revised Statute 533.025, the water of all sources of water supply within the state of Nevada, whether surface water or groundwater, is property of the state and managed as a public resource. Nevada water law is based on two fundamental principles: prior appropriation and beneficial use. Prior appropriation (also known as “first in time, first in right”) ensures the senior uses are granted priority, even as new uses for water are allocated. Beneficial use is based on the demonstration of water utilization for manners such as irrigation, mining, stockwatering, recreation, commercial, industrial, and municipal supply. Water may be appropriated for beneficial use as provided in Chapters 533 and 534 of the Nevada Revised Statutes.

The appropriation of water in Nevada requires a permit for the ownership of water rights. The key definitions associated with water rights are summarized below.

Waters of the state are defined under Nevada statute as waters situated wholly or partly within or bordering upon the state, including but not limited to: (1) all streams, lakes, ponds, impounding reservoirs, marshes, water courses, waterways, wells, springs, irrigation systems, and drainage systems; and (2) all bodies or accumulations of water, surface and underground, natural or artificial (see Nevada Revised Statutes 445A.415 and 445.191).

A **permit application** is an application to NDWR to appropriate water for a Beneficial Use.

A **permit** is issued by NDWR, and authorizes the permittee to use the appropriated amount of water for beneficial use in a specified manner (such as stockwatering for ranching).

Beneficial Use examples include irrigation, mining, stock watering, recreation, commercial, industrial, wildlife supplemental watering, and municipal uses. Permittees must also exercise the beneficial use or they will lose the water right.

A **Point of Diversion** is the legal location where a right holder can divert water from its source. Legal descriptions that might be used are government lots, block, subdivision, parcel numbers, townsite names, mining claim information, homestead entry surveys, and other survey information.

The **Place of Use** is the legal location where a right holder may use the water.

NDWR issues a **Certificate of Appropriation** after an application is granted and after the applicant files proof of completion of division works and proof of Beneficial Use.

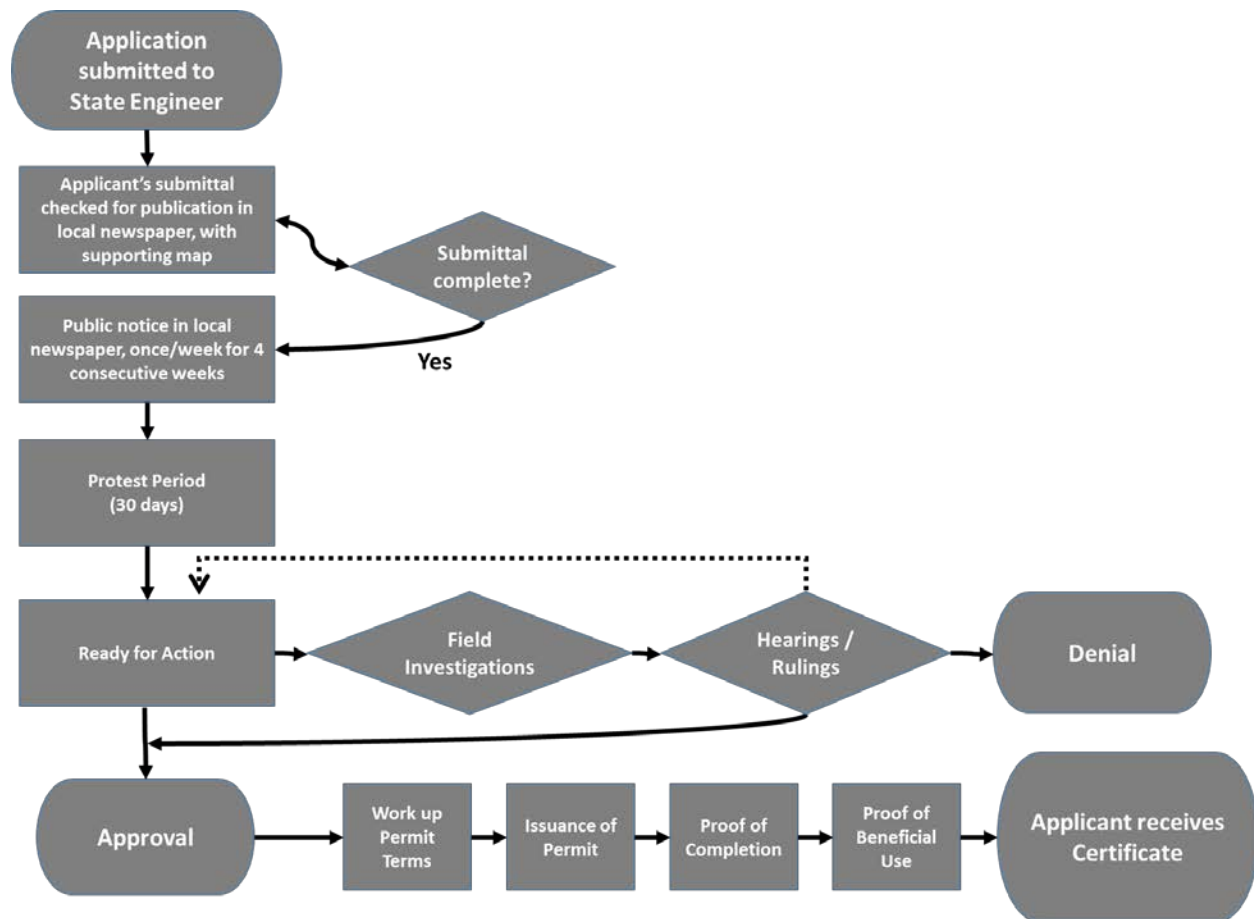
If a water rights user does not provide proof of completion of work and proof of beneficial use by the deadlines outlined in the permit terms, the permit will be **cancelled**. **Forfeiture** of a groundwater right occurs if the water right is not exercised for five consecutive years. Surface water rights can only be lost by **abandonment**. A review of whether or not a surface water right has been abandoned is based on a review of all the surrounding circumstances; however, water law provides statutory reasons that prevent a declaration of abandonment.

The Nevada Department of Conservation and Natural Resources is responsible for management of the state's natural resources, which includes conserving, protecting, managing, and enhancing these resources. The Nevada Department of Conservation and Natural Resources is organized into nine divisions or programs to meet this goal, which includes the Nevada Division of Water Resources (NDWR).

Once a Water Right is granted, it has the standing of both real and personal property, meaning it is conveyed as an appurtenance to real property unless it is specifically excluded in the deed of conveyance. When water rights are purchased or sold as personal property or treated as a separate appurtenance in a real-estate transaction, they are conveyed specifically by a deed of conveyance. It is possible to buy or sell water rights and change the water's point of diversion, manner of use, and/or place of use by filing the appropriate application with the State Engineer (see Figure 3.9-1).

3.9.1.3 Approach to Analysis

In this Environmental Impact Statement (EIS), the analysis of surface water quality considers the potential for impacts that may change the water quality, including both improvements and degradation of current water quality. Groundwater analysis focuses on the potential for impacts on the quality, quantity, and accessibility of the water.



Source: Nevada Revised Statute 533.025

Figure 3.9-1: Nevada Water Law: Obtaining Water Rights

- Surface water quality analysis considers the potential for effects that may change the water quality, including both improvements to and degradation of current water quality. This analysis also considers potential impacts on stream drainages, wetlands, and floodplains.
- The groundwater analysis focuses on the potential for effects to the quality, quantity, and accessibility of the water.

The analysis of water resources effects would consider possible changes in the quality of surface waters or groundwater that could result from the Proposed Action. Such changes could arise from use of military munitions, incidental spills, or soil disturbance or compaction from construction activities. Factors evaluated to determine the potential effects on water resources would include (1) the potential for surface water or groundwater to become contaminated, (2) whether surface water or groundwater represents a substantial threat of a contaminant release to an off-range area, (3) whether such a release would pose an unacceptable risk to human health or the environment, and (4) stormwater management associated with proposed construction activities, such as any rerouted Nevada State Highway or other roads required to maintain new targets and infrastructure, or perimeter fencing.

This section will discuss potential direct and indirect effects to existing water quality in and adjacent to the region of influence. Effects to existing water quality will focus on a qualitative discussion regarding

the potential for military training activities and site improvements to affect groundwater quality, surface water quality, wetlands, and waters of the state.

Nevada Water Rights Inventory and Assessment

The Navy is proposing an expansion of land ranges through the additional withdrawal of public lands and the acquisition of non-federal land. Some of these lands are associated with existing water rights issued through the State of Nevada that provide an entity the right to use water and are considered real property. Therefore, a water right is transferable; assignable; and must be valued, inventoried, and maintained. In addition, a water right can be revoked by the State due to non-use and requires the water be used for a beneficial use, such as agriculture or industry.

The FRTC Modernization Project will limit public access to Bravo ranges for any purpose other than for ceremonial or cultural site visits by local tribes and wildlife management, which are currently occurring within the existing and proposed withdrawal areas. Land previously used for livestock grazing, mineral exploration surveying and development, or recreation would no longer be used for these purposes or would be limited to controlled access regulations. Public access in the Dixie Valley Training Area (DVTA) would remain as is and would not be impacted under all alternatives analyzed in this EIS. However, any development associated with water rights in the DVTA would need to be compatible with military training activities.

The Proposed Action would impact existing water rights within these areas. Therefore, the Navy, as part of this EIS, has conducted an inventory of current water rights for both surface water and groundwater that exist on current and proposed withdrawal areas. The results of this database search are discussed under each range's description in Section 3.9.2 (Affected Environment). The disposition of these water rights and associated wells is also discussed in this EIS under each range's impact analysis summary in Section 3.9.3 (Environmental Consequences). In addition, the Navy acknowledges that more detailed and complete information may be obtained directly from site visits and NDWR field offices. Ongoing collaboration with the NDWR to further identify relevant water rights and related information would continue through the development of the Final EIS. The Navy is also performing an independent water rights inventory.

3.9.1.4 Public Concerns

The public raised several issues during scoping for this EIS, including general effects on water and water resources. Specifically, concerns focused on potential contamination of the water table or damage to the structure of the water table, potential loss of natural surface water flows or direction of surface waters, effects of training with explosive ordnance on the groundwater table and other hazardous materials concerns, and expansion of water quality monitoring with the expanded range area. Public commenters also expressed concerns regarding water wells. Each of the region of interest maps in Section 3.9.2 (Affected Environment) show water wells, which are analyzed within the expanded areas in the context of the Safe Drinking Water Act.

The Mineral County Board of Commissioners, Nye County Commissioners, Lahontan Conservation District, Stillwater Conservation District, Theodore Roosevelt Conservation Partnership, Nevada Department of Wildlife, and the Nevada Board of Wildlife Commissioners raised concerns regarding game and non-game wildlife preservation, with specific concerns regarding long-term investments to date for water structures for wildlife.

The Nevada Department of Agriculture, among many individual members of the public, raised specific concerns regarding water rights, as they are held as vested rights in Nevada. Some of these water rights for groundwater or surface water pre-date statutory water law. As “vested” water rights, the Nevada Department of Agriculture commented that these rights enjoy maximum protection against later appropriations and later statutory provisions. Watering of livestock is a beneficial use of water rights that are vested and non-vested. These water rights hold value, which will be lost if livestock operators cannot prove beneficial use of water in the areas proposed for closure or seasonal restrictions.

The Sierra Club of Nevada provided comments regarding potential contamination of surface and groundwater resources, with specific concerns on potential impacts on Stillwater National Wildlife Refuge. The EPA provided additional comments on addressing contamination issues, such as a description of range clearance activities, fate and transport of munitions constituents in low and high-order detonations, and the use of perfluorinated compounds.

For further information regarding comments received during the public scoping process, please refer to Appendix D (Public Involvement).

3.9.2 Affected Environment

3.9.2.1 Overview

This section provides a general description of the surface and subsurface hydrology within the region of influence. Climate, along with geologic substrate, strongly influences the hydrological characteristics of surface waters and groundwater within the region of interest.

Evapotranspiration and Precipitation

The climate of Nevada is semiarid, with precipitation in the state averaging about 5 inches per year (Western Regional Climate Center, 2017). Because approximately 90 percent of precipitation falling within the region is lost to evapotranspiration (water lost to the atmosphere from the ground surface, evaporation from the capillary fringe of the groundwater table, and evaporation of water from plants, called transpiration), rainfall is a secondary source of water in the region. Reservoirs and groundwater aquifers retain only 10 percent of precipitation (Nevada Division of Environmental Protection, 2016; Western Regional Climate Center, 2017).

Hydrographic Regions

The Great Basin hydrologic province is a 200,000-square-mile area that drains internally. All precipitation in the region evaporates, sinks underground, or flows into mostly saline lakes. The Wasatch Mountains to the east, the Sierra Nevada to the west, and the Snake River Plain to the north bound this

Terminology and Spatial Scales: Provinces, Hydrographic Regions, and Hydrologic Landscape Regions

The Great Basin is a large hydrologic province with no surface connection to the Pacific Ocean. The Great Basin covers most of Nevada (with the exception of the Colorado River Basin in the southeast portion of the state, which empties into the Gulf of California and the Snake River Basin in the northeast portion of the state, which drains into the Snake River, and eventually the Columbia River and the Northwest Pacific coast).

Hydrographic Regions generally coincide with drainage basin boundaries of major river systems and their tributaries. Within the Great Basin hydrographic province, there are 14 hydrographic regions. Within project areas, there are two hydrographic regions—the Carson River Basin and the Central Region.

Within hydrographic regions, **Hydrologic Landscape Regions** (HLRs) are delineated to further characterize such variables as slope, soil permeability, precipitation, and surface drainage.

Hydrographic basins correspond to hydrographic regions and is the spatial unit used by Nevada Department of Water Resources to administer water rights and to make calculations by the State Water Engineer for water right allocations.

region. The Great Basin includes most of Nevada, approximately half of Utah, and portions of California, Oregon, Wyoming, and Oregon. The Great Basin region within Nevada can be divided into 14 hydrographic regions, two of which are within the region of interest—the Carson River Basin hydrographic region and the Central Region hydrographic region (Figure 3.9-2).

Carson River Basin hydrographic region. The Carson River Basin hydrographic region is about 3,900 square miles and extends about 150 miles from eastern California to Pershing County, Nevada. The Carson River, the major surface water feature in this region, flows approximately 184 miles to the northeast from its headwaters in California to its terminus at Carson Sink in Churchill County, Nevada. Flow in Carson River is extremely variable, ranging from a low of about 26,000 acre-feet per year in 1977 to slightly more than 800,000 acre-feet per year in 1983 near Fort Churchill. The Carson River Basin includes the following hydrographic areas: Carson Desert, Churchill Valley, Dayton Valley, Eagle Valley, and Carson Valley.

Flooding occurs fairly often in the Carson River Basin. Floods are either main channel flooding, localized (flash) flooding, or debris flows. A rain-on-snow event in the higher elevations is the usual cause of main channel flooding. History shows repeated incidents of flooding, with 33 documented floods in the watershed since 1852, on an average of every five years (Azad, 2008). At least 17 of these events caused major flooding and extensive damage. Rapid snowmelt causes the river channel to fill quickly until the river overflows its banks. Localized flooding usually occurs during the summer months and is caused by intense rainfall during thunderstorms. Debris flows can occur when water from rapid snowmelt or intense rainfall mixes with sediment; the texture of a debris flow often resembles wet concrete. The predominate use of Carson River waters is agriculture. Only a few storage reservoirs exist in the basin, of which Lahontan Reservoir southwest of Fallon is the largest. Lahontan Reservoir stores water from Carson River, as well as water diverted from Truckee River via Truckee Canal. Water from Carson River is also stored in Stillwater Point Reservoir, Sheckler Reservoir, and Carson Lake. The Truckee-Carson Irrigation District, originally formed in 1918 to work with the U. S. Reclamation Service (now the Bureau of Reclamation within the U. S. Department of Interior), controls all releases from the Lahontan Reservoir as part of the Newlands Project. The Newlands Project was one of the first large-scale land reclamation projects in the U.S. Data from Carson River gauging stations show an overall trend of decreasing stream flow for water in the years 1940–2006 (Maurer et al., 2009).

Point source pollution is defined as any single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, or factory smokestack. Because the proposed action does not include any facilities that would discharge point source pollutants into the drainages within the region of interest, this EIS does not analyze point source pollution. The development of water storage reservoirs, the buildout of an extensive system of canals, and the use of agricultural water on fields have altered groundwater levels, degrading water quality upstream and within the region of interest (Maurer et al., 2009). Nonpoint source pollution typically occurs because of runoff. When precipitation moves over and through the ground, the water absorbs and assimilates any pollutants it comes into contact with. Subsequently, poor water quality flows, containing high concentrations of trace metals, such as arsenic and selenium, flow into basins within the region of interest (e.g., Carson Sink, wetlands at Stillwater National Wildlife Refuge).

The State of Nevada has identified these waters as impaired waterbodies under Section 303(d) of the CWA (Nevada Division of Environmental Protection, 2016). The state classifies a waterbody as impaired if it does not meet any single associated water quality standard and thereby does not support a beneficial use. Water quality parameters that have one or more associated impaired beneficial uses

include arsenic, boron, *Escherichia coli* (bacteria), iron, mercury in fish tissue and sediment, total phosphorus, and total dissolved solids (Nevada Division of Environmental Protection, 2016). The TMDL is the allowable loading from all pollutant sources established as a level necessary to achieve compliance with applicable water quality standards. States are required to develop TMDLs for waterbody segment/parameter combinations appearing in the 303(d) List (40 Code of Federal Regulations part 130.7). However, the State of Nevada has not yet established TMDLs for drainages within the region of interest (Nevada Division of Environmental Protection, 2016).

Nonpoint source water pollution in Carson River Basin is due mainly to historic mining activities and mill sites, with continued non-point source pollution from agricultural operations, urban runoff, and hydrologic modifications. Water quality parameters of concern include nutrients, pesticides and herbicides, suspended solids, turbidity, and bacteria, all of which the state's Nonpoint Source Program (administered by the Division of Environmental Protection) targets.

Central Region hydrographic region. The Central Region hydrographic region has a surface area of approximately 46,783 square miles spanning 13 Nevada counties. No major urban or industrial lands lie within this sparsely settled basin. Carson River Basin and Walker River Basin to the west, Humboldt River Basin to the north, Great Salt Lake Basin and Colorado River Basin to the east, and Death Valley Basin to the southwest bound the Central Region hydrographic basin. The Central Region hydrographic basin consists of several small, isolated watersheds. Horse Creek in the upper Dixie Valley watershed is a perennial stream. No other continuous surface water flows are found in this region. The Bravo training ranges and the DVTAs are within the Central Region hydrographic region and located in the Rawhide, Stingaree, Fairview, and Dixie Valley watersheds.

Hydrologic Landscape Regions

To further characterize the region of interest, hydrological landscape regions (HLRs) are defined to generalize large areas of land with similar characteristics. Maurer et al. (2004) and Maurer et al. (2009) defined HLRs for Nevada. They used slope, mean annual precipitation, soil permeability, and hydrogeological units (also called administrative groundwater basins) as variables to describe and map the different HLRs. These are the basic variables that control the hydrologic processes that take place within an area. While there are other variables that affect the hydrologic processes, considering more of these variables would make hydrologic landscape regions too complex for generalization for the purposes of this EIS.

Within these HLRs, groundwater movements are typically determined by surface and subsurface soil permeability (the measure of how fast water permeates rocks, where poor permeability results in surface flow faster than rocks with high permeability). Figure 3.9-3 shows the relationship of surface and groundwater flows, as determined by the slope and permeability of mountain blocks and alluvial slopes.

With permeable consolidated rocks, rainfall on mountain slopes will infiltrate surface rocks, resulting in meager runoff. The area where precipitation infiltrates subsurface rocks is the zone of recharge. On alluvial slopes, the subsurface flow enters the zone of lateral discharge, where evapotranspiration within the valley floor will define the zone of discharge. With poorly permeable rocks or soils with low permeability, recharge typically occurs at more shallow depths as water is conveyed on the surface towards alluvial slopes, and into receiving basins. Within each detailed discussion of ranges, maps are included that list the HLR number, which may be indexed to Table 3.9-1, which lists each HLR along with the major defining variables.



Figure 3.9-2: Basins Within the Region of Influence

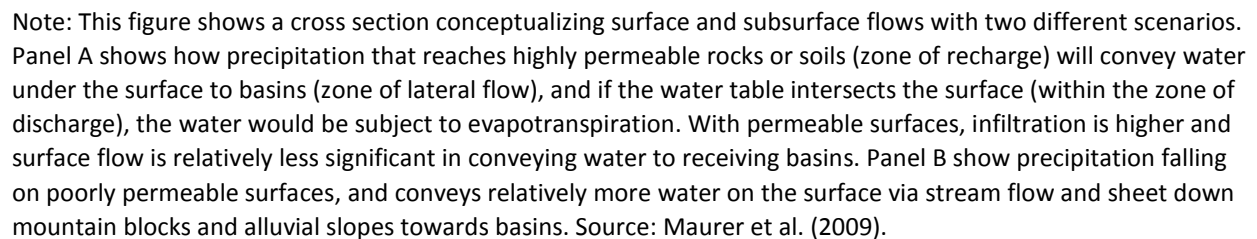


Figure 3.9-3: Typical Groundwater Flow Patterns for Mountain Blocks with Different Permeability

Table 3.9-1: HLRs within Areas B-16, B-17, B-20, and the DVTA

Hydrogeological Landscape Region	Precipitation Amount ¹	Soil Permeability ²	Slope ³	Distribution
1	High	Low	Moderate	Most ranges in Nevada
2	Low	Low	Moderate	Carson Sink
3	Moderate	Moderate	High	Most ranges in central Nevada
4	Moderate	Moderate	Low	Playas
5	Moderate	Moderate	Moderate	Scattered, consolidated rock
6	Moderate	Moderate	High	Scattered, consolidated rock
7	Low	High	Moderate	Playas, unconsolidated rock
8	High	High	Moderate	Southerly aspect
9	Moderate	Moderate	Low	Valley floors
10	Low	Moderate	Moderate	Alluvial slopes
11	High	Low	Moderate	Most ranges in central Nevada
12	Low	Low	Moderate	Alluvial slopes
13	Moderate	Moderate	High	Most ranges in central Nevada
14	Moderate	Moderate	Moderate	Northerly aspects, consolidated rock
15	High	High	Moderate	Southerly aspect, alluvial slopes
16	Moderate	Moderate	High	Northerly aspects, consolidated rock

¹ Low precipitation = <8 in/year, Moderate = 8-16 in/year, High = >16 in/year

² Low soil permeability = <5 ft./day, Moderate = 5-10 ft./day, High = >10 ft./day³ Low slope = <3 percent, Moderate = 3-25 percent, High = >25 percent

Water Wells and Water Rights

The Navy used NDWR database archives as the primary sources of information regarding existing water rights and their status. However, this source may not be entirely comprehensive and without errors. Some of the limitations of this source are that it may include limited information regarding current status, surface water rights, or water rights existing on Bureau of Land Management (BLM) grazing allotments that are not recorded in the NDWR database.

In an effort to gather existing water rights and well information, the Navy performed three queries of the information included on the NDWR website (<http://water.nv.gov/>): (1) wells located in the existing and proposed withdraw areas, (2) well logs that have been recorded on wells located in the existing and proposed withdraw areas, and (3) water rights located in the existing and proposed withdraw areas. Using the information from these queries, a comprehensive database search of the NDWR was conducted to download any associated well data information, including well driller's reports, well log details, certificate, and permit information associated with wells identified as being inside the proposed withdraw area. Further analysis cross walked well information and associated well log information. Information from the three queries was organized by Bravo ranges/DVTA and summarized in each training area description below. Some of the wells identified in the database search are not associated with water rights. Similarly, some water rights do not have wells. For example, a holder of a water right may use the water from a spring or surface impoundment.

3.9.2.2 Bravo-16

B-16 is within the southwestern portion of Carson River Basin hydrographic region, as shown in Figure 3.9-2. The existing B-16 range is generally associated with the Lahontan Valley basin, a terminal sub-basin for the Carson River. The requested withdrawal area associated with B-16 extends to the west to include portions of the Dead Camel Mountains. Runoff in Lahontan Valley eventually reaches wetlands at Carson Lake, Stillwater National Wildlife Refuge, and Carson Sink.

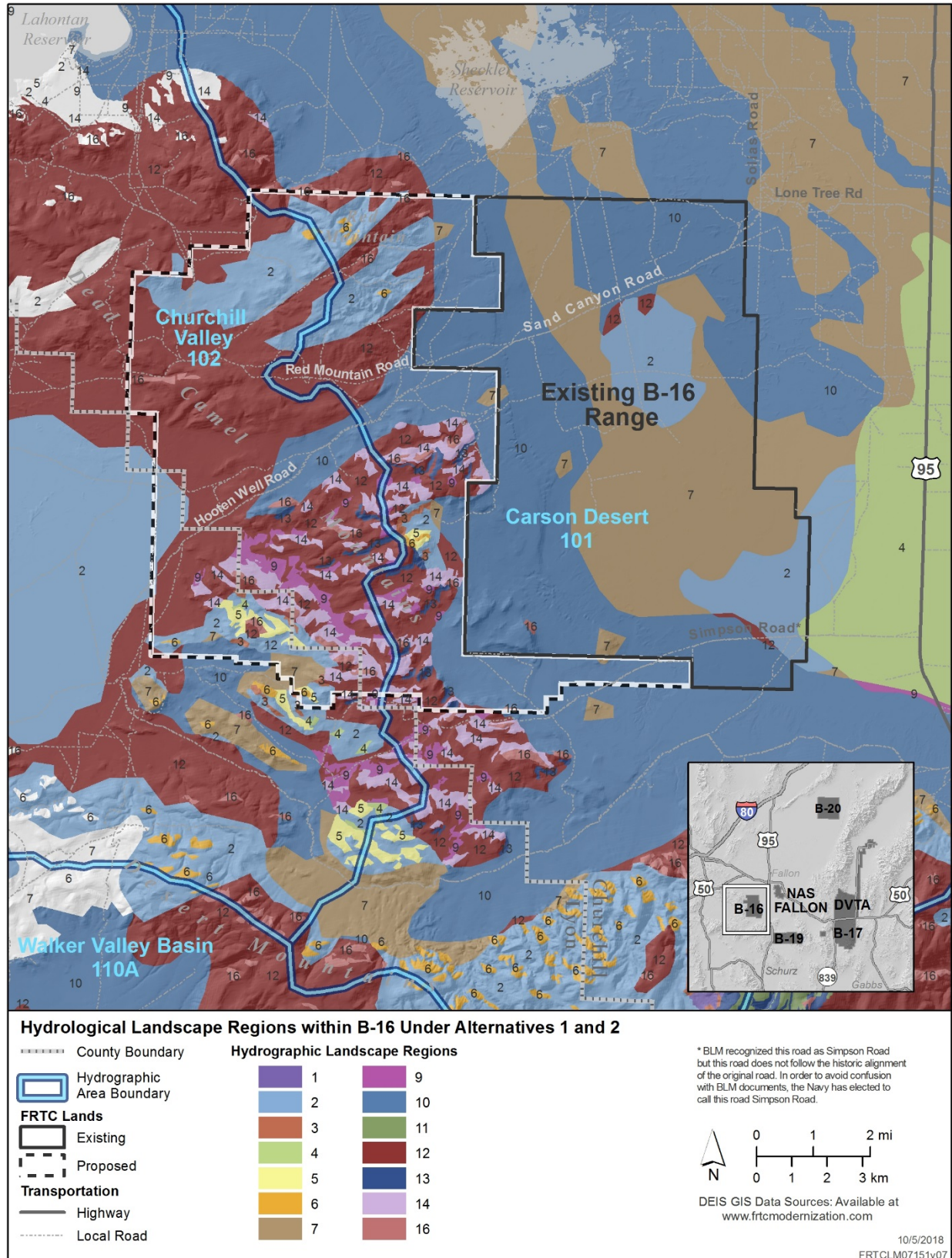
Surface Water

Several major ephemeral stream channels converge in and cross the existing B-16 and requested withdrawal areas that would be part of the B-16 range as they flow to Carson Lake (U.S. Department of the Navy, 2014). The training area contains alluvial fans, valley bottoms, alkali flats, sand dunes, and segments of three major irrigation canals. During wet years, water may pond seasonally in low areas (U.S. Department of the Navy, 2014). No ponds, streams, or other permanent surface waters occur in B-16, and no intermittent streams have been identified (U.S. Department of the Navy, 1998). Truckee Carson Irrigation District maintains a spillway and constructed a new weir system to divert large flows from the town of Fallon.

Groundwater

Springs, where they occur, are found in bedrock outcrops, near fault zones, and in areas with high water tables. There are several hydrologic landscape regions throughout the B-16 range and requested withdrawal areas (Figure 3.9-4). The current B-16 range and requested withdrawal areas that would be part of B-16 are mainly comprised of HLRs 2, 7, and 10. All of these areas receive less than 5 inches of rain per year. HLR 2 has low soil permeability, and moderate slope, which is characteristic of playas systems. HLR 7 has high soil permeability, with moderate slopes. HLR 10 is found on alluvial slopes surrounding the Carson Sink, and soil permeability is considered moderate with moderate slopes.

The northwestern portion of the proposed range is primarily HLRs 2, 10, and 12, which are found on moderately sloping alluvial areas with low soil permeability. The southwestern portion of the proposed range is within the southern portion of the Dead Camel Mountains, has some high variation of topography, and is composed primarily of HLRs 2, 9, 12, 14, and 16. Section 3.1 (Geological Resources) contains a detailed description of the distribution of soils underlying B-16 and specific aspects of their hydrogeological properties (U.S. Department of the Navy, 2014).



Note: The key to the characteristics of the Hydrographic Landscape Regions is provided in Table 3.9-1.

Figure 3.9-4: Hydrographic Landscape Regions within B-16 Under Alternatives 1 and 2

Water Rights and Water Wells

The disposition of water rights associated with B-16 are discussed under each alternative's discussion within Section 3.9.3 (Environmental Consequences). The Navy evaluated water rights and well locations within B-16 based on an August 2018 search of the NDWR Hydrographic Assay database. The Navy recognizes there may be differences between the Hydrographic Abstracts and detailed place of use/point of diversion information from NDWR and will coordinate with NDWR between the Draft and Final EIS to resolve differences between the online and detailed water right information. A search of the NDWR website identified four existing water rights records with a certificate of appropriation within the B-16 range expansion area. Two of the records identified the beneficial use as stock water, and two were identified as commercial (see Figure 3.9-5).

A search of the NDWR website identified a total of 36 wells in the B-16 range (see Figure 3.9-6). The beneficial use identified for each well is as follows:

- 13 test wells,
- 9 domestic wells,
- 7 monitoring wells
- 5 wells used for stock water
- 1 irrigation well,
- 1 unused well, and
- 2 additional wells were listed in the NDWR database as having an unknown use.

Four wells are permitted or have a certificate of appropriation, the remaining wells are not required to have a water right.

3.9.2.3 Bravo-17

B-17 is located east of NAS Fallon and south of U.S. Route 50, and is bounded on the west by State Route 839. The area around B-17 is composed primarily of BLM land with a few private parcels. The existing B-17 range is wholly located within Churchill County. Mineral and Nye Counties are south of B-17, and the Walker River Indian Reservation is southwest of B-17 (under Alternatives 1 and 2, the expanded B-17 range would also include Mineral County, and under Alternative 3, the expansion of B-17 would extend east beyond State Route 361 into both Mineral and Nye Counties). HLRs within B-17 are shown in Figure 3.9-7, Figure 3.9-8 shows the water rights, and Figure 3.9-9 shows the types and locations of water wells within B-17.

B-17 is the most highly used range within FRTC, with respect to the amount of ordnance expended (U.S. Department of the Navy, 2008). The live ordnance impact area is in the eastern portion of the range, with topography generally associated with alluvial slopes. The Navy uses inert conventional weapons in the western portion of the B-17 range (U.S. Department of the Navy, 2004, 2015a). There have been spills and other releases near B-17. These incidents are primarily oil and gas spills and include the release of 50 gallons of diesel fuel that leaked from a diesel tank at an unspecified electronic warfare site in Section 11 of T16N R34E. Section 3.13 (Socioeconomics) provides a summary of chemical releases as reported to the EPA's Toxic Release Inventory for B-17 (TRI ID# 8940WNVLRSSHEEL; FRS ID# 110067124686) and B-19, respectively, since 2010.

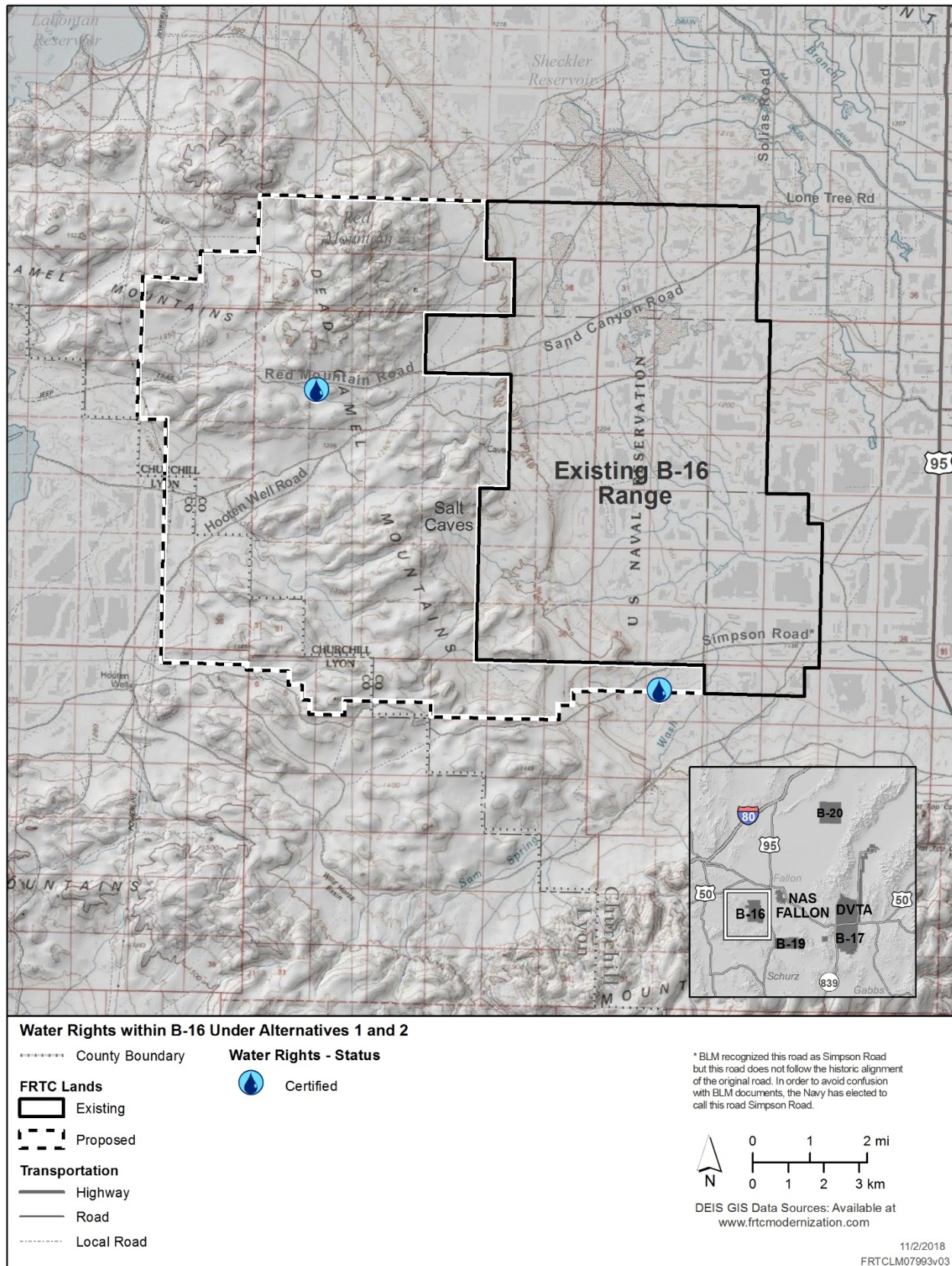


Figure 3.9-5: Water Rights within B-16 Under Alternatives 1 and 2

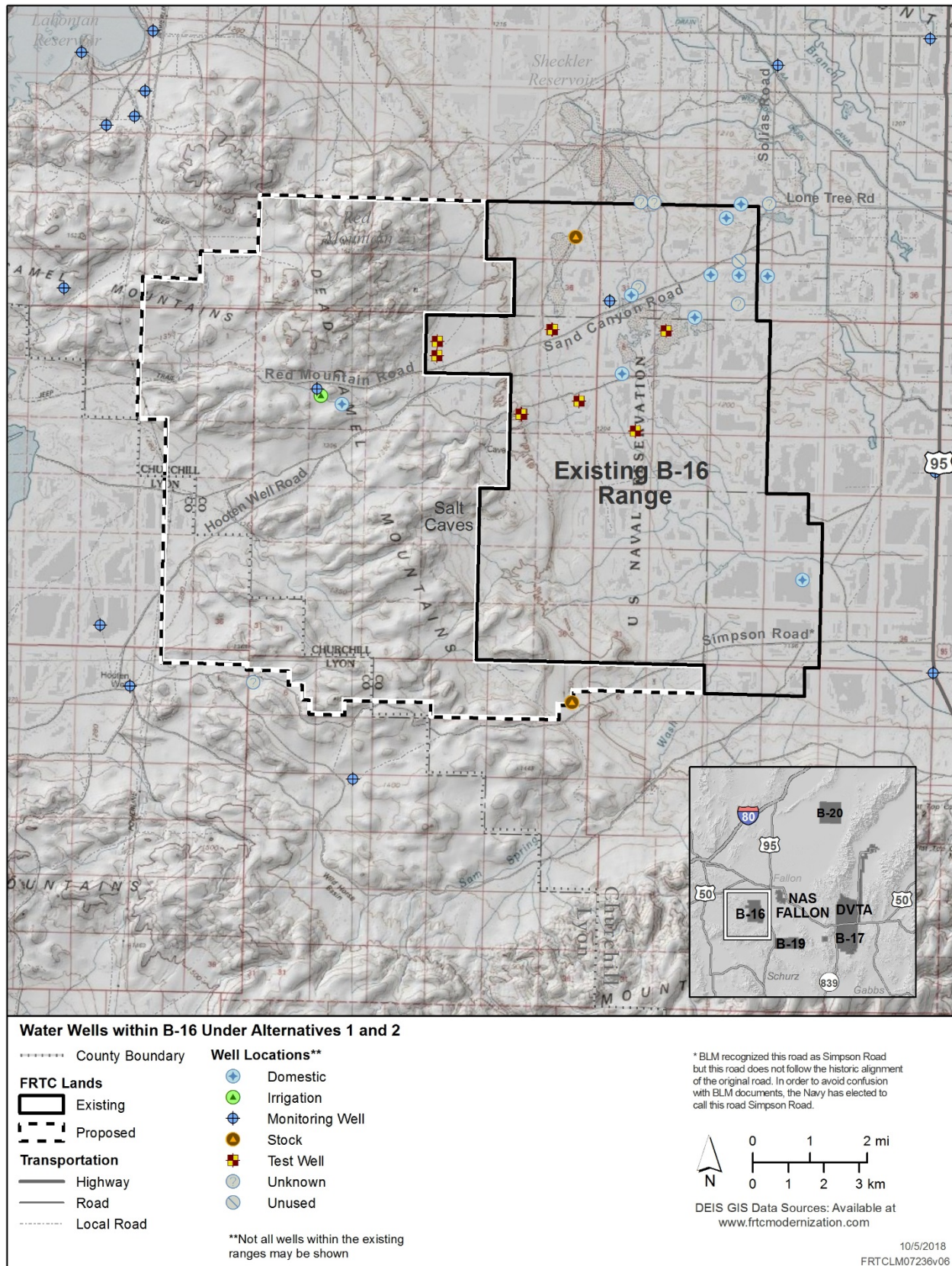
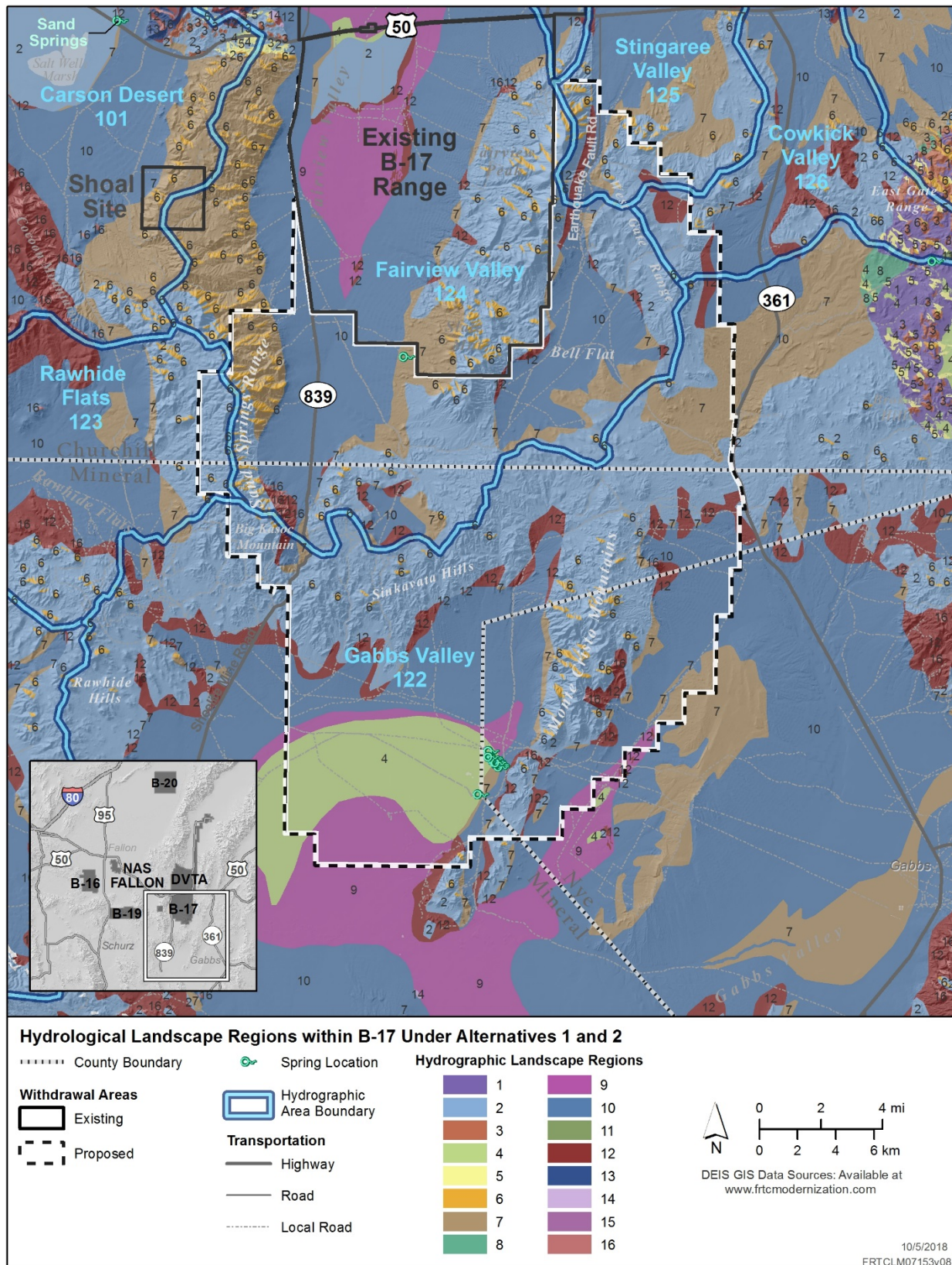


Figure 3.9-6: Water Wells within B-16 Under Alternatives 1 and 2



Note: The key to the characteristics of the Hydrographic Landscape Regions is provided in Table 3.9-1.

Figure 3.9-7: Hydrographic Landscape Regions within B-17 Under Alternatives 1 and 2

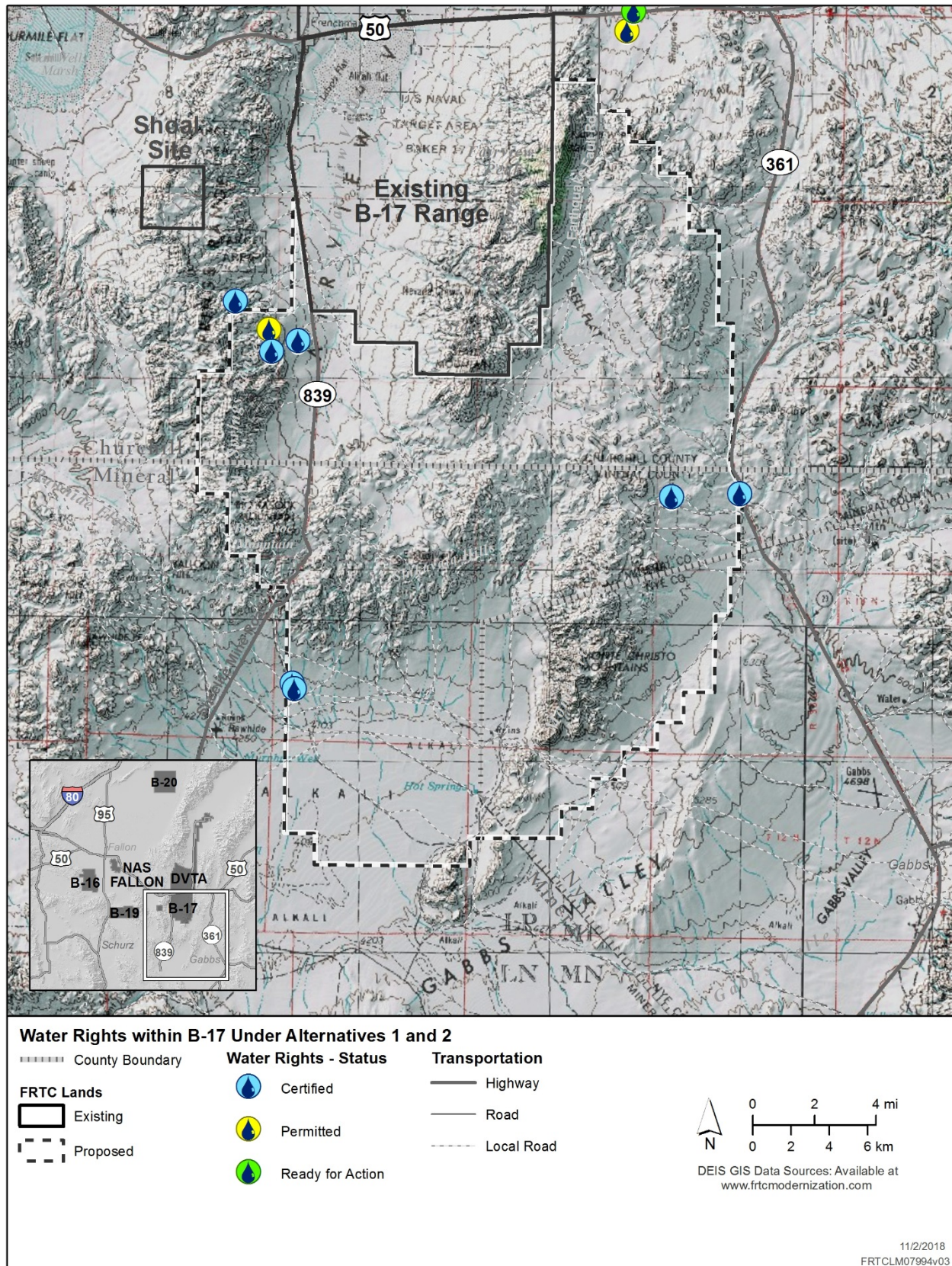


Figure 3.9-8: Water Rights within B-17 Under Alternatives 1 and 2

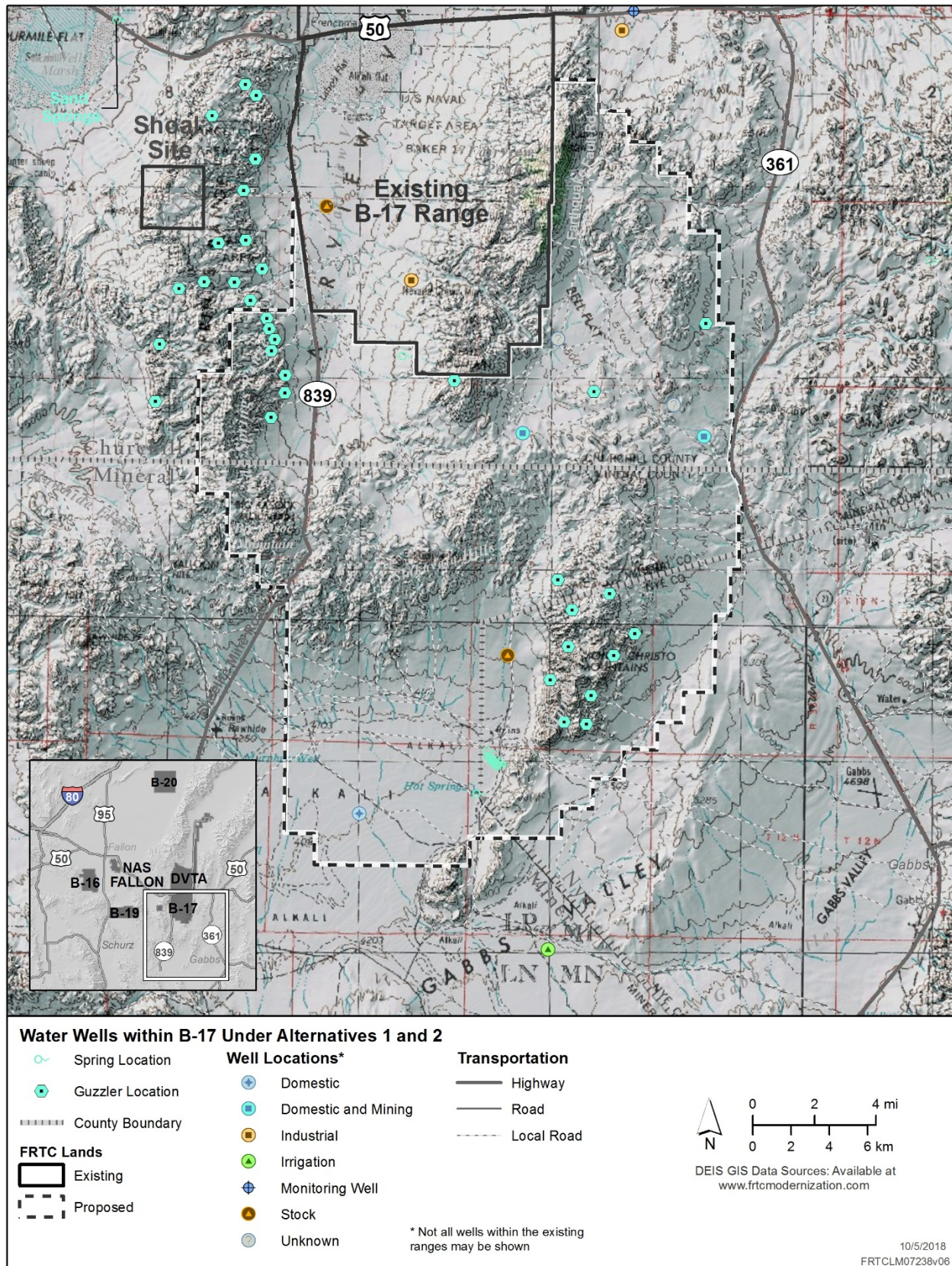


Figure 3.9-9: Water Wells within B-17 Under Alternatives 1 and 2

Surface Water

There are no perennial streams are present in the area and, as such, ephemeral washes around B-17 tend to drain into the Labou Flat. In addition, floodwater around Gabbs Valley reaches the alkali flats in the western part of Gabbs Valley.

Numerous water developments for wildlife have been installed within B-17 by the Nevada Department of Wildlife, in conjunction with the Navy and others, to support large and small game hunting. Nevada Department of Wildlife are planning several water developments within B-17 within existing range areas and areas proposed for withdrawal.

Groundwater

B-17 has large stretches of HLRs 2 and 10. Relatively large patches of Region 7 are present within the area. Hydrologic landscape Region 9 covers a portion of the northern part of the area. Many small patches of Region 6 are interspersed within the portions of Regions 2 and 7. Lining the stretches of Region 2 are thin patches of Region 12. Section 3.1 (Geological Resources) contains a detailed description of the distribution of soils underlying B-17 and specific aspects of their hydrogeological properties.

Water Rights and Water Wells

The disposition of water rights associated with B-17 are discussed under each alternative's discussion within Section 3.9.3 (Environmental Consequences). The Navy evaluated water rights and well locations within B-17 based on an August 2018 search of the NDWR Hydrographic Assay database. The Navy recognizes there may be differences between the Hydrographic Abstracts and detailed place of use/point of diversion information from NDWR and will coordinate with NDWR between the Draft and Final EIS to resolve differences between the online and detailed water right information. A search of the NDWR website identified a total of 19 existing water rights records within the proposed expansion area of the B-17 range (see Figure 3.9-8). Most of these water rights (15 of the 19 water rights) have certificates of appropriation, with 3 vested water rights and 1 permitted water right. These water rights are used either for stock water, mining, recreation, or domestic use.

A search of the NDWR website identified a total of 12 wells in the B-17 range (see Figure 3.9-9). The beneficial use identified for 10 of the wells is as follows:

- 5 wells used for stock water
- 2 wells used for either domestic water or mining
- 2 wells used for domestic water
- 1 well used for irrigation purposes.

There are also two wells with unknown uses. Of the 12 wells within the B-17 proposed expansion area under Alternatives 1, 2, and 3, 3 wells were identified as having a permit and a certificate of appropriation; 6 wells were identified as permitted, but do not have a certificate of appropriation; and the remaining wells are not permitted.

3.9.2.4 Bravo-20

The majority of the lands requested for withdrawal or proposed for acquisition for B-20, shown in Figure 3.9-2, is located within the Carson Sink, between the Stillwater and the Humboldt mountain ranges. HLRs within B-20 are shown in Figure 3.9-10, Figure 3.9-11 shows the water rights, and Figure 3.9-12 shows the types and locations of water wells within B-20.

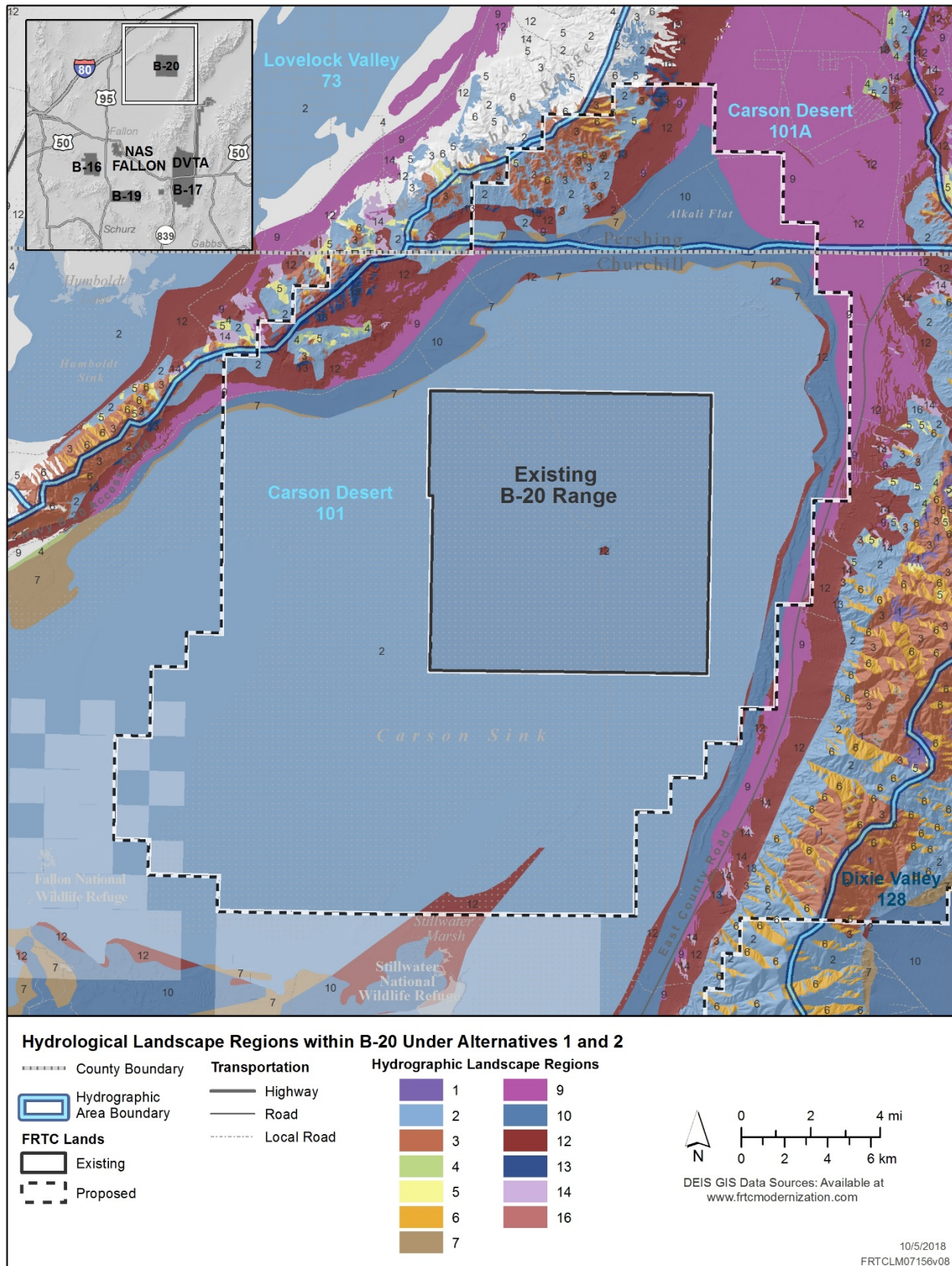


Figure 3.9-10: Hydrographic Landscape Regions within B-20 Under Alternatives 1 and 2

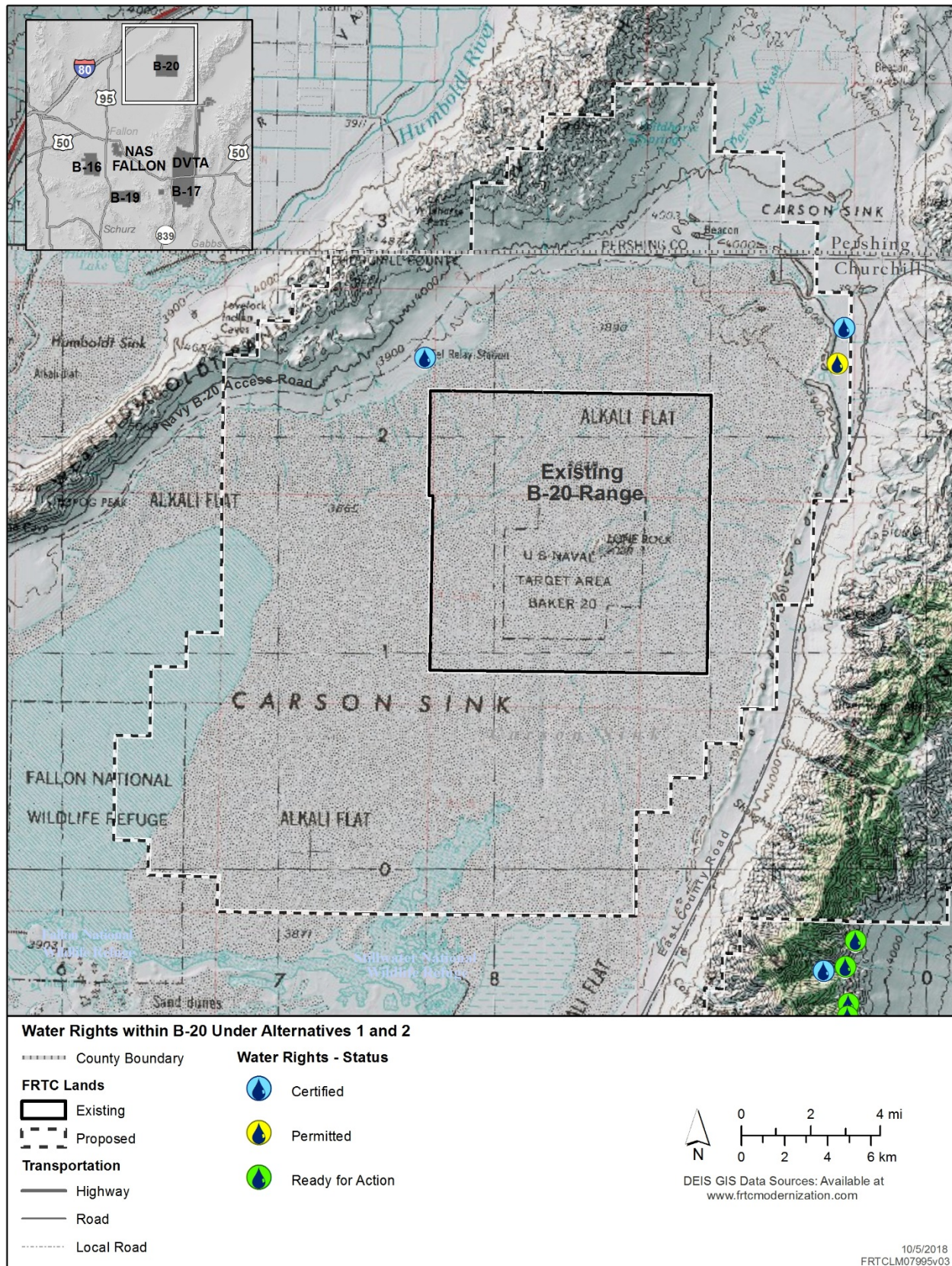


Figure 3.9-11: Water Rights within B-20 Under Alternatives 1 and 2

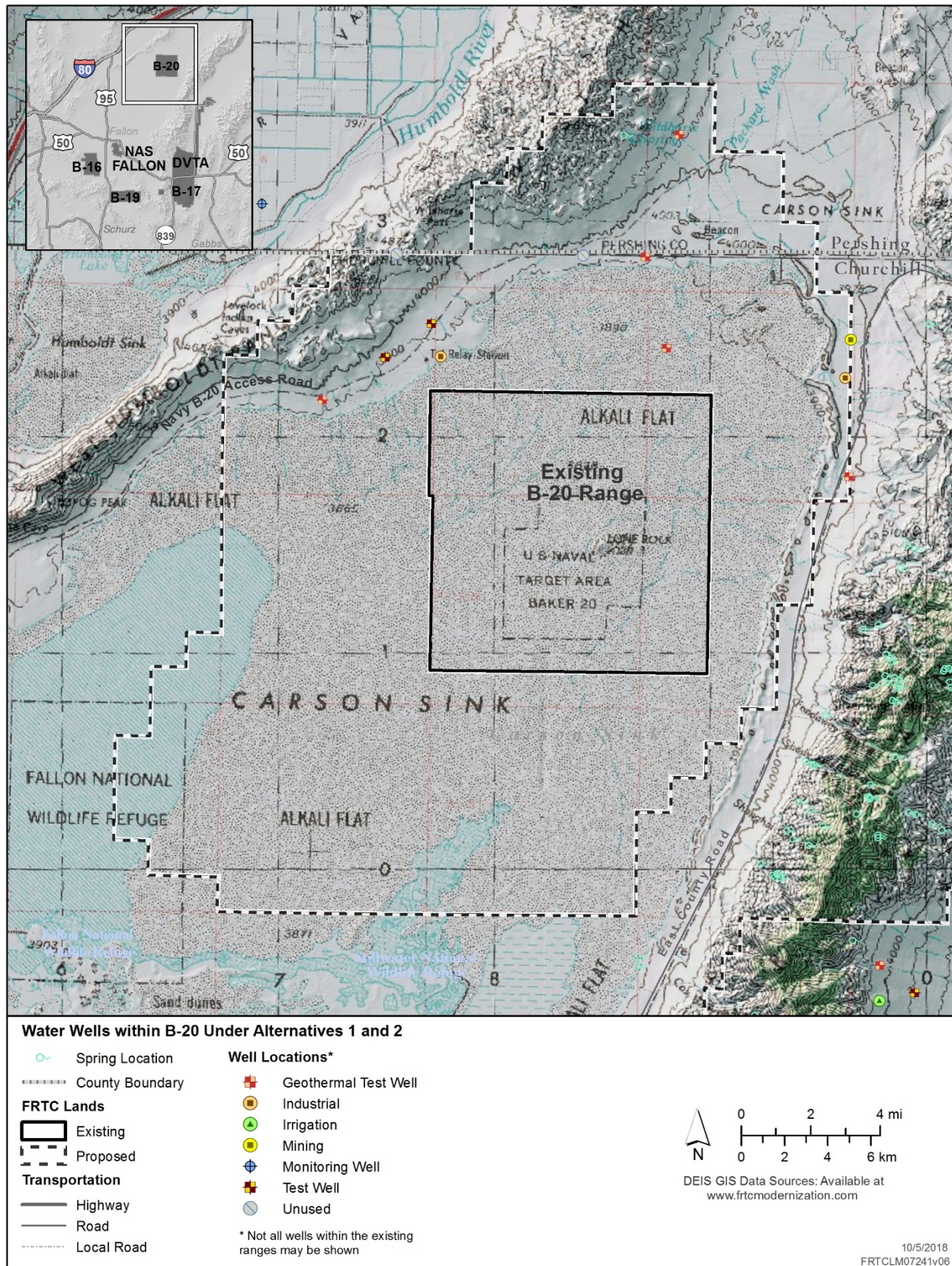


Figure 3.9-12: Water Wells within B-20 Under Alternatives 1 and 2

Surface water

There are no identified perennial waters within B-20. The Stillwater National Wildlife Refuge has perennial waters southwest of the requested withdrawal area for B-20. The Carson Sink is the lowest area in the Carson River drainage, so it may be inundated depending on rainfall; it floods on average every five years (Azad, 2008).

The southern and western portions of B-20 are located in the Operable Unit 2 (OU2) section of the Carson River Mercury Superfund site. This site includes mercury, arsenic, and lead contaminated soils at former mill sites and mercury contamination in water, sediments, and fish over more than 100 miles of the Carson River. Historic mining activities used imported elemental mercury at mill sites to amalgamate gold and silver. Mercury, lead, and arsenic from these upstream mill sites migrated into the Carson River to the river's termination points at the Carson Lake, Stillwater National Wildlife Refuge, and the Carson Sink (Nevada Division of Environmental Protection, 2006, 2013). In the 1970s, the EPA listed the Carson River Mercury Superfund site on the National Priority List. The Comprehensive Environmental Response, Compensation, and Liability Act regulates the list.

On April 26, 2017, the EPA released the Final OU2 Remedial Investigation Report. The report includes the Final Remedial Investigation Report, the Human Health Risk Assessment, and the Screening Level Ecological Risk Assessment. The EPA has initiated the Feasibility Study, which will evaluate costs and benefits of cleaning up the mercury, arsenic, and lead contamination in the river, reservoir, and wetlands and establish the need for any type of cleanup.

B-20 expansion area also includes the Fallon Aerial Gunnery Range West Formerly Used Defense Site (T22N, R32E). The Navy acquired this range in 1944 and terminated control of the range site in 1947. Military activities at this range included aerial gunnery, strafing, dive-bombing using practice bombs, and rocket fire. The use of live bombs also was proposed. The Navy has removed several bombing targets, including Target 15 Carson Sink A, Target 16 Carson Sink B, and Target 11 Carson Sink, from this area. There were no reported ordnance-related incidents connected with this site.

Groundwater

B-20 is comprised almost entirely of HLR 2. In the northern portion of the area, a line of HLR 10 separates a variety of landscape regions from the large swath of Region 2 along the Humboldt Range and along the eastern side with the Stillwater Range. North of the stretch of HLR 10 are patches of HLRs 2, 3, 4, 5, 6, 12, and 13. In the southern portion of the lands requested for withdrawal for B-20, the topography slopes southward towards the Stillwater Marsh (and eventually into the wetlands within the Stillwater National Wildlife Refuge). The existing B-20 range is entirely within the Carson Sink and is most predominantly characterized by HLR 2. Section 3.1 (Geological Resources) contains a detailed description of the distribution of soils underlying the lands requested for withdrawal for B-20 and specific aspects of their hydrogeological properties.

Water Rights and Water Wells

The disposition of water rights associated with B-20 are discussed under each alternative's discussion within Section 3.9.3 (Environmental Consequences). The Navy evaluated water rights and well locations within B-20 based on an August 2018 search of the NDWR Hydrographic Assay database. The Navy recognizes there may be differences between the Hydrographic Abstracts and detailed place of use/point of diversion information from NDWR and will coordinate with NDWR between the Draft and Final EIS to resolve differences between the online and detailed water right information. A search of the NDWR website identified a total of six existing water rights records within the B-20 range (see Figure

3.9-11). Three of these water rights have certificates of appropriation, one is a permitted water right, and two are expired. Of these water rights, three have designated beneficial uses for mining and milling—one for stock water, one for construction purposes, and one for irrigation. A search of the NDWR website identified a total of 12 wells in the B-20 range (see Figure 3.9-12). The beneficial use identified for 11 of the wells is as follows:

- 5 wells used as geothermal test wells-geothermal test wells,
- 2 wells used for industrial purposes,
- 2 test wells,
- 1 well used for mining, and
- 1 unused well
- An additional well was identified, but with unknown use.

3.9.2.5 Dixie Valley Training Area

The DVTA encompasses the portion of the DVTA north of U.S. Route 50 and includes the Dixie Valley, the western slope of the Clan Alpine Mountains, and the eastern portion of the Stillwater Mountain Range, as shown in Figure 3.9-2. A significant portion of the DVTA is composed of remnant livestock and agricultural farmland with abandoned outbuildings, as well as training locations such as Centroid, electronic warfare sites, and other training sites. The existing boundary of the DVTA is comprised of a strip of HLR 12, with the southern portion of the existing DVTA characterized by HLRs 9 and 10. HLRs for the DVTA are shown in Figure 3.9-13, Figure 3.9-14 shows the water rights, and Figure 3.9-15 shows the types and locations of water wells within the DVTA.

Surface water

North Dixie Valley includes numerous wetlands associated with flowing wells and isolated areas of sandy habitats. These wetlands are typically streams and washes that support vegetation, such as cottonwoods, willows, cattails, and bulrushes (U.S. Department of the Navy, 2014). The DVTA also includes the Humboldt Salt Marsh, a playa lake where Dixie Valley drainages terminate. Navy lands are near the junction of Shoshone Creek and Spring Creek, the principal ephemeral drainages in the area. Several manmade ponds, which are designed to enhance water quality and availability for wildlife and enhance wetland vegetation, are within the DVTA (U.S. Department of the Navy, 2014).

Groundwater

Within the lands requested for withdrawal for the DVTA, to the east and west of the existing DVTA are stretches of HLR 10. The mountain ranges that lie on either side of Dixie Valley are primarily comprised of Region 2 with patches of Regions 6 and 7. A variety of hydrologic landscape regions are scattered within the portion of the DVTA that is north of Cowkick Valley. Hydrologic landscape regions included in the DVTA include HLRs 1, 3, 4, 5, 8, 9, 11, 13, 14, and 15 (Figure 3.9-13). In the southern portion of the DVTA, just north of U.S. Route 50, is an area of Region 9.

Water Rights and Water Wells

The Navy evaluated water rights and well locations within the DVTA based on an August 2018 search of the NDWR Hydrographic Assay database. The Navy recognizes there may be differences between the Hydrographic Abstracts and detailed place of use/point of diversion information from NDWR and will coordinate with NDWR between the Draft and Final EIS to resolve differences between the online and detailed water right information. A search of the NDWR website identified a total of 57 existing water rights records within the DVTA (see Figure 3.9-14).

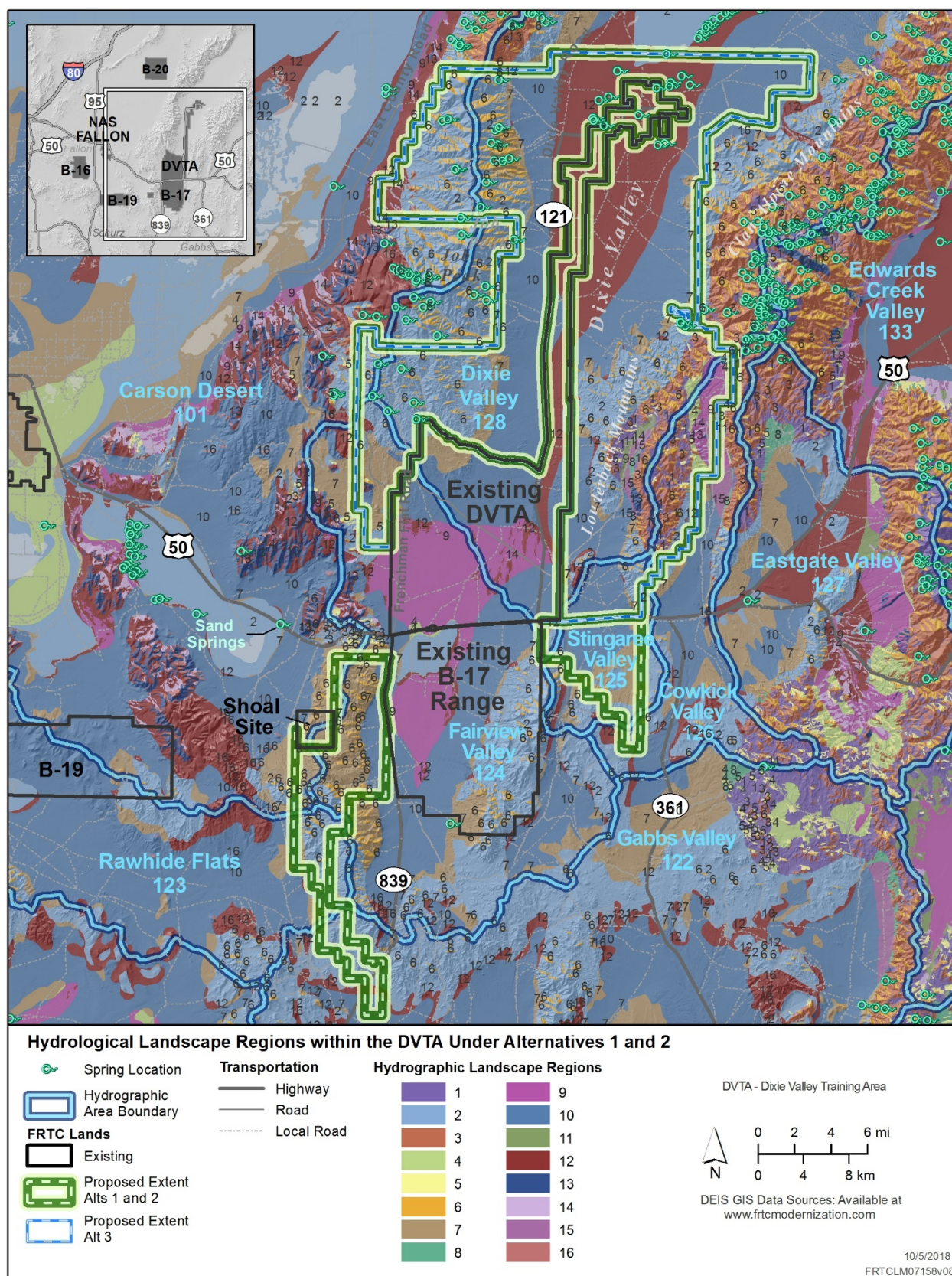


Figure 3.9-13: DVTA Hydrographic Landscape Regions within the DVTA Under Alternatives 1 and 2

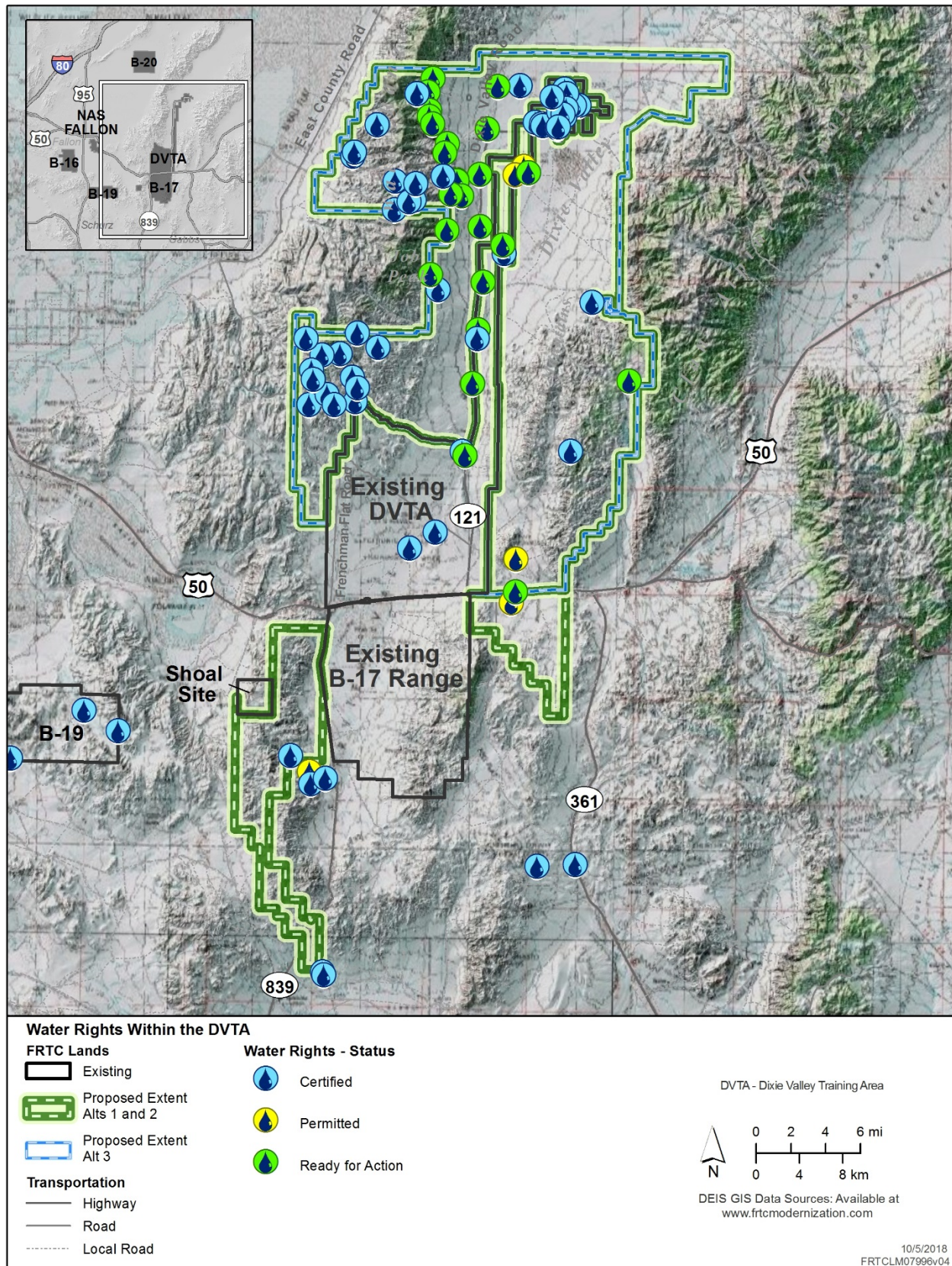


Figure 3.9-14: Water Rights Within the DVTA

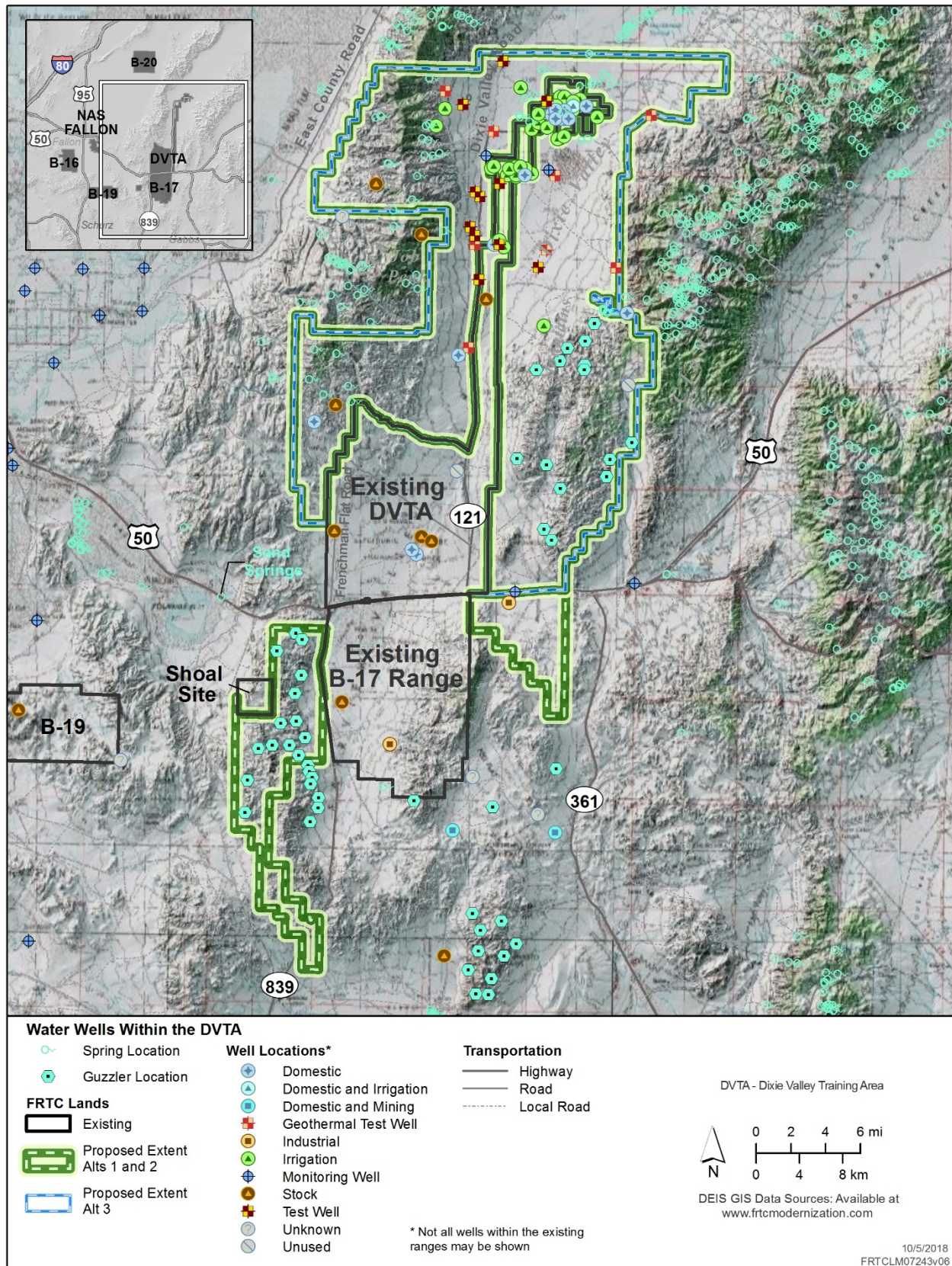


Figure 3.9-15: Water Wells Within the DVTA

Of these 57 water rights, 30 have a certificate of appropriation; 10 are listed as pending certificates; 10 are listed as vested water rights; and 1 is a permitted water right, with the remaining water rights having been either terminated, abrogated, withdrawn, or otherwise forfeited. Most of these water rights are used for stock water (35 of the 57 water rights), 9 are used for either municipal or “quasi-municipal” purposes, 5 for irrigation, 7 for supplemental water for wildlife, and 1 for mining and milling operations. Eighty-four wells are within the DVTA, as shown in Figure 3.9-15. Several of these wells feed a number of the ponds mentioned above that are designed to provide water for wildlife and wetland vegetation (U.S. Department of the Navy, 2014).

3.9.2.6 Special Use Airspace Area

Modifications to the special use airspace (SUA) proposed in this EIS would not impact water resources; therefore, SUA is not a component of the affected environment analyzed for potential impacts. Impacts on land use and the potential to cease current or future incompatible land uses outside of ranges under the SUA may indirectly impact water rights and water due to changes in land use initiated by the modification of the existing SUA.

3.9.3 Environmental Consequences

This section evaluates each of the three different alternatives’ potential effect on water resources. The following text provides an analysis of environmental effects of the No Action Alternative and Alternatives 1 through 3 against the environmental baseline as described in Section 2.4 (Environmental Baseline [Current Training Activities]). A summary of the potential impacts with implementation of the No Action Alternative or any of the three action alternatives (Alternatives 1, 2, and 3) is provided at the end of this section (see Section 3.9.3.6, Summary of Effects and Conclusions).

3.9.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. For water resources, potential future land uses in the event that the current FRTC land withdrawal were not renewed under the No Action Alternative could include clean-up or restricted land use of areas previously disturbed by military operations and recreational use; utility corridor construction; or mining and geothermal, solar, or wind energy resource development. These activities may increase impervious cover and compact soils, thereby affecting surface and groundwater. Under the No Action Alternative, the cessation of military surface uses reduces the potential for ground disturbance. Release of the FRTC lands to another Department of Defense agency, the BLM, or the State of Nevada would likely open restricted lands to public use or mineral resource development, which would likely broaden the areas subject to soil disturbance compared to current baseline levels.

Munitions constituents¹ are typically consumed entirely during a detonation. When chemical constituents of explosive ordnance are released, these chemicals are immediately and continually subjected to a natural attenuation and degradation process. Munitions constituents are not considered recalcitrant to biodegradation like some other organic chemicals commonly known as groundwater and soil contaminants at hazardous waste sites. The Navy conducts Range Conditions Assessments as part of

¹ Military expended materials, include munitions constituents (all materials from munitions and their emissions, and the degradation or breakdown of the constituent elements) and expended material constituents (any material released into the environment from the use of military expended materials).

the Navy's Range Sustainment Environmental Program Assessment every five years. The most recent Range Conditions Assessment for FRTC was completed in 2015 (U.S. Department of the Navy, 2015b). A team of environmental and operational range experts evaluated the history of range use within FRTC ranges, the types and quantities of munitions or military expended materials used and their chemical constituents, range location, spatial distribution of activities, available environmental data, environmental regulatory requirements, and compliance efforts. The Range Conditions Assessment information and data were derived from site visits, personnel interviews, archive search reports, and document reviews conducted in 2013 and 2014. The review team's findings, based on these data, concluded that the range and training operations are in compliance with environmental laws and policies, and there are no munitions constituents migrating off of the ranges.

Surface Water. Depending on the future land uses allowed, impacts on surface water resources from parties other than the U.S. Navy could be considerable. While future allowable uses are undefined at this time, a few examples of potential use can help to understand the potential effects. Off-road activities, whether from recreational use or mineral or energy exploration and development, could increase sheet flow erosion in localized locations where off-road vehicle traffic would occur; however, it is unlikely that soil compaction would affect measureable changes in runoff. The amount of runoff from off-road vehicle use, as with any ground-disturbing activities, is dependent on site-specific factors and localized characteristics of the surface (e.g., surface texture, slope). Combined, these activities increase sediment loss, sediment loads, sedimentation, and runoff in the ephemeral drainages. However, erosion and runoff control measures, if implemented during mining activities, would reduce sediment transport and minimize impacts on water quality. Due to limited funding availability, enforcement of erosion and runoff control measures for mining activities may not be enacted.

Groundwater. Mineral or energy exploration and development would likely have the most substantial impacts on groundwater resources within the region of interest. One of the most important impacts on groundwater from geothermal exploration and development is pumping and reinjection of water during exploration, production, and operation of injection wells. Mineral or energy exploration would likely impact ground water resources; deep wells, as typical of geothermal test wells, would not likely have measureable impacts on groundwater resources because of the lack of aquifer connectivity with deep substrates and substrates shown in the conceptual ground water models shown in Figure 3.9-3.

Disposition of Water Rights and Water Wells. Under the No Action Alternative, there would be no requirements for the Navy to acquire water rights or for water right holders to move place of use or point of diversion locations. Beneficial uses, although they may change with future water development projects in the region, would continue for each water right in accordance with the State of Nevada's Revised Statutes.

In summary, the No Action Alternative could result in significant impacts on water resources through the continued development of water resources in lands requested for withdrawal. Sedimentation and ground disturbance through allowed activities (e.g., recreation and resource extraction) would likely continue, but not impede in a measurable way the normal flow and residency times of surface waters.

3.9.3.2 Alternative 1: Modernization of the Fallon Range Training Complex

Under Alternative 1, the Navy proposes renewal by Congress of the current public land withdrawal at the FRTC. Additional public lands would be requested for withdrawal and non-federally owned lands would be proposed for acquisition. Under Alternative 1, the Weapons Danger Zones (WDZs) for all ranges would be within the expanded range boundaries, and the probability of munitions landing

beyond the range boundaries would be very low (i.e., 99.99 percent containment). There are minute opportunities for munitions constituents to migrate beyond range boundaries (e.g., excessive flooding and transport of contaminants). However, the intention of the withdrawal request is to expand range boundaries, which would decrease the chances of transport of munition constituents and compounds beyond requested new range boundaries. Policies and procedures would continue to remain in place at FRTC that prevent off-range release of munitions and respond in the unlikely event of a future off-range release of munitions. Range cleanup activities, the same activities that occur within the existing ranges, would occur within the requested withdrawal areas. The following sections assess the potential impacts on groundwater and surface water resources from training activities that would occur within the requested withdrawal areas.

Disposition of Water Rights and Water Wells

Alternative 1 would continue current livestock grazing activities within the DVTA with no prohibitions on continued well operation and exercise of water rights. The Navy will continue to work with Churchill County between the draft and final versions of this EIS to determine appropriate design features for water development projects compatible with military training activities within the DVTA. Within B-16, B-17, and B-20, implementation of Alternative 1 would discontinue livestock grazing within these ranges and render the wells that support stock and irrigation activities inactive. Some wells may be kept active for beneficial use (e.g., conservation and wildland fire response). The primary purposes for withdrawing and acquiring this land are to contain weapon and surface danger zones. As such, large portions of these areas would remain in their natural state following implementation of Alternative 1 and, therefore, this alternative would not affect baseline current hydrological functions in the withdrawal areas.

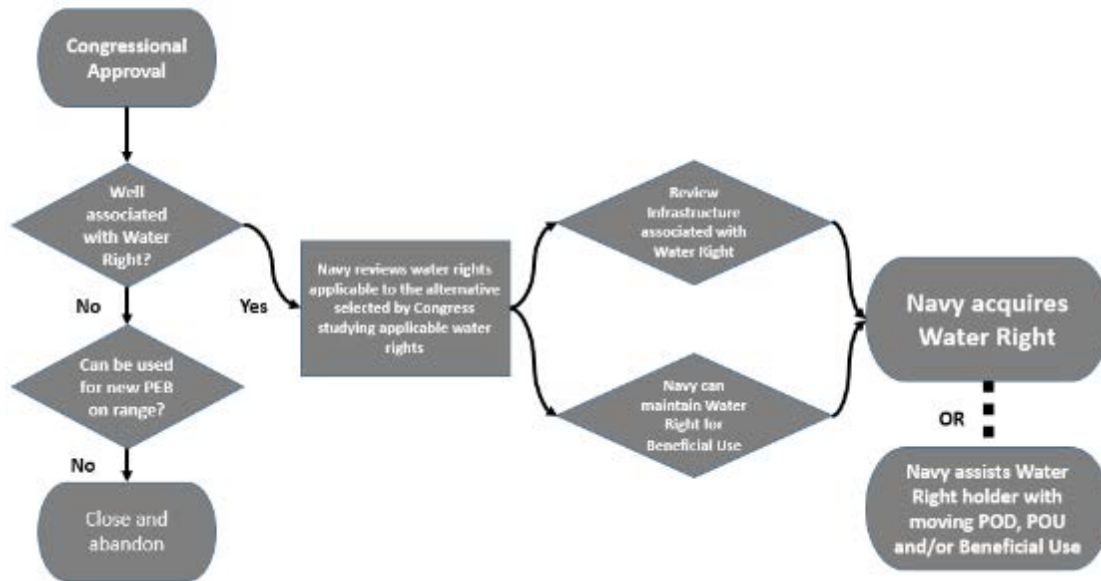
Any surface impoundments may continue to be used for firefighting operations. Any wells indicated on Navy land would be verified and inspected. Those with no existing water rights (such as those indicated as “domestic”) can be considered for a change in Place of Use, for new water rights (Wildlife, Other), for use as a source for new construction planned on the ranges, or be plugged and abandoned.

3.9.3.2.1 Bravo-16

Land Withdrawal and Acquisition

Alternative 1 would expand B-16 to approximately 59,560 acres, which is an increase of approximately 32,201 acres over existing conditions (Table 2-1). Figure 3.9-4 shows the HLRs within the requested withdrawal area that would expand B-16. Most of the expansion area includes HLRs associated with low permeable soils on alluvial slopes that convey water downslope into the Carson Sink.

Disposition of Water Rights and Water Wells within B-16. As stated previously, pending Congressional approval, the four water rights and 12 wells discussed in Section 3.9.2.2 (B-16) would be evaluated on a case-by-case basis by the Navy. The general case-by-case evaluation process would generally follow the steps shown in Figure 3.9-16. Pending congressional approval and selection of Alternative 1, the Navy, as part of the case-by-case evaluation of water rights within B-16, would obtain the most recent hydrographic abstracts and water rights and wells information through NDWR database queries, and review paper files in the NDWR archives at NDWR state and field offices. These files may differ from or may contain more information than the information obtained through NDWR database queries in August 2018.



Note: The decision process for the disposition of water rights and associated wells would begin once Congressional approval is obtained and the Navy selects an alternative. Sources for water right information for the EIS has come from NDWR online sources. After selection of an alternative, the Navy would further investigate water rights in more detail (e.g., with visits to search paper sources in NDWR field office archives). If no well is associated with a water right, and no use for the well can be obtained, the Navy would close and abandon the well. For identified water rights, the Navy would review the infrastructure (e.g., diversion works, stock ponds) and determines if a beneficial use for the water right can continue under the selected alternative. The result of this process is either the Navy's acquisition of the water right or working with the water right holder to move the point of diversion or place of use so that there is no need for water right acquisition.

Figure 3.9-16: Case-by-Case Evaluation of the Disposition of Water Rights

Since it is possible that a water right within B-16 has a Point of Diversion outside of the proposed B-16 expansion area but a Place of Use inside that could be missed doing a search of the database (which appears to only include Point of Diversion location data), the NDWR "Township Cards" should be consulted. The cards, according to NDWR, will likely contain a listing of all water rights that have a Point of Diversion or Place of Use located in that township. The paper files in the NDWR offices are more likely to contain the most recent information than the online files, as well providing much better ownership and contact information critical to accurately reviewing the existing water rights potentially impacted by the Navy action within B-16. The Navy recognizes there may be differences between the Hydrographic Abstracts and detailed place of use/point of diversion information from NDWR and will coordinate with NDWR between the Draft and Final EIS to resolve differences between the online and detailed water right information.

Under Alternative 1 within the requested withdrawal area to expand the B-16 range, the following changes from the No Action Alternative may impact or beneficially affect surface waters: (1) changes to public access under Alternative 1, (2) construction activities, and (3) training activities. Within the requested withdrawal area to expand the B-16 range, the following changes from baseline conditions may impact or beneficially affect groundwater resources: (1) changes to public access under Alternative 1 and (2) training activities.

Training Activities

Surface waters. Under Alternative 1, unit-level types and tempo of training activities would not increase over baseline activities, but would expand to utilize the entire proposed B-16 range. Unit-level training

includes Air-to-Surface Ordnance Delivery, Combat Search and Rescue training, and Naval Special Warfare training. The proposed expansion area would include additional land for Navy Special Warfare Tactical Ground Mobility Course, Naval Aviation, basic air-to-surface training, and a Helicopter Gunnery Training Range.

If compaction occurred over a wide area, differences in runoff (a function of precipitation amounts, permeability of surface rocks and soils, and slope) would be measureable; however, because the training activities have a localized and small footprint, differences in runoff rates would be negligible.

Groundwater. B-16 allows only practice/inert ordnance with spotting charges for air-to-ground training activities. Figure 3.9-5 and Figure 3.9-6 show the water rights and water wells that exist within the B-16 existing and proposed withdrawal areas. The use of practice ordnance would not release measurable quantities of munitions constituents to the environment (U.S. Department of the Navy, 2008). A potential concern is the fate and transport of metals from bullets and bullet fragments accumulating in soil, with lead being the primary constituent of concern because of its toxicity and its ability to persist in the environment. Several factors influence the fate and transport of lead on a training range, including soil type, soil pH, annual precipitation rate, and topographic slope (U.S. Environmental Protection Agency, 2005). Backstops at targets would concentrate small-caliber munitions and be considered a source of potential metal contamination into sediments and eventually into groundwater. However, range scrap would be removed at regular intervals based on the Fallon Operational Range Clearance Plan (U.S. Department of the Navy, 2004), further reducing the potential for heavy metal infiltration of sediments and groundwater.

Approximately 7,541 acres within B-16 would be set aside for an Immediate Action Drill Ground Maneuver B-16 and Close Air Support Target Area. There would be physical disturbance to soils within the target area from military munition strikes and targets would be moved around within this target area. The existing B-16 target areas are within alkali flats. Alternative 1 would move targets from these flats upslope into the eroded slopes dissected by ephemeral washes. As shown in Figure 3.9-4, these alluvial slopes (HLRs 10 and 12) have low soil permeability. This increases the potential for sediments to migrate from disturbance areas compared to baseline conditions. With poorly permeable rocks or soils with low permeability, recharge typically occurs at more shallow depths as water is conveyed on the surface on the alluvial slopes, and into receiving basins (as shown in Figure 3.9-3, Panel B).

Potential impacts on surface and groundwater resources within B-16 under Alternative 1 would be negligible for the following reasons: (1) the limited amount of disturbance from munitions use within the B-16 withdrawal lands, (2) the localized areas of disturbance from munitions use within the withdrawal areas, (3) the small footprint of new infrastructure, (4) best management practices (BMPs) specifically designed to reduce or avoid potential impacts on surface water and groundwater (discussed in Section 3.9.3.5, Proposed Management Practices, Monitoring, and Mitigation Measures), (5) rainfall amounts under 5 inches per year where potential contaminants would rapidly degrade and dry in the arid environment, and (6) water rights obtained and relinquished back to the State of Nevada and cessation of some wells would relieve pressure on groundwater resources. There would be no significant impacts on water resources under Alternative 1 within B-16.

Public Accessibility

Surface waters. Alternative 1 would not allow the public to access B-16 for any purpose other than ceremonial or cultural site visits by local tribes and management, which are currently occurring within the requested withdrawal area. Accordingly, livestock grazing would not be allowed at B-16. Areas

previously used for livestock grazing, mineral exploration and development, or recreation would no longer be used for these purposes.

Groundwater. The Navy anticipates that with the requested withdrawal of lands and expansion of the B-16 range, some water rights would be obtained and relinquished back to the State of Nevada, with plugging and capping of the well as ordered by the State Water Engineer. Figure 3.9-5 shows the water rights within the proposed B-16 range. Closing water wells within B-16 would likely benefit groundwater quality and result in a higher water table within basins, sinks, and valley floors. Water well locations in relation to Alternative 1 proposed withdrawal areas are shown in Figure 3.9-6.

Construction

Surface water. As part of Alternative 1, the construction of a Combat Village and installation of perimeter fences and gates would have a permanent impact of 92 acres with temporary impacts of an additional 69 acres. The total construction area (161 acres) is less than 1 percent of the requested withdrawal area of B-16 (see Table 3.1-3). Proposed construction would directly disturb the ground surface within B-16 by excavating, grading, grubbing, compacting, and clearing soil and vegetation in construction areas during the construction phase.

Another concern is potential contamination from spills of petroleum, oil, and lubricants during training and other range activities. Vehicle targets would continue to be drained of petroleum, oil, and lubricants prior to being placed on the range (U.S. Department of the Navy, 2008). Personnel are required to notify Range Control and Naval Air Station Fallon Environmental whenever there is a spill of petroleum, oil, or lubricants that is greater than five gallons, enters any drain, contaminates soil, are of an unknown material, or are beyond the capability of the activity to handle.

Although there are several ephemeral washes within the B-16 expansion area, there are no perennial streams or waterbodies in the proposed boundary of B-16. During wet years, water may pond seasonally in low areas within the range, and flow out of the basin. Soil structure and function are important to the resistance, resilience, and overall function of semiarid ecosystems in Nevada. Construction could disturb soils, increasing the potential for water erosion and sedimentation to enter these ephemeral washes. The vegetation and terrain of the area influence erosion. If vegetation, soil crusts, or desert pavement are damaged or destroyed by surface use and not provided adequate recovery periods, water erosion would cause the bare ground to expand, impacting vegetation and soil productivity beyond the initial disturbance area, and continue to impact surface water resources through sedimentation. Wind erosion can occur in playas, sand dunes, and other disturbed sites, but shrub and grasslands of the Great Basin usually do not have appreciable wind erosion in their undisturbed state. Therefore, construction has the potential to facilitate wind erosion if soils are not covered after disturbance events. As with any construction project, the construction phase would likely include an increased number of personnel, vehicles, and equipment on the construction site. Personnel would stay within established corridors in order to minimize disturbance areas to the maximum extent practicable during construction. All personnel would follow posted speed limits. The maximum speed limit on FRTC bombing ranges is 35 miles per hour unless otherwise posted. This requirement minimizes fugitive dust, decreases the spread of invasive plant species, and reduces the potential to disturb or compact soil off road or outside target areas during construction.

As a standard operating procedure, all project-related BMPs would include erosion and sediment control measures (e.g., wattles, silt fences) and measures that would minimize or avoid direct and indirect impacts on soil, vegetation, and surface waters (Nevada Division of Environmental Protection, 2015).

BMPs would remain in effect until the construction sites have stabilized. Although BMPs do not eliminate potential for impacts on water resources, implementation of BMPs minimizes impacts on the maximum extent practical during construction, when impacts on water resources are likely to occur.

Safe Drinking Water Act

As shown in Figure 3.9-6, there is only one water well permitted for domestic water consumption within the B-16 proposed expansion area, with eight other domestic water wells within the existing B-16 range. With the exclusion of the public from B-16, it is unlikely that the existing domestic wells in the expansion area would be used as a source of drinking water, even if they have previously been used for that purpose. None of these wells qualify as a public water system (having at least 15 service connections or serving at least 25 people per day for 60 days of the year). Therefore, the Safe Drinking Water Act provisions are not applicable to the proposed expansion of B-16 under Alternative 1.

Clean Water Act

No permanent or intermittent sources of water within the proposed B-16 expansion area would be considered as jurisdictional waters of the U.S.; therefore, there are no locations under the authority of the EPA or U.S. Army Corps of Engineers granted to these agencies under Section 404 of the CWA.

3.9.3.2.2 Bravo-17

Land Withdrawal and Acquisition

Alternative 1 would expand B-17 to approximately 232,799 acres, which would be an increase of approximately 176,977 acres from existing conditions (Table 2-1). In addition, Alternative 1 includes the discussion of three notional options for relocating State Route 839 and one notional option of relocating the Paiute Pipeline. HLRs within the B-17 expansion area in relation to Alternative 1 are shown in Figure 3.9-7 and described in Table 3.9-1 and show alluvial slopes with high soil permeability that convey water to valley floors and the Carson Sink. Figure 3.9-8 shows the water rights within the B-17 expansion area in relation to Alternative 1, and Figure 3.9-9 shows the water wells potentially impacted under Alternative 1 within B-17. There would be no change to water resources at the Shoal Site under any alternative.

Disposition of Water Rights and Water Wells within B-17. As stated previously, pending Congressional approval, the 19 Water Rights and 12 wells discussed in Section 3.9.2.3 (B-17) would be evaluated on a case-by-case basis by the Navy. The general case-by-case evaluation process would generally follow the steps shown in Figure 3.9-16. Pending congressional approval and selection of Alternative 1, the Navy, as part of the case-by-case evaluation of water rights within B-17, would obtain the most recent hydrographic abstracts and water rights and wells information through NDWR database queries, and review paper files in the NDWR archives at NDWR state and field offices. These files may differ from or may contain more information than the information obtained through NDWR database queries conducted in August 2018. Since it is possible that a water right within B-17 has a Point of Diversion outside of the proposed B-17 expansion area but a Place of Use inside that could be missed doing a search of the database (which appears to only include Point of Diversion location data), the NDWR “Township Cards” should be consulted. The cards, according to NDWR, will likely contain a listing of all water rights that have a Point of Diversion or Place of Use located in that township. The paper files in the NDWR offices are more likely to contain the most recent information than the online files, as well, providing much better ownership and contact information critical to accurately reviewing the existing water rights potentially impacted by the Navy action within B-17. The Navy recognizes there may be

differences between the Hydrographic Abstracts and detailed place of use/point of diversion information from NDWR and will coordinate with NDWR between the Draft and Final EIS to resolve differences between the online and detailed water right information.

Under Alternative 1 within the requested withdrawal area to expand the B-17 range, the following changes from baseline conditions may impact or beneficially affect groundwater: (1) changes to public access under Alternative 1 and (2) training activities.

Training Activities

Surface water. Under Alternative 1, B-17 would continue to be the most heavily used bombing range at the FRTC. Alternative 1 would not increase the use of B-17, and training activities would be uniformly or proportionately redistributed over the range. Live and inert munitions would continue to be used at this range. Although the types and tempo of activities would not increase under Alternative 1, expended munitions may be concentrated in additional target locations within the requested expansion areas. Alternative 1 would require the establishment of 39 new target areas within the requested withdrawal area that would be added to the existing B-17 boundary. It is estimated that Alternative 1 would set aside approximately 2,833 acres for new target areas within the proposed B-17 expansion area. When combined with existing target areas, it is estimated that approximately 24,161 acres of B-17 would be used for target areas (approximately 10 percent of B-17).

This range would continue to use live and inert munitions. Although explosives 4-amino-2, 6-DNT (a TNT degradation product), royal demolition explosive (commonly referred to as RDX), and high melting explosive (commonly referred to as HMX) were detected in one soil sample collected in B-17, explosive material that is not consumed in the detonation undergoes rapid degradation and do not appear to be migrating off the existing range (U.S. Department of the Navy, 2008). Any impact on the surface from using these target areas would continue to be localized and would not be anticipated to alter the hydrological function of B-17 described in U.S. Department of the Navy (2015a).

Most nonexplosive practice and explosive munitions would impact the ground and thus physically disturb surficial soils in designated new target areas, which would likely induce higher sediment content in runoff. The long-term effect from military munitions strikes would result in an increased potential for soil erosion, compaction, and displacement within and in the immediate vicinity of the target areas. Compared to baseline conditions, there is an increased potential for sediments or contaminants to migrate from the new target areas, specifically in areas with high runoff rates. Loose soil and sediment could then be carried downhill and settle into canyon systems, valleys, and sinks during rain events. Runoff is a function of precipitation amounts, permeability of surface rocks and soils, and slope. Training activities within B-17 would not likely result in soil compaction at enough of the overall surface of the B-17 range to cause detectable changes in runoff rates compared to baseline conditions. Most of the training is air based, with target placement and debris removal the primary ground operations.

Groundwater. Generally, groundwater is largely stored beneath valley fills between mountain ranges. Figure 3.9-3 shows different groundwater infiltration patterns for consolidated and unconsolidated surface soils. As shown in Figure 3.9-7, HLRs within B-17 on alluvial slopes (HLRs 7 and 10) demonstrate moderate to high permeability, which allows for subsurface flows towards sinks and valley floors (HLRs 2, 4, and 9). With highly permeable surfaces, groundwater flows down gradient towards sinks, as conceptualized in Figure 3.9-3, panel A. Although this area appears to be more conducive to subsurface flows, vertical migration of munition constituents to groundwater would be limited. These constituents degrade rapidly in the environment and would not be anticipated to accumulate. In addition, areas

where silt or clay are abundant, like the alkali flats, have low permeability. This further limits the vertical migration of munition constituents, and potential contaminants would be conveyed along the surface through sheet flow and channelized flow through the ephemeral drainages.

Another concern is potential contamination from spills of petroleum, oil, and lubricants during training and other range activities. Vehicle targets would continue to be drained of petroleum, oil, and lubricants prior to being placed on the range (U.S. Department of the Navy, 2008). Personnel are required to notify Range Control and Naval Air Station Fallon Environmental whenever there is a spill of petroleum, oil, or lubricants that is greater than five gallons, enter any drain, contaminate soil, are of an unknown material, or are beyond the capability of the activity to handle. Potential impacts on surface water and groundwater resources within B-17 under Alternative 1 would be minimal for the following reasons: (1) the limited amount of disturbance from munitions use within the B-17 withdrawal lands, (2) the localized areas of disturbance from munitions use within the requested withdrawal areas, (3) the small footprint of new infrastructure, (4) BMPs specifically designed to reduce or avoid potential impacts on surface and groundwater (discussed in Section 3.9.3.5, Proposed Management Practices, Monitoring, and Mitigation Measures), (5) rainfall amounts under 5 inches per year where potential contaminants would rapidly degrade and dry in the arid environment, and (6) water rights obtained and relinquished back to the State of Nevada and cessation of some wells would relieve pressure on groundwater resources. There would be no significant impacts on water resources under Alternative 1 within B-17.

Public Accessibility

Surface waters. Under Alternative 1, public access would not be allowed, and no livestock grazing would continue. Ending public access within the requested withdrawal area of B-17 would likely improve surface water quality by reducing factors that are known to diminish water quality (e.g., nutrient loading from cattle grazing, ground disturbance from off-road vehicle use).

Groundwater. Under Alternative 1, public access would not be allowed, and no livestock grazing would continue, thereby effectively ending most current beneficial uses associated with the wells located within B-17. Figure 3.9-9 shows water wells within the B-17 proposed expansion area. There are 10 wells within the proposed expansion area. Of these 10, 3 wells are rated for domestic use, 1 for irrigation, and 6 for stock tanks. Some wells may be maintained for other purposes (e.g., wildlife conservation purposes, wildland fire response). Closing water wells within B-17 would likely benefit groundwater quality and result in a higher water table within basins, sinks, and valley floors.

Construction

Surface waters. Under Alternative 1, construction at B-17 would include constructing an administrative building, communication towers, and electronic warfare sites, as well as installing approximately 75 miles of perimeter fence. Fence construction would require some ground-disturbing activities to dig posts and vehicles to deliver fence materials and construction workers along the fence alignments. This ground disturbance may loosen soils and would be susceptible to erosion and transport, especially along slopes. This alternative would also include the potential construction of approximately 30 miles of road for State Route 839 and 12 miles of pipeline. B-17 is largely composed of alkaline desert soils. No perennial water bodies are found along the proposed realignments of State Route 839. In topographically low spots along the route, it is possible for ponding to occur during wet years. There are several ephemeral washes within the proposed boundary of B-17. As a standard operating procedure, all project-related BMPs would include erosion and sediment control measures (e.g., wattles, silt fences) and measures that would minimize or avoid direct and indirect impacts on soil, vegetation, and surface

waters (Nevada Division of Environmental Protection, 2015). BMPs would remain in effect until the construction sites have stabilized. Although BMPs do not eliminate potential for impacts on water resources, implementation of BMPs minimizes impacts to the maximum extent practical during construction, when impacts on water resources are likely to occur.

Road and Infrastructure Improvements to Support Alternative 1

State Route 839

Alternative 1 includes three notional options for the potential relocation of State Route 839. All three of these options include closing portions of the existing State Route 839 to public travel and improving existing roads from dirt roads to paved roads. The Navy is working with the Nevada Department of Transportation, the BLM, Churchill County, and other stakeholders to identify a suitable location outside of the lands requested for withdrawal for B-17 for relocating State Route 839. A follow-on, site-specific National Environmental Policy Act (NEPA) document would be required to analyze the impacts of any feasible relocation of the road, which would include analyzing potential impacts on water resources.

Paiute Pipeline

Alternative 1 includes the potential relocation of the Paiute Pipeline outside the B-17 WDC. The Navy is working with the operator of the pipeline, the BLM, Mineral and Nye Counties, and other stakeholders to identify a suitable location for relocating the pipeline. The Navy and stakeholders are exploring one notional option at this time as part of this alternative. Construction activities would result in impacts on surface water resources, including direct physical disturbance of soils within drainage basins (e.g., excavating, grading, grubbing, and soil compaction) and could lead to soil contamination resulting from accidental spills of petroleum, oil, or lubricants. It is assumed that staging and laydown areas would be located within the proposed construction area for the pipeline. It is estimated that the potential relocation of the pipeline could disturb up to 219 acres. A follow-on, site-specific NEPA document would be required to analyze the impacts of any feasible relocation of the Paiute Pipeline, which would include analyzing potential impacts on water resources.

Safe Drinking Water Act

As shown in Figure 3.9-9, there are nine water wells permitted for domestic water consumption within the B-17 proposed expansion area. With the exclusion of the public from B-17, it is unlikely that wells with water rights obtained and relinquished back to the State of Nevada would be prospectively used as a potable water source outside of the need for potable water for administrative buildings constructed as part of Alternative 1. None of these wells qualify as a public water system (having at least 15 service connections or serving at least 25 people per day for 60 days of the year). Therefore, the Safe Drinking Water Act provisions are not applicable to the proposed expansion of B-17 under Alternative 1.

Clean Water Act

No permanent or intermittent bodies of water are within the proposed B-17 expansion area that would be considered as jurisdictional Waters of the U.S.; therefore, there are no locations under the authority of the EPA or USACE granted to these agencies under Section 404 of the CWA.

3.9.3.2.3 Bravo-20

Land Withdrawal and Acquisition

Alternative 1 would expand B-20 to approximately 221,334 acres, which would be an increase of approximately 180,329 acres from existing conditions (Table 2-1). Hydrological landscape units within the B-20 expansion area in Figure 3.9-10 and described in Table 3.9-1 show alluvial slopes with high soil permeability that convey water to valley floors and the Carson Sink. Figure 3.9-11 shows the water rights within the B-20 expansion area in relation to Alternative 1, and Figure 3.9-12 shows the water well locations within the proposed expansion area for B-20.

Disposition of Water Rights and Water Wells within B-20. As stated previously, pending Congressional approval, the six Water Rights and 12 wells discussed in Section 3.9.2.4 (B-20) would be evaluated on a case-by-case basis by the Navy. The general case-by-case evaluation process would generally follow the steps shown in Figure 3.9-16. Pending congressional approval and selection of Alternative 1, the Navy, as part of the case-by-case evaluation of water rights within B-20, would obtain the most recent hydrographic abstracts and water rights and wells information through NDWR database queries, and review paper files in the NDWR archives at NDWR state and field offices. These files may differ from or may contain more information than the information obtained through NDWR database queries in August 2018. Since it is possible that a water right within B-20 has a Point of Diversion outside of the proposed B-20 expansion area but a Place of Use inside that could be missed doing a search of the database (which appears to only include Point of Diversion location data), the NDWR “Township Cards” should be consulted. The cards, according to NDWR, will likely contain a listing of all water rights that have a Point of Diversion or Place of Use located in that township. The paper files in the NDWR offices are more likely to contain the most recent information than the online files, as well, providing much better ownership and contact information critical to accurately reviewing the existing water rights potentially impacted by the Navy action within B-20. The Navy recognizes there may be differences between the Hydrographic Abstracts and detailed place of use/point of diversion information from NDWR and will coordinate with NDWR between the Draft and Final EIS to resolve differences between the online and detailed water right information.

Under Alternative 1 within the requested withdrawal area to expand the B-20 range, the following changes from baseline conditions may impact or beneficially affect surface waters: (1) changes to public access under Alternative 1, (2) construction, and (3) training activities. Under Alternative 1 within the requested withdrawal area to expand the B-20 range, only training activities proposed under Alternative 1 may impact or beneficially affect groundwater resources.

Training Activities

Surface water. The Navy would continue to use B-20 for any air-to-ground delivery of live munitions. Alternative 1 would not increase the use of B-20, and training activities would be distributed to existing targets and five new target areas within the expansion area. High-velocity explosives would be capable of shattering rock and displacing soil. However, these target areas are within primarily flat playa marsh lands (dry lake) with flat alluvial deposits. Runoff is a function of precipitation amounts, permeability of surface rocks and soils, and slope. Training activities within B-20 would not likely result in soil compaction (most of the training is air based with target placement and debris removal the primary ground operations) in sufficient areas as to affect detectable changes in runoff rates compared to baseline conditions.

Implementation of Alternative 1 would potentially lead to long-term elevated levels of constituents like lead in the immediate area of the target areas, but these impacts would be localized within the impact areas of B-20. In addition, explosive constituents would largely be consumed during detonation, and those not consumed would degrade rapidly in the environment. Removal of nonexplosive practice bombs and range scrap would occur as needed based on the Fallon Operational Range Clearance Plan. In addition, range condition assessments (soil sampling and predictive modeling) would continue to be used as part of the Range Sustainability Environmental Program Assessment to ensure that munition constituents are not migrating outside the range. Removal of material expended during training activities would eliminate potential sources of additional contamination into the Carson Sink, already receiving heavy metal contamination associated with the Carson River Mercury Superfund Site.

Potential impacts on surface water quality within B-20 under Alternative 1 would occur, however, cessation of training activities would not measurably improve surface water quality because of the concentration of heavy metals from a long environmental contamination legacy associated with the Carson River and OU2 Superfund Site.

Groundwater. With the establishment of five new target areas within the lands requested for withdrawal surrounding B-20, new sources of contamination may be concentrated in the vicinity of targets. As shown in Figure 3.9-10, most of B-20 is comprised of HLR 2, an area typical of playas demonstrating low soil permeability. The playa deposits consist of fine-textured sediments that have not developed characteristics of soil and are very poorly drained. Soils in the vicinity of Lone Rock, a small igneous outcrop in the northeast portion of B-20, consists primarily of soils derived from alluvial and dune deposits. These soils are deep and well drained, and available water capacity is moderate (Natural Resources Conservation Service, 2017). Lone Rock is mapped as HLR 12 (Figure 3.9-10). Groundwater flows down the alluvial slopes of the Humboldt Mountains and the Stillwater Ridge (HLRs 9, 10, and 12 with moderate soil permeability) likely reflect the conceptual model of groundwater movement shown in Figure 3.9-3, Panel B. In this situation, alluvial slopes that drain into the Carson Sink likely carry precipitation via sheetflow down gradient, rather than through a downslope subsurface flow towards the water table underlying the Carson Sink as would happen with highly permeable soils. Based on this information, infiltration of contaminants from training activities into subsurface waters is slight on the flatter playa deposits, with increased permeability on the relatively more permeable soils surrounding Lone Rock and on the alluvial slopes of the Humboldt Range and Stillwater Ridge.

Figure 3.9-12 shows the location of wells within the requested withdrawal areas surrounding the existing B-20 range. These wells include geothermal exploration and test wells, which would not be allowed to continue operations under Alternative 1. These wells are likely deeper than any aquifer or water table potentially impacted by training activities. Therefore, discontinued operation of these wells would not likely impact the groundwater resources potentially affected under Alternative 1.

Potential impacts on groundwater resources within B-20 under Alternative 1 would not likely be measureable because (1) the low permeability of surface strata preventing contamination of underlying groundwater resources within the majority of B-20, (2) although concentrated around target areas, expended munitions would be removed as part of routine range maintenance activities, and (3) continued use of wells associated with geothermal exploration are not likely to influence the water table or other shallow aquifer lenses closer to the surface. There would be no significant impacts on water resources under Alternative 1 within B-20.

Public Accessibility

Surface water. Under Alternative 1, the Navy would not allow the public to access B-20 for any purpose other than for ceremonial or cultural site visits by local tribes and management, which are currently occurring within the requested withdrawal area. Land previously used for livestock grazing, mineral exploration and development, or recreation would no longer be used for these purposes. This could reduce the amount of soil erosion, compaction, and displacement that is currently occurring; however, any beneficial impact on surface water resources would be largely offset by the proposed construction and training activities on B-20, discussed below.

Construction

Surface water. As part of Alternative 1, the construction of a Target Maintenance Building and installation of perimeter fences and gates would have a permanent impact of 24 acres with temporary impacts of 203 acres. The total construction area (227 acres) is less than 1 percent of the requested withdrawal area of B-20. Proposed construction would directly disturb the ground surface within B-20 by excavating, grading, grubbing, compacting, and clearing soil and vegetation in construction areas during the construction phase.

Construction within the proposed B-20 boundary would be located in the Carson Sink, a large playa with an alkali flat composed of silty clay. Although there are several ephemeral washes within the B-20 expansion area, there are no perennial streams or waterbodies in the proposed boundary of B-20. These ephemeral streams and draws are found along the periphery of the Carson Sink (southeast facing slopes of the Humboldt Range and west facing slopes of Stillwater Ridge). Carson Sink tends to flood and fill on wet years or during a series of wet years. As discussed in Section 3.9.2.4 (B-20), Carson Sink is the terminal basin for the Carson River and OU2 section of the Carson River Mercury Superfund site. This site includes mercury, arsenic, and lead contaminated soils at former mill sites and mercury contamination in water, sediments, and fish over more than 100 miles of the Carson River. Construction could disturb soils, increasing the potential for water erosion; however, as the terminal basin for the Carson River, ground disturbance during construction would not contribute to downstream/down gradient impacts on water resources.

As with any construction project, the construction phase would likely include an increased number of personnel, vehicles, and equipment on the construction site. Personnel would stay within established corridors in order to minimize disturbance areas to the maximum extent practicable during construction. All personnel would follow posted speed limits. The maximum speed limit on FRTC bombing ranges is 35 miles per hour unless otherwise posted. This requirement minimizes fugitive dust, decreases the spread of invasive plant species, and reduces the potential to disturb or compact soil off road or outside target areas during construction.

As a standard operating procedure, all project-related BMPs would include erosion and sediment control measures (e.g., wattles, silt fences) and measures that would minimize or avoid direct and indirect impacts on soil, vegetation, and surface waters {Nevada Division of Environmental Protection, 2015 #506}. BMPs would remain in effect until the construction sites have stabilized. Although BMPs do not eliminate potential for impacts on water resources, implementation of BMPs minimizes impacts to the maximum extent practical during construction, when impacts on water resources are likely to occur.

Safe Drinking Water Act

As shown in Figure 3.9-12, there are no water wells currently located on B-20. Therefore, the Safe Drinking Water Act provisions are not applicable to the proposed expansion of B-20 under Alternative 1.

Clean Water Act

No permanent or intermittent sources of water are within the proposed B-20 expansion area that would be considered as jurisdictional waters of the U.S.; therefore, there are no locations under the authority of the EPA or U.S. Army Corps of Engineers granted to these agencies under Section 404 of the CWA.

3.9.3.2.4 Dixie Valley Training Area

Land Withdrawal and Acquisition

Alternative 1 would expand the DVTa to approximately 370,903 acres, which would be an increase of approximately 302,065 acres from existing conditions (Table 2-1). Hydrological landscape regions associated with Alternative 1 within the DVTa are shown in Figure 3.9-13. Figure 3.9-14 shows the water rights within the DVTa in relation to Alternative 1, and Figure 3.9-15 shows the water wells potentially impacted under Alternative 1 within the DVTa.

Disposition Water Rights and Water Wells within the DVTa. As stated previously, pending Congressional approval, wells discussed in Section 3.9.2.5 (Dixie Valley Training Area) would be evaluated on a case-by-case basis by the Navy. As noted previously, the Navy would not seek to acquire water rights within the DVTa. Water right holders would continue to exercise their beneficial uses associated with the water right. Between the draft and final versions of this EIS, the Navy, through the BLM, will continue to consult with Churchill County planners and engineers so that future water development projects are designed to meet Churchill County water development goals with project design features consistent with military training activities within the DVTa.

Under Alternative 1 within the requested withdrawal area to expand the DVTa, the following changes from baseline conditions may impact or beneficially affect surface waters: (1) construction and (2) training activities. Unlike the Bravo ranges, the public would largely be allowed to continue accessing and using the DVTa area proposed for expansion. As such, impacts on surface waters would be comparable to existing conditions. Under Alternative 1 within the requested withdrawal area to expand the DVTa, public access is the only change from baseline activities may impact or beneficially affect groundwater resources. Additionally, training activities within the DVTa would not include munitions or explosives; therefore, Alternative 1's training activities would not introduce potential contaminants into subsurface waters.

Training Activities

Surface water. Implementation of Alternative 1 would expand Convoy Training and Combat Search and Rescue training within the DVTa. Ground-disturbing activities would have long-term impacts on soils, which would consist of increased potential for soil erosion, compaction, and displacement during training events. Soil erosion and displacement would increase sedimentation into the ephemeral washes and receiving basins. Based on the types of training activities within the DVTa under Alternative 1, compaction of soils is not likely to occur over a wide area as to induce measureable differences in runoff (a function of precipitation amounts, permeability of surface rocks and soils, and slope).

Potential impacts on surface water and groundwater resources within the DVTa under Alternative 1 would be negligible for the following reasons: (1) the limited amount of disturbance expected to occur within the DVTa withdrawal lands, (2) the localized areas of disturbance from convoy training and

search and rescue training activities use within the withdrawal areas, (3) the small footprint of new infrastructure, and (4) BMPs specifically designed to reduce or avoid potential impacts on surface water (discussed in Section 3.9.3.5, Proposed Management Practices, Monitoring, and Mitigation Measures). There would be no significant impacts on water resources under Alternative 1 within the DVTa.

Public Accessibility

Surface water. Allowable public uses of surface waters within lands requested for withdrawal for the DVTa would not change from current conditions under Alternative 1. These activities include fishing. Ongoing military training activities would continue (e.g., search and rescue activities, convoy training), as would the protective measures employed as standard operating procedures to protect surface water resources.

Groundwater. Allowable public uses of the lands requested for withdrawal for the DVTa would not change from current conditions under Alternative 1, except for mineral resource exploration and development. Churchill County is planning to expand water development within Dixie Valley to serve the growing water requirements for domestic and commercial use for the City of Fallon. The exercise of Churchill County's water rights is consistent with activities proposed under Alternative 1; however, design criteria for improvements (e.g., pump houses, utility lines, pipelines) would need to be consistent with Navy training requirements. The Navy would allow existing recreational activities to continue within the DVTa. As such, impacts on groundwater resources would be comparable to existing conditions. Additionally, training activities within the DVTa would not include munitions or explosives; therefore, Alternative 1's training activities would not introduce potential contaminants into subsurface waters.

Construction

Surface water. Under Alternative 1, construction within the requested withdrawal area of the DVTa would directly disturb an estimated 15 acres for the construction of three electronic warfare sites (i.e., less than one percent of the DVTa). All staging and laydown areas for these sites would be located within the proposed construction area. These activities would directly disturb surface substrates by excavating, grading, grubbing, compacting, and clearing soil and vegetation during the construction phase.

As a standard operating procedure, all project-related BMPs would include erosion and sediment control measures (e.g., wattles, silt fences) and measures that would minimize or avoid direct and indirect impacts on soil, vegetation, and surface waters (Nevada Division of Environmental Protection, 2015). BMPs would remain in effect until the construction sites have stabilized. Although BMPs do not eliminate potential for impacts on water resources, implementation of BMPs minimizes impacts to the maximum extent practical during construction, when impacts on water resources are likely to occur (Nevada Division of Environmental Protection, 2015).

Safe Drinking Water Act

As shown in Figure 3.9-15, there is one well rated to serve as a public water supply, which provides potable water to the existing electronic warfare range facility. The existing Centroid water treatment facility removes arsenic in the well water to levels safe for human consumption. This treatment system is expected to continue in service throughout the future range expansion. Infrastructure supporting electronic warfare training would not require a potable water supply. Churchill County is planning expansion of water resource development activities within Dixie Valley, primarily to serve expanding

potable water needs for the city of Fallon. Under Alternative 2, the infrastructure improvements originally proposed by Churchill County may be constrained to meet military requirements (e.g., safety requirements for structure height), but these design constraints would not be expected to affect the quality of water for domestic consumption and commercial use.

Clean Water Act

No permanent or intermittent sources of water are within the proposed DVTA expansion area that would be considered as jurisdictional waters of the U.S.; therefore, there are no locations under the authority of the EPA or USACE granted to these agencies under Section 404 of the CWA.

3.9.3.2.5 Special Use Airspace

Proposed changes to the SUA under Alternative 1 would not impact water resources. Impacts on land use and the potential to cease current or future incompatible land uses outside of ranges under the SUA may indirectly impact water rights and water due to changes in land use initiated by the modification of the existing SUA.

3.9.3.2.6 Summary of Effects and Conclusions

Potential impacts on water resources (surface water and groundwater resources) would be limited, because of (1) the limited amount of disturbance from munitions use within the withdrawal lands, (2) the localized areas of disturbance from munitions use within the withdrawal areas, (3) the small footprint of new infrastructure, (4) BMPs and mitigation measures specifically designed to reduce or avoid potential impacts on surface and groundwater, (5) in training ranges that expend munitions (B-16, B-17, and B-20), operational range clearance activities would periodically remove expended munitions and munitions fragments (removing a source of potential contamination to surface and groundwater), and (6) for expended munitions not retrieved, the arid environment would likely dry and degrade chemical compounds. No significant impacts on water resources would occur under Alternative 1.

3.9.3.3 Alternative 2: Modernization of Fallon Range Training Complex and Managed Access

Alternative 2 is similar to Alternative 1. The differences between Alternative 1 and Alternative 2 are the public activities that would be allowed within B-16, B-17, B-20, and the DVTA (Table 2-5). Hydrological landscape regions associated with Alternative 2 within B-16, B-17, B-20, and the DVTA are shown in Figure 3.9-4, Figure 3.9-7, Figure 3.9-10, and Figure 3.9-13. Water rights potentially impacted by Alternative 2 within B-16, B-17, B-20, and the DVTA are shown in Figure 3.9-5, Figure 3.9-8, Figure 3.9-11, and Figure 3.9-14. Water wells potentially impacted by Alternative 2 within B-16, B-17, B-20, and the DVTA are shown in Figure 3.9-6, Figure 3.9-9, Figure 3.9-12, and Figure 3.9-15. The requested withdrawal areas, construction and extents, and training activities and locations would be the same as Alternative 1. The disposition and case-by-case evaluation of water rights under Alternative 2 within B-16, B-17, B-20, and the DVTA would be the same as described under Alternative 1. The proposed modifications to SUA under Alternative 2, as with Alternative 1, would have no impact on water resources.

Opening the bombing ranges to special events (e.g., races) could potentially lead to substantial impacts in localized areas on water resources because these activities directly disturb soil and increase erosion, potentially causing additional sediments to eventually settle in ephemeral washes and sinks. In addition, continuing to allow for the exploration and development of leasable and salable minerals within the DVTA could substantially impact surface and subsurface water resources. However, these activities are currently occurring within the proposed withdrawal areas, and therefore, any impact on water resources

from continuation of such activities would presumably be comparable to current conditions. Other public activities allowed under Alternative 2 would not significantly impact water resources because of the low intensity of impacts associated with some public use activities. For example, impacts on water resources from hunting would be minimal because these activities would not significantly increase erosion or impede surface or groundwater flows. The primary environmental concern from camping and hunting activities are solid waste (trash) management and the prevention of wildfires. The Navy would create a program to oversee the approval process of any allowed land use activities within B-16, B-17, and B-20 (public access for grazing, hunting, OHV usage, camping, hiking, site and ceremonial visits, and large event off-road races would not change in the DVTA), which would review the environmental impacts of any proposed public use of FRTC lands. Although the specific locations and details of these activities are uncertain, these activities are assumed comparable to existing baseline conditions. However, combined with military activities, it is more likely that these activities would have greater impacts on the soil, particularly when considering the length of time necessary for the desert soils to recover or stabilize, with adverse consequences for sedimentation.

As with Alternative 1, the Navy would not seek to acquire water rights within DVTA under Alternative 2. Water right holders would continue to exercise their beneficial uses associated with the water right. Between the draft and final versions of this EIS, the Navy, through the BLM, will continue to consult with Churchill County planners and engineers so that future water development projects are designed to meet Churchill County water development goals with project design features consistent with military training activities within the DVTA.

Although impacts on water resources would be greater under this alternative compared to Alternative 1, implementation of this alternative would not result in significant impacts on water resources. Potential impacts on water resources (surface water and groundwater resources) would be limited, because of (1) the limited amount of disturbance from munitions use within the lands requested for withdrawal; (2) the localized areas of disturbance from munitions use within the withdrawal areas; (3) the small footprint of new infrastructure; (4) BMPs and mitigation measures specifically designed to reduce or avoid potential impacts on surface and groundwater; (5) in training ranges that expend munitions (B-16, B-17, and B-20), operational range clearance activities would periodically remove expended munitions and munitions fragments (removing a source of potential contamination to surface and groundwater); and (6) for expended munitions not retrieved, the arid environment would likely dry and degrade chemical compounds. There would be no significant impacts on water resources under Alternative 2 within B-16.

3.9.3.4 Alternative 3: Bravo-17 Shift and Managed Access (Preferred Alternative)

Alternative 3 is similar to Alternatives 1 and 2. The main difference between Alternatives 1 and 2, and Alternative 3 is that the B-17 range would be shifted and situated farther south and east under Alternative 3. The areas adjacent to the B-17 range to the east and west as indicated in Figure 2.3-13 would be managed as Special Land Management Overlay by the BLM. Alternative 3 would implement the same managed access programs as Alternative 2.

The Navy evaluated water rights and well locations based on an August 2018 search of the NDWR Hydrographic Assay database within lands proposed for expansion under Alternative 3. The disposition and case-by-case evaluation of water rights under Alternative 3 within B-16, B-17 shift, B-20, and the DVTA would be the same as described under Alternatives 1 and 2. After selection of an alternative, the Navy would further investigate water rights in more detail (e.g., with visits to search paper sources in

NDWR field office archives). If no well is associated with a water right, and no use for the well can be obtained, the Navy would close and abandon the well. For identified water rights, the Navy would review the infrastructure (e.g., diversion works, stock ponds) and determine if a beneficial use for the water right can continue under the selected alternative. The result of this process is either the Navy's acquisition of the water right or working with the water right holder to move the point of diversion or place of use so that there is no need for water right acquisition. The Navy recognizes there may be differences between the Hydrographic Abstracts and detailed place of use/point of diversion information from NDWR and will coordinate with NDWR between the Draft and Final EIS to resolve differences between the online and detailed water right information.

3.9.3.4.1 Bravo-16

Under Alternative 3, the removal of proposed and existing withdrawals south of Simpson Road on B-16 would decrease the withdrawal portion associated with B-16 by 365 acres compared to Alternatives 1 and 2 (see Section 3.9.3.2, Alternative 1: Modernization of the Fallon Range Training Complex; and Section 3.9.3.3, Alternative 2: Modernization of Fallon Range Training Complex and Managed Access). The total requested additional withdrawal area for B-16 is 31,836 acres. In addition to the existing range size of 27,359 acres, the total size of B-16 under Alternative 3 would be 59,195 acres. Hydrological landscape regions associated with Alternative 3 within B-16 are shown in Figure 3.9-17. Figure 3.9-18 shows the water rights within B-16 in relation to Alternative 3, and Figure 3.9-19 shows the water wells potentially impacted under Alternative 3 within B-16. This alternative would have the same access restrictions to B-16 as Alternative 2. Therefore, expanding B-16 under Alternative 3 would impact water resources in the same manner as Alternatives 1 and 2.

Potential impacts on water resources within B-16 under Alternative 3 would be negligible, because of (1) the limited amount of disturbance from munitions use within B-16 withdrawal lands, (2) the localized areas of disturbance from munitions use within the withdrawal areas, (3) the small footprint of new infrastructure, (4) BMPs and management practices specifically designed to reduce or avoid potential impacts on surface and groundwater (discussed in Section 3.9.3.5, Proposed Management Practices, Monitoring, and Mitigation Measures), and (5) for expended munitions not retrieved, the arid environment would likely dry and degrade chemical compounds. There would be no significant impacts on water resources under Alternative 3 within B-16.

3.9.3.4.2 Bravo-17

Land Withdrawal and Acquisition

Alternative 3 would expand B-17 to approximately 267,448 acres, which includes the proposed withdrawal of approximately 211,424 acres and acquisition of 1,237 acres of non-federally owned lands (Table 2-6). Hydrological landscape regions associated with Alternative 3 within B-17 are shown in Figure 3.9-20. Figure 3.9-21 shows the water rights within B-17 in relation to Alternative 3, and Figure 3.9-22 shows the water wells potentially impacted under Alternative 3 within B-17. The proposed expansion of B-17 would include withdrawing public land (e.g., BLM land) and purchasing private land. These private parcels are largely vacant land, which landowners have historically used for livestock grazing and other uses.

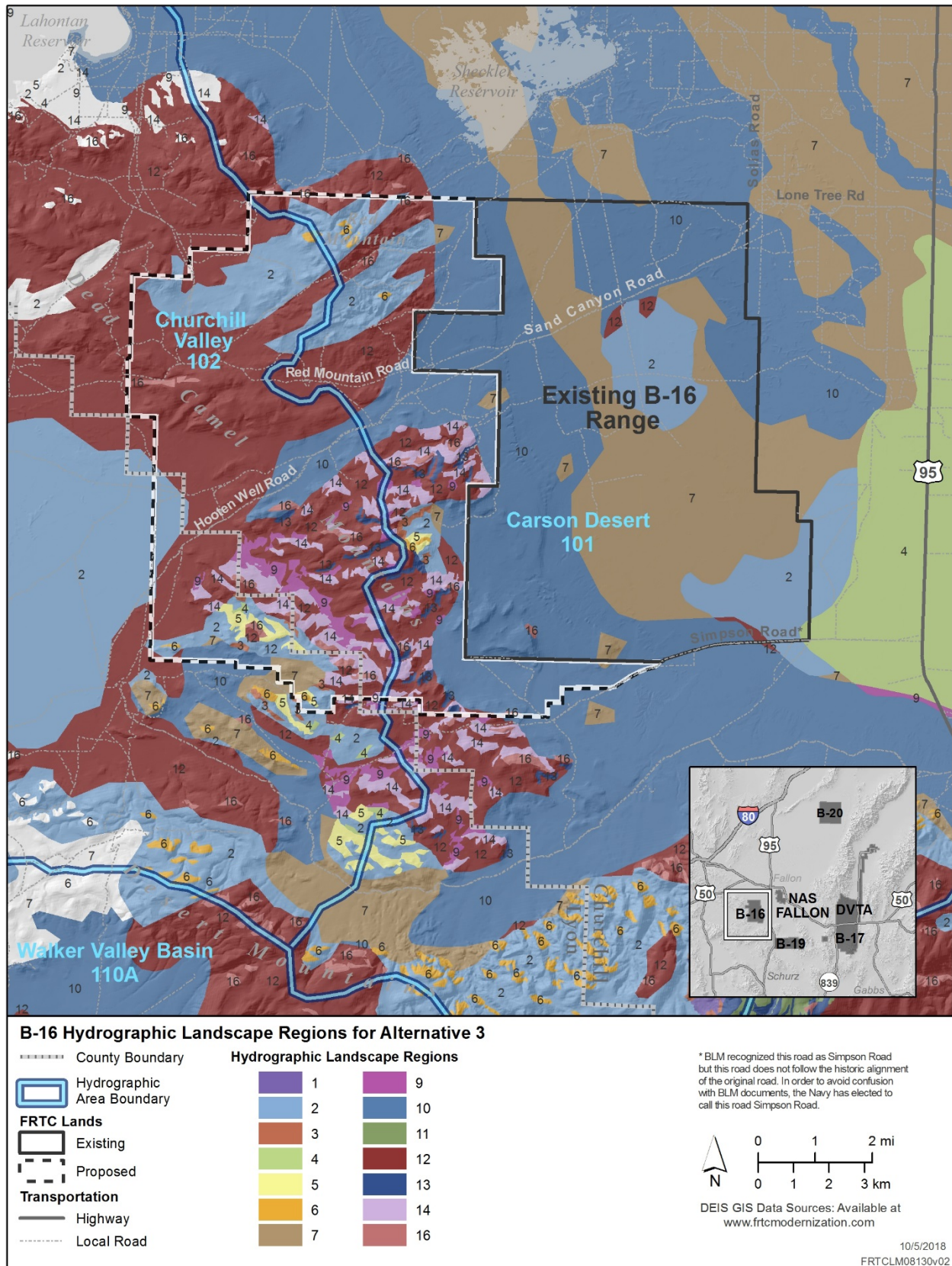


Figure 3.9-17: B-16 Hydrological Landscape Regions for Alternative 3



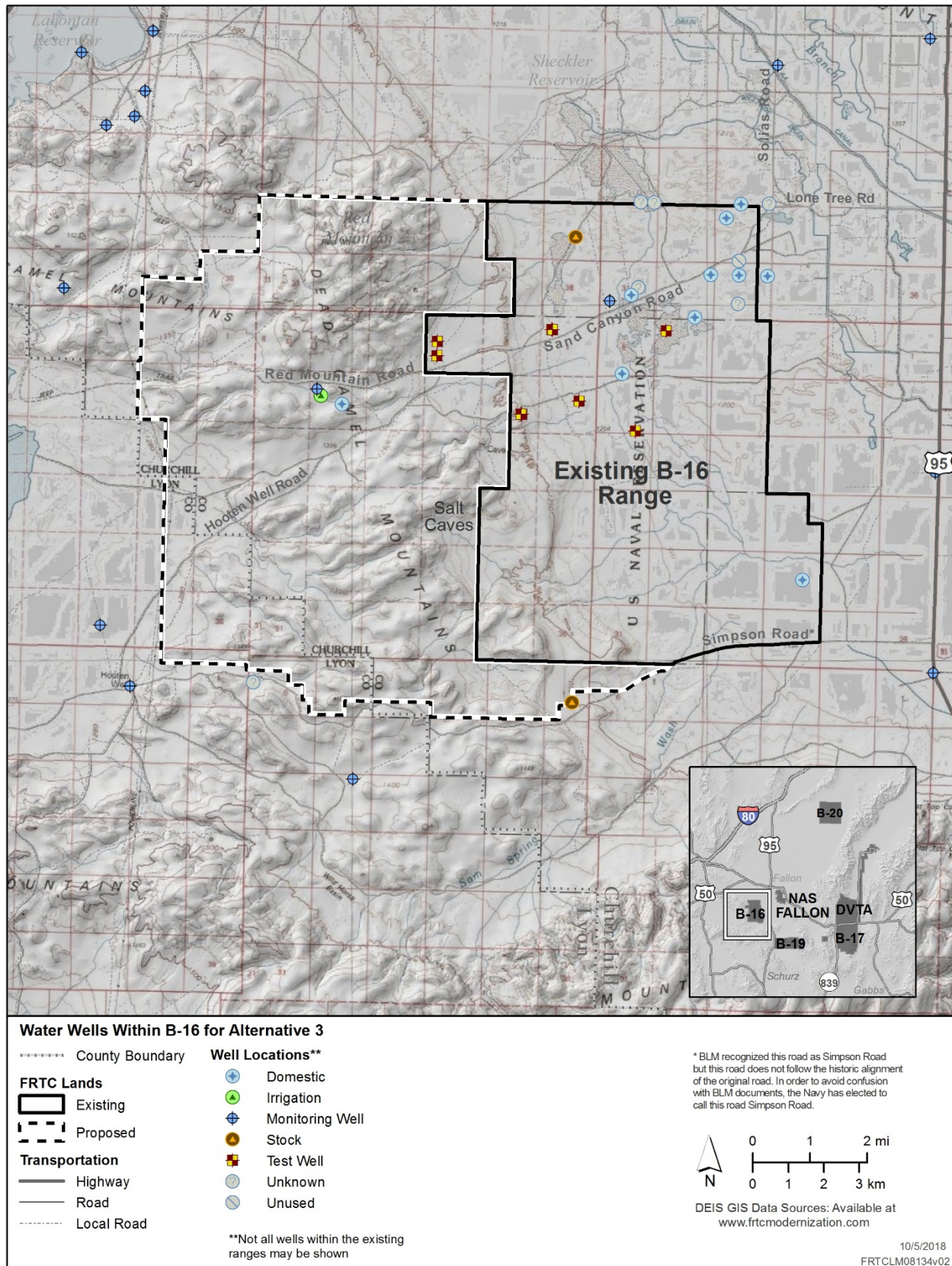


Figure 3.9-19: Water Wells Within B-16 for Alternative 3

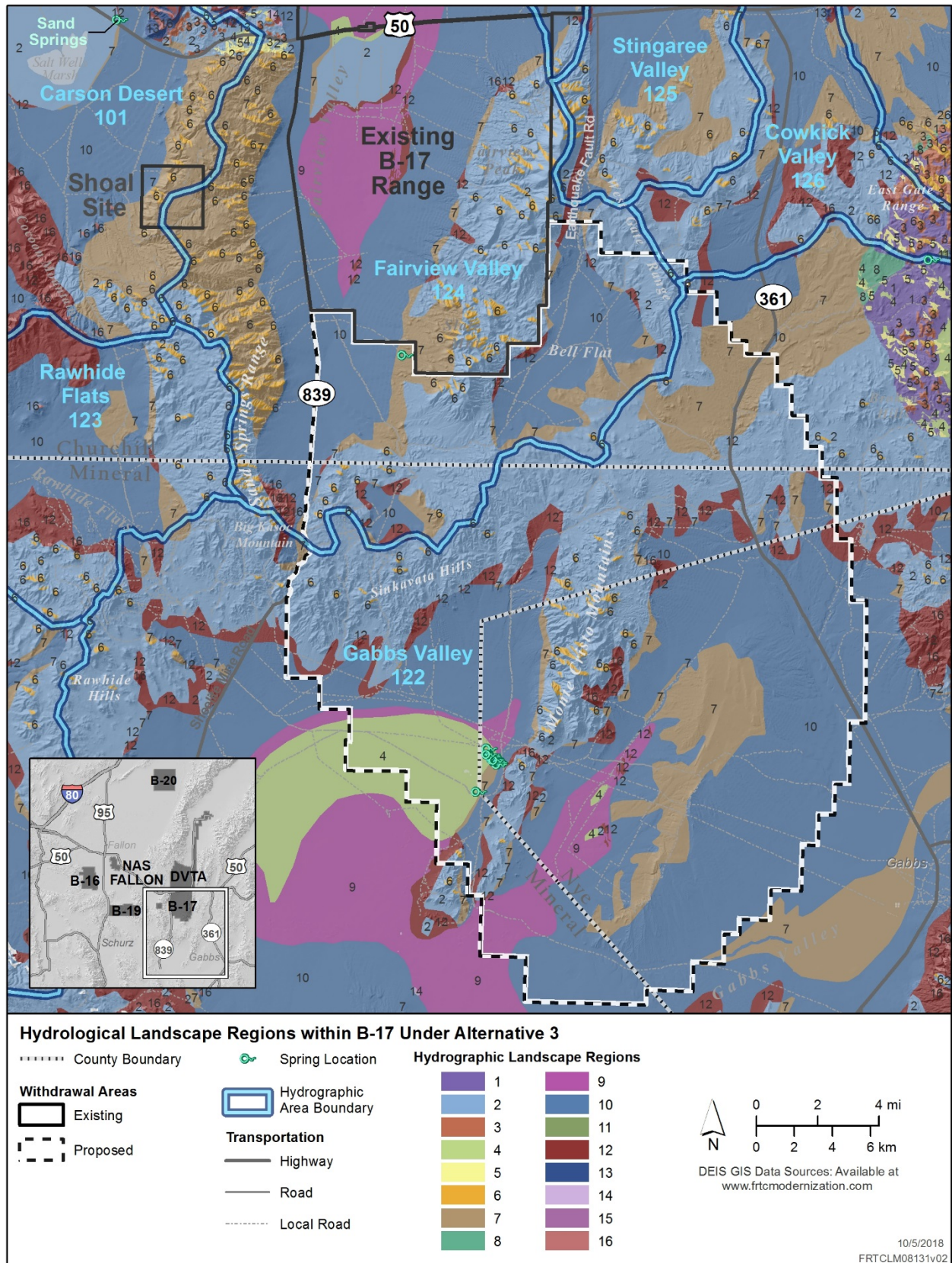


Figure 3.9-20: Hydrological Landscape Regions within B-17 Under Alternative 3

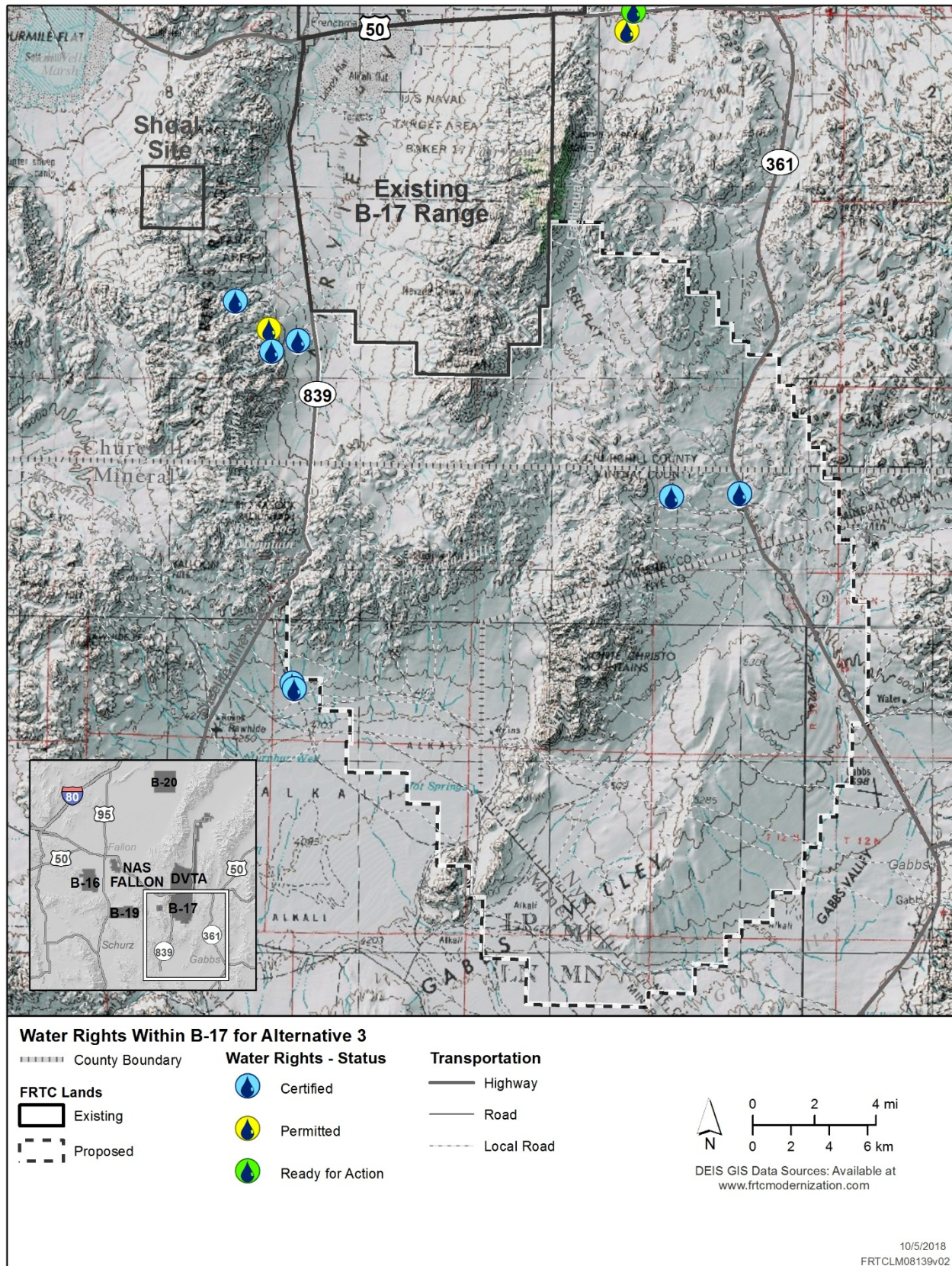


Figure 3.9-21: Water Rights Within B-17 for Alternative 3

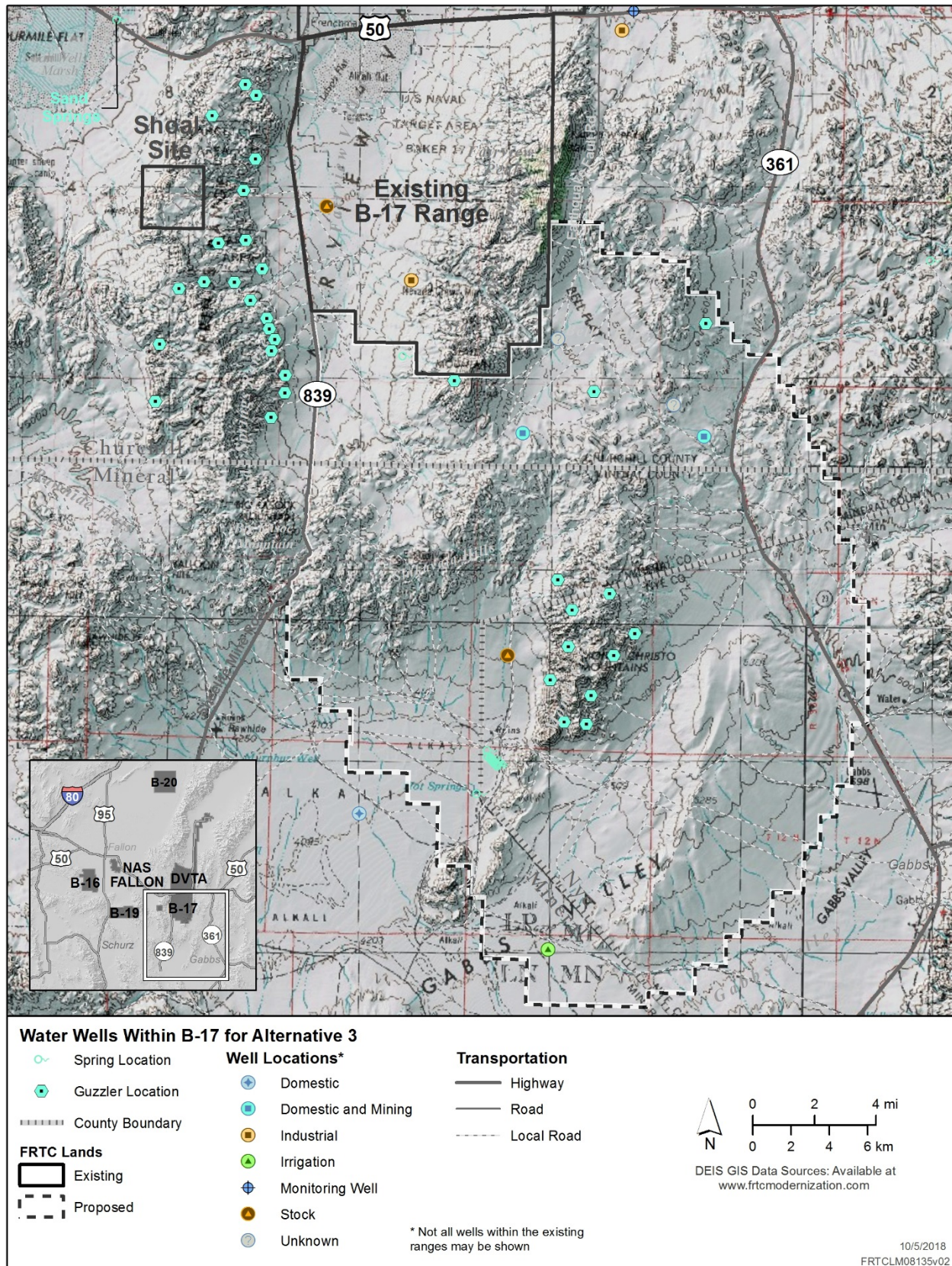


Figure 3.9-22: Water Wells Within B-17 for Alternative 3

Training Activities

The potential impacts of training activities on water resources in the B-17 area would be the same as with Alternative 1 and Alternative 2, except that under Alternative 3 targets for high-explosive ordnance use would be placed on the western portion of Gabbs Valley and in ephemeral tributaries that connect to Gabbs Wash. Because of the proposed locations of these targets under Alternative 3, training activities would likely induce additional erosional processes relative to baseline conditions or Alternatives 1 and 2. However, explosive constituents are largely consumed during detonation, and those that are not consumed degrade rapidly in the environment. In addition, given the low level of precipitation within the region, the lack of perennial surface water in the area, and the low solubility of munition constituents, concentrations of explosives in soils would not represent a substantial threat of a release to an off-range area that poses unacceptable risk to human health or the environment. Potential impacts on water quality within B-17 under Alternative 3 would not be significant, because of (1) the limited amount of disturbance from munitions use within B-17 withdrawal lands; (2) the localized areas of disturbance from munitions use within the withdrawal areas; (3) the small footprint of new infrastructure; (4) BMPs and management practices specifically designed to reduce or avoid potential impacts on surface and groundwater (discussed in Section 3.9.3.5, Proposed Management Practices, Monitoring, and Mitigation Measures); and (5) for expended munitions not retrieved, the arid environment would likely dry and degrade chemical compounds. There would not be significant impacts on water resources under Alternative 3 within B-17.

Public Accessibility

Alternative 3 would implement the same managed access program as described under Alternative 2. Therefore, the impacts of public access on water resources under Alternative 3 would be the same as Alternative 2.

Construction

The proposed construction within B-17 would be similar to Alternative 1. The primary difference would be the location of the proposed perimeter fence. These activities may potentially have indirect effects on water resources through excavation, grading, grubbing, compacting, and clearing soil and vegetation necessary during the construction phase of the project. As with Alternative 1, as standard operating procedure, all project-related BMPs would include erosion and sediment control measures (e.g., wattles, silt fences) and measures that would minimize or avoid direct and indirect impacts on soil, vegetation, and surface waters (Nevada Division of Environmental Protection, 2015). BMPs would remain in effect until the construction sites have stabilized. Although BMPs do not eliminate potential for impacts on water resources, implementation of BMPs minimizes impacts on the maximum extent practical during construction, when impacts on water resources are likely to occur.

Road and Infrastructure Improvements to Support Alternative 3

State Route 361 Relocation Corridor: Under Alternative 3, the Nevada Department of Transportation, using funds provided by the Navy, would potentially construct a new road section outside of the proposed withdrawal area and complete construction prior to the potential closure of the existing State Route 361. The replacement road would be developed to have an asphalt driving surface of up to 26 feet wide (13-foot lanes) with a 15-foot dirt shoulder on each side, which are the same specifications as the existing State Route 361. Design elements to minimize impacts on surface flows would include drainage structures, which could prevent adverse impacts on roads, drainages, and adjacent areas. BMPs would be implemented in accordance with SWPPPs to impede or capture stormwater runoff, which would minimize potential impacts on receiving basins (Nevada Department of Transportation,

2006). A follow-on, site-specific NEPA action would be required to analyze the impacts of any feasible relocation of the road, which would include analyzing potential impacts on water resources.

Paiute Pipeline: Alternative 3 also includes the potential relocation of a portion of the Paiute Pipeline outside the B-17 WDZ. Constructing new pipeline and removing existing pipeline could result in indirect impacts on water resources, such as loosening sediments and making them more transportable during rain events. These impacts would be more prevalent where the pipeline would cross ephemeral washes because of the concentrated water flows through the drainages. A follow-on, site-specific NEPA action would be required to analyze the impacts of any feasible relocation of the Paiute Pipeline, which would include analyzing potential impacts on water resources.

Safe Drinking Water Act

As shown in Figure 3.9-9, there are three water wells permitted for domestic water consumption. Under the managed access, it is unlikely that wells would be used prospectively as a source of potable water for domestic conception, although support facilities within B-17 as part of Alternative 3 may require a potable water source. None of these wells qualify as a public water system (having at least 15 service connections or serving at least 25 people per day for 60 days of the year). Therefore, the Safe Drinking Water Act provisions are not applicable to the proposed expansion of B-17 under Alternative 3.

Clean Water Act

No permanent or intermittent sources of water are within the proposed B-17 expansion area that would be considered jurisdictional Waters of the U.S.

3.9.3.4.3 Bravo-20

The proposed expansion areas, construction areas, and training activities for B-20 under Alternative 3 would be similar to Alternatives 1 and 2 (see Section 3.9.3.2, Alternative 1: Modernization of the Fallon Range Training Complex). With the removal of proposed withdrawals east of East County Road on B-20, the B-20 withdrawal area decreases by 360 acres under Alternative 3 compared to Alternatives 1 and 2. Hydrological landscape regions associated with Alternative 3 within B-20 are shown in Figure 3.9-23. Figure 3.9-24 shows the water rights within B-20 in relation to Alternative 3, and Figure 3.9-25 shows the water wells potentially impacted under Alternative 3 within B-20. This alternative would have the same access restrictions to B-20 as Alternative 2. Therefore, expanding B-20 under Alternative 3 would impact water resources the same as Alternative 2.

Potential impacts on water quality within B-20 under Alternative 3 would be not be significant because of (1) the limited amount of disturbance from munitions use within B-20 withdrawal lands; (2) the localized areas of disturbance from munitions use within the withdrawal areas; (3) the small footprint of new infrastructure; (4) BMPs and management practices specifically designed to reduce or avoid potential impacts on surface and groundwater (discussed in Section 3.9.3.5, Proposed Management Practices, Monitoring, and Mitigation Measures); (5) for expended munitions not retrieved, the arid environment would likely dry and degrade chemical compounds; and (6) water rights obtained and relinquished back to the State of Nevada and cessation of some wells would relieve pressure on groundwater resources. There would be no significant impacts on water resources under Alternative 3 within B-20.

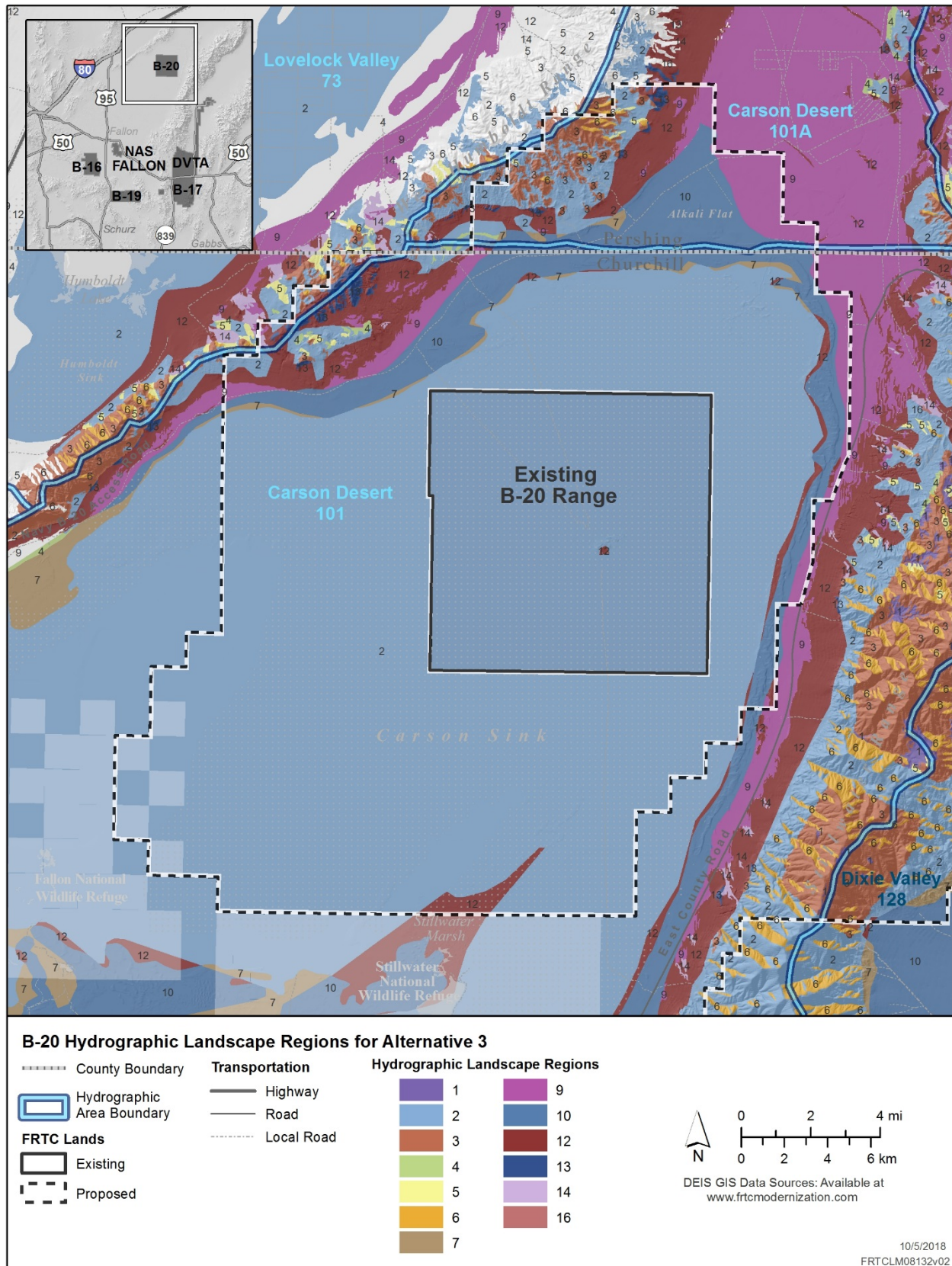


Figure 3.9-23: B-20 Hydrological Landscape Regions Within B-20 for Alternative 3

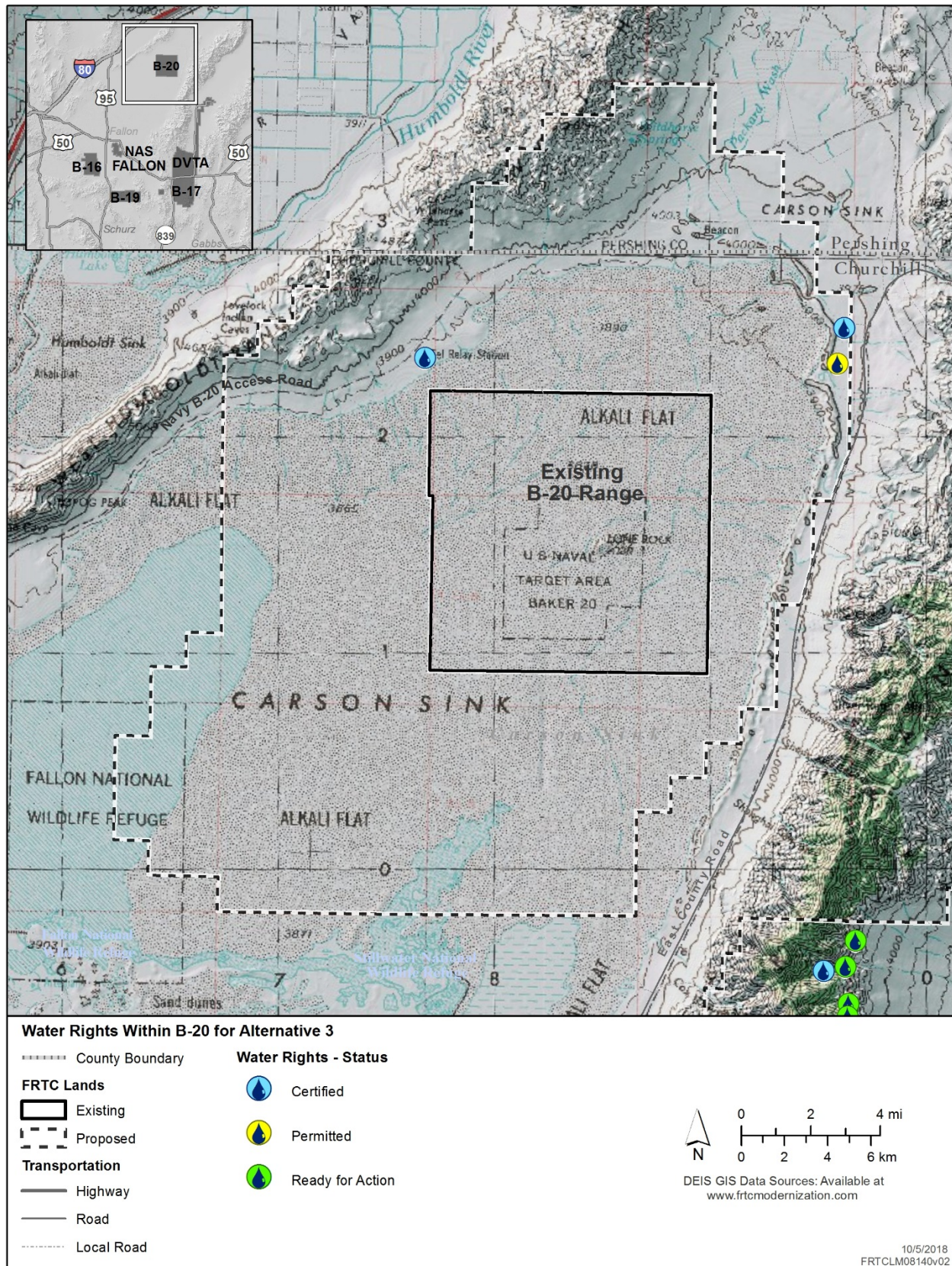


Figure 3.9-24: Water Rights Within B-20 for Alternative 3

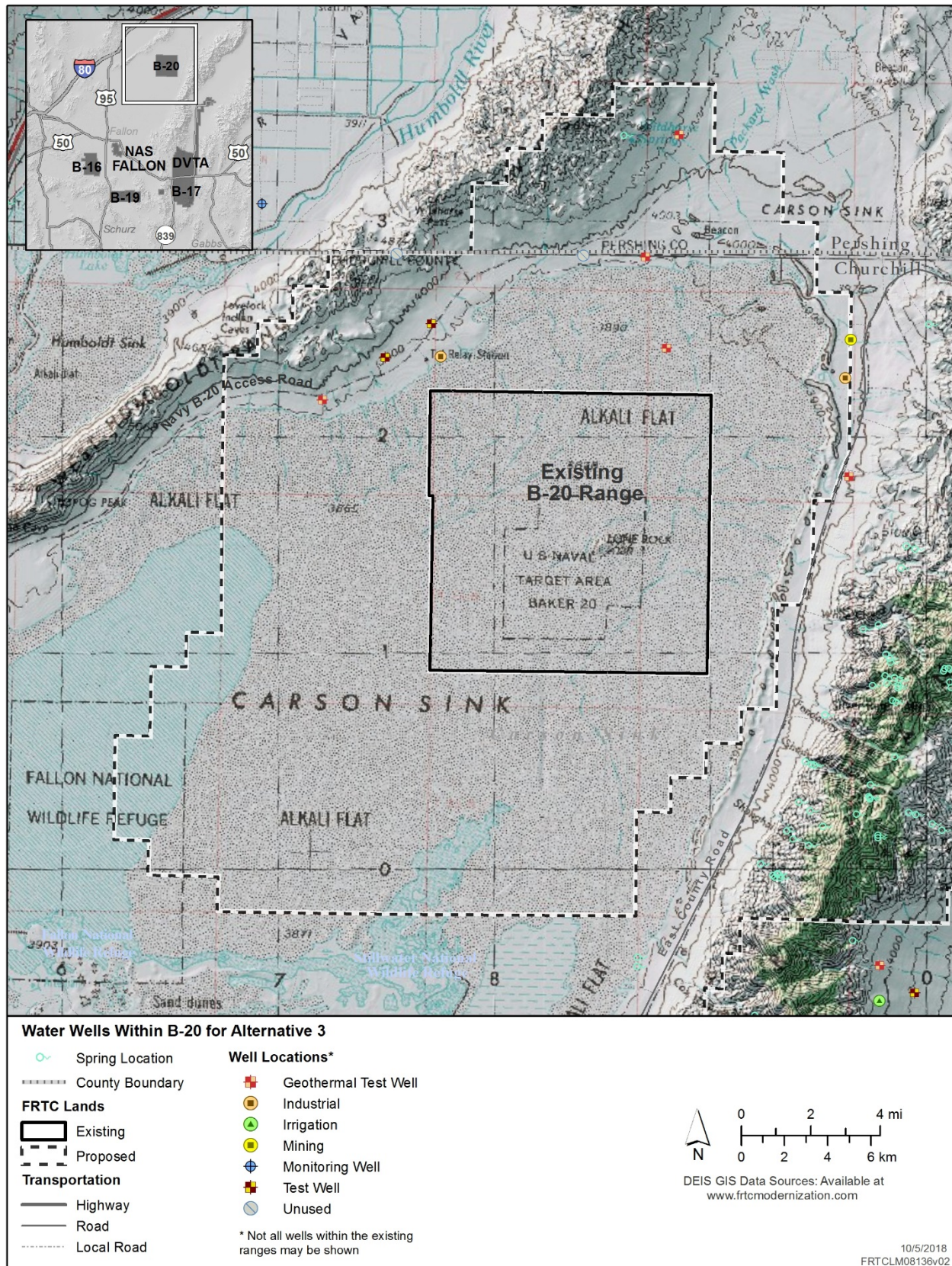


Figure 3.9-25: Water Wells Within B-20 for Alternative 3

3.9.3.4.4 Dixie Valley Training Area

The withdrawal area proposed under Alternative 3 for the DVTA would differ slightly from Alternatives 1 and 2. Hydrological landscape regions associated with Alternative 3 within the DVTA are shown in Figure 3.9-26, Figure 3.9-27 and Figure 3.9-28. These figures show the water rights and water wells that exist within the existing DVTA and proposed withdrawal area. Under Alternative 3, the land requested for withdrawal for the DVTA north of U.S. Route 50 would remain the same as under Alternatives 1 and 2. Unlike Alternatives 1 and 2, the Navy would not withdraw land south of U.S. Route 50 as the DVTA. Rather, the Navy proposes that Congress categorize this area as a Special Land Management Overlay. This Special Land Management Overlay will define two areas (one east and one west of the B-17 range) as Military Electromagnetic Spectrum Special Use Zones. These two areas, which are public lands under the jurisdiction of BLM, would not be withdrawn or managed by the Navy. The proposed expansion (requested withdrawal and proposed for acquisition) would total approximately 256,440 acres and would increase the total range size to 325,277 acres. Ground-disturbing activities that would occur on the DVTA from public and operational activities could impact a slightly larger area; however, these activities are anticipated to be commensurate with current baseline activities. Therefore, implementation of Alternative 3 would result in similar impacts on water resources as Alternative 1.

Under Alternative 3 (as with Alternatives 1 and 2), the Navy would not seek to acquire water rights within DVTA. Water right holders would continue to exercise their beneficial uses associated with the water right. Between the draft and final versions of this EIS, the Navy, through the BLM, will continue to consult with Churchill County planners and engineers so that future water development projects are designed to meet Churchill County water development goals with project design features consistent with military training activities within the DVTA.

Potential impacts on water quality within the DVTA under Alternative 3 would not be significant for the following reasons: (1) the limited amount of disturbance from munitions use within the DVTA withdrawal lands, (2) the localized areas of disturbance from munitions use within the withdrawal areas, (3) the small footprint of new infrastructure, (4) BMPs and management practices specifically designed to reduce or avoid potential impacts on surface and groundwater (discussed in Section 3.9.3.5, Proposed Management Practices, Monitoring, and Mitigation Measures), and (5) an arid environment that would likely dry and degrade chemical compounds in expended munitions not retrieved. There would be no significant impacts on water quality under Alternative 3.

3.9.3.4.5 Special Use Airspace

Proposed changes to the SUA under Alternative 3 would not impact water resources. Impacts on land use and the potential to cease current or future incompatible land uses outside of ranges under the SUA may indirectly impact water rights and water due to changes in land use initiated by the modification of the existing SUA.

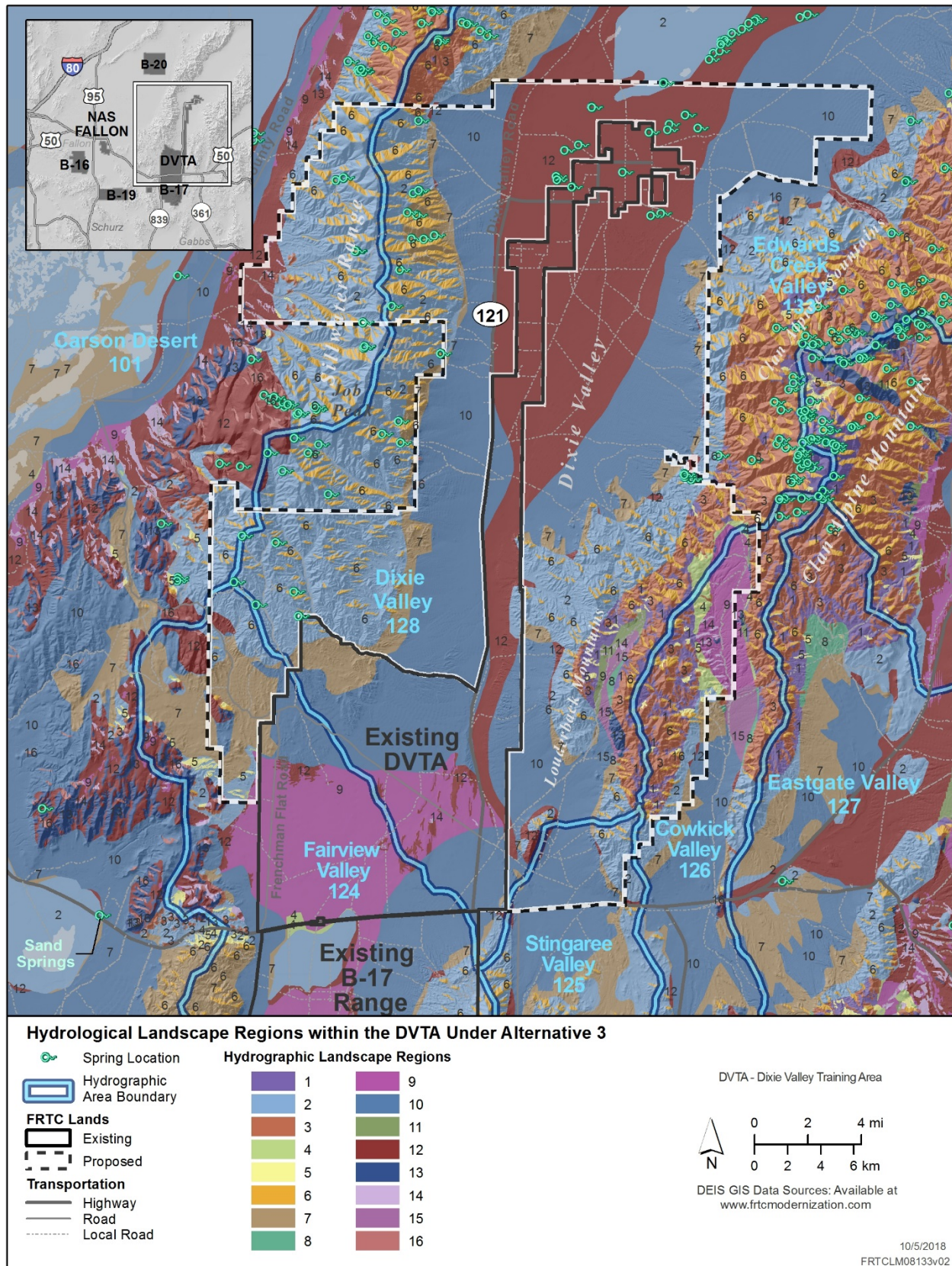


Figure 3.9-26: Hydrological Landscape Regions Within the DVTA Under Alternative 3

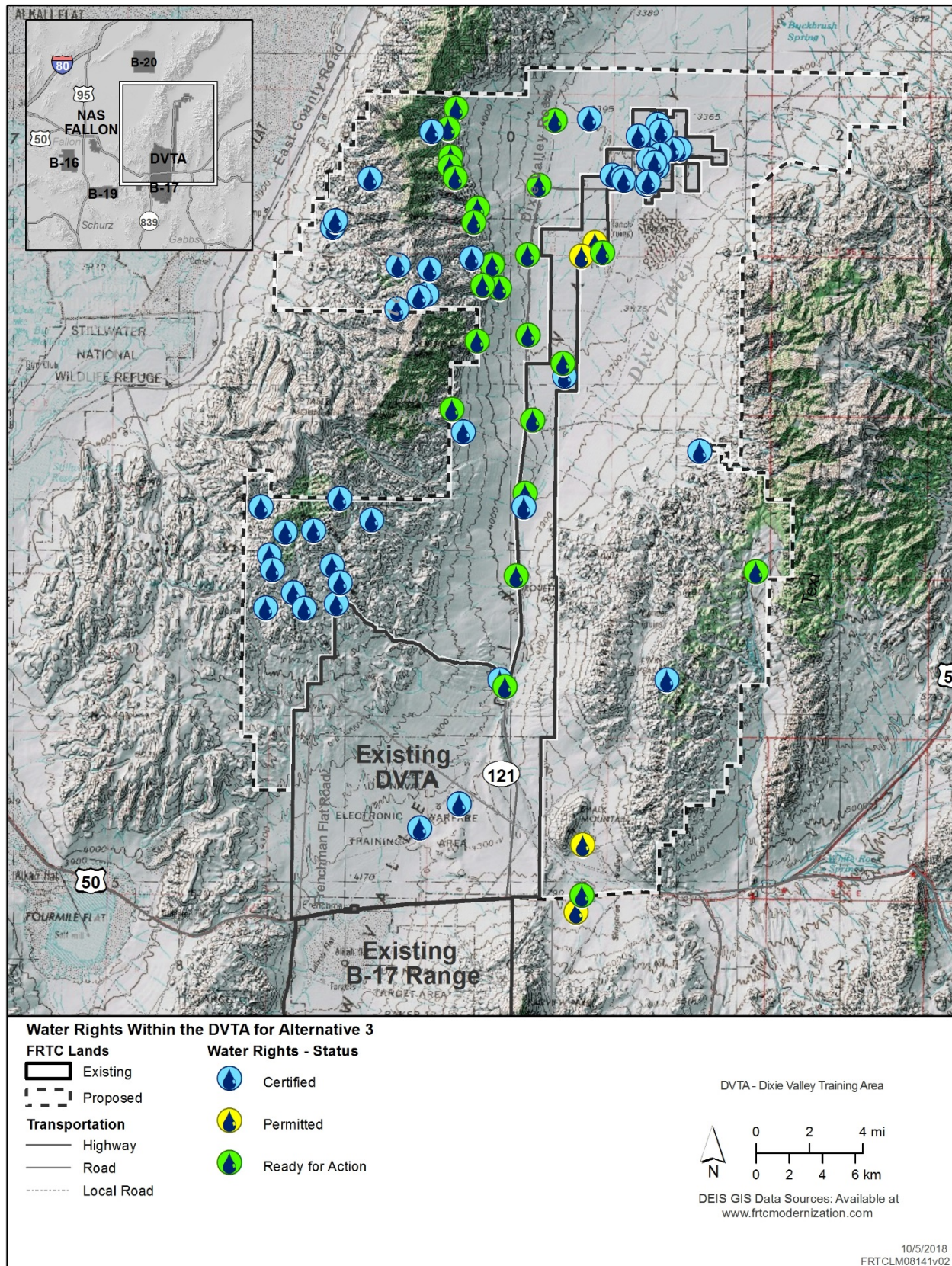


Figure 3.9-27: Water Rights Within the DVTA for Alternative 3

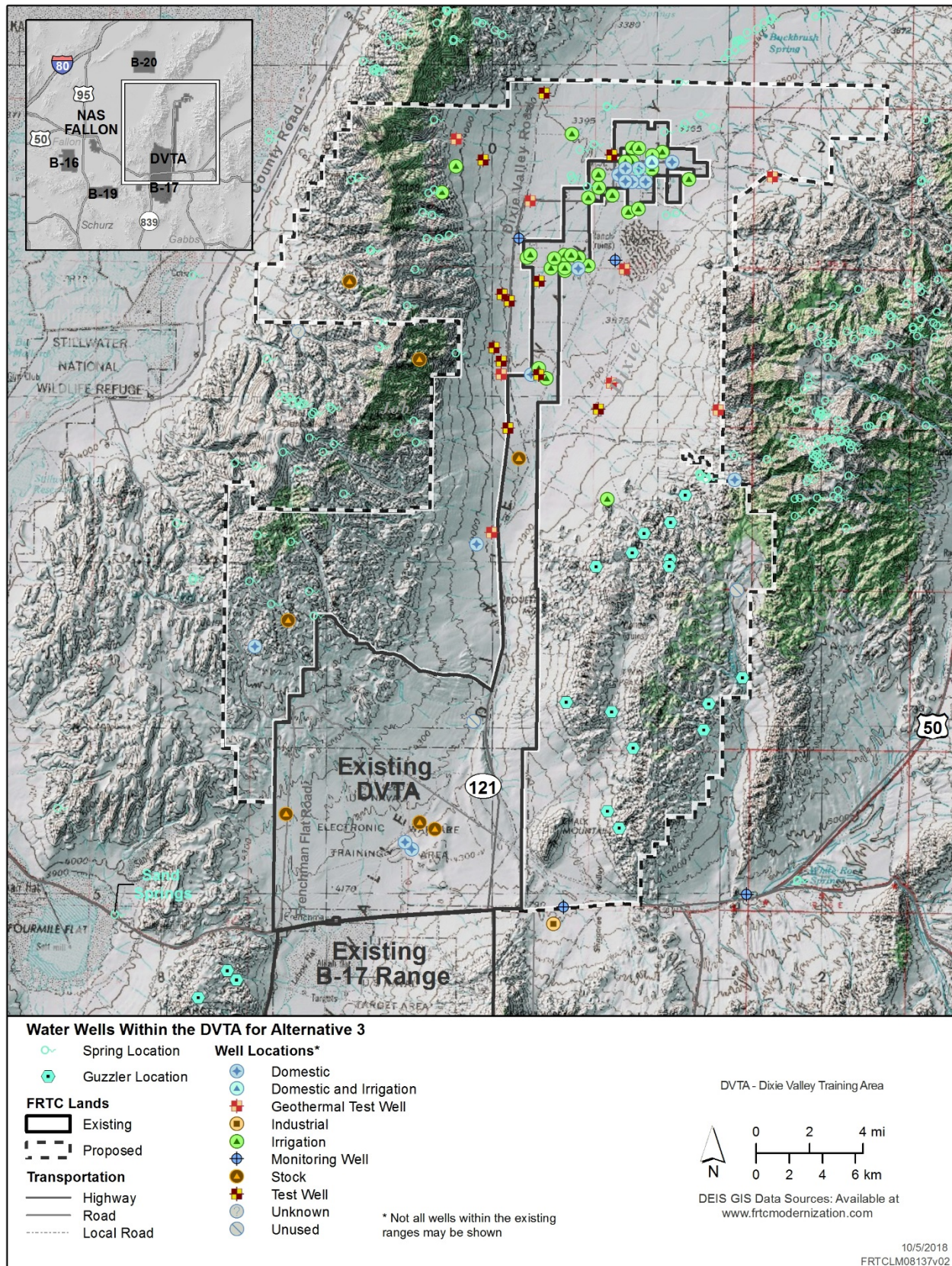


Figure 3.9-28: Water Wells Within the DVTA for Alternative 3

3.9.3.4.6 Summary of Effects and Conclusions

Potential impacts on water quality would be not be significant, because of (1) the limited amount of disturbance from munitions use within the withdrawal lands, (2) the localized areas of disturbance from munitions use within the withdrawal areas, (3) the small footprint of new infrastructure, (4) BMPs and mitigation measures specifically designed to reduce or avoid potential impacts on surface and groundwater, (5) operational range clearance activities that would periodically remove expended munitions and munitions fragments (removing a source of potential contamination to surface and groundwater) in training ranges that expend munitions (B-16, B-17, and B-20), and (6) an arid environment that would likely dry and degrade chemical compounds in expended munitions not retrieved. There would be no significant impacts on water quality under Alternative 3.

3.9.3.5 Proposed Management Practices, Monitoring, and Mitigation

3.9.3.5.1 Proposed Management Practices

The current management practices would continue to be implemented under the No Action Alternative, Alternative 1, Alternative 2, or Alternative 3 and existing programs and plans would be updated to reflect new conditions. The following management practices would continue to be implemented to avoid and minimize potential impacts on water quality under each alternative. There are no new management practices, monitoring, or mitigation measures proposed for water resources.

- Environmental impacts from incidental fuel spills would be avoided by conducting all ground-based refueling activities in a secondary containment area.
- Drip pads would be placed under equipment when parked to avoid soil contamination from leaking fluids.
- A spill prevention, control, and countermeasures plan would be developed to respond to any event that would exceed spill prevention, containment, and countermeasures quantity thresholds. The plan would help to ensure rapid and effective response to incidental spills and avoid contaminant migration to groundwater.
- Any spills of petroleum or other waste products would be managed and cleaned up in accordance with applicable state and federal regulatory requirements. If such a spill included a regulated material or impacted a waterway, the event would be immediately reported to the Nevada Department of Environmental Protection by the NAS Fallon Environmental Program. For more information, see Section 3.14 (Public Health and Safety and the Protection of Children).
- The operational range clearance plan would be updated and implemented to address any new requirements for the ranges.
- Range condition assessment five-year reviews would continue to be conducted, and appropriate steps would be taken, if necessary, to prevent or respond to a release or substantial threat of a release of munitions constituents of potential concern to off-range areas that could pose unacceptable risks to human health or the environment.
- Evaluate wells on expansion areas prior to closing to determine if a beneficial use (fire suppression, wildlife/stock water, etc.)

3.9.3.5.2 Proposed Monitoring

The need for groundwater sampling, analysis, or monitoring would continue to be considered during range condition assessment five-year reviews conducted under the Navy's Range Sustainability

Environmental Program assessment program. With implementation of existing monitoring, there are no new monitoring programs proposed.

3.9.3.5.3 Proposed Mitigation

No mitigation measures are warranted for water resources based on the analysis for potential impacts on water resources. The Navy, as part of the proposed action, would acquire water rights within the proposed withdrawal areas if the water right can be maintained for beneficial use. If a condition of the water right can be modified (e.g., the point of use moved outside of the withdrawal areas), then the water right would not be acquired by the Navy. If wells are associated with the water right, then the Navy will evaluate on a case-by-case basis the disposition of the well (e.g., continued beneficial use or capping of the well). The Navy acknowledges that there may be impacts that have yet to be defined and will continue to develop and incorporate mitigation measures as necessary.

3.9.3.6 Summary of Effects and Conclusions

Based on the analysis of potential impacts on water quality of the No Action Alternative, Alternative 1, Alternative 2, and Alternative 3, there would be no significant impacts on groundwater or surface water resources within the withdrawal areas. Table 3.9-2 summarizes the effects of the alternatives on water resources. In the event that any of the alternatives analyzed herein is ultimately implemented, follow-on NEPA analysis would be conducted for any potential road and/or pipeline relocations, and a decision would ultimately be made as to whether to implement any such relocations.

Table 3.9-2: Summary of Effects and Conclusions for Water Resources

Summary of Effects and National Environmental Policy Act Determinations	
No Action Alternative	
Summary	<ul style="list-style-type: none"> Potential future land uses in the event that the current FRTC land withdrawal were not renewed under the No Action Alternative could include clean-up or restricted land use of areas previously disturbed by military operations and recreational use; utility corridor construction; or mining and geothermal, solar, or wind energy resource development. These activities may increase impervious cover and compact soils, thereby affecting surface and groundwater. The cessation of military surface uses reduces the potential for ground disturbance. Release of the FRTC lands to another Department of Defense agency, the BLM, or the State of Nevada would likely open restricted lands to public use or mineral resource development, which would likely broaden the areas subject to soil disturbance compared to current baseline levels. Depending on the future land uses allowed, impacts on surface water resources from parties other than the U.S. Navy could be considerable. Sedimentation and ground disturbance through allowed activities (e.g., recreation and resource extraction) would likely continue, but not impede in a measurable way the normal flow and residency times of surface waters. Mineral or energy exploration and development would likely have the most substantial impacts on groundwater resources within the region of interest. There would be no requirements for the Navy to acquire water rights or for water right holders to move place of use or point of diversion locations. Beneficial uses, although they may change with future water development projects in the region, would continue for each water right in accordance with the State of Nevada's Revised Statutes.
Impact Conclusion	The No Action Alternative could result in significant impacts on water resources.

Table 3.9-2: Summary of Effects and Conclusions for Water Resources (continued)

Summary of Effects and National Environmental Policy Act Determinations	
Alternative 1	
Summary	<ul style="list-style-type: none"> • Training activities would not increase compared to the baseline. However, range improvements may increase the number of targets and thus the number of sites where expended munitions can accumulate and from which residual constituents could potentially migrate. Alternative 1 could therefore result in an increased chance of surface and subsurface waters potentially receiving trace amounts of such residual material from larger areas up-gradient. However, regularly-conducted range clearance activities would remove most expended munitions and munitions fragments, greatly reducing the potential for such migration. The Navy has not identified any evidence of or potential for significant impacts to water resources (or otherwise to human health and the environment) from munitions constituents in the FRTC. • Road construction and facilities may cause temporary impacts on water resources; however, all construction activities would incorporate best management practices to contain and divert runoff from construction sites. • Standard operating procedures, such as range clearance procedures and spill response would reduce potential impacts of runoff. • Any impacts on surface and groundwater features would be temporary and minor. • Implementation of Alternative 1 may necessitate the Navy's acquisition of water rights and fair market compensation of water right holders. This evaluation of water right acquisitions would occur on a case-by case basis if Alternative 1 is selected.
Impact Conclusion	Alternative 1 would not result in no overall significant impacts to water resources but acknowledge that there may be impacts to individuals.
Alternative 2	
Summary	<ul style="list-style-type: none"> • Training activities would not increase compared to the baseline. However, range improvements may increase the number of targets and thus the number of sites where expended munitions can accumulate and from which residual constituents could potentially migrate. Alternative 2 could therefore result in an increased chance of surface and subsurface waters potentially receiving trace amounts of such residual material from larger areas up-gradient. However, regularly-conducted range clearance activities would remove most expended munitions and munitions fragments, greatly reducing the potential for such migration. The Navy has not identified any evidence of or potential for significant impacts to water resources (or otherwise to human health and the environment) from munitions constituents in the FRTC. • Road construction and facilities may cause temporary impacts on water resources; however, all construction activities would incorporate best management practices to contain and divert runoff from construction sites. • Standard operating procedures, such as range clearance procedures and spill response would reduce potential impacts of runoff. • Any impacts on surface and groundwater features would be temporary and minor. • Implementation of Alternative 2 may necessitate the Navy's acquisition of water rights and fair market compensation of water right holders. This evaluation of water right acquisitions would occur on a case-by case basis if Alternative 2 is selected.

Table 3.9-2: Summary of Effects and Conclusions for Water Resources (continued)

Summary of Effects and National Environmental Policy Act Determinations	
Alternative 2 (continued)	
Impact Conclusion	Alternative 2 would not result in no overall significant impacts to water resources but acknowledge that there may be impacts to individuals.
Alternative 3	
Summary	<ul style="list-style-type: none"> • Training activities would not increase compared to the baseline. However, range improvements may increase the number of targets and thus the number of sites where expended munitions can accumulate and from which residual constituents could potentially migrate. Alternative 3 could therefore result in an increased chance of surface and subsurface waters potentially receiving trace amounts of such residual material from larger areas up-gradient. However, regularly-conducted range clearance activities would remove most expended munitions and munitions fragments, greatly reducing the potential for such migration. The Navy has not identified any evidence of or potential for significant impacts to water resources (or otherwise to human health and the environment) from munitions constituents in the FRTC. • Road construction and facilities may cause temporary impacts on water resources; however, all construction activities would incorporate best management practices to contain and divert runoff from construction sites. • Standard operating procedures, such as range clearance procedures and spill response would reduce potential impacts of runoff. • Any impacts on surface and groundwater features would be temporary and minor. • Implementation of Alternative 3 may necessitate the Navy's acquisition of water rights and fair market compensation of water right holders. This evaluation of water right acquisitions would occur on a case-by case basis if Alternative 3 is selected.
Impact Conclusion	Alternative 3 would result in no overall significant impacts to water resources but acknowledge that there may be impacts to individuals.

This page intentionally left blank.

REFERENCES

- Azad, G. (2008). *Carson River Watershed Regional Floodplain Management Plan*. Carson City, NV: Carson Water Subconservancy District.
- Maurer, D. K., T. J. Lopes, R. L. Medina, and J. L. Smith. (2004). *Hydrogeology and Hydrologic Landscape Regions of Nevada* (Scientific Investigations Report 2004–5131). Carson City, NV: U.S. Geological Survey.
- Maurer, D. K., A. P. Paul, D. L. Berger, and C. J. Mayers. (2009). *Analysis of Streamflow Trends, Ground-Water and Surface-Water Interactions, and Water Quality in the Upper Carson River Basin, Nevada and California* (U.S. Geological Survey Scientific Investigations Report 2008–5238). Carson City, NV: U.S. Geological Survey.
- Natural Resources Conservation Service. (2017). *Web Soil Survey*. Retrieved from <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.
- Nevada Department of Transportation. (2006). *Storm Water Quality Manuals Construction Site Best Management Practices (BMPs) Manual*. Carson City, NV: Camp Dresser & McKee Inc.
- Nevada Division of Environmental Protection. (2006). *Bureau of Water Quality Planning's 5-Year Plan: July 2006 – June 2011*. Carson City, NV: Bureau of Water Quality Planning.
- Nevada Division of Environmental Protection. (2013). *Nevada 2008–10 Water Quality Integrated Report with EPA Overlisting*. Carson City, NV: Bureau of Water Quality Planning.
- Nevada Division of Environmental Protection. (2015). *Permit for Stormwater Discharge Associated with Large Construction Activity, Small Construction Activity and Industrial Activity from Temporary Concrete, Asphalt and Material Plants or Operations Dedicated to the Permitted Construction Project. NVR100000*. Carson City, NV: Bureau of Water Pollution Control.
- Nevada Division of Environmental Protection. (2016). *Nevada 2014 Water Quality Integrated Report With EPA Overlisting*. Carson City, NV: Bureau of Water Quality Planning.
- U.S. Department of the Navy. (1998). *Final Legislative Environmental Impact Statement Renewal of the B-20 Land Withdrawal Naval Air Station Fallon, Nevada*. Fallon, NV: Naval Air Station Fallon.
- U.S. Department of the Navy. (2004). *Final Operational Range Clearance Plan*. Fallon, NV: Naval Air Station Fallon.
- U.S. Department of the Navy. (2008). *Fallon Range Condition Assessment Report: Five-Year Review Fallon Range Training Complex, Nevada*. San Diego, CA: Naval Facilities Engineering Command Southwest.
- U.S. Department of the Navy. (2014). *Final Integrated Natural Resources Management Plan Naval Air Station Fallon*. Fallon, NV: AMEC Environment & Infrastructure, Inc.
- U.S. Department of the Navy. (2015a). *Military Readiness Activities at Fallon Range Training Complex Environmental Impact Statement*. Fallon, NV: Commander, U.S. Pacific Fleet.
- U.S. Department of the Navy. (2015b). *Fallon Range Training Complex Range Condition Assessment Update*. Pearl Harbor, HI: Commander Pacific Fleet Public Affairs Office.
- U.S. Environmental Protection Agency. (2005). *Best Management Practices for Lead at Outdoor Shooting Ranges*. New York, NY: Division of Enforcement and Compliance Assistance.

Western Regional Climate Center. (2017). *Fallon Experiment Station, Nevada Period of Record Monthly Climate Summary*. Retrieved from <http://www.wrcc.dri.edu/cgi-bin/cli-RECtm>