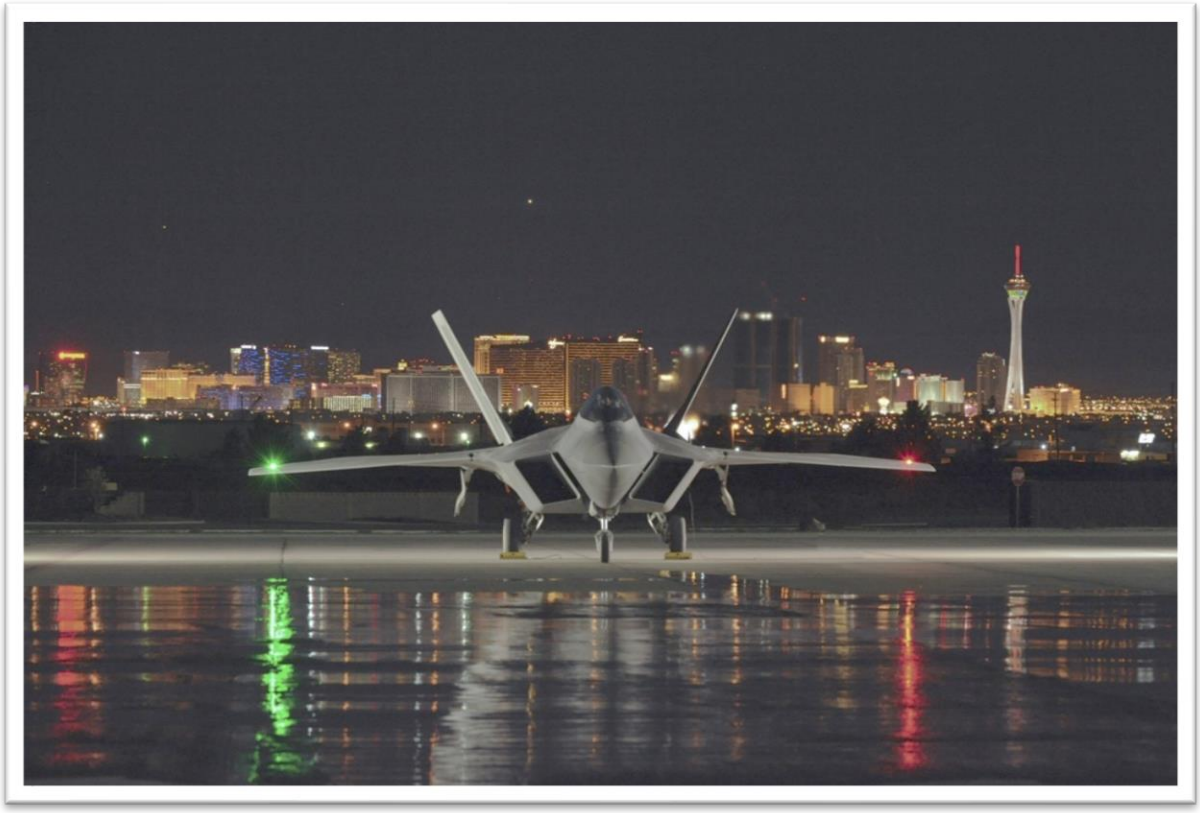
Draft
Programmatic Environmental Impact Statement for Master Plan and Installation Development at Nellis Air Force Base, Nevada

May 2025

Prepared for:
United States Department of the Air Force
57th Wing
99th Air Base Wing
65th Aggressor Squadron
422nd Test and Evaluation Squadron

Nellis Air Force Base, Nevada



PRIVACY ADVISORY

This Draft Programmatic Environmental Impact Statement (PEIS) has been provided for public comment in accordance with the *National Environmental Policy Act* (NEPA) and Title 32 *Code of Federal Regulations* Part 989, *Environmental Impact Analysis Process (EIAP)*, which provides an opportunity for public input on United States Department of the Air Force (DAF) decision-making, allows the public to offer input on alternative ways for DAF to accomplish what it is proposing, and solicits comments on DAF's analysis of environmental effects.

Public input allows DAF to make better-informed decisions. Letters or other written or verbal comments provided may be published in this PEIS. Providing personal information is voluntary. Private addresses will be compiled to develop a stakeholders inventory. However, only the names of the individuals making comments and specific comments will be disclosed. Personal information, home addresses, telephone numbers, and email addresses will not be published in this PEIS.

SECTION 508 OF THE REHABILITATION ACT OF 1973

The digital version of this EIS and its project website are compliant with Section 508 of the *Rehabilitation Act of 1973* because assistive technology (e.g., "screen readers") can be used to help the disabled to understand these electronic media. Due to the nature of graphics, figures, tables, and images occurring in the document, accessibility may be limited to a descriptive title for each item.

COVER SHEET

DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR MASTER PLAN AND INSTALLATION DEVELOPMENT AT NELLIS AIR FORCE BASE, NEVADA

May 2025

Lead Agency: Nellis Air Force Base (AFB), Nevada

Affected Location: Nellis AFB, Nevada

Proposed Action: Master Plan and Installation Development at Nellis AFB, Nevada

Report Designation: Draft Programmatic Environmental Impact Statement

Comments and Inquiries: Comments may be submitted by one of the following methods: mail a written comment to Daniel Fisher, Attn: Master Plan and Installation Development at Nellis AFB, 2222 S. 4th Avenue, P.O. Box 6257, Yuma, AZ 85366 or submit a comment via email to comments@nellisafbeis.com or via the project website at https://www.nellisafbeis.com.

Abstract: This Programmatic Environmental Impact Statement (PEIS) analyzes the potential environmental consequences resulting from the Department of the Air Force (DAF) proposal to develop the east side of Nellis Air Force Base (AFB) to meet all current and future DAF mission requirements at the Installation. Expanding the east side of the airfield at Nellis AFB is a central undertaking to ensure the Installation's continued effectiveness in supporting a growing mission set and accommodating a rapidly growing personnel force. Failure to pursue strategic expansion would pose a significant challenge to Nellis AFB's ability to fulfill its anticipated future mission requirements. Development of the east side represents a critical investment in the operational capabilities that reinforce Nellis AFB's vital role in national defense.

By strategically developing the east side of the airfield, Nellis AFB can secure the necessary space to accommodate essential training requirements, maintenance facilities, and critical support functions. Without expansion, the Installation risks falling short of its potential to train the next generation of combat Aircrews, which could negatively impact the readiness of the DAF.

Procedurally, this PEIS was developed in compliance with the *National Environmental Policy Act of 1969* (42 United States Code [USC] § 4321 et seq.) (NEPA), as amended by the *Fiscal Responsibility Act of 2023* (FRA) (Public Law 118-5), the DAF's Environmental Impact Analysis Process implementing regulations (Title 32 *Code of Federal Regulations* [CFR] Part 989), and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provision of NEPA (40 CFR Parts 1500–1508) of July 2024. Executive Order (EO) 14154 of January 20, 2025, *Unleashing American Energy*, revoked EO 11991, *Relating to Protection and Enhancement of Environmental Quality*, which amended EO 11514, *Protection and Enhancement of Environmental Quality*. While the CEQ has provided notice that it intends to rescind the CEQ NEPA regulations, the DAF has accepted in this instance CEQ's suggestion to voluntarily rely on the CEQ regulations to allow for timely completion of this PEIS, which will support efficiency in planning for future mission-critical requirements.

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SUMMARY

The United States (US) Department of the Air Force (DAF), Air Combat Command (ACC), prepared this *Programmatic Environmental Impact Statement for Master Plan and Installation Development at Nellis Air Force Base, Nevada* (Master Plan PEIS or PEIS) in compliance with the *National Environmental Policy Act of 1969* (42 *United States Code* [USC] § 4321 et seq.) (NEPA) and the DAF's NEPA implementing regulations at Title 32 Code of Federal Regulations (CFR) Part 989, *Environmental Impact Analysis Process (EIAP)*. The DAF wrote this EIS programmatically to analyze the potential environmental consequences resulting from the DAF proposal to eventually develop the east side of Nellis Air Force Base (AFB). Expanding the east side of Nellis AFB is a central undertaking to ensure the Installation's continued effectiveness in supporting a growing mission set and accommodating a rapidly growing personnel force, as the west side of the Installation has reached capacity for development. Failure to pursue strategic expansion would pose a significant challenge to Nellis AFB's ability to fulfill its anticipated future mission requirements. Development of the east side represents a critical investment in the operational capabilities that reinforce Nellis AFB's vital role in national defense. The programmatic analysis in this PEIS primarily focuses on the proposed use of the area from a conceptual and qualitative perspective; site-specific NEPA analyses will be necessary in the future for specific locations of infrastructure when those plans and details have been formulated and are mature for analysis. Details regarding the actions that are currently known are outlined in **Section 2.4** of this PEIS. These conceptual details were the basis of analysis for the PEIS.

This PEIS analyzes general constraints to development of the east side of Nellis AFB; separate NEPA analysis tiering off this PEIS would be conducted as individual projects are identified in order to thoroughly document environmental impacts of future actions that are unknown at the time of development of this PEIS.

By programmatically developing the east side of the Installation, Nellis AFB can secure the necessary space to accommodate essential training requirements, maintenance facilities, and critical support functions. Without expansion, the Installation risks falling short of its potential to train the next generation of combat Aircrews, which could negatively impact the readiness of the DAF.

Procedurally, this PEIS was developed in compliance with NEPA, as amended by the *Fiscal Responsibility Act of 2023* (FRA), the DAF's Environmental Impact Analysis Process (EIAP) (32 *Code of Federal Regulations* [CFR] 989), and the Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provision of NEPA* (40 CFR Parts 1500–1508) of July 2024. Executive Order (EO) 14154 of January 20, 2025*, Unleashing American Energy,* revoked EO 11991*, Relating to Protection and Enhancement of Environmental Quality,* which amended EO 11514*, Protection and Enhancement of Environmental Quality.* While the CEQ has provided notice that it intends to rescind the CEQ NEPA regulations, the DAF has accepted in this instance CEQ's suggestion to voluntarily rely on the CEQ regulations to allow for timely completion of this PEIS, which will support efficiency in planning for future mission-critical requirements.

S.1 BACKGROUND

Nellis AFB, located in Clark County in the southeast corner of the state of Nevada, lies 5 miles northeast of the city of Las Vegas. Comprising 16,246 acres, the Installation is home to the 99th Air Base Wing (99 ABW), United States Air Force Warfare Center (USAFWC), 57th Wing, Nevada Test and Training Range (NTTR), elements of the 53rd Wing and 505th Command Control Wing, and more than 52 tenant units and agencies. The 99 ABW is the host wing for Nellis AFB and the NTTR and is responsible for two groups: the 99th Mission Support Group and the 99th Medical Group. Nellis AFB is a dynamic installation that plays a central role in DAF training and readiness. Demands on the Nellis AFB infrastructure have increased in recent years with the US Department of Defense (DoD) initiation of acquisition of additional fifth-generation (5th Gen) aircraft, such as the F-35 Lightning II strike fighter, and the continued growth of mission and civilian personnel at the Installation. The DoD plans to acquire 5th Gen F-35 aircraft for the DAF and other branches of the DoD between fiscal years (FY) 2007 and 2034. It is anticipated that a portion of these aircraft would be assigned to Nellis AFB. Nellis AFB was also selected as the beddown location for the F-35

Force Development Evaluation and the DAF Weapons School's advanced weapons training; the existing mission may require additional aircraft, which could drive new F-35s to the Installation.

S.2 PURPOSE AND NEED FOR THE ACTION

The purpose of the Proposed Action is to optimize Nellis AFB's current operational capabilities and capacity for future warfighting training and testing. According to the *Final Installation Development Plan Nellis Air Force Base, Nevada* (IDP) (Nellis AFB, 2018a), the Proposed Action is needed because the current Nellis and USAFWC mission sets are outpacing the ability to expand resources and capacity. In addition, the DAF anticipates that facility requirements are likely to increase over time through normal attrition and the arrival of new missions; the number of active-duty and civilian personnel also would increase. The existing infrastructure does not meet current and future mission needs; mission capability at Nellis AFB is nearing physical capacity and additional space is needed for the eventual construction of flightline support facilities and infrastructure to meet the anticipated future growth. The Proposed Action is also needed to relieve stress on facility and infrastructure constraints on the west side of the Installation. Flying units are currently sharing hangar space, which is not conducive to future mission growth. Presently, the Installation's infrastructure and utilities limit operational expansion and growth; utilities and the west-side ramp are reaching full operational capacity and must be expanded to accommodate future operations. Without expansion, the existing facilities and infrastructure at Nellis AFB would be insufficient to meet DAF and DoD current and future mission requirements (Nellis AFB, 2018a).

Nellis AFB has identified areas on the east side of the Installation that would be used to eventually construct facilities and infrastructure that are adequate to meet the Installation's current and future operational needs and meet the mission requirements of the ACC and 99 ABW and its tenant units.

S.3 PROPOSED ACTION AND ALTERNATIVES

In addition to the No Action Alternative, the DAF has identified two action alternatives (i.e., Alternative 1–Proposed Action and Alternative 2) that meet the purpose and need.

S.3.1 No Action Alternative

No action is the absence of action and is not static. This means that an action would not take place. The resulting environmental effects from taking no action have been compared to the effects of implementing the action alternatives over time. Analysis of this alternative provides a baseline against which decision-makers can compare the environmental effects resulting from the action alternatives. Under the No Action Alternative, development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing facilities and infrastructure as personnel and missions continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB would be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

S.3.2 Alternative 1: Preferred Alternative (Complete Development)

Alternative 1 is complete development of the east side of Nellis AFB to accommodate current and future mission needs in accordance with proposed functional use categories. Alternative 1 would fully utilize this undeveloped area, covering 2,000 acres, and identify areas for the future construction of facilities and infrastructure required to meet current and future mission needs over the next decade. Development of the east side of the Installation would include areas designated for airfield operations and light industrial uses; administrative uses; lodging/residential uses; and community services uses to improve mission readiness. Additional areas for transportation and utility infrastructure have been identified to accommodate the eventual development. Alternative 1 would also include areas for dedicated open space used for morale, welfare, recreation, and training for use by personnel and their families.

S.3.3 Alternative 2 (Partial Development)

Alternative 2 is partial development of the east side of Nellis AFB to accommodate current and future mission needs also in accordance with functional use categories. While Alternative 2 proposes a reduced development footprint (1,486 acres), it would still address the 99 ABW's current mission constraints. Alternative 2 would allow the Installation to meet mid-term requirements for future growth and would provide access to airfield, industrial, and administrative areas for personnel working on the east side of the Installation. This alternative does not include space for new lodging/residential uses. Under this alternative, accompanied and unaccompanied military personnel would utilize existing on-Installation living quarters or live off the Installation. Alternative 2 does not include space for outdoor recreation, training, and community services. In addition, the areas designated for transportation and utility infrastructure would be smaller than those areas under Alternative 1.

S.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table S-1 provides a comparison of the environmental consequences associated with Alternative 1, Alternative 2, and the No Action Alternative.

Table S-1
Impact Comparison of Alternatives

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
Land Use	Under the No Action Alternative, there would be no changes to land use in the Region of Influence (ROI) beyond baseline conditions; land use within the Proposed Action area, which is currently designated as Airfield and Open Space, would remain unchanged from current conditions. No additional space would be designated for development to meet future mission requirements, including space for transportation and utility infrastructure, administrative facilities, airfield operations facilities, lodging, community support facilities, and other uses.	Alternative 1 would designate up to 2,000 acres of land on the east side of the Installation for various development purposes. This includes future facilities for administration, utilities, housing, medical services, and recreation. Expansion of DAF operations under Alternative 1 would occur east and southeast of the current runway. The majority of the land (1,261 acres) is currently unused, designated as Open Space, and managed by the US Bureau of Land Management (BLM) but withdrawn for military use. Development under Alternative 1 would permanently change the designation of this land. Implementation of Alternative 1 would result in long-term, adverse impacts that would not be significant to land use due to the conversion of Open Space to developed areas. Nellis AFB would explore ways to adjust training exercises or operations to minimize their impact on sensitive areas within the BLM-withdrawn land. This could involve designating specific training zones to avoid critical habitats, implementing seasonal restrictions for construction and operational activities, or other activities to minimize impacts to the natural resources located within withdrawn land.	Alternative 2 would provide designated space for some of the same functional use categories as Alternative 1 within a total footprint of 1,486 acres. A total of 888 acres of BLM lands withdrawn for military use would be designated for permanent development with implementation of Alternative 2. Unlike Alternative 1, Alternative 2 would not designate any areas for Open Space functional use or Lodging/Residential use. Alternative 2 would also provide for a reduced total footprint for Medical/Community Services/Community Commercial/Small-Scale Retail compared to Alternative 1 (110 acres versus 33 acres). Implementation of Alternative 2 would result in long-term, adverse impacts to land use at Nellis AFB that would not be significant.
Air Quality and Climate Change	Under the No Action Alternative, there would be no changes to air quality resources in the ROI beyond baseline conditions.	Alternative 1 would not lead to significant adverse impacts to ambient air quality or human health. However, there may be short-term, adverse impacts to air quality that would not be significant during future	Air quality impacts from implementation of Alternative 2 would be similar to those under Alternative 1 but would be reduced due to the reduced size and activity of the development footprint.

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		construction activity due to increased emissions from construction equipment. Emissions from Alternative 1 development activities would occur over a 7-year period, but none of the pollutants for which the area is in nonattainment would exceed General Conformity *de minimis* thresholds. Additionally, levels of sulfur dioxide and fine inhalable particulate matter ($PM_{2.5}$) would not exceed the comparative indicator thresholds. Significant exposures to ground-level pollutants by sensitive receptors due to pollutant migration would be unlikely given the characteristics of the construction activity, the distance from the activities to the receptor locations, and seasonality of wind direction. Accordingly, implementation of Alternative 1 would not be anticipated to result in significant, adverse impacts to ambient air quality or human health. Short-term, adverse impacts to air quality that would not be significant would be anticipated to occur during future construction as a result of an increase in emissions from construction equipment. BMPs to be implemented in accordance with Clark County Air Quality Regulations include, but are not limited to: • Stabilize soil prior to, during, and after cut and fill activities. • Apply water to stabilize disturbed soil throughout the construction site. • Limit vehicle traffic and disturbance on soils where possible. • Limit the size of staging areas. • Apply water to surface soils where support equipment and vehicles will be operated.	

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
Earth Resources	Under the No Action Alternative, there would be no changes to earth resources in the ROI beyond baseline conditions. Consequently, the anticipated benefits of enhanced stormwater drainage, particularly in reducing soil erosion and sedimentation, would not be realized.	Under Alternative 1, development activities would alter the surface topography of Nellis AFB, resulting in the future creation of up to 1,480 acres of impervious surfaces and potential grading impacts on additional areas. While future grading activities could affect existing slopes, the predominantly flat nature of the Proposed Action area suggests minimal alteration to underlying geology and topography. Soil disturbance, covering up to 1,480 acres may elevate the risk of erosion and sedimentation during heavy rainfall, particularly in areas with high runoff potential. Implementing best management practices (BMPs) during and after construction, including stormwater management measures, would help mitigate these effects. Long-term, beneficial impacts to stormwater infrastructure would also occur under Alternative 1 through future stormwater drainage improvements such as the future construction of a reinforced berm designed to divert stormwater from Sunrise Mountain toward the proposed expansion of the flood control basin by the Clark County Regional Flood Control District, which would help to reduce the potential for sedimentation and erosion that would occur as a result of soil disturbance. Implementing mitigation measures during and after future construction, including stormwater management measures, would help mitigate these effects. Mitigation measures could include the following: • Minimize the total disturbed area during future construction and development. • Cluster future construction within the functional use category thresholds (see **Section 2.4.1**). • Minimize soil compaction.	Development under Alternative 2 would result in the creation of up to 1,216 acres of new impervious surfaces, with grading potentially altering existing slopes. Impacts under Alternative 2 would be anticipated to be the same as under Alternative 1, albeit on a smaller scale due to the reduced footprint.

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		• Implement design standards to manage increases in stormwater runoff and to limit opportunities for increased sedimentation and erosion. The Proposed Action would comply with the *Energy Independence and Security Act* (Public Law 110-140) and National Pollutant Discharge Elimination System permit requirements related to maintaining or restoring to predevelopment hydrology conditions.	
Water Resources	Under the No Action Alternative, stormwater issues in the ROI, such as flooding, sedimentation, and soil erosion, would persist. Groundwater and surface water would remain unchanged.	Alternative 1 would result in no impacts to surface waters. The future addition of up to 1,480 acres of impervious surfaces would be anticipated to result in a short-term increase in stormwater contamination from future construction activities. There would also be the potential for long-term impacts to stormwater as a result of increased contamination from operational uses on developed land. The future addition of up to 1,480 acres of impervious surfaces would result in increased runoff; however, under Alternative 1, the DAF would make future improvements to stormwater infrastructure that would help to manage stormwater flow and flooding. Impacts to groundwater would include the potential for contamination during future construction and operation from stormwater runoff or chemical use. However, deep groundwater resources would be unlikely to be impacted due to depth and the implementation of BMPs. Future construction would occur within areas that are designated as floodplains by the Colorado State University Center for Environmental Management of Military Lands but are not designated as floodplains by the Federal Emergency Management	Future development under Alternative 2 would result in up to 1,216 acres of new impervious surfaces, potentially resulting in a short-term increase in stormwater contamination and runoff and groundwater contamination. Impacts under Alternative 2 would be anticipated to be the same as under Alternative 1, albeit on a smaller scale due to the reduced footprint.

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		Agency. Accordingly, future construction within the floodplain would adhere to applicable regulations as defined by Nellis AFB and the Clark County Regional Flood Control District. Impacts to water resources under the Proposed Action and Alternatives would be managed, to the extent possible, through the use of mitigation measures that could include the following: • Minimize the total disturbed area during future construction and development. • Cluster future construction within the functional use category thresholds defined in **Section 2.4.1**. • Minimize soil compaction. • Implement design standards to manage increases in stormwater runoff and to limit opportunities for stormwater contamination. • Construct structures above the base-flood elevation, dry- or wet-proof foundations, and use permanent tie-downs of non-structural equipment such as propane tanks or wash racks. • Establish a proper connection between the stormwater channel to the Clark County Regional Flood Control District retention pond. • Implement development designs that support the flow of stormwater runoff and containment. • Conduct ongoing maintenance of existing stormwater channels.	
Biological Resources	Under the No Action Alternative, the current ecological state in the ROI would remain unchanged beyond baseline conditions. Species considered sensitive or of greatest	Under Alternative 1, approximately 1,580 acres of native and non-native vegetation would have the potential to be removed during future development, including	Under Alternative 2, approximately 1,071 acres of native and non-native vegetation would have the potential to be removed during future development, including

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
	conservation need (SGCN) would not be affected. Impacts to the Mojave desert tortoise habitat and individual desert tortoises would not occur.	construction, grading, and laydown of equipment. Approximately 715 acres, or 56 percent, of the Parry's Saltbush Wet Shrubland Alliance vegetation that occurs on Nellis AFB would have the potential to be removed during project implementation. Under Alternative 1, the DAF would remove approximately 559 acres, or about 10 percent, of the Creosotebush-Burrobush Bajada and Valley Desert Scrub Alliance vegetation association on Nellis AFB, resulting in significant, long-term, adverse impacts to native vegetation. Populations of small mammals and reptiles in the Proposed Action area would be lost during vegetation removal as a result of mortality during land clearing. Species that are considered sensitive by the BLM and SGCN by the state of Nevada that could be affected by the loss of habitat include the desert horned lizard, desert iguana, Great Basin collared lizard, long-tailed brush lizard, and Mojave sidewinder. Approximately 1,000 acres of Mojave desert tortoise habitat would be disturbed under Alternative 1. The estimated 982 acres of the 1,000 acres of desert tortoise habitat that would be disturbed from implementation of Alternative 1 would be covered by the Programmatic Biological Opinion (PBO), provided the DAF implements all terms and conditions and reporting requirements in the PBO. It is expected that an unknown number of small tortoises and tortoise eggs may not be found and would be killed during ground-disturbing activities, which would be allowable under the incidental take provision of the PBO. Conducting preconstruction surveys and installing tortoise-proof fencing around the project area would be expected to prevent injuries or mortality of adult	construction, grading, and laydown of equipment. Approximately 681 acres, or 53 percent, of the Parry's Saltbush Wet Shrubland Alliance vegetation that occurs on Nellis AFB would have the potential to be removed during project implementation. Under Alternative 2, the DAF would remove approximately 212 acres, or about 4 percent, of the Creosotebush-Burrobush Bajada and Valley Desert Scrub Alliance vegetation association on Nellis AFB, resulting in significant, long-term, adverse impacts to native vegetation. Impacts to wildlife under Alternative 2 would be the same as those under Alternative 1, albeit on a smaller scale as a result of the reduced development footprint. Approximately 487 acres of Mojave desert tortoise habitat would be disturbed under Alternative 2. The estimated 487 acres of desert tortoise habitat that would be disturbed from implementation of Alternative 2 would be covered by the PBO, provided the DAF implements all terms and conditions and reporting requirements in the PBO. It is expected that an unknown number of small tortoises and tortoise eggs may not be found and would be killed during ground-disturbing activities, which would be allowable under the incidental take provision of the PBO. Conducting preconstruction surveys and installing tortoise-proof fencing around the project area would be expected to prevent injuries or mortality of adult tortoises. The DAF has determined that the adverse effects of the Proposed Action under Alternative 2 on the desert tortoise from development of tortoise habitat and potential translocation of several adult desert tortoises was fully evaluated through Section 7 consultation with the USFWS in 2023 as documented in

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		tortoises. The DAF has determined that the adverse effects of the Proposed Action under Alternative 1 on the desert tortoise from development of tortoise habitat and potential translocation of several adult desert tortoises was fully evaluated through Section 7 consultation with the US Fish and Wildlife Services (USFWS) in 2023 as documented in the PBO. Potential adverse impacts to desert tortoises would be minimized through the implementation of the conservation measures and requirements in the PBO.	the PBO. Potential adverse impacts to desert tortoises would be minimized through the implementation of the conservation measures and requirements in the PBO.
Cultural Resources	Under the No Action Alternative, there would be no changes to cultural resources in the ROI beyond baseline conditions.	Implementation of Alternative 1 would have the potential to result in adverse effects to cultural resources. In keeping with the programmatic nature of this Environmental Impact Statement, consultation with the Nevada State Historic Preservation Officer (SHPO) would occur in the future on a project-by-project basis prior to beginning construction. There is currently no Programmatic Agreement between Nellis AFB and the SHPO, nor is one in development. The following historic resources would have the potential to experience direct visual effects under Alternative 1: • Red Flag Historic District, including Building (B-) 222, B-224, B-226, B-228, B-201, and B-220 • Thunderbirds Hangar (B-292) Archaeological sites CK11269 and S1827 are awaiting SHPO eligibility determination. Should an “Adverse Effect” determination be made by Nellis AFB, Base personnel will consult with SHPO to develop and evaluate alternatives or modifications to the undertaking that avoid, minimize, or mitigate the adverse effects. Mitigation measures would be identified on a project-by-project	Impacts to cultural resources under Alternative 2 would be anticipated to be the same as those described under Alternative 1.

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		basis should the Nevada SHPO make an adverse effect determination for any historic architectural or archaeological properties.	
Noise	Under the No Action Alternative, there would be no changes to the noise environment, which is dominated by aircraft-related noise, beyond baseline conditions.	Noise under Alternative 1 would not be anticipated to result in significant impacts to noise-sensitive receptors. The residential community of Sunrise Manor, as well as Sunrise Mountain High School, Dr. William H. "Bob" Bailey Middle School, and Liliam Lujan Hickey Elementary School would remain under elevated noise contours generated by ongoing aircraft operations. Operation of the future support facilities proposed under Alternative 1 would not result in significant impacts to the existing noise environment. Operations and maintenance activities associated with the proposed development would result in intermittent noise that would be indistinguishable from the noise generated by ongoing aircraft operations. There would be no change in the number or types of aircraft, flight training, or associated ground-based training currently occurring at Nellis AFB under Alternative 1. Mitigation measures to minimize noise impacts could include limiting construction activities to daylight hours (7 a.m. to 6 p.m.).	Impacts to noise under Alternative 2 would be anticipated to be the same as those described under Alternative 1.
Hazardous Materials and Waste, Toxic Substances, and Contaminated Sites	Under the No Action Alternative, there would be no development on the east side of Nellis AFB. While this would avoid introducing new hazardous materials, existing hazardous waste management issues, such as debris from illegal dumping and hazardous waste sites, would remain unresolved, posing a continued threat. Increased personnel and evolving missions at Nellis AFB would further strain existing facilities. As capacity limitations become more severe, managing hazardous materials	Under Alternative 1, the eventual use of hazardous materials during future construction would be anticipated to result in short-term, adverse impacts that would not be significant. Hazardous wastes encountered during future excavation or grading activities during development could potentially expose construction and maintenance workers to potential hazards associated with contaminants. The use of certain petroleum products would be required during proposed development associated with Alternative 1. Short-term, adverse impacts that would not be significant	Impacts to hazardous materials and waste, toxic substances, and contaminated sites would be anticipated to be the same under Alternative 2 as Alternative 1.

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
	and wastes could become a challenge. This could lead to: • improper disposal – Strained resources could increase the risk of improper disposal of hazardous materials, posing environmental and health risks; and • accidental releases – Inadequate storage facilities and crowded conditions could increase the likelihood of accidents or spills involving hazardous materials. Overall, while the No Action Alternative would avoid immediate disruption, it could exacerbate existing problems related to hazardous materials and waste management, potentially leading to future environmental and health risks.	would be anticipated to result from the use of petroleum products with implementation of Alternative 1. Asbestos-containing material, lead-based paint, or polychlorinated biphenyls (PCBs) encountered during future excavation or grading activities during development under Alternative 1 could potentially expose construction and maintenance workers to potential hazards associated with these materials. Per- and polyfluoroalkyl substances (PFAS) and perfluorooctane sulfonate are known to occur within the soils and groundwater in the northwest corner of the Proposed Action area. Eleven total aqueous film forming foam (AFFF) sites are known to occur within the flightline area, three of which occur within the Proposed Action area. Soil disturbance and excavation within these areas have the potential to expose construction workers to PFAS in a way that could lead to adverse human health impacts. Three Environmental Restoration Program (ERP) sites, SS028, SS046, and L-13, are located within the Proposed Action area. Soil excavation occurring within the boundaries of these ERP sites under Alternative 1 would not be anticipated to result in any adverse impacts because no known soil contamination is associated with these sites. Short-term, adverse impacts to these sites that would not be significant would be anticipated to occur with implementation of Alternative 1. Impacts to this resource area resulting from the Proposed Action would be managed, to the extent possible, through the use of BMPs that could include the following:	

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		• Coordinate with the Nevada Division of Environmental Protection (NDEP) regarding land use controls at L-13 prior to construction. • Identify the extent of PFAS-impacted soils for AT001P/AFFF Area #3, AT002P/AFFF Area #8, B-2069/AFF Area #5, and the fire training area prior to construction. • Characterize the unidentified debris dumped within the Proposed Project area prior to construction, and coordinate with NDEP to properly manage or dispose of any wastes that are identified. • Create and implement a soil and water management plan in compliance with NDEP requirements. • Implement measures to stockpile contaminated soils to prevent further impacts. • Adhere to the Nellis AFB Hazardous Waste Management Plan, Lead-Based Paint Management Plan, and Asbestos Management and Operations Plan.	

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)

Infrastructure, Including Transportation and Utilities	Under the No Action Alternative, there would be no changes to utilities or infrastructure improvements in the ROI beyond baseline conditions. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Beneficial impacts from stormwater infrastructure improvements would not occur under the No Action Alternative. Demand for current facilities and infrastructure would continue to outpace capacity.
	
	Several locations would experience an unacceptable level of service with future projected growth under the No Action Alternative. Additionally, the Hollywood Gate would continue to remain closed. The volume of traffic at the existing four gate entrances would continue to increase in relation to the 10-percent increase in personnel, and these gates would continue to be inadequate to support anticipated growth.
		Development under Alternative 1 would eventually require the future construction of approximately 43,000 linear feet of water main line. Potable water demand under Alternative 1 would increase by approximately 0.3 million gallons per day, an increase of 18 percent. Future construction occurring under Alternative 1 would have the potential to further strain the long-term potable water availability on Nellis AFB, resulting in long-term, adverse impacts to the potable water supply that would not be significant.
		
		To decrease potable water demand, the following measures are considered for mitigation:
		
		• Ensure proposed landscaping design is water efficient.
		• Ensure low-flow plumbing fixtures are integrated into the design of the new facilities.
		• Eliminate potable water for outdoor use/irrigation.
		• Curtail waste by minimizing unrecoverable potable water losses:
		  ○ termination of the Area II flushing system with a looped system that would connect the existing water supply lines from Areas I and II,
		  ○ implementation of hardening strategies for the water distribution system, including a deeper burial of distribution pipes,
		  ○ improving the overall management of the distribution system by installation of a Supervisory Control and Data Acquisition system.
		
		Approximately 25,000 linear feet of sewage piping would be required to support
			Impacts to infrastructure, including transportation and utilities, under Alternative 2 would be anticipated to be generally the same as under Alternative 1, albeit on a smaller scale. Future improvements to infrastructure to support development under Alternative 2 are described below.
			
			Development under Alternative 2 would require the future construction of approximately 41,000 linear feet of water main line.
			
			Approximately 23,000 linear feet of sewage piping would be constructed in the future to support development under Alternative 2.
			
			Alternative 2 would involve the same stormwater infrastructure improvements as Alternative 1.
			
			Development under Alternative 2 would increase electricity demand by 24 megawatts, approximately 15-percent less than development under Alternative 1. Electrical infrastructure upgrades would be the same as those described under Alternative 1.
			
			Approximately 70,000 linear feet of underground duct bank telecommunications infrastructure pathways would be required to support development under Alternative 2, or approximately 20 percent less than Alternative 1.
			
			Natural gas demand under Alternative 2 would increase by approximately 1.1 trillion British thermal units, or approximately 40 percent less than Alternative 1. Approximately 19,500 linear feet of natural gas lines would be required to support development under Alternative 2,

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		development under Alternative 1. Overall, changes in regional demand would be minimal and the wastewater treatment system would have the capacity required to meet increased demands under Alternative 1. Stormwater rate control would be managed within the Proposed Action area by the construction of stormwater culverts, open-top flumes, and other stormwater management features per Nevada General Permit NVR100000. A stormwater detention facility would be constructed on the southwest corner of the Proposed Action area. A reinforced berm within the fence line would be constructed in the future to safely divert stormwater runoff from Sunrise Mountain around the Proposed Action area toward the proposed stormwater basin. Long-term, beneficial impacts to stormwater infrastructure would be anticipated to occur with implementation of Alternative 1. Development under Alternative 1 would increase electrical demand by 28 megawatts, requiring the installation of a new Nellis AFB-owned distribution South substation in the southeastern corner of the Proposed Action area; future construction of this substation would double the overall electricity capacity of the Installation to 80 megavolt-ampere. The future infrastructure improvements would ensure that the electrical system would have the capacity required to meet new demands under Alternative 1. Approximately 85,000 linear feet of underground duct bank telecommunications infrastructure pathways would be required to support development under Alternative 1. The future data/communications fiber optic	approximately 7 percent less than Alternative 1. Alternative 2 would involve the same hydrant fuel infrastructure improvements as Alternative 1. Impacts to traffic at the gates were analyzed compared to the No Action Alternative; no significant queuing impacts at the gates would be expected under Alternative 2 with implementation of future improvements, including construction of Hollywood Gate. Traffic at the gates under Alternative 2 would be expected to improve when compared to the No Action Alternative. Improvements to the transportation infrastructure under Alternative 2 would be anticipated to maintain an acceptable level of service, and no significant adverse impacts to transportation infrastructure would occur..

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		system would originate from existing information transfer buildings B-1740 in Area I and B-10215 in Area II. These infrastructure improvements would ensure that the telecommunications system would have the capacity required to meet new demands under Alternative 1. Natural gas demand under Alternative 1 would increase by approximately 1.6 trillion British thermal units. Approximately 21,000 linear feet of natural gas lines would be installed in the future to support development. Changes in demand would not be significant and the natural gas supply system would have the capacity required to meet new demands under Alternative 1. A new hydrant fuel system would be required to support development under Alternative 1. Future construction would include 11,000 linear feet of 8-inch steel fuel lines and four 500,000-gallon (approximately 12,000-barrel each) tanks installed and connected to proposed flightline facilities for airframe use and interconnected with the existing system. Infrastructure improvements would ensure that the hydrant fuel system would have the capacity required to meet new demands under Alternative 1. Alternative 1 would require the development of a completely new transportation system to support development within the Proposed Action area, including the future extension of Ellsworth Avenue from its current end at O'Bannon Road to Hollywood Boulevard. Feeder roads connected to the extended Ellsworth Avenue would also be constructed. An anticipated 75 percent of the 2,500 personnel expected to be added to Nellis AFB over the next decade would live off Installation, resulting in an increase in total	

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		gate volume. Impacts to traffic at the gates were analyzed compared to the No Action Alternative; no significant queuing impacts at the Nellis AFB gates would be expected under Alternative 1 with implementation of the proposed improvements, including future construction of Hollywood Gate. Traffic at the gates under Alternative 1 would be expected to improve when compared to the No Action Alternative.	
Safety and Occupational Health	Under the No Action Alternative, there would be no change to safety conditions, including current explosive safety quantity-distance (ESQD) arcs, foreign object damage (FOD) hazards, and bird/wildlife aircraft strike hazard (BASH) concerns, in the ROI beyond baseline conditions.	Three portions of the Clear Zone (CZ) totaling 5.41 acres overlap the Proposed Action area and 4.98 acres of Accident Potential Zone (APZ) I overlap the Proposed Action area. Future construction would not occur within the CZ, and future construction within the APZ would be in compliance with existing guidance. Future construction activities under Alternative 1, including those associated with Airfield/Industrial/Light Industrial functional use categories, would take place in close proximity to the airfield. Debris associated with future construction of new facilities in this area would have the potential to create additional FOD hazards. Future construction activities would be conducted in accordance with the Nellis AFB FOD Prevention Program, which would help to prevent and minimize FOD incidents. Therefore, no significant impacts to ground safety would be anticipated to occur with implementation of Alternative 1. No changes to existing ESQD arcs would be anticipated to occur with implementation of Alternative 1. Should future construction include facilities that handle explosive materials and specified exposures, new ESQD arcs would be established in compliance with DAF regulations.	Impacts to safety and occupational health would be the same under Alternative 2 as Alternative 1.

	No Action Alternative	Alternative 1 (Complete Development)	Alternative 2 (Partial Development)
		There would be no changes to existing flight safety procedures; therefore, no impacts to flight safety would be anticipated to occur with implementation of Alternative 1. No BMPs or mitigation measures are recommended for impacts to safety and occupational health.	
Socioeconomics	Under the No Action Alternative, there would be no changes to the socioeconomic environment of the ROI beyond baseline conditions.	Alternative 1 would have the potential to result in short-term, beneficial impacts to income and employment in the ROI that would not be significant because of the temporary need for future construction personnel and the expenditures associated with implementing the Proposed Action. Alternative 1 would also have the potential for long-term, beneficial impacts to income and employment that would not be significant from creating a small number of jobs needed to support the new development. A long-term, permanent, beneficial impact to housing availability on Nellis AFB would occur under Alternative 1 as a result of the construction of the dormitories. Alternative 1 would not be anticipated to impact educational resources in the ROI. No BMPs or mitigation measures are recommended for impacts to socioeconomics.	Impacts to socioeconomic resources under Alternative 2 would be largely the same as Alternative 1, albeit on a smaller scale. However, no dormitories would be constructed in the future, resulting in an increased demand for off-Installation housing as compared to Alternative 1.

99 ABW = 99th Air Base Wing; AFB = Air Force Base; AFFF = aqueous film forming foam; B- = Building (as in B-224); BASH = Bird/Wildlife Aircraft Strike Hazard; BLM = Bureau of Land Management; BMP = best management practice; DAF = Department of the Air Force; ERP = Environmental Restoration Program; ESQD = explosive safety quantity-distance; FOD = foreign object damage; NDEP = Nevada Division of Environmental Protection; PBO = Programmatic Biological Opinion; PCBs = polychlorinated biphenyls; $PM_{2.5}$ = fine inhalable particles with diameters of 2.5 micrometers or smaller; ROI = Region of Influence; SGCN = species of greatest conservation need; SHPO = State Historic Preservation Officer; USFWS = US Fish and Wildlife Service

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APPENDICES

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ACRONYMS AND ABBREVIATIONS

5th Gen	fifth-generation
99 ABW	99th Air Base Wing
AAGR	annual average growth rate
ACAM	Air Conformity Applicability Model
ACC	Air Combat Command
ACHP	Advisory Council on Historic Preservation
ACM	asbestos-containing material
ADP	Area Development Plan
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFFF	aqueous film forming foam
AFI	Air Force Instruction
AFPD	Air Force Policy Directive
AHERA	Asbestos Hazard Emergency Response Act
AICUZ	Air Installations Compatible Use Zones
Air Force	United States Air Force
APE	Area of Potential Effect
APZ	Accident Potential Zone
AQCR	air quality control region
AST	aboveground storage tank
AT/FP	anti-terrorism/force protection
BASH	Bird/Wildlife Aircraft Strike Hazard
BEA	Bureau of Economic Analysis
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BLM	Bureau of Land Management
BMP	best management practice
BTU	British thermal unit
CAA	Clean Air Act
CCA	Collaborative Combat Aircraft
CCAS	contracted close air support
CCRFCD	Clark County Regional Flood Control District
CCWRD	Clark County Water Reclamation District
CEMML	Center for Environmental Management of Military Lands
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CNLV	City of North Las Vegas
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CSTR	Combat Support Training Range
CSU	Colorado State University
CT	Census Tract
CWA	Clean Water Act
CY	calendar year
CZ	Clear Zone
DAF	Department of the Air Force
dBA	A-weighted decibels
DCE	1,2-dichloroethane
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene

DDT	dichlorodiphenyltrichloroethane
DES	Department of Environment and Sustainability
DNL	Day-Night Average Sound Level
DoD	United States Department of Defense
DoDI	Department of Defense Instruction
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EISA	Energy Independence and Security Act
EO	Executive Order
EOU	Experimental Operations Unit
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESQD	explosive safety quantity-distance
EUL	Enhanced Use Lease
°F	degree Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act
FOD	foreign object damage
ft^2	square feet
FTA	fire training area
FY	fiscal year
GBI	Green Building Initiative
GHG	greenhouse gas
GWP	Global Warming Potential
HAP	hazardous air pollutants
HAZMAT	hazardous materials
HD	Historic District
HDPE	high-density polyethylene
I-15	Interstate 15
ICRMP	Integrated Cultural Resources Management Plan
IDP	Installation Development Plan
in	inches
INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Consultation
ITB	Information Transfer Building
IWG	Interagency Working Group
LBP	lead-based paint
LOLA	Live Ordnance Loading Area
LOS	level of service
LVVWD	Las Vegas Valley Water District
µg	microgram
$\mu g/m^3$	microgram per cubic meter
MBTA	Migratory Bird Treaty Act
MGD	million gallons per day
MILCON	military construction
MOA	Memorandum of Agreement
MSA	Munitions Storage Area
MVA	megavolt-ampere
MW	Monitoring Well
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation

NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLVWD	North Las Vegas Water District
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHD	National Register Historic District
NRHP	National Register of Historic Places
NTTR	Nevada Test and Training Range
NVCRIS	Nevada Cultural Resource Information System
NVE	NV Energy
O_3	ozone
OSHA	Occupational Safety and Health Administration
PBA	Programmatic Biological Assessment
PBO	Programmatic Biological Opinion
PCBs	polychlorinated biphenyls
PCE	perchloroethylene
pCi/L	picocuries per liter
PEIS	Programmatic Environmental Impact Statement
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PGR	percent growth rate
PLO	Public Land Order
PM	particulate matter
PM_{10}	inhalable particles with diameters of 10 micrometers or smaller
$PM_{2.5}$	fine inhalable particles with diameters of 2.5 micrometers or smaller
ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
PV	photovoltaic
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SAR	Small Arms Range
SARA	Superfund Amendments and Reauthorization Act
SGCN	species of greatest conservation need
SHPO	State Historic Preservation Officer
SIP	state implementation plan
SNWA	Southern Nevada Water Authority
SO_2	sulfur dioxide
SOH	Safety and Occupational Health
SPCC	Spill Prevention, Control, and Countermeasure
SR	State Road
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TASS	Tactical Air Support Squadron
TCE	trichloroethylene
TCP	Traditional Cultural Property
TMP	Transportation Management Plan
TSCA	Toxic Substances Control Act
UFC	United Facilities Code
US	United States

USACE	United States Army Corps of Engineers
USAFWC	United States Air Force Warfare Center
USC	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGBC	United States Green Building Council
UST	underground storage tank
VOC	volatile organic compound
vph	vehicles per hour
WRF	Water Reclamation Facility

CHAPTER 1 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 PROJECT DESCRIPTION

The United States (US) Department of the Air Force (DAF), Air Combat Command (ACC), prepared this *Programmatic Environmental Impact Statement for Master Plan and Installation Development at Nellis Air Force Base, Nevada* (Master Plan PEIS or PEIS) in compliance with the *National Environmental Policy Act of 1969* (42 *United States Code* [USC] § 4321 et seq.) (NEPA) and the DAF's NEPA implementing regulations at Title 32 Code of Federal Regulations (CFR) Part 989, *Environmental Impact Analysis Process (EIAP)*. ACC organizes, trains, and equips combat-ready forces to provide dominant combat airpower in support of national security strategy implementation. This Master Plan PEIS is written programmatically to analyze the potential environmental consequences resulting from the DAF proposal to eventually develop the east side of Nellis Air Force Base (AFB) and to analyze existing environmental constraints with the potential to impact long-term planning objectives and potential future DAF mission requirements. This PEIS analyzes general constraints to development of the east side of Nellis AFB; separate NEPA analysis tiering off of this PEIS would be conducted as individual projects are identified in the appropriate functional use areas in order to thoroughly document the environmental impacts of future actions that are unknown at the time of development of this PEIS. The programmatic analysis in this PEIS primarily focuses on the proposed use of the area from a conceptual and qualitative perspective, and site-specific NEPA analyses will be necessary in the future for specific locations of facilities and infrastructure when those plans and details have been formulated and are mature for analysis.

Procedurally this PEIS was developed in compliance with NEPA, as amended by the *Fiscal Responsibility Act of 2023* (Public Law 118-5) (FRA), 32 CFR Part 989), and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provision of NEPA (40 CFR Parts 1500–1508) of July 2024. Executive Order (EO) 14154 of January 20, 2025, *Unleashing American Energy*, revoked EO 11991, *Relating to Protection and Enhancement of Environmental Quality*, which amended EO 11514, *Protection and Enhancement of Environmental Quality*. While CEQ has provided notice that it intends to rescind the CEQ NEPA regulations, the DAF has accepted in this instance CEQ's suggestion to voluntarily rely on the CEQ regulations to allow for timely completion of this PEIS, which will support efficiency in planning for future mission-critical requirements. The 99th Air Base Wing (99 ABW) at Nellis AFB in Nevada is proposing to develop the east side of the Installation to address current operational and land use capacity constraints and to ensure that there are adequate facilities and infrastructure available to accommodate future mission growth, as the west side of the Installation has reached capacity for development.

1.1.1 Location

Nellis AFB, located in Clark County in the southeast corner of the state of Nevada, lies 5 miles northeast of the city of Las Vegas. The Installation is bordered on the west and south by the unincorporated township of Sunrise Manor (**Figure 1-1**). Nellis AFB is the center for ACC training and testing activities at the Nevada Test and Training Range (NTTR), providing logistical and organizational support, aircraft training, and personnel for the Range. Sunrise Manor and undeveloped portions of Clark County surround the majority of Nellis AFB, although open space dominates to the northeast. Covering 16,246 acres, the Installation contains three major functional areas (**Figure 1-2**). Area I, the Main Base, is located east of Interstate 15 (I-15) and includes the airfield and most Installation functions. Area II, northeast of the Main Base, contains the Munitions Storage Area/Weapons Storage Area. Area III, situated northwest of the Main Base, comprises a number of facilities such as a hospital, storage, and housing. Nellis AFB also includes a Small Arms Range (SAR), which comprises 10,623 acres of land and is disjunct from the remainder of the Installation. The SAR is located northwest of I-15 and south of the Desert National Wildlife Range. With the exception of several buildings and access roads, the SAR consists of undeveloped desert scrub land.

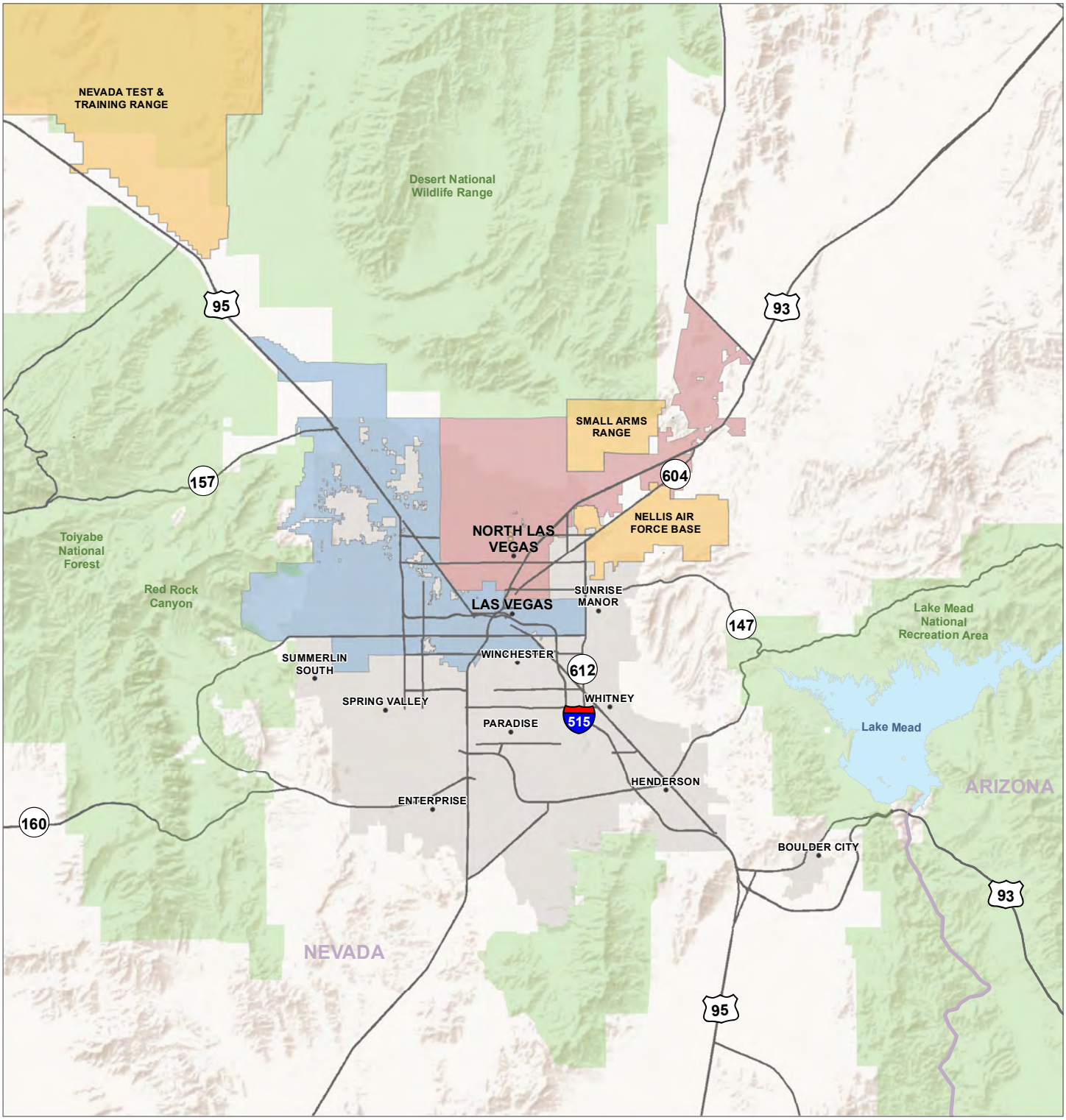

FIGURE 1-1
Nellis AFB Vicinity

- City of Las Vegas
- City of North Las Vegas
- Nellis Air Force Base Properties

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0 5 10 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

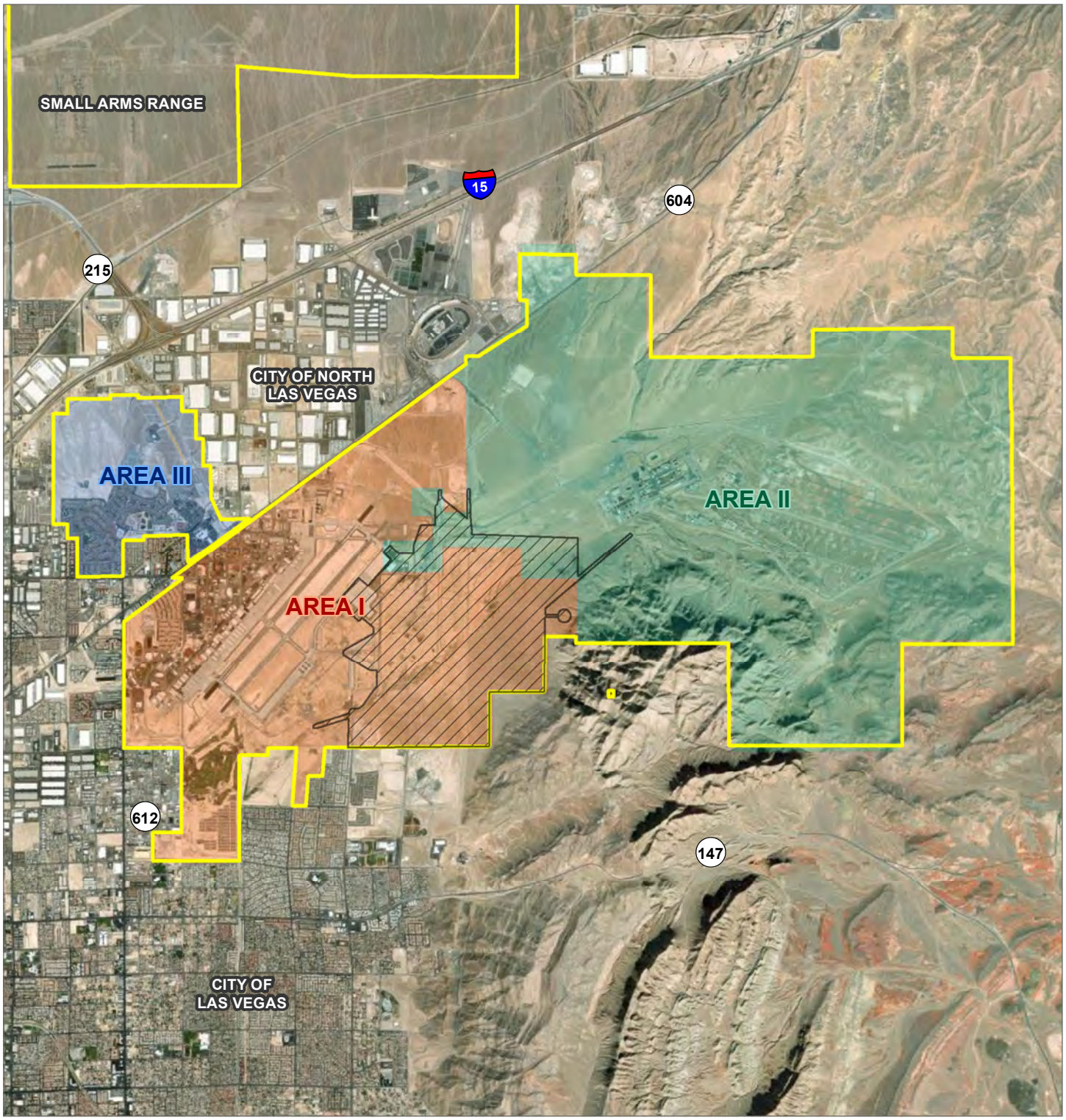

FIGURE 1-2
Nellis AFB Functional Areas

Installation Boundary
East-Side Development Area
Area I
Area II
Area III

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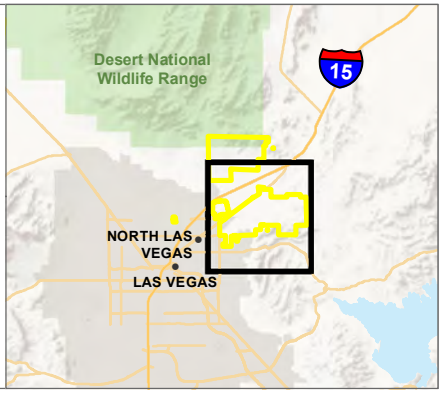
0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Nellis AFB is home to the 99 ABW, United States Air Force Warfare Center (USAFWC), 57th Wing, NTTR, elements of the 53rd Wing and 505th Command Control Wing, and more than 52 tenant units and agencies. The 99 ABW is the host wing for Nellis AFB and the NTTR and is responsible for two groups: the 99th Mission Support Group and the 99th Medical Group.

1.1.2 History

Nellis AFB is a dynamic installation that plays a central role in DAF training and readiness. Demands on the Nellis AFB infrastructure have increased in recent years with the US Department of Defense (DoD) initiation of acquisition of additional fifth-generation (5th Gen) aircraft, such as the F-35 Lightning II strike fighter, and the continued growth of mission and civilian personnel at the Installation. The DoD plans to acquire 5th Gen F-35 aircraft for the DAF and other branches of the DoD between fiscal years (FY) 2007 and 2034. It is anticipated that a portion of these aircraft would be assigned to Nellis AFB. Nellis AFB was also selected as the beddown location for the F-35 Force Development Evaluation and the DAF Weapons School's advanced weapons training; the existing mission may require additional aircraft, which could drive new F-35s to the Installation. F-35 procurement, in addition to unmanned aerial systems, development of new systems and other operations, is a significant driver of increased operations and training requirements at Nellis AFB and NTTR.

The number of active-duty mission personnel at Nellis AFB increased 12 percent from 2014 to 2021 (Nellis AFB, 2014, 2022c). It is anticipated that new missions and basing of 5th Gen aircraft would increase the number of active-duty and civilian personnel who live and work on Nellis AFB over the next decade.

This PEIS is being prepared to evaluate the potential environmental consequences of developing the east side of the Installation to expand Nellis AFB's current operational capabilities and address future growth. Any new missions and procurement of next-generation aircraft would be evaluated in separate NEPA analyses.

1.2 PURPOSE AND NEED

The purpose of the Proposed Action is to optimize Nellis AFB's current operational capabilities and capacity for future warfighting training and testing. According to the *Final Installation Development Plan Nellis Air Force Base, Nevada* (IDP) (Nellis AFB, 2018a), the Proposed Action is needed because the current Nellis and USAFWC mission sets are outpacing the ability to expand resources and capacity. In addition, the DAF anticipates that facility requirements are likely to increase over time through normal attrition, and the arrival of new missions and that the number of active-duty and civilian personnel would also increase. The existing infrastructure does not meet current and future mission needs; mission capability at Nellis AFB is nearing physical capacity, and additional space is needed for the eventual construction of flightline support facilities and infrastructure to meet anticipated future growth. The Proposed Action is also needed to relieve stress on facility and infrastructure constraints on the west side of the Installation. Flying units are currently sharing hangar space, which is not conducive to future mission growth. Presently, the Installation's infrastructure and utilities limit operational expansion and growth; utilities and the west-side ramp are reaching full operational capacity and must be expanded to accommodate future operations. Without expansion, the existing facilities and infrastructure at Nellis AFB would be insufficient to meet DAF and DoD current and future mission requirements (Nellis AFB, 2018a).

Nellis AFB has identified areas on the east side of the Installation that would be used to eventually construct facilities and infrastructure that are adequate to meet the Installation's current and future operational needs and meet the mission requirements of the ACC and 99 ABW and its tenant units.

1.3 INTERGOVERNMENTAL COORDINATION, PUBLIC AND AGENCY PARTICIPATION

NEPA requirements help ensure that environmental information is made available to the public during the decision-making process and prior to actions being taken. The premise of NEPA is that the quality of federal decisions will be enhanced if proponents provide information to federal agencies, federally recognized tribes, and the public and involve the stakeholders in the planning process.

Per EO 12372, *Intergovernmental Review of Federal Programs*, the DAF notified federal, state, and local agencies and tribal governments with jurisdiction that could potentially be affected by the Proposed Action and Alternatives via written correspondence throughout development of this PEIS. Nellis AFB considered comments from agencies and tribes in shaping the analysis of potential environmental impacts performed as part of PEIS development. Sample agency and tribal coordination letters mailed during scoping are included in **Appendix A**. Responses to these coordination letters are included in **Appendix A**.

Compliance with ESA Section 7 and implementing regulations (50 CFR Part 402) requires communication with the US Fish and Wildlife Service (USFWS) in cases where a federal action could affect listed threatened or endangered species, species proposed for listing, or candidates for listing. Section 7 consultation under the ESA was completed with USFWS through several Programmatic Biological Assessments (PBAs) and Programmatic Biological Opinions (PBOs), as described in **Section 3.8.2**.

The DAF coordinated with the US Bureau of Land Management (BLM) on proposed modification to existing BLM lands withdrawn for military use (see **Section 3.4.1.3**). Because of this, the DAF inquired as to BLM's interest in serving as a cooperating agency on this PEIS. BLM indicated that it did not wish to serve as a cooperating agency on this PEIS, noting that further NEPA analysis would occur as part of the proposed modification of the existing Public Land Order (PLO) Number 7890. Some of the projects proposed for construction would occur on land owned by the BLM and currently withdrawn for certain military use (**Figure 1-3**). The purpose of PLO 7890 is "to continue providing safety buffers from potentially hazardous areas, protect populated areas, and comply with DoDD 6055.09E regarding ammunition and explosive safety standards on lands adjacent to the LOLA at Nellis AFB, northeast of Las Vegas, Clark County, Nevada." The Proposed Action would include improvements to the withdrawn land, including the eventual construction of potential aircraft parking, hangars, and other facilities, which would be inconsistent with PLO 7890. Under the Proposed Action and Alternatives, withdrawn land would not be returned to BLM. Instead, the functional use of the land would change, requiring an eventual modification to the PLO when DAF plans are formalized. No construction would occur under the Proposed Action without approved modification of PLO 7890 by BLM following that public review process.

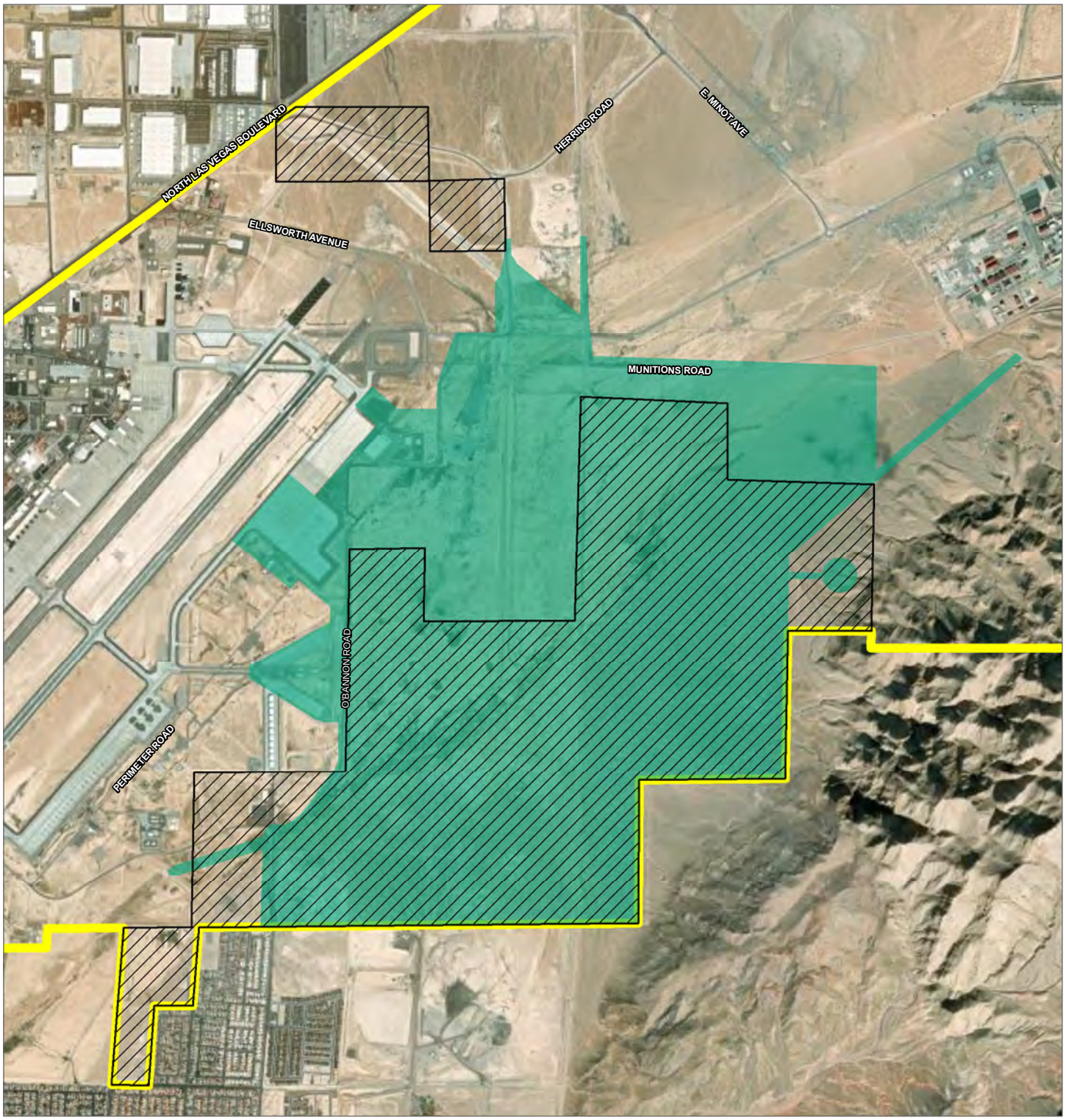
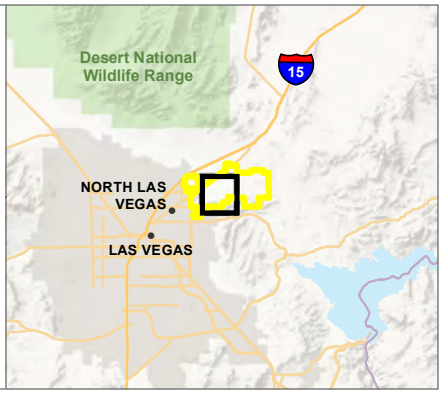


FIGURE 1-3
East-Side Development Area and BLM-Withdrawn Lands

Installation Boundary

East-Side Development Area

US BLM Withdrawn Land



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Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

CHAPTER 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This section provides a description of the standards used in selecting the Proposed Action and Alternatives; a detailed description of the Proposed Action and Alternatives, including the No Action Alternative; decision-making process and identification of the Preferred Alternative; identification of alternatives considered but eliminated from further analysis; comparison of environmental consequences of the alternatives; and mitigation measures.

2.2 ALTERNATIVE SELECTION STANDARDS

In accordance with 32 CFR § 989.8(c), selection standards were developed to establish a means for determining the reasonableness of an alternative and whether an alternative should be carried forward for further analysis in the PEIS. Consistent with 32 CFR § 989.8(c), the following selection standards meet the purpose of and need for the Proposed Action and were used to identify reasonable alternatives for construction of facilities and infrastructure to address current mission constraints and future growth at Nellis AFB for analysis in the PEIS.

1) Each alternative must allow for additional operational growth in support of mission activities.
2) Each alternative must provide adequate space to accommodate existing facility and infrastructure deficiencies in order to adequately support current and future strategic missions.
3) Each alternative must be consistent with land use requirements, anti-terrorism/force protection (AT/FP) standards, and planning concepts.
4) Each alternative must provide and promote the quality of life and wellness environment on Nellis AFB and maintain military personnel readiness and response times to support the DAF mission.
5) Each alternative must maximize training time and minimize travel time.
6) Each alternative must support future mission expansion.

Alternatives eliminated from further evaluation are discussed in **Section 2.5**. Alternatives that were determined to be feasible were carried forward for further analysis in **Chapter 3**.

2.3 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action identifies additional areas on Nellis AFB to accommodate facility and infrastructure requirements and to allow for tiered future analysis for the anticipated increase in space requirements. As discussed in **Chapter 1**, the DoD plans to acquire 5th Gen F-35 aircraft for the DAF and other branches of the DoD between FY 2007 and 2034. It is anticipated that a portion of these aircraft would be assigned to Nellis AFB. The potential addition of new missions and basing of 5th Gen aircraft at Nellis AFB would increase the number of active-duty and civilian personnel who live and work on Nellis AFB over the next decade. For planning purposes, Nellis AFB anticipates that the growth and expansion of mission capabilities would result in the future addition of approximately 2,500 mission personnel to Nellis AFB phased over the next 10 years, requiring tiered future analysis as projects are identified. Although the exact number of personnel to support future missions is unknown at this time, approximately 2,500 mission personnel were used as a planning number in **Section 3.12** for the infrastructure and transportation analyses.

In order to address the requirements needed to support current and future mission structure changes and the associated potential increase in mission personnel, the DAF is proposing two alternatives to gain functional capacity and support future mission growth at Nellis AFB: Alternative 1, Complete Development, and Alternative 2, Partial Development. All of the eventual development would comply with applicable federal, state, and local regulations to include the most current Nellis AFB Installation Facilities Standards. The two alternatives to support future development on the east side of Nellis AFB are discussed in greater detail in **Section 2.4**.

2.4 DESCRIPTION OF ALTERNATIVES

The Proposed Action includes development of the east side of Nellis AFB to address current mission constraints with the potential to impact long-term planning objectives and potential future DAF mission requirements. The majority of land available for future development is located in the undeveloped area on the east side of the Installation. The proposed land use categories have been sited based on functional use (e.g., areas adjacent to the flightline proposed for development would be compatible with aircraft noise). Areas with similar uses and mission functions have been co-located. For planning purposes, the DAF grouped similar mission activities into eight categories based on facility and infrastructure function and conservatively estimated the anticipated area of each functional use category (**Table 2-1**). Correspondingly, the DAF developed alternatives for the Proposed Action by placing functional use categories within the east-side development area consistent with current land use and development plans, including the Airfield District Plan and Installation Development Plan, and mission visions and goals.

Table 2-1
Functional Use Categories

Functional Use Category	Typical Mission Functions
1. Airfield Operations/Industrial/Light Industrial	Airfield and areas surrounding the airfield, launch support facilities, hangars, aircraft maintenance, control towers, passenger terminals, simulator facilities, repair and maintenance facilities, warehouses and storage facilities, engineering and maintenance shops, vehicle storage facilities, vehicle filling stations, and fire stations
2. Administrative/Small-scale Administrative	Command posts, legal offices, administrative offices, satellite command and control facilities, indoor training and academic/educational facilities, communication facilities, security forces operations, and military and family readiness facilities
3. Medical/Community Services/Community Commercial/Small-Scale Retail and Service	Clinics, hospitals, dental services, pharmacies, and veterinary services
4. Lodging/Residential (Accompanied and Unaccompanied)	Dormitories (enlisted/officer bachelor housing), privatized housing, military family housing (single-family and multi-family), and temporary lodging facilities
5. Outdoor Recreation/Open Space/Training Space	Undeveloped land in natural conditions not intended for future development and with minimal maintenance requirements; areas designated as undeveloped land due to natural or operational constraints such as floodplains, wetlands, explosive safety quantity-distance arcs, and airfield clear zones; training functions including maneuver areas, firing ranges, and drop zones; outdoor recreational areas; and other open space regularly maintained for outdoor activities
6. Transportation	New paved roadways and security gate areas
7. Utilities/Infrastructure	Underground utility lines such as transmission, electric, water, telecommunication, wastewater, natural gas, and wastewater lines; power substations; solar farms; wastewater treatment plants, water towers, and regional pump stations; water purification systems; detention basins; and security fences
8. Existing Pavements	Existing paved surfaces such as runways, taxiways, aprons, ramps, and overruns

2.4.1 Determination of Functional Categories

Nellis AFB examined patterns of existing land use on the west side of the Installation in order to develop the functional categories included as part of the Proposed Action. Often, similar mission functions are grouped together to improve efficiency and allow for ready collaboration. Further, the location of functional areas on Nellis AFB is often determined by the required proximity to specific resources, such as the airfield.

For example, aircraft maintenance, hangars, and launch support facilities are grouped together because they all must be located adjacent to the airfield and they are compatible with the existing noise environment. Similarly, commercial and community services facilities are typically located close to lodging and residential facilities, as are outdoor recreation and open spaces. The DAF considered existing land use patterns and mission functions to develop the eight functional categories (**Table 2-1**).

The Proposed Action incorporates the planning considerations addressed in Nellis AFB planning documents, including the IDP and Area Development Plans (ADPs) for the Airfield District and Flightline District, as required by AFI 32-1015, *Integrated Installation Planning*. For example, the Proposed Action adheres to project-specific development standards, including land use constraints for the eventual siting of new facilities, and regulated design parameters such as height, scale, and orientation. When appropriate, the standards and component plans of the applicable ADPs are discussed and referenced throughout this PEIS. Land analyzed in this PEIS is not currently permitted for development through the existing PLO and was not included in the IDP. A PLO modification to allow for future development on the east side of Nellis AFB is in process. This PEIS analyzes additional areas outside the boundaries of the current IDP and ADP areas.

The planning principles set forth in AFI 32-1015 and included in the IDP are also incorporated into the Proposed Action by design. These principles set objectives for sustainable development, including guidelines and requirements for land, water, and energy conservation.

Components of the district plans and Installation-wide plans, such as those for transportation, energy, and natural and cultural resources management, implement design and development standards and requirements at the Installation level. Those measures that serve to prevent or reduce adverse environmental impacts would be incorporated into the Proposed Action by design and are described in this PEIS, where appropriate.

2.4.2 Alternative 1 – Preferred Alternative (Complete Development)

Alternative 1 designates functional use categories for the complete development of the east side of Nellis AFB to accommodate current and future mission needs. Alternative 1 would fully utilize this undeveloped area, covering 2,000 acres, to identify areas for the future construction of facilities and infrastructure required to meet current and future mission needs over the next decade. Alternative 1 identifies areas for airfield operations and light industrial uses, administrative uses, lodging/residential uses, and community service uses to improve mission readiness. Additional areas for transportation and utility infrastructure have been identified to accommodate the eventual development. Alternative 1 would also include areas for dedicated open space used for morale, welfare, recreation, and training by personnel and their families.

Table 2-2 lists the functional use categories included under Alternative 1 and the approximate total acreage dedicated to each category. **Figure 2-1** shows the boundaries of Alternative 1 with its associated functional use categories.

2.4.3 Alternative 2 – Partial Development

Alternative 2 designates functional use categories for the partial development of the east side of Nellis AFB to accommodate current and future mission needs. While Alternative 2 would result in a reduced development footprint (1,486 acres), it would still address the 99 ABW's current mission constraints. Alternative 2 would allow the Installation to meet mid-term requirements for future growth and would provide access to airfield, industrial, and administrative areas for personnel working on the east side of the Installation. This alternative does not include space for new lodging/residential uses or space for outdoor recreation, training and community services. In addition, the areas designated for transportation and utility infrastructure would be smaller than those areas under Alternative 1.

Table 2-3 lists the functional use categories included under Alternative 2 and the approximate total acreage dedicated to each category. **Figure 2-2** shows the boundaries of Alternative 2 with its associated functional use categories.

Table 2-2
Summary of Alternative 1

Functional Use Category	Example Projects	Estimated Total Area (acres)
1. Airfield Operations/Industrial/Light Industrial	Aprons, taxiways, ramps, traffic and cargo deployment function terminal, hangars, wash racks, aerospace ground equipment facilities, wheels and tire shops, vehicle and engine maintenance facilities, warehouses, storage facilities, and gasoline stations	866
2. Administrative/Small-scale Administrative	Simulators; training facilities; auditoriums; administrative facilities; operation facilities; and security forces, armory, and canine facilities	351
3. Medical/Community Services/Community Commercial/Small-scale Retail and Service	Fitness center and running track, shopette, dining facilities, food court, commissary, and Base Exchange	120
4. Lodging/Residential (Accompanied and Unaccompanied)	Dormitories	37
5. Outdoor Recreation/Open Space/Training Space	Parks, playgrounds, sport courts, park areas, and a drop zone training area	261
6. Transportation	New paved roads and expansion of security gates and entry areas	59
7. Utilities/Infrastructure	Utility corridors for electricity, water, natural gas, communications, and sewer/wastewater; expansion of stormwater drainage canal; water tank; stormwater retention pond; de-arsenic plant; water purification plant; liquid oxygen plant; pumpstations; and utility pads	224
8. Existing Pavements	Improvements/maintenance of existing aprons, taxiways, ramps, roads, parking lots, and stormwater drainage canal; and installing structures on existing paved surfaces such as aircraft noise abatement, aircraft covered and parking areas	82
Total		**2,000**

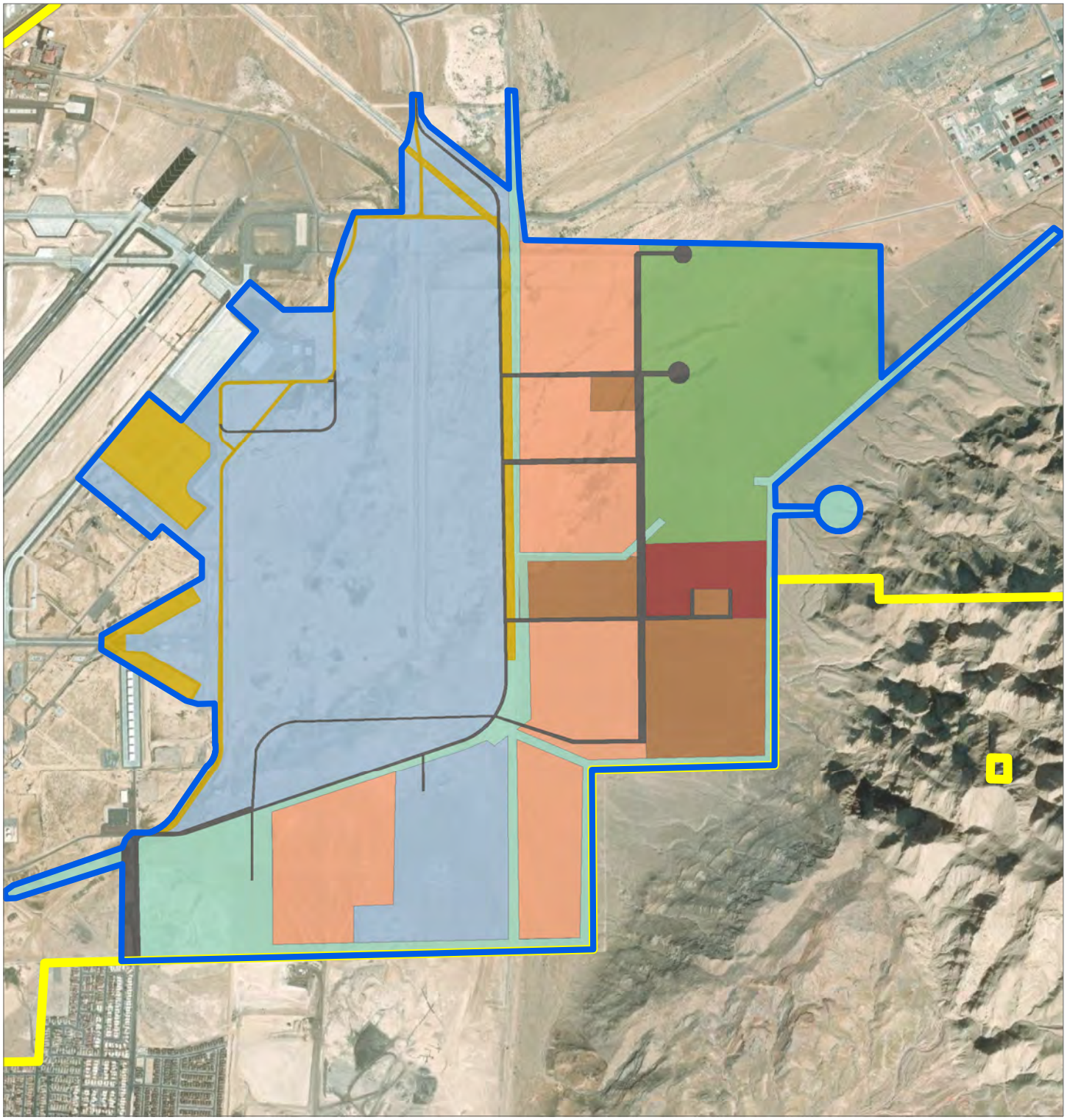

FIGURE 2-1
Alternative 1 – Complete Development Project Area with Functional Categories

Table 2-3
Summary of Alternative 2

Functional Use Category	Example Projects	Estimated Total Area (acres)
1. Airfield Operations/Industrial/Light Industrial	Aprons, taxiways, ramps, traffic and cargo deployment function terminal, hangars, wash racks, aerospace ground equipment facilities, wheels and tire shops, vehicle and engine maintenance facilities, warehouses, storage facilities, and gasoline stations	866
2. Administrative/Small-scale Administrative	Simulators; training facilities; auditoriums; administrative facilities; operation facilities; and security forces, armory, and canine facilities	232
3. Medical/Community Services/Community Commercial/Small-scale Retail and Service	Fitness center and running track, shopette, dining facilities, food court, commissary, and Base Exchange	40
4. Lodging/Residential (Accompanied and Unaccompanied)	Dormitories	N/A
5. Outdoor Recreation/Open Space/Training Space	Parks, playgrounds, sport courts, park areas, and a drop zone training area	N/A
6. Transportation	New paved roads and expansion of security gates and entry areas	45
7. Utilities/Infrastructure	Utility corridors for electricity, water, natural gas, communications, and sewer/wastewater; expansion of stormwater drainage canal; water tank; stormwater retention pond; de-arsenic plant; water purification plant; liquid oxygen plant; pumpstations; and utility pads	221
8. Existing Pavements	Improvements/maintenance of existing aprons, taxiways, ramps, roads, parking lots, and stormwater drainage canal; and installing structures on existing paved surfaces such as aircraft noise abatement, aircraft covered and parking areas.	82
Total		**1,486**

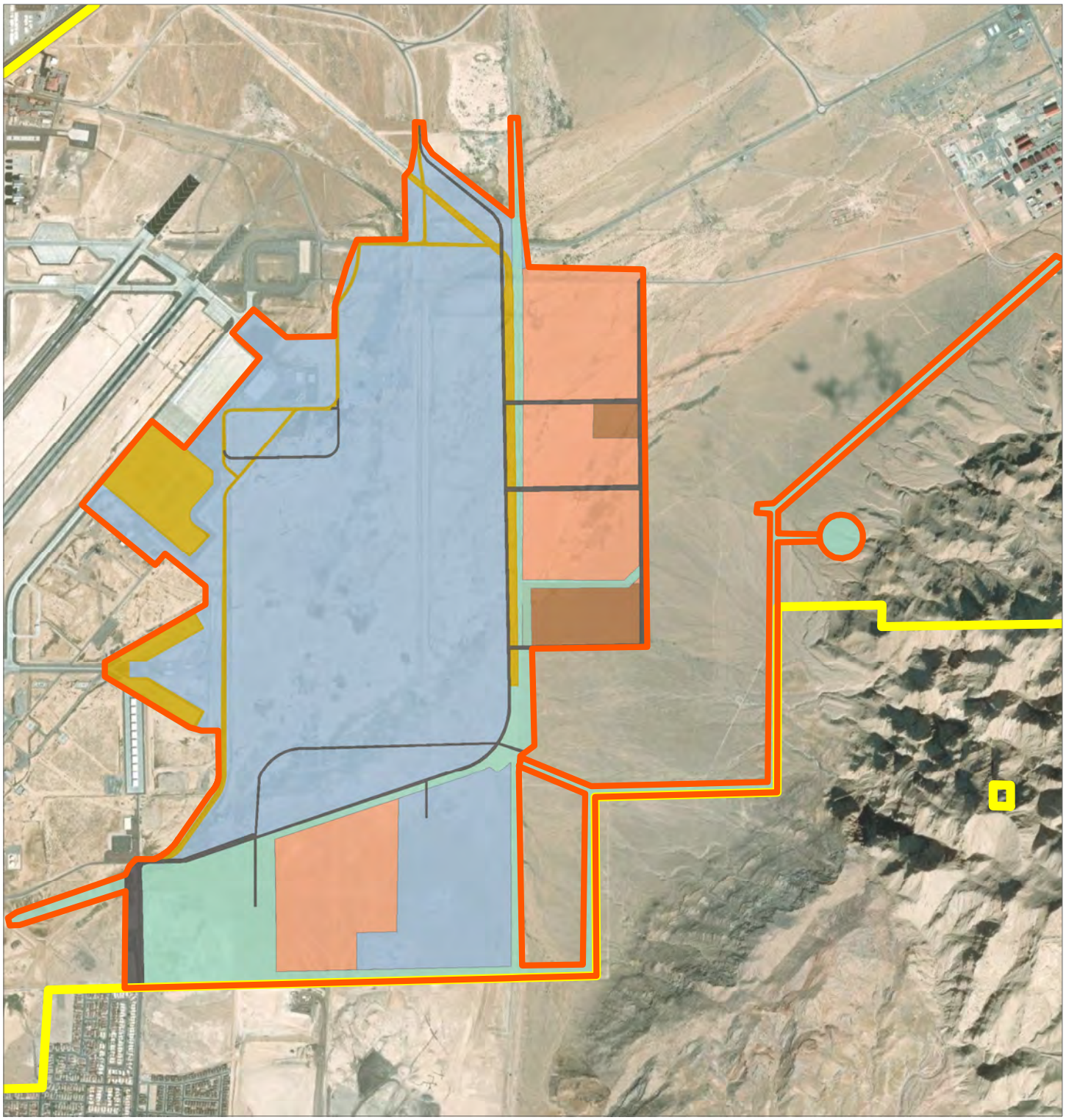

FIGURE 2-2
Alternative 2 – Partial Development Project Area with Functional Categories

- Alternative 2
- Installation Boundary
- Administrative/Small-scale Administrative
- Airfield Operations/Industrial/Light Industrial
- Existing Pavements
- Medical/Community Services/Community Commercial/Small-scale Retail
- Transportation (Proposed)
- Utilities/Infrastructure

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

2.4.4 No Action Alternative

No action is the absence of action and is not static. This means that an action would not take place. The resulting environmental effects from taking no action have been compared to the effects of implementing the action alternatives over time. Analysis of this alternative provides a baseline against which decision-makers can compare the environmental effects resulting from the action alternatives. Under the No Action Alternative in this PEIS, development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing facilities and infrastructure as personnel and missions continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB would be insufficient to meet future DAF and DoD mission requirements and would require current missions to continue to operate in substandard facilities.

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

2.5.1 Sustainment Alternative

The Sustainment Alternative was developed to address known facility deficiencies in the Airfield District in order to sustain the facilities and ensure that mission capability is not degraded. Under this alternative, areas designated for construction, demolition, and renovation actions would be concentrated on the west side of the airfield and would include those east-side activities that are already planned or underway.

This alternative was dismissed because it does not meet Selection Standards 1, 2, and 6 as described in **Section 2.2**. While the Sustainment Alternative would not degrade current mission capabilities, it would not identify future opportunities for significant modernization and would fail to plan for mission expansion. This alternative would not meet the purpose of and need for the Proposed Action because the Airfield District would be unable to meet future operational capacity.

2.5.2 Minimal Development Alternative

The Minimum Development Alternative was developed to address known facility deficiencies and provide Nellis AFB with areas to meet the minimum facility and space requirements to accomplish its short-term mission goals. Under this alternative, mid- and long-term mission growth and capacity issues on Nellis AFB would not be addressed. This alternative focused on utilizing existing facilities where possible and designating areas for the future construction of mission support facilities and infrastructure that are currently not available. This alternative was dismissed because it does not meet Selection Standards 1, 2, and 6 as described in **Section 2.2**. This alternative would not support the purpose of the Proposed Action because it would not provide areas to allow for future operational growth in support of mission activities, remedy existing facility and infrastructure deficiencies, or support future mission expansion, as it would only address short-term mission requirements.

2.5.3 Complete Development Including Leasing Off-Installation Facilities

The Complete Development Including Leasing Off-Installation Facilities Alternative was developed to address known facility deficiencies providing facility and space requirements to accomplish its short-,mid-, and long-term mission goals. This alternative would be similar to Alternative 1 but would acquire administrative and training space through off-Installation leasing actions. This alternative was dismissed because it does not meet Selection Standards 3, 4, 5, and 6 as described in **Section 2.2**. Specifically, using off-Installation facilities would increase response and travel times for personnel, would increase inefficiencies by preventing consolidation of mission functions, and would not meet DAF and DoD requirements for security and anti-terrorism/force protection (AT/FP).

2.6 PERMITS, LICENSES, AND OTHER AUTHORIZATIONS

Table 2-4 lists permits, licenses, and other authorizations required for implementation of the Proposed Action and Alternatives, including proposed projects identified for implementation in the future. This list reflects readily available known requirements but may not be comprehensive based on the programmatic approach to this PEIS. As additional project details become available, authorization requirements would be outlined in separate NEPA analysis. Regulatory requirements are also outlined in the Affected Environment sections for each resource area discussion within **Chapter 3**.

Table 2-4
Permits, Licenses, and Other Authorizations

Resource Area	Agency	Requirement
Air Quality	Clark County Department of Air Quality and Environmental Management	Obtain a dust control permit for construction activities that involve: • soil-disturbing or construction projects greater than or equal to 0.25 acre, • trenching greater than or equal to 100 feet in length, or • mechanical demolition of any structure larger than or equal to 1,000 ft^2.
Air Quality	Clark County Department of Air Quality and Environmental Management	Submit a dust mitigation plan in conformance with Section 94 of the Clark County Air Quality Regulations for construction sites greater than 0.25 acre.
Air Quality	Clark County Department of Air Quality and Environmental Management	Submit annual emissions inventory reports and adhere to emissions limits and monitoring processes for permitted stationary sources in compliance with Nellis AFB's Title V permit (Part 70 Operating Permit, Source ID 114, 99th Civil Engineer Squadron, Nellis AFB, expires 14 June 2026).
Earth Resources and Water Resources	United States Environmental Protection Agency	Comply with *Energy Independence and Security Act* requirements to maintain or restore to predevelopment hydrology conditions.
Earth Resources	Clark County Department of Public Works	Obtain a grading or building permit, including grading plan submittal, for surface disturbances involving grading.
Water Resources; Infrastructure, Including Transportation and Utilities	National Pollutant Discharge Elimination System (NPDES), Section 402 of the *Clean Water Act*, as administered by Nevada Department of Environmental Protection	Comply with Municipal Separate Storm Sewer System permit NV-0021911 for stormwater management.
Water Resources	NPDES, Section 402 of the *Clean Water Act*, as administered by Nevada Department of Environmental Protection	Obtain a NPDES permit for discharges into navigable waters.

Resource Area	Agency	Requirement
Biological Resources	United States Fish and Wildlife Service	Adhere to the terms of the Programmatic Biological Opinion, as developed under Section 7 of the Endangered Species Act, for impacts to biological resources (see **Section 3.8.2**).
Cultural Resources	Nevada State Historic Preservation Office	Consult on undertakings with the potential to impact historic resources in accordance with Section 106 of the National Historic Preservation Act.
Infrastructure, Including Transportation and Utilities	United States Environmental Protection Agency	Obtain a Construction Stormwater General Permit, including development of a site-specific best management practices.
Infrastructure, Including Transportation and Utilities	Nevada Division of Environmental Protection	Obtain a Construction Stormwater Nevada General Permit NVR100000, which requires construction of stormwater culverts, open-top flumes, and stormwater management features to control stormwater rate.
Infrastructure, Including Transportation and Utilities	Nevada Division of Environmental Protection	Obtain and comply with the Nevada Multi-Sector General Permit requirements (Industrial Stormwater Permit NVR05000).

NPDES = National Pollutant Discharge Elimination System

2.7 COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Table 2-5 summarizes the potential impacts of the Proposed Action and Alternatives. The summary is based on information discussed in detail in **Chapter 3** of this PEIS and includes a concise definition of the issues addressed and the potential environmental impacts associated with each alternative.

Table 2-5
Summary of Environmental Consequences

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
Land Use	Under the No Action Alternative, there would be no changes to land use in the Region of Influence (ROI) beyond baseline conditions; land use within the Proposed Action area, which is currently designated as Airfield and Open Space, would remain unchanged from current conditions. No additional space would be designated for development to meet future mission requirements, including space for transportation and utility infrastructure, administrative facilities, airfield operations facilities, lodging, community support facilities, and other uses.	Alternative 1 would designate up to 2,000 acres of land on the east side of the Installation for various development purposes. This includes future facilities for administration, utilities, housing, medical services, and recreation. Expansion of DAF operations under Alternative 1 would occur east and southeast of the current runway. The majority of the land (1,261 acres) is currently unused, designated as Open Space, and managed by the US Bureau of Land Management (BLM) but withdrawn for military use. Development under Alternative 1 would permanently change the designation of this land. Implementation of Alternative 1 would result in long-term, adverse impacts that would not be significant to land use due to the conversion of Open Space to developed areas. Nellis AFB would explore ways to adjust training exercises or operations to minimize their impact on sensitive areas within the BLM-withdrawn land. This could involve designating specific training zones to avoid critical habitats, implementing seasonal restrictions for construction and operational activities, or other activities to minimize impacts to the natural resources located within withdrawn land.	Alternative 2 would provide designated space for some of the same functional use categories as Alternative 1 within a total footprint of 1,486 acres. A total of 888 acres of BLM lands withdrawn for military use would be designated for permanent development with implementation of Alternative 2. Unlike Alternative 1, Alternative 2 would not designate any areas for Open Space functional use or Lodging/Residential use. Alternative 2 would also provide for a reduced total footprint for Medical/Community Services/Community Commercial/Small-Scale Retail compared to Alternative 1 (110 acres versus 33 acres). Implementation of Alternative 2 would result in long-term, adverse impacts to land use at Nellis AFB that would not be significant.
Air Quality and Climate Change	Under the No Action Alternative, there would be no changes to air quality resources in the ROI beyond baseline conditions.	Alternative 1 would not lead to significant adverse impacts to ambient air quality or human health. However, there may be short-term, adverse impacts to air quality that would not be significant during future	Air quality impacts from implementation of Alternative 2 would be similar to those under Alternative 1 but would be reduced due to the reduced size and activity of the development footprint.

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		construction activity due to increased emissions from construction equipment. Emissions from Alternative 1 development activities would occur over a 7-year period, but none of the pollutants for which the area is in nonattainment would exceed General Conformity *de minimis* thresholds. Additionally, levels of sulfur dioxide and fine inhalable particulate matter ($PM_{2.5}$) would not exceed the comparative indicator thresholds. Significant exposures to ground-level pollutants by sensitive receptors due to pollutant migration would be unlikely given the characteristics of the construction activity, the distance from the activities to the receptor locations, and seasonality of wind direction. Accordingly, implementation of Alternative 1 would not be anticipated to result in significant, adverse impacts to ambient air quality or human health. Short-term, adverse impacts to air quality that would not be significant would be anticipated to occur during future construction as a result of an increase in emissions from construction equipment. BMPs to be implemented in accordance with Clark County Air Quality Regulations include, but are not limited to: • Stabilize soil prior to, during, and after cut and fill activities. • Apply water to stabilize disturbed soil throughout the construction site. • Limit vehicle traffic and disturbance on soils where possible. • Limit the size of staging areas. • Apply water to surface soils where support equipment and vehicles will be operated.	

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
Earth Resources	Under the No Action Alternative, there would be no changes to earth resources in the ROI beyond baseline conditions. Consequently, the anticipated benefits of enhanced stormwater drainage, particularly in reducing soil erosion and sedimentation, would not be realized.	Under Alternative 1, development activities would alter the surface topography of Nellis AFB, resulting in the future creation of up to 1,480 acres of impervious surfaces and potential grading impacts on additional areas. While future grading activities could affect existing slopes, the predominantly flat nature of the Proposed Action area suggests minimal alteration to underlying geology and topography. Soil disturbance, covering up to 1,480 acres may elevate the risk of erosion and sedimentation during heavy rainfall, particularly in areas with high runoff potential. Implementing best management practices (BMPs) during and after construction, including stormwater management measures, would help mitigate these effects. Long-term, beneficial impacts to stormwater infrastructure would also occur under Alternative 1 through future stormwater drainage improvements such as the future construction of a reinforced berm designed to divert stormwater from Sunrise Mountain toward the proposed expansion of the flood control basin by the Clark County Regional Flood Control District, which would help to reduce the potential for sedimentation and erosion that would occur as a result of soil disturbance. Implementing mitigation measures during and after future construction, including stormwater management measures, would help mitigate these effects. Mitigation measures could include the following: • Minimize the total disturbed area during future construction and development. • Cluster future construction within the functional use category thresholds (see **Section 2.4.1**). • Minimize soil compaction.	Development under Alternative 2 would result in the future creation of up to 1,216 acres of new impervious surfaces, with grading potentially altering existing slopes. Impacts under Alternative 2 would be anticipated to be the same as under Alternative 1, albeit on a smaller scale due to the reduced footprint.

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		• Implement design standards to manage increases in stormwater runoff and to limit opportunities for increased sedimentation and erosion. The Proposed Action would comply with the *Energy Independence and Security Act* (Public Law 110-140) and National Pollutant Discharge Elimination System permit requirements related to maintaining or restoring to predevelopment hydrology conditions.	
Water Resources	Under the No Action Alternative, stormwater issues in the ROI, such as flooding, sedimentation, and soil erosion, would persist. Groundwater and surface water would remain unchanged.	Alternative 1 would result in no impacts to surface waters. The future addition of up to 1,480 acres of impervious surfaces would be anticipated to result in a short-term increase in stormwater contamination from future construction activities. There would also be the potential for long-term impacts to stormwater as a result of increased contamination from operational uses on developed land. The future addition of up to 1,480 acres of impervious surfaces would result in increased runoff; however, under Alternative 1, the DAF would make future improvements to stormwater infrastructure that would help to manage stormwater flow and flooding. Impacts to groundwater would include the potential for contamination during future construction and operation from stormwater runoff or chemical use. However, deep groundwater resources would be unlikely to be impacted due to depth and the implementation of BMPs. Future construction would occur within areas that are designated as floodplains by the Colorado State University Center for Environmental Management of Military Lands but are not designated as floodplains by the Federal Emergency Management	Future development under Alternative 2 would result in up to 1,216 acres of new impervious surfaces, potentially resulting in a short-term increase in stormwater contamination and runoff and groundwater contamination. Impacts under Alternative 2 would be anticipated to be the same as under Alternative 1, albeit on a smaller scale due to the reduced footprint.

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		Agency. Accordingly, future construction within the floodplain would adhere to applicable regulations as defined by Nellis AFB and the Clark County Regional Flood Control District. Impacts to water resources under the Proposed Action and Alternatives would be managed, to the extent possible, through the use of mitigation measures that could include the following: • Minimize the total disturbed area during future construction and development. • Cluster future construction within the functional use category thresholds defined in **Section 2.4.1**. • Minimize soil compaction. • Implement design standards to manage increases in stormwater runoff and to limit opportunities for stormwater contamination. • Construct structures above the base-flood elevation, dry- or wet-proof foundations, and use permanent tie-downs of non-structural equipment such as propane tanks or wash racks. • Establish a proper connection between the stormwater channel to the Clark County Regional Flood Control District retention pond. • Implement development designs that support the flow of stormwater runoff and containment. • Conduct ongoing maintenance of existing stormwater channels.	
Biological Resources	Under the No Action Alternative, the current ecological state in the ROI would remain unchanged beyond baseline conditions. Species considered sensitive or of greatest	Under Alternative 1, approximately 1,580 acres of native and non-native vegetation would have the potential to be removed during future development, including	Under Alternative 2, approximately 1,071 acres of native and non-native vegetation would have the potential to be removed during future development, including

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
	conservation need (SGCN) would not be affected. Impacts to the Mojave desert tortoise habitat and individual desert tortoises would not occur.	construction, grading, and laydown of equipment. Approximately 715 acres, or 56 percent, of the Parry's Saltbush Wet Shrubland Alliance vegetation that occurs on Nellis AFB would have the potential to be removed during project implementation. Under Alternative 1, the DAF would remove approximately 559 acres, or about 10 percent, of the Creosotebush-Burrobush Bajada and Valley Desert Scrub Alliance vegetation association on Nellis AFB, resulting in significant, long-term, adverse impacts to native vegetation. Populations of small mammals and reptiles in the Proposed Action area would be lost during vegetation removal as a result of mortality during land clearing. Species that are considered sensitive by the BLM and SGCN by the state of Nevada that could be affected by the loss of habitat include the desert horned lizard, desert iguana, Great Basin collared lizard, long-tailed brush lizard, and Mojave sidewinder. Approximately 1,000 acres of Mojave desert tortoise habitat would be disturbed under Alternative 1. The estimated 982 acres of the 1,000 acres of desert tortoise habitat that would be disturbed from implementation of Alternative 1 would be covered by the Programmatic Biological Opinion (PBO), provided the DAF implements all terms and conditions and reporting requirements in the PBO. It is expected that an unknown number of small tortoises and tortoise eggs may not be found and would be killed during ground-disturbing activities, which would be allowable under the incidental take provision of the PBO. Conducting preconstruction surveys and installing tortoise-proof fencing around the project area would be expected to prevent injuries or mortality of adult	construction, grading, and laydown of equipment. Approximately 681 acres, or 53 percent, of the Parry's Saltbush Wet Shrubland Alliance vegetation that occurs on Nellis AFB would have the potential to be removed during project implementation. Under Alternative 2, the DAF would remove approximately 212 acres, or about 4 percent, of the Creosotebush-Burrobush Bajada and Valley Desert Scrub Alliance vegetation association on Nellis AFB, resulting in significant, long-term, adverse impacts to native vegetation. Impacts to wildlife under Alternative 2 would be the same as those under Alternative 1, albeit on a smaller scale as a result of the reduced development footprint. Approximately 487 acres of Mojave desert tortoise habitat would be disturbed under Alternative 2. The estimated 487 acres of desert tortoise habitat that would be disturbed from implementation of Alternative 2 would be covered by the PBO, provided the DAF implements all terms and conditions and reporting requirements in the PBO. It is expected that an unknown number of small tortoises and tortoise eggs may not be found and would be killed during ground-disturbing activities, which would be allowable under the incidental take provision of the PBO. Conducting preconstruction surveys and installing tortoise-proof fencing around the project area would be expected to prevent injuries or mortality of adult tortoises. The DAF has determined that the adverse effects of the Proposed Action under Alternative 2 on the desert tortoise from development of tortoise habitat and potential translocation of several adult desert tortoises was fully evaluated through Section 7 consultation with the USFWS in 2023 as documented in

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		tortoises. The DAF has determined that the adverse effects of the Proposed Action under Alternative 1 on the desert tortoise from development of tortoise habitat and potential translocation of several adult desert tortoises was fully evaluated through Section 7 consultation with the US Fish and Wildlife Services (USFWS) in 2023 as documented in the PBO. Potential adverse impacts to desert tortoises would be minimized through the implementation of the conservation measures and requirements in the PBO.	the PBO. Potential adverse impacts to desert tortoises would be minimized through the implementation of the conservation measures and requirements in the PBO.
Cultural Resources	Under the No Action Alternative, there would be no changes to cultural resources in the ROI beyond baseline conditions.	Implementation of Alternative 1 would have the potential to result in adverse effects to cultural resources. In keeping with the programmatic nature of this Environmental Impact Statement, consultation with the Nevada State Historic Preservation Officer (SHPO) would occur in the future on a project-by-project basis prior to beginning construction. There is currently no Programmatic Agreement between Nellis AFB and the SHPO, nor is one in development. The following historic resources would have the potential to experience direct visual effects under Alternative 1: • Red Flag Historic District, including Building (B-) 222, B-224, B-226, B-228, B-201, and B-220 • Thunderbirds Hangar (B-292) Archaeological sites CK11269 and S1827 are awaiting SHPO eligibility determination. Should an “Adverse Effect” determination be made by Nellis AFB, Base personnel will consult with SHPO to develop and evaluate alternatives or modifications to the undertaking that avoid, minimize, or mitigate the adverse effects. Mitigation measures would be identified on a project-by-project	Impacts to cultural resources under Alternative 2 would be anticipated to be the same as those described under Alternative 1.

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		basis should the Nevada SHPO make an adverse effect determination for any historic architectural or archaeological properties.	
Noise	Under the No Action Alternative, there would be no changes to the noise environment, which is dominated by aircraft-related noise, beyond baseline conditions.	Noise under Alternative 1 would not be anticipated to result in significant impacts to noise-sensitive receptors. The residential community of Sunrise Manor, as well as Sunrise Mountain High School, Dr. William H. "Bob" Bailey Middle School, and Liliam Lujan Hickey Elementary School would remain under elevated noise contours generated by ongoing aircraft operations. Operation of the future support facilities would not result in significant impacts to the existing noise environment. Operations and maintenance activities associated with the proposed development would result in intermittent noise that would be indistinguishable from the noise generated by ongoing aircraft operations. There would be no change in the number or types of aircraft, flight training, or associated ground-based training currently occurring at Nellis AFB under Alternative 1. Mitigation measures to minimize noise impacts could include limiting construction activities to daylight hours (7 a.m. to 6 p.m.).	Impacts to noise under Alternative 2 would be anticipated to be the same as those described under Alternative 1.
Hazardous Materials and Waste, Toxic Substances, and Contaminated Sites	Under the No Action Alternative, there would be no development on the east side of Nellis AFB. While this would avoid introducing new hazardous materials, existing hazardous waste management issues, such as debris from illegal dumping and hazardous waste sites, would remain unresolved, posing a continued threat. Increased personnel and evolving missions at Nellis AFB would further strain existing facilities. As capacity limitations become more severe, managing hazardous materials and wastes could become a challenge. This could lead to:	Under Alternative 1, the eventual use of hazardous materials during future construction would be anticipated to result in short-term, adverse impacts that would not be significant. Hazardous wastes encountered during future excavation or grading activities during development could potentially expose construction and maintenance workers to potential hazards associated with contaminants. The use of certain petroleum products would be required during proposed development associated with Alternative 1. Short-term, adverse impacts that would not be significant would be anticipated to result from the use of	Impacts to hazardous materials and waste, toxic substances, and contaminated sites would be anticipated to be the same under Alternative 2 as Alternative 1.

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
	• improper disposal – Strained resources could increase the risk of improper disposal of hazardous materials, posing environmental and health risks; and • accidental releases – Inadequate storage facilities and crowded conditions could increase the likelihood of accidents or spills involving hazardous materials. Overall, while the No Action Alternative would avoid immediate disruption, it could exacerbate existing problems related to hazardous materials and waste management, potentially leading to future environmental and health risks.	petroleum products with implementation of Alternative 1. Asbestos-containing material, lead-based paint, or polychlorinated biphenyls (PCBs) encountered during future excavation or grading activities during development under Alternative 1 could potentially expose construction and maintenance workers to potential hazards associated with these materials. Per- and polyfluoroalkyl substances (PFAS) and perfluorooctane sulfonate are known to occur within the soils and groundwater in the northwest corner of the Proposed Action area. Eleven total aqueous film forming foam (AFFF) sites are known to occur within the flightline area, three of which occur within the Proposed Action area. Soil disturbance and excavation within these areas have the potential to expose construction workers to PFAS in a way that could lead to adverse human health impacts. Three Environmental Restoration Program (ERP) sites, SS028, SS046, and L-13, are located within the Proposed Action area. Soil excavation occurring within the boundaries of these ERP sites under Alternative 1 would not be anticipated to result in any adverse impacts because no known soil contamination is associated with these sites. Short-term, adverse impacts to these sites that would not be significant would be anticipated to occur with implementation of Alternative 1. Impacts to this resource area resulting from the Proposed Action would be managed, to the extent possible, through the use of BMPs that could include the following:	

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		• Coordinate with the Nevada Division of Environmental Protection (NDEP) regarding land use controls at L-13 prior to construction. • Identify the extent of PFAS-impacted soils for AT001P/AFFF Area #3, AT002P/AFFF Area #8, B-2069/AFF Area #5, and the fire training area prior to construction. • Characterize the unidentified debris dumped within the Proposed Project area prior to construction, and coordinate with NDEP to properly manage or dispose of any wastes that are identified. • Create and implement a soil and water management plan in compliance with NDEP requirements. • Implement measures to stockpile contaminated soils to prevent further impacts. • Adhere to the Nellis AFB Hazardous Waste Management Plan, Lead-Based Paint Management Plan, and Asbestos Management and Operations Plan. Development under Alternative 1 would require the future construction of approximately 43,000 linear feet of water main line . Potable water demand under Alternative 1 would increase by approximately 0.3 million gallons per day, an increase of 18 percent. Future construction occurring under Alternative 1 would have the potential to further strain the long-term potable water availability on Nellis AFB, resulting in long-term, adverse impacts to the potable water supply that would not be significant.	

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)

Infrastructure, Including Transportation and Utilities	Under the No Action Alternative, there would be no changes to utilities or infrastructure improvements in the ROI beyond baseline conditions. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Beneficial impacts from stormwater infrastructure improvements would not occur under the No Action Alternative. Demand for current facilities and infrastructure would continue to outpace capacity.
	
	Several locations would experience an unacceptable level of service with future projected growth under the No Action Alternative. Additionally, the Hollywood Gate would continue to remain closed. The volume of traffic at the existing four gate entrances would continue to increase in relation to the 10-percent increase in personnel, and these gates would continue to be inadequate to support anticipated growth.
		To decrease potable water demand, the following measures are considered for mitigation:
		
		• Ensure proposed landscaping design is water efficient.
		• Ensure low-flow plumbing fixtures are integrated into the design of the new facilities.
		• Eliminate potable water for outdoor use/irrigation.
		• Curtail waste by minimizing unrecoverable potable water losses:
		  ○ termination of the Area II flushing system with a looped system that would connect the existing water supply lines from Areas I and II,
		  ○ implementation of hardening strategies for the water distribution system, including a deeper burial of distribution pipes,
		  ○ improving the overall management of the distribution system by installation of a Supervisory Control and Data Acquisition system.
		
		Approximately 25,000 linear feet of sewage piping would be required to support development under Alternative 1. Overall, changes in regional demand would be minimal and the wastewater treatment system would have the capacity required to meet increased demands under Alternative 1.
		
		Stormwater rate control would be managed within the Proposed Action area by the construction of stormwater culverts, open-top flumes, and other stormwater management features per Nevada General Permit NVR100000. A stormwater detention facility would be constructed on the
			Impacts to infrastructure, including transportation and utilities, under Alternative 2 would be anticipated to be generally the same as under Alternative 1, albeit on a smaller scale. Future improvements to infrastructure to support development under Alternative 2 are described below.
			
			Development under Alternative 2 would require the future construction of approximately 41,000 linear feet of water main line.
			
			Approximately 23,000 linear feet of sewage piping would be constructed in the future to support development under Alternative 2.
			
			Alternative 2 would involve the same stormwater infrastructure improvements as Alternative 1.
			
			Development under Alternative 2 would increase electricity demand by 24 megawatts, approximately 15-percent less than development under Alternative 1. Electrical infrastructure upgrades would be the same as those described under Alternative 1.
			
			Approximately 70,000 linear feet of underground duct bank telecommunications infrastructure pathways would be required to support development under Alternative 2, or approximately 20 percent less than Alternative 1.
			
			Natural gas demand under Alternative 2 would increase by approximately 1.1 trillion British thermal units, or approximately 40 percent less than Alternative 1. Approximately 19,500 linear feet of natural gas lines would be required to support development under Alternative 2,

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		southwest corner of the Proposed Action area. A reinforced berm within the fence line would be constructed in the future to safely divert stormwater runoff from Sunrise Mountain around the Proposed Action area toward the proposed stormwater basin. Long-term, beneficial impacts to stormwater infrastructure would be anticipated to occur with implementation of Alternative 1. Development under Alternative 1 would increase electrical demand by 28 megawatts, requiring the installation of a new Nellis AFB-owned distribution South substation in the southeastern corner of the Proposed Action area; future construction of this substation would double the overall electricity capacity of the Installation to 80 megavolt-ampere. The future infrastructure improvements would ensure that the electrical system would have the capacity required to meet new demands under Alternative 1. Approximately 85,000 linear feet of underground duct bank telecommunications infrastructure pathways would be required to support development under Alternative 1. The future data/communications fiber optic system would originate from existing information transfer buildings B-1740 in Area I and B-10215 in Area II. These infrastructure improvements would ensure that the telecommunications system would have the capacity required to meet new demands under Alternative 1. Natural gas demand under Alternative 1 would increase by approximately 1.6 trillion British thermal units. Approximately 21,000 linear feet of natural gas lines would be installed in the future to support development. Changes in demand would not	approximately 7 percent less than Alternative 1. Alternative 2 would involve the same hydrant fuel infrastructure improvements as Alternative 1. Impacts to traffic at the gates were analyzed compared to the No Action Alternative; no significant queuing impacts at the gates would be expected under Alternative 2 with implementation of future improvements, including construction of Hollywood Gate. Traffic at the gates under Alternative 2 would be expected to improve when compared to the No Action Alternative. Improvements to the transportation infrastructure under Alternative 2 would be anticipated to maintain an acceptable level of service, and no significant adverse impacts to transportation infrastructure would occur.

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		be significant and the natural gas supply system would have the capacity required to meet new demands under Alternative 1. A new hydrant fuel system would be required to support development under Alternative 1 . Future construction would include 11,000 linear feet of 8-inch steel fuel lines and four 500,000-gallon (approximately 12,000-barrel each) tanks installed and connected to proposed flightline facilities for airframe use and interconnected with the existing system. Infrastructure improvements would ensure that the hydrant fuel system would have the capacity required to meet new demands under Alternative 1. Alternative 1 would require the development of a completely new transportation system to support development within the Proposed Action area, including the future extension of Ellsworth Avenue from its current end at O'Bannon Road to Hollywood Boulevard. Feeder roads connected to the extended Ellsworth Avenue would also be constructed. An anticipated 75 percent of the 2,500 personnel expected to be added to Nellis AFB over the next decade would live off Installation, resulting in an increase in total gate volume. Impacts to traffic at the gates were analyzed compared to the No Action Alternative; no significant queuing impacts at the Nellis AFB gates would be expected under Alternative 1 with implementation of the proposed improvements, including future construction of Hollywood Gate. Traffic at the gates under Alternative 1 would be expected to improve when compared to the No Action Alternative.	
Safety and Occupational Health	Under the No Action Alternative, there would be no change to safety conditions, including current explosive safety quantity-distance (ESQD) arcs, foreign object damage (FOD)	Three portions of the Clear Zone (CZ) totaling 5.41 acres overlap the Proposed Action area and 4.98 acres of APZ I overlap the Proposed Action area. Future	Impacts to safety and occupational health would be the same under Alternative 2 as Alternative 1.

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
	hazards, and bird/wildlife aircraft strike hazard (BASH) concerns, in the ROI beyond baseline conditions.	construction would not occur within the CZ, and future construction within the APZ would be in compliance with existing guidance. Future construction activities under Alternative 1, including those associated with Airfield/Industrial/Light Industrial functional uses, would take place in close proximity to the airfield. Debris associated with future construction of new facilities in this area would have the potential to create additional FOD hazards. Future construction activities would be conducted in accordance with the Nellis AFB FOD Prevention Program, which would help to prevent and minimize FOD incidents. Therefore, no significant impacts to ground safety would be anticipated to occur with implementation of Alternative 1. No changes to existing ESQD arcs would be anticipated to occur with implementation of Alternative 1. Should future construction include facilities that handle explosive materials and specified exposures, new ESQD arcs would be established in compliance with DAF regulations. There would be no changes to existing flight safety procedures; therefore, no impacts to flight safety would be anticipated to occur with implementation of Alternative 1. No BMPs or mitigation measures are recommended for impacts to safety and occupational health.	
Socioeconomics	Under the No Action Alternative, there would be no changes to the socioeconomic environment of the ROI beyond baseline conditions.	Alternative 1 would have the potential to result in short-term, beneficial impacts to income and employment in the ROI that would not be significant because of the temporary need for future construction personnel and the expenditures associated with implementing the Proposed Action. Alternative 1 would also have the potential	Impacts to socioeconomic resources under Alternative 2 would be largely the same as Alternative 1, albeit on a smaller scale. However, no dormitories would be constructed in the future , resulting in an increased demand for off-Installation housing as compared to Alternative 1.

	No Action Alternative	Alternative 1 (Proposed Action)	Alternative 2 (Partial Development)
		for long-term, beneficial impacts to income and employment that would not be significant from creating a small number of jobs needed to support the new development. A long-term, permanent, beneficial impact to housing availability on Nellis AFB would occur under Alternative 1 as a result of the construction of the dormitories. Alternative 1 would not be anticipated to impact educational resources in the ROI. No BMPs or mitigation measures are recommended for impacts to socioeconomics.	
Protection of Children	Under the No Action Alternative, there would be no potential for impacts to children in the ROI beyond baseline conditions.	Under Alternative 1, there would be no disproportionate, adverse impacts to children. The use of heavy construction equipment within the Proposed Action area would contribute to a temporary increase in fugitive dust emissions that could result in short-term impacts that would not be significant to air quality in the vicinity, including at Shadow Rock Park, Sunrise Mountain High School, Dr. William H. "Bob" Bailey Middle School, and Lilliam Lujan Hickey Elementary School. No BMPs or mitigation measures are recommended for impacts to children.	Impacts to children would be the same under Alternative 2 as under Alternative 1.

99 ABW = 99th Air Base Wing; AFB = Air Force Base; AFFF = aqueous film forming foam; B- = Building (as in B-224); BASH = Bird/Wildlife Aircraft Strike Hazard; BLM = Bureau of Land Management; BMP = best management practice; DAF = Department of the Air Force; ERP = Environmental Restoration Program; ESQD = explosive safety quantity-distance; FOD = foreign object damage; NDEP = Nevada Division of Environmental Protection; PBO = Programmatic Biological Opinion; PCBs = polychlorinated biphenyls; $PM_{2.5}$ = fine inhalable particles with diameters of 2.5 micrometers or smaller; ROI = Region of Influence; SGCN = species of greatest conservation need; SHPO = State Historic Preservation Officer; USFWS = US Fish and Wildlife Service

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CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This Master Plan PEIS uses a conservative approach to estimate the potential impacts resulting from future complete and partial development of the east side of Nellis AFB. The complete development scenario identified as Alternative 1 assumes that approximately 2,000 acres of the east side of Nellis AFB would be developed, while the partial development scenario identified as Alternative 2 assumes that approximately 1,486 acres would be developed. While no construction is proposed as part of this PEIS, the analysis herein reflects potential impacts to the environment should future construction occur within the footprint of each functional use category under each alternative. Future tiered NEPA analysis would be required to thoroughly identify and address impacts as projects ripe for near-term analysis are identified. To provide a framework for the analyses in this PEIS, the DAF defined a study area specific to each resource or sub-resource area. Referred to as a Region of Influence (ROI), these areas delineate a boundary where possible effects from the considered alternatives would have a reasonable likelihood to occur. Beyond these ROIs, potential adverse effects on resources would not be anticipated.

When relevant to the analyses in this PEIS, potential effects are further defined as direct or indirect; short- or long-term; and temporary, intermittent, or permanent. Based upon the nature of the Proposed Action and the affected environment, both qualitative and quantitative thresholds were used as benchmarks to qualify effects. Further, cumulative effects analysis considering the Proposed Action in conjunction with other past, present, and reasonably foreseeable environmental trends and planned actions are under each resource.

3.2 RESOURCES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

CEQ regulations state that federal agencies should "identify and eliminate from detailed study the issues which are not significant, or which have been covered by prior environmental review" (40 CFR § 1502.4(d)(1)). **Table 3-1** lists those resources that were not carried forward for analysis in this PEIS along with a brief rationale.

Table 3-1
Resources Not Carried Forward for Further Analysis

Resource Area Eliminated	Rationale
Airspace	The Proposed Action and Alternatives would not include changes to airspace, air training, or aircraft utilization. Therefore, analysis of airspace is not included in this PEIS.
Aircraft Noise	The Proposed Action and Alternatives would not include changes to airspace, air training, or aircraft utilization. Therefore, analysis of aircraft noise is not included in this PEIS.
Visual Resources	The Proposed Action and Alternatives would occur entirely within the boundaries of Nellis AFB within areas designated for military use. Future construction projects would be evaluated under separate NEPA analysis as more details become available, at which time potential impacts to visual resources would be considered. However, any future construction would adhere to DAF and Installation aesthetic requirements.

3.3 RESOURCES CARRIED FORWARD FOR DETAILED ANALYSIS

The following resources were carried forward for analysis: land use; air quality and climate change; earth resources; water resources; biological resources; cultural resources; noise; hazardous materials and waste, toxic substances, and contaminated sites; infrastructure, including transportation and utilities; safety and occupational health; and socioeconomics.

3.3.1 Cumulative Effects Framework

Federal agencies must consider potential environmental impacts resulting from "the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (10 CFR § 1508.1(i)(3)). Assessing cumulative impacts helps decision-makers understand how the environment is affected by multiple actions occurring within a specific spatial and temporal boundary. The assessment of cumulative impacts acknowledges that while the individual impacts of one action in a particular area or region may not be considered independently significant, the combination of numerous projects in a particular area may result in significant impacts. Cumulative impacts are more likely to occur when projects occur in a similar location or within a similar period.

In accordance with CEQ guidance, the significance of cumulative effects is described in comparison to the environmental baseline and, where applicable, relative to regulatory standards and thresholds. The analyses in **Sections 3.4–3.15** consider how the impacts of the actions in **Table 3-2** might affect or be affected by the Proposed Action and Alternatives, including the No Action Alternative. The analysis considers whether such a relationship would result in potentially significant impacts not identified when the Proposed Action is considered alone. The effects of past DoD actions listed in **Table 3-2** are reflected in baseline conditions described in **Sections 3.4–3.15**.

Relevant Past, Present, and Reasonably Foreseeable Future Actions

Cumulative effects refer to the combined effects of multiple actions, events, or stressors over time that result in changes to a system or environment. These effects can be categorized into direct and indirect effects (Federal Highway Administration [FHA], 2024). Direct effects are immediate and observable consequences that stem directly from a specific action or event. For instance, at Nellis AFB, a direct impact to safety resources could be an aircraft accident, equipment failure, or a security breach. These events directly affect safety resources by necessitating immediate responses, such as deploying emergency personnel, conducting investigations, or repairing damaged infrastructure.

Indirect effects, on the other hand, are less immediate and often result from a combination of factors or processes over time (FHA, 2024). For example, increasing operational tempo, heightened budget constraints, or changing environmental conditions can lead to indirect effects on safety resources. Indirect effects may include cumulative wear and tear on equipment, decreased morale among personnel due to high stress levels, or deferred maintenance due to budget constraints. While each individual factor may not cause an immediate impact on safety resources, their cumulative effect can gradually strain resources and increase the risk of safety incidents over time. Addressing both direct and indirect effects is essential for maintaining optimal safety standards at Nellis AFB, requiring proactive risk management strategies and resource allocation to mitigate potential risks and ensure the safety of personnel and operations.

When assessing and analyzing resource effects from cumulative effects, spatial and geographic limits are utilized to refer to the boundaries within which the combined effects of multiple projects, actions, events, or stressors would occur (FHA, 2024). These limits define the area over which cumulative effects are evaluated and may vary depending on the specific context and objectives of the assessment.

This PEIS evaluates actions occurring within the past 10 years through present day and includes reasonably foreseeable future projects. This temporal boundary assessed long-term trends to consider in order to provide a comprehensive understanding of cumulative effects over time. The geographical area for the evaluation of cumulative effects primarily was limited to Nellis AFB, as development under the Proposed Action would occur entirely within the boundaries of the Installation. However, where appropriate, projects outside of Nellis AFB with the potential to contribute to cumulative effects were also considered, such as the impact of regional transportation projects on air quality. This approach allows for a detailed analysis of the interactions between various activities and their effects within the defined spatial limits. Accordingly, **Table 3-2** identifies past, present, and reasonably foreseeable future actions that are evaluated as part of the cumulative effects analysis. For each of these actions, published environmental and planning documents were reviewed in order to determine their potential to result in cumulative impacts when considered in conjunction with the Proposed Action.

Table 3-2
Past, Present, and Reasonably Foreseeable Actions

Action	Description	Timeframe	Contributes to Cumulative Impacts?	Affected Resource Areas
Department of the Air Force Actions				
Final Environmental Assessment for the Beddown of Tactical Air Support Squadron at Nellis AFB (June 2017) (referred to as the TASS beddown) (Nellis AFB, 2017a)	The DAF proposes to stand up the TASS at Nellis AFB using excess F-16 aircraft from Hill AFB, Utah. The action would transfer and assign up to 16 F-16C aircraft (14 PAA and 2 backup) and would increase the Installation population by 123 DAF and government support positions and 170 contract maintenance positions. Facilities would include expansion of the ramp space and Live Ordnance Loading Area (LOLA) on the east side of the airfield to accommodate additional aircraft (11.5 acres and 7 acres, respectively). A new support facility would be constructed at the LOLA, and O'Bannon Road would be realigned to allow the expansion of the ramp and LOLA. B-295 would be demolished and a new aircraft maintenance unit facility would be constructed at the same site. A new headquarters building would be constructed on the west side of the airfield as part of this action. The TASS would fly approximately 2,700 sorties per year, departing Nellis AFB and transiting to the Nevada Test and Training Range (NTTR).	Past	Yes. Construction in support of the TASS beddown was proposed within the Proposed Action area.	Land Use; Air Quality and Climate Change; Earth, Water, Biological, and Cultural Resources; Noise; Hazardous Materials and Wastes, Toxic Substances; and Contaminated Sites; Safety and Occupational Health; Socioeconomics
Final Environmental Assessment for Nellis Reclaimed Waterline Project (December 2017) (Greeley and Hansen, 2017)	The project is designed to fulfill the conditions of the Enhanced Use Lease between Nellis AFB and the City of North Las Vegas (CNLV) in which the DAF allowed CNLV to construct the CNLV water reclamation facility (CNLV-WRF) on land leased from Nellis AFB. Per this agreement, CNLV-WRF is commissioned to deliver reclaimed water back to Nellis AFB for uses in which non-potable water is suitable. To use this reclaimed water, DAF is proposing the construction of a pipeline between the CNLV-WRF and the Sunrise Vista Golf Course. The water would then be used to irrigate the golf course, allowing for its continued operation.	Past	Yes. Construction in support of the Nellis Reclaimed Waterline Project occurred in the vicinity of the Proposed Action area.	Land Use; Air Quality and Climate Change; Earth, Water, and Biological Resources; Infrastructure, Including Transportation and Utilities; Safety and Occupational Health
Final Environmental Assessment for Contracted Close Air Support (April 2022) (referred to as CCAS) (Nellis AFB, 2022a)	The DAF is proposing to provide contracted close air support (CCAS) training for the Joint Terminal Attack Controller Qualification Course for Nellis AFB. CCAS would support Nellis AFB training operations out of the North Las Vegas Airport. The contractor would use the Jean, Nevada, Airport for munitions loading and unloading. The Proposed Action would include the addition of 21 contracted	Past	Yes. Sorties would occur within the AQCR.	Air Quality and Climate Change; Noise; Safety and Occupational Health

Action	Description	Timeframe	Contributes to Cumulative Impacts?	Affected Resource Areas
	maintainers, 10 contracted pilots, and 4 administrative and management personnel operating an estimated six aircraft and approximately 1,350 annual contracted sorties. The 1,350 training sorties would be added to perform training activities at the Fort Irwin National Training Center/R-502 Range special use airspace, or a backup range, NTTR/R-4806. Training activities would continue to use the Leach Lake Training Range within Fort Irwin.			
Completed Military Construction (MILCON) projects	The DAF completed construction of a new Combat Rescue Helicopter Simulator (7,726 ft^2); construction of a new Joint Simulation Environment Facility (50,590 ft^2); construction of a new facility for the 365th Intelligence, Surveillance, & Reconnaissance (70,451 ft^2) and demolition of B-69, B-470, and B-474; and construction of a new F-35A Munitions Assembly Conveyor Facility, including a sunshade (15,000 ft^2), concrete pad (60,000 ft^2), and administration building (546 ft^2)	Past	Yes. Construction in support of the completed MILCON projects occurred within the Proposed Action area.	Land Use; Air Quality and Climate Change; Earth, Water, Biological, and Cultural Resources; Hazardous Materials and Wastes, Toxic Substances; and Contaminated Sites; Safety and Occupational Health
Final Environmental Assessment for Addition of F-35 Joint Strike Fighters, Addition of F-22A Raptors and Contract Adversary Air (August 2021) (referred to as the Nellis Aggressor EA) (Nellis AFB, 2021d)	The DAF is proposing to add 17 F-35 Joint Strike Fighter aircraft at Nellis AFB to support the 65th Aggressor Squadron, 422nd Test and Evaluation Squadron, No. 17 Test and Evaluation Squadron; add three F-22A Raptor aircraft to the 422nd Test and Evaluation Squadron; and operate contractor-owned contractor-operated Adversary Air (COCO ADAIR) from Nellis AFB, Nevada. Together, the components of this action would add 751 personnel at Nellis AFB (479 personnel for the addition of the 17 F-35 Joint Strike Fighter aircraft, 32 personnel for the addition of the three F-22A Raptor aircraft, and 240 personnel for COCO ADAIR). Facility demolition, renovation, construction, and addition would be necessary to support the new aircraft.	Ongoing	Yes. Sorties proposed under the Nellis Aggressor beddown would impact the existing noise environment. Facilities construction, demolition, renovation, and addition would occur within Nellis AFB.	Land Use; Air Quality and Climate Change; Earth, Water, and Biological Resources; Noise; Hazardous Materials and Wastes, Toxic Substances; and Contaminated Sites; Socioeconomics
Draft Environmental Assessment for Installation Development (April 2022) (referred to as Nellis IDP EA) (Nellis AFB, 2022b)	The Air Combat Command at Nellis AFB has identified a total of 32 construction, renovation, infrastructure, and demolition projects and proposes to implement them over a 6-year period.	Beginning FY 2025	Yes. Facilities construction, demolition, renovation, and addition would occur within Nellis AFB.	Land Use; Air Quality and Climate Change; Earth, Water, Biological, and Cultural Resources; Noise; Socioeconomics

Action	Description	Timeframe	Contributes to Cumulative Impacts?	Affected Resource Areas
Nellis Combat Support Training Range	The DAF proposes to develop a regional contingency training location at Nellis AFB in an area currently known as Camp Cobra. The DAF proposes to repurpose existing structures at Camp Cobra as well as construct new, austere (or minimalist) buildings, such as basic concrete block and prefabricated steel structures. The training location would be connected to a new training airfield with taxiway system. The new airfield would include a driving course using existing roads and a foot patrol area located outside of the Camp Cobra footprint.	Beginning FY 2025	Yes. Facilities construction, demolition, renovation, and addition would occur within Nellis AFB adjacent to the Proposed Action area.	Land Use; Air Quality and Climate Change; Earth, Water, Biological, and Cultural Resources; Hazardous Materials and Wastes, Toxic Substances; and Contaminated Sites; Socioeconomics
Draft Environmental Assessment for Proposed Integrated Natural Resources Management Plan Projects at Nellis AFB and the Nevada Test and Training Range (January 2024) (referred to as the Nellis INRMP EA) (Nellis AFB, 2024a)	The DAF is proposing to update and revise the Integrated Natural Resources Management Plan (INRMP) for Nellis AFB and the NTTR. Updates and revisions for the 2024–2028 INRMP include proposed natural resource management projects at Nellis AFB and NTTR.	Beginning FY 2024	Yes. Projects would occur within the boundaries of Nellis AFB.	Air Quality and Climate Change; Earth, Water, and Biological Resources
Collaborative Combat Aircraft (CCA) Experimental Operations Unit (EOU) Beddown	Beddown of the EOU would primarily occur at Creech AFB but would also have a footprint at Nellis AFB. The DAF proposes to beddown up to 40 personnel using existing facilities at Nellis AFB to support the CCA EOU beddown.	Future, timing unknown	Yes. Facilities renovation and addition would occur within Nellis AFB.	Air Quality and Climate Change; Cultural Resources; Hazardous Materials and Wastes, Toxic Substances; and Contaminated Sites; Infrastructure, Including Transportation and Utilities; Socioeconomics

Action	Description	Timeframe	Contributes to Cumulative Impacts?	Affected Resource Areas
Other Actions and Plans				
I-15/CC-215 Northern Beltway Interchange Project, North Las Vegas (Nevada Department of Transportation [NDOT], 2024a)	This project involves the design of new ramps, flyovers, and street connections to complete a system-to-system interchange configuration where the northern I-15 meets the Clark County 215 Las Vegas Beltway.	Past	Yes. The project occurred within the regional air quality control region (AQCR) and contributes to air quality emissions. It would also have the potential to impact traffic flow in the vicinity of Nellis AFB.	Air Quality and Climate Change; Infrastructure, Including Transportation and Utilities
State Road (SR) 160 Widening, Las Vegas (NDOT, 2024b)	This is a widening project that targets a 6-mile stretch of SR 160 from Mile Marker 16.3 to Mile Marker 22. This will expand the highway from two to four lanes in Clark County.	Ongoing	Yes. The project occurred within the regional AQCR and contributes to air quality emissions. It would also have the potential to impact traffic flow in the vicinity of Nellis AFB.	Air Quality and Climate Change; Infrastructure, Including Transportation and Utilities
US 95 Northwest Corridor Improvements Project, Las Vegas (NDOT, 2024c)	This project will bridge the transportation gap in northwest Las Vegas with the substantial completion of the US State Highway 95/Clark County 215 (US 95/CC 215) interchange, also known as the Centennial Bowl.	Ongoing	Yes. The project occurred within the regional AQCR and contributes to air quality emissions. It would also have the potential to impact traffic flow in the vicinity of Nellis AFB.	Air Quality and Climate Change; Infrastructure, Including Transportation and Utilities
Stewart Avenue Complete Streets Project (NDOT, 2024d)	This is a street improvements project that will improve the Stewart Avenue Corridor from 6th Street to Nellis Boulevard with bus stop improvements and amenities as well as improvements to cyclist and pedestrian infrastructure.	Future, timing unknown	Yes. The project would impact transportation in the vicinity of the Proposed Action.	Infrastructure, Including Transportation and Utilities
Downtown Access Project, Las Vegas (NDOT, 2024e)	NDOT's Downtown Access Project is evaluating long-term solutions for I-515/US 95, between Rancho Drive and Mojave Road, to address the aging infrastructure, safety, and congestion in order to increase efficiency of the movement of people, goods, and services while revitalizing and reconnecting the community.	Future, timing unknown	Yes. The project occurred within the regional AQCR and contributes to air quality emissions.	Air Quality and Climate Change

Action	Description	Timeframe	Contributes to Cumulative Impacts?	Affected Resource Areas
Clark County Regional Flood Control District Confluence Detention Basin Expansion (CCRFCD, 2024a)	CCRFCD proposes to expand the regional confluence detention basin to 1,945 acre-feet and extend the existing stormwater conveyance within the Proposed Action area to meet the expanded detention basin.	Beginning FY 2028	Yes, the project would occur adjacent to and within the Proposed Action area.	Earth, Biological, and Water resources; Infrastructure, Including Transportation and Utilities

AFB = Air Force Base; AQCR = air quality control region; CCA = Collaborative Combat Aircraft; CCAS = contracted close air support; CCRFCD = Clark County Regional Flood Control District; CNLV = City of North Las Vegas; COCO ADAIR = contractor-owned contractor-operated Adversary Air; DAF = Department of the Air Force; EOU = Experimental Operations Unit; IDP = Installation Development Plan; INRMP = Integrated Natural Resources Implementation Plan; LOLA = Live Ordnance Loading Area; MILCON = military construction; NDOT = Nevada Department of Transportation; NTTR = Nevada Test and Training Range; TASS = Tactical Air Support Squadron; WRF = Water Reclamation Facility

3.3.2 Other Considerations Required by NEPA

NEPA requires environmental analyses to include identification of "any irreversible and irretrievable commitments of resources" that would be involved if the Proposed Action should be implemented (40 CFR 1502.16). **Sections 3.4–3.15** address irreversible and irretrievable commitments of resources, unavoidable significant adverse effects, the relationship between local short-term uses of the environment and long-term productivity that would occur with implementation of the Proposed Action.

3.3.2.1 Irreversible and Irretrievable Commitments of Resources

The commitment of nonrenewable resources can have irreversible and irretrievable impacts on these resources for future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., critical habitat, energy, or fossil fuel) that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site) (Air Force Global Strike Command, 2023).

3.3.2.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts may be defined as adverse effects that can not be avoided due to constraints in alternatives. To the extent possible, adverse effects to environmental resources would be avoided, minimized, or mitigated; however, some adverse effects may not be entirely avoidable and/or mitigated.

3.3.2.3 Relationship Between Short-Term Uses of Man's Environment and Long-Term Productivity

Section 102(2)(C) of NEPA requires that significant actions that impact the human environment are to be analyzed with a detailed statement to include the connection between short-term utilization of the local environment and the preservation and improvement of long-term productivity. The objective of this analysis is to analyze and address (in general terms) the effects of short-term uses of resources associated with the Proposed Action and how these uses affect the long-term productivity of the Proposed Action area (80 FR 68743; November 6, 2015).

3.4 LAND USE

3.4.1 Affected Environment

3.4.1.1 Definition of the Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. The Nellis IDP (Nellis AFB, 2018a) is the Installation's planning tool to guide future development on the Installation to align with current and programmed mission requirements and was prepared in response to AFI 32-1015, *Integrated Installation Planning*. Goals and objectives of land use planning are to maintain mission readiness; achieve and maintain compliance with operational, safety, environmental, energy, and security regulations and requirements; maximize functional capabilities through the utilization and adaption of existing areas; incorporate Leadership in Energy and Environmental Design guidelines; achieve environmental compliance through reduction of the Installation environmental footprint; and foster awareness of the Installation by community stakeholders (Nellis AFB, 2018a).

3.4.1.2 Region of Influence

The ROI for land use is Nellis AFB and its environs, as depicted in **Figure 1-2**.

3.4.1.3 Nellis AFB

Nellis AFB is located northeast of the city of North Las Vegas in Clark County, Nevada, in the valley region of the Mojave Desert. The valley is surrounded by mountains and is adjacent to Lake Mead. Unincorporated Clark County land is adjacent to Nellis AFB and the cities of Las Vegas and North Las Vegas.

Nellis AFB occupies approximately 16,246 acres of land and is divided into three functional areas: Area I (the Main Base), Area II, and Area III (see **Figure 1-2**). Area I is located east of Las Vegas Boulevard and contains 30 percent of the total Installation land area. Area I contains the greatest variety of land use activities, including runways, industrial facilities, housing areas, and most of the Installation's administrative, training, and support facilities. Area II is located northeast of the Main Base and accounts for 60 percent of the total Installation land area. The majority of Area II is undeveloped acreage. Area III, west of Las Vegas Boulevard, makes up 10 percent of the total Installation land area. The majority of Installation family housing and recreational facilities is located in Area III. Area III also houses the Mike O'Callaghan Medical Center Campus, which occupies the hospital facilities vacated by the Veterans Administration. A large solar photovoltaic array covers much of the remaining undeveloped land in Area III.

Withdrawn Land

PUBLIC LAND ORDERS ARE ISSUED BY THE SECRETARY OF THE INTERIOR TO IMPLEMENT, MODIFY, EXTEND, OR REVOKE LAND WITHDRAWALS UNDER THE AUTHORITY OF THE FLPMA.

Nellis AFB incorporates 2,252 acres of public lands withdrawn for military use within its boundaries. Located north and east of the runway, the withdrawn lands are owned by the Federal Government, reserved by Congress for the use of the DAF, and administered by BLM, pursuant to the FLPMA (**Figure 1-3**). The public lands were withdrawn for military use under PLO 7419 in December 1999; the public land withdrawal was renewed under PLO Number 7890 in December 2019 for an additional 20 years (64 FR 69025; 84 FR 66927). The extension allows the DAF to continue to reserve lands for use by the DoD and continue providing safety buffers from potentially hazardous areas, protect populated areas, and comply with Defense Explosives Safety Regulation (DESR) 6055.9E, *DoD Explosives Safety Standards* (February 2024) regarding ammunition and explosive safety standards on lands adjacent to the Live Ordnance Loading Area (LOLA) on Nellis AFB. As defined in DESR 6055.9E, the safety buffer zone includes security patrol roads and a security checkpoint (84 FR 66927; December 6, 2019).

The DAF is permitted to construct new facilities within withdrawn lands upon meeting certain conditions for use. DAF is required to carefully assess the ecological, cultural, and recreational values of the withdrawn lands in question. Environmental impact assessments, in accordance with applicable laws and regulations such as NEPA, must be conducted to evaluate potential consequences and identify mitigation measures as necessary. Additionally, meaningful consultation with state and local government, along with other stakeholders, is required to ensure transparency, address concerns, and explore alternative solutions where feasible. By integrating these considerations into the decision-making process, the DAF can effectively fulfill its mission while minimizing adverse impacts on natural resources on withdrawn lands.

Land Use Categories

For Installation development and management planning purposes, the DAF divided Nellis AFB into 12 major land use categories (**Table 3-3** and **Figure 3-1**). **Table 3-3** describes each land use, its size in acres, the percentage of Nellis AFB it comprises, and its development capacity and planning constraints. Planning constraints are man-made or natural elements that can create significant limitations to the operation or construction of buildings, roadways, utility systems, airfields, training ranges, and other facilities. These constraints, when considered collectively with the Installation's capacity opportunities, identify potential areas for development, as well as those areas that can be redeveloped to support growth. The identification of planning constraints at Nellis AFB integrates a multitude of considerations, such as natural and cultural resources information, environmental quality issues, airspace restrictions, operational safety requirements, the built environment, and other factors that influence facility site planning on the Installation. Planning for constraints is critical when identifying land for mission redevelopment, expansion, or new mission acceptance. Major planning constraints are mainly due to explosive safety zones, and minor constraints to development include airfield clearances, Air Installations Compatible Use Zones (AICUZ), anti-terrorism

standards, threatened and endangered species and their habitats, and Environmental Restoration Program (ERP) site contamination.

Clark County land uses immediately south of the Proposed Action area are designated as mid-intensity suburban neighborhood, public use, and open lands (Clark County, 2024a). The closest residential neighborhood is Sunrise Manor, which is located immediately adjacent to the Proposed Action area south of the Hollywood Gate (**Figure 3-1**). The Boulder Sand & Gravel Hollywood Construction Pit is also located immediately south of the Proposed Action area and east of Sunrise Manor.

According to the 2021 *Transform Clark County Master Plan*, the nearest parcels of land outside of the Installation are located south (Sunrise Manor) and southeast of the Proposed Action area. The parcels of land south and adjacent to the Proposed Action area are currently zoned for agriculture, open lands, public use, and business employment. The parcels of land located southeast of, but not adjacent to, the Proposed Action area are currently zoned as business employment, corridor mixed-use (i.e., transportation right-of-way), and urban neighborhood (Clark County, 2021).

Table 3-3
Nellis AFB Existing Land Uses and Development Capacity

Land Use	Land Use Description	Acres	Percent of Nellis AFB (%)	Development Capacity
Airfield	The Airfield land use is divided into three subdistricts: Airfield West, Airfield Center, and Airfield East. The Airfield land use includes the Main Base flightline and supports Nellis AFB's test, training, and tactics mission. The airfield contains the most diverse composition of customers, missions, and assets on the Installation.	4,852	17	Airfield West and Airfield Center are heavily developed, include functional related mission areas that are already or have exceeded capacity, and have limited development opportunities; mission functions are scattered and disconnected. Airfield East has the most land capacity and provides the best opportunity for development and growth. However, this area is undeveloped and does not have existing transportation and utility infrastructure and would require extensive time, approvals, and fiscal investment for development.
MSA	The MSA is the primary mission storage, maintenance, and assembly area for the Installation. The MSA contains approximately 70 munition storage igloos and stores live and inert munitions.	1,326	5	This category has adequate storage capacity for current and anticipated mission requirements; however, development is restricted due to ESQD arcs.
Open Space A	This land use is the largest planning district on Nellis AFB. It is largely preserved as open land and the primary purpose is to act as a buffer for this Installation.	7,184	26	This category contains limited development opportunities due to ESQD arcs, land use restrictions, and the DAF's goal to preserve this area as open space.
Open Space B	This land use is vacant and is bordered on the east and south by residential encroachment.	63	<1	This category contains limited development opportunities and serves as a buffer to prevent future incompatible land use encroachment.
Open Space C	This land use is currently open space and is used to protect sensitive bearpoppy habitat. However, this area can be	350	1	This category has capacity for development; however, any development requires environmental approvals and mitigation.

Land Use	Land Use Description	Acres	Percent of Nellis AFB (%)	Development Capacity
	developed should this space be required for the DAF mission.			
Industrial A	This land use is the Area III industrial area and is characterized by large warehouses, storage facilities, equipment yards, laydown space, dog kennels, Security Force Squadron armory, and photovoltaic (PV) arrays.	563	2	This category provides opportunities for development. In addition, functions in this area can be consolidated and optimized to further increase capacity for other mission functions.
Industrial B	The primary function of this land use is to act as the Installation's industrial area, providing facility engineering, maintenance, and logistics readiness. This area includes warehouses, shops, storage facilities, equipment yards, and laydown space.	117	<1	This category has limited developable area to support mission requirements.
Industrial C	A small portion of this land use includes some of the Sunrise Vista Golf Course and the remainder of the area is covered in a PV array.	203	1	Land use restrictions in this category apply, and facilities cannot be constructed in this area.
Industrial D	This land use is in an insulated location and is surrounded by wild terrain. Capabilities in this area support specialized training such as explosive demolition, quarry operations, concrete and asphalt operations, and Camp Combat Operations and Base Readiness.	484	2	Demand for this category has been growing and there is developable capacity.
Housing/ Community A	This land use includes the primary housing and community for Nellis AFB. This area includes housing schools, parks, sports fields, fitness center, shopettes, civic spaces, food facilities, the Mike O'Callaghan Medical Center, child development center, and family camp area.	725	3	This category has limited developable area to support mission requirements.
Housing/ Community B	This land use contains the Sunrise Vista Golf Course and supporting facilities and infrastructure.	259	1	This category has limited developable area to support mission requirements.
SAR	This land use is located approximately 3 miles north of the main portion of Nellis AFB. This area comprises lands north of Interstate 15, east of County Highway 215, west of US-95, and south of the Desert National Wildlife Reserve. This area is mostly desert scrub with a few buildings and access roads that support the SAR. The SAR includes munition response sites, firing range, energy corridor, a water reservoir, and a vital jettison area for Nellis AFB airfield operations.	11,446	41	This area lacks infrastructure and utilities and is not expected to undergo any development or mission changes in the future.

Source: Nellis AFB, 2018a
MSA = munitions storage area; PV = photovoltaic; SAR = small arms range

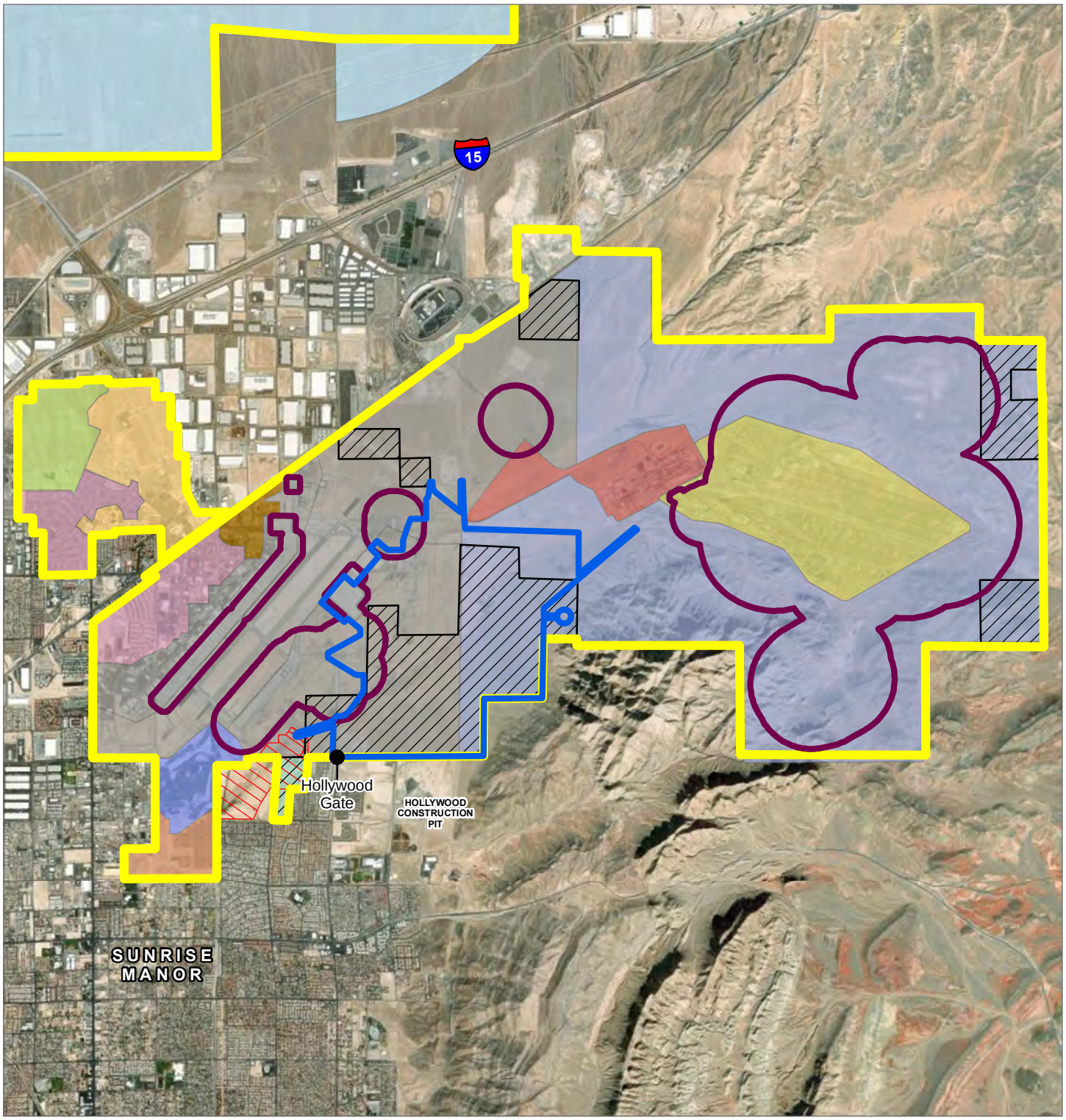


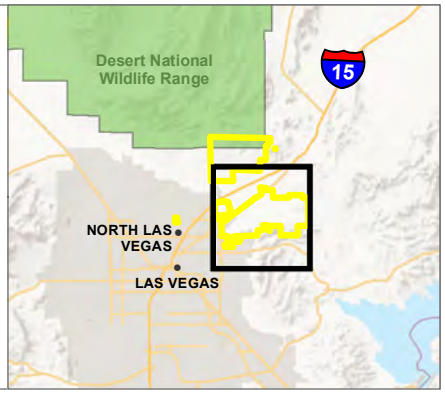
FIGURE 3-1
Land Use – Alternative 1

- Alternative 1
- BLM Withdrawn Lands
- CCRFCD
- Explosive Safety Quantity Distance Arc
- Installation Boundary
- Airfield
- Housing/Community A
- Housing/Community B
- Industrial A
- Industrial B
- Industrial C
- Industrial D
- Munitions Storage Area
- Open Space A
- Open Space B
- Open Space C
- Small Arms Range

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



3.4.1.4 East-Side Development Area and Adjacent Land Uses

The Proposed Action area encompasses portions of Area I (84.1 percent) and Area II (15.9 percent). A total of 1,261 acres within the Proposed Action area is withdrawn for military use under PLO 7890. Existing land use categories within the Proposed Action area include 1,187 acres within the Airfield (Airfield West and Airfield East) category and 802 acres of Open Space A. The Proposed Action area consists primarily of undeveloped land bisected by paved and unpaved transportation networks, utility infrastructure and corridors, lands owned and managed by the Clark County Regional Flood Control District (CCRFCD), and a land withdrawal area owned by the BLM. It is bordered by or in close proximity to the Sunrise Vista Golf Course to the southwest, the main airfield and runways to the west, Clark County residential properties and businesses to the south, undeveloped mountainous terrain to the east and northeast, and the 820th Red Horse Squadron and 57th Munitions Squadron facilities to the north and northeast. As described in **Table 3-3**, the areas closest to the airfield have limited capacity due to constraints associated with the Clear Zones (CZs), Accident Potential Zones (APZs), build restriction line limits, transitional surfaces, high decibel noise contours, and explosive safety quantity-distance (ESQD) arcs.

Land Use Constraints

Two ESQD arcs intersect the west and northwest portions of the Proposed Action area. The ESQD marks extend approximately 0.5 mile into the Proposed Action area covering a total of 214 acres (see **Figure 3-1**). ESQD restrictions are imperative safety measures implemented across DAF installations to mitigate the risks associated with explosives materials. DESR 6055.09_DAFMAN 91-201, *Explosives Safety Standards* establishes specific minimum distances that must be maintained between explosives storage facilities, operational areas, and inhabited structures to safeguard personnel, equipment, and surrounding communities from the potential hazards of accidental explosions. All construction within or on the periphery of ESQD arcs must be closely managed and should be coordinated as early as possible in the planning and design phase to ensure compliance with this standard.

In addition, the Open Space A land use area includes habitat for protected and important species and ephemeral streams and washes.

The CCRFCD-owned lands within the Proposed Action area include a 1,025 acre-foot confluence detention basin located to the west of the Hollywood Gate in the southwestern portion of the Proposed Action area (CCRFCD, 2023) (see **Figure 3-1**). In addition, CCRFCD owns several stormwater earthen/unlined, grass, and concrete channels that bisect or connect to the Proposed Action area.

3.4.2 Environmental Consequences

3.4.2.1 Evaluation Criteria

Potential impacts to land use are based on the level of land use sensitivity in areas potentially affected by a proposed action as well as compatibility of the action with existing conditions. Potential adverse impacts to land use would occur if the Proposed Action or Alternatives:

- are inconsistent or noncompliant with existing land use plans or policies,
- preclude the viability of existing land use,
- preclude continued use or occupation of an area,
- are incompatible with adjacent land use to the extent that public health or safety is threatened, or
- conflict with planning criteria established to ensure the safety and protection of human life and property.

3.4.2.2 Alternative 1

Alternative 1 would implement complete development of the Proposed Action area but would not increase the size of Nellis AFB. All development would occur within the existing boundaries of the Installation (see **Figure 3-1**). No changes to land use on Nellis AFB would occur outside of the Proposed Action area. To understand how proposed development within each functional use category would change land use within the Proposed Action area, each functional use category was mapped to an existing land use category at Nellis AFB based on the types of development that would occur within the functional use category (**Table 3-4**). **Table 3-5** summarizes changes to land use within the Proposed Action area under Alternative 1.

Table 3-4
Relationship of Functional Use Categories to Existing Land Uses on Nellis AFB

Functional Use Category	Existing Land Use Category on Nellis AFB
Administrative/Small-scale Administrative	Industrial B
Airfield Operations/Industrial/Light Industrial	Airfield
Existing Pavements	Airfield
Lodging/Residential	Housing/Community A
Medical/Community Services/Community Commercial/Small-scale Retail	Housing/Community A
Outdoor Recreation/Open Space/Training Space	Open Space A
Transportation	Industrial B
Utilities/Infrastructure	Industrial C

Table 3-5
Changes in Land Use – Alternative 1

Existing Land Use Type	Existing Land Use Total Acres Within Proposed Action Area	Total Acres Under Alternative 1	Percentage of Proposed Action Area Under Alternative 1 (%)
Airfield	1,190	948	47.4
Housing/Community A	0	146	7.3
Housing/Community B	0	0	0
Industrial A	0	0	0
Industrial B	0	420	21
Industrial C	0	224	11.2
Industrial D	0	0	0
Munitions Storage Area	0	0	0
Open Space A	810	262	13.1
Open Space B	0	0	0
Open Space C	0	0	0
Small Arms Range	0	0	0
Total Acreage	**2,000**	**2,000**	**100**

Alternative 1 would provide designated space for the functional use categories outlined in **Table 3-6** within a total footprint of approximately 2,000 acres. Under Alternative 1, the western portion of the Proposed Action area would largely remain designated for Airfield land uses (948 acres) (see **Figure 2-1**). Alternative 1 would designate 224 acres for utility and infrastructure improvements (Industrial C) within the southwest portion of the Proposed Action area south of O'Bannon Road, as well as along the O'Bannon Road corridor. Additionally, a proposed utilities corridor would follow the southern and eastern boundary of the Proposed Action area, extending northeastwardly toward Area II. A total of 420 acres would be allocated for Administrative/Small-scale Administrative functional uses (Industrial B), including areas south of O'Bannon Road just to the east of the area designated for future utility and infrastructure improvements and east of

O'Bannon Road. Also east of O'Bannon Road, Alternative 1 would designate 110 acres for Medical/Community Services/Community Commercial/Small-Scale Retail (Housing/ Community A) and 36 acres for Lodging/Residential uses (Housing/Community A). Under Alternative 1, 262 acres in the northeastern portion of the Proposed Action area would be designated as Outdoor Recreation/Open Space/Training Space (Open Space A).

Table 3-6
Changes in Land Use – Alternative 2

Existing Land Use Type	Existing Land Use Total Acres Within Proposed Action Area	Total Acres Under Alternative 2	Percentage of Proposed Action Area Under Alternative 2
Airfield	1,190	948	63.8
Housing/Community A	0	33	2.2
Housing/Community B	0	0	0
Industrial A	0	0	0
Industrial B	0	284	19.1
Industrial C	0	221	14.9
Industrial D	0	0	0
Munitions Storage Area	0	0	0
Open Space A	296	0	0
Open Space B	0	0	0
Open Space C	0	0	0
Small Arms Range	0	0	0
Total Acreage	**1,486**	**1,486**	**100**

Permanent changes to land use would include parcels of DoD-owned land that would be converted from their current land use category to another land use category under Alternative 1. Of the 2,000 acres within the Proposed Action area, 1,261 acres are BLM lands withdrawn for military use, representing 63 percent of the total area. These lands would be permanently developed with implementation of Alternative 1 (see **Figure 3-1**). Alternative 1 would include improvements to the withdrawn land, including space for potential aircraft parking, hangars, and other airfield infrastructure, which would be inconsistent with PLO 7890. Accordingly, a modification to PLO 7890 would eventually be required to specify the new uses identified by Nellis AFB prior to development activities occurring under Alternative 1. No development would occur under Alternative 1 without approved modification of PLO 7890 by BLM following the public review process described in **Section 1.3.**

Expansion of DAF operations under Alternative 1 would occur east and southeast of the current runway and would include development of up to 810 acres of existing areas designated as Open Space to another land use category (e.g., Administrative/Small-scale Administrative or Lodging/Residential). Although a total of 1,480 acres would be developed under Alternative 1, some of these areas would remain within their current or similar land use category (e.g., Airfield land use designated as Airfield Operations/Industrial/Light Industrial land use).

Land use outside of the boundaries of the Installation would not be expected to change with implementation of Alternative 1. However, according to the *Las Vegas 2050 Master Plan Overview*, Clark County is anticipated to continuously increase in population for decades to come, and by 2050, more than 3 million people will reside in Clark County (City of Las Vegas, 2023). Therefore, future land use changes to the parcels south of the Installation and adjacent of the Proposed Action area could occur as a result of the anticipated increase in residents.

Since development activities under Alternative 1 would occur within the current Installation footprint, and parcels within the Proposed Action area would be changed from Open Space to other appropriate land use categories, long-term, adverse impacts to land use would not be significant with implementation of

Alternative 1. Should Alternative 1 be selected for implementation, the DAF at Nellis AFB would be required to update the Installation Development Plan to reflect the proposed changes to land use for approval by the Facility Board in accordance with AFI 32-1015, *Integrated Installation Planning*. Additional analysis of land use changes would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.4.2.3 Alternative 2

Alternative 2 would implement partial development of the Proposed Action area within the Alternative 2 development area but would not increase the size of Nellis AFB. All development activities would occur within the existing boundaries of the Installation (**Figure 3-2**). No changes to land use on Nellis AFB would occur outside of the Proposed Action area. Changes to land use within the Proposed Action area under Alternative 1 are reflected in **Table 3-6**.

Alternative 2 would provide designated space for some of the same functional use categories as Alternative 1 within a total footprint of 1,486 acres. Long-term, permanent changes to land use would include parcels of DoD-owned land that would be converted from their current land use category to another land use category under Alternative 1.

Of the 1,486 acres within the Alternative 2 development area, 888 acres are BLM lands withdrawn for military use, representing 60 percent of the total area. These lands would be permanently developed with implementation of Alternative 2 (**Figure 3-2**). As with Alternative 1, Alternative 2 would include improvements to the withdrawn land, including space for potential aircraft parking, hangars, and other airfield infrastructure, which would be inconsistent with PLO 7890. Accordingly, a modification to PLO 7890 would be required to specify the new uses identified by Nellis AFB prior to development activities occurring under Alternative 2. No development would occur under Alternative 2 without approved modification of PLO 7890 by BLM following the public review process described in **Section 1.3.**

The total space allocated for airfield uses, 948 acres, would remain the as under Alternative 1, covering the western portion of the Alternative 2 development area as well as a small area south of O'Bannon Road (**Figure 2-2**). Alternative 2 would designate 221 acres for utility and infrastructure improvements (Industrial C) within the southwest portion of the Alternative 2 development area. East and south of O'Bannon Road, Alternative 2 would designate 280 acres for Administrative/Small-scale Administrative uses (Industrial B), as well as 33 acres for Medical/Community Services/Community Commercial/Small-Scale Retail (Housing/Community A). Alternative 2 would retain the proposed utility corridor that follows the eastern boundary of the Alternative 2 development area and extends toward Area II.

Unlike Alternative 1, Alternative 2 would not designate any areas for Open Space functional use or Lodging/Residential use. Alternative 2 would also provide for a reduced total footprint for Medical/Community Services/Community Commercial/Small-Scale Retail compared to Alternative 1 (110 acres versus 33 acres).

Because development activities under Alternative 2 would occur within the current Installation footprint, and parcels within the Alternative 2 development area would be changed from Open Space to other appropriate land use categories, Alternative 2 would result in long-term impacts to land use at Nellis AFB that would not be significant. Additional analysis of land use changes would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

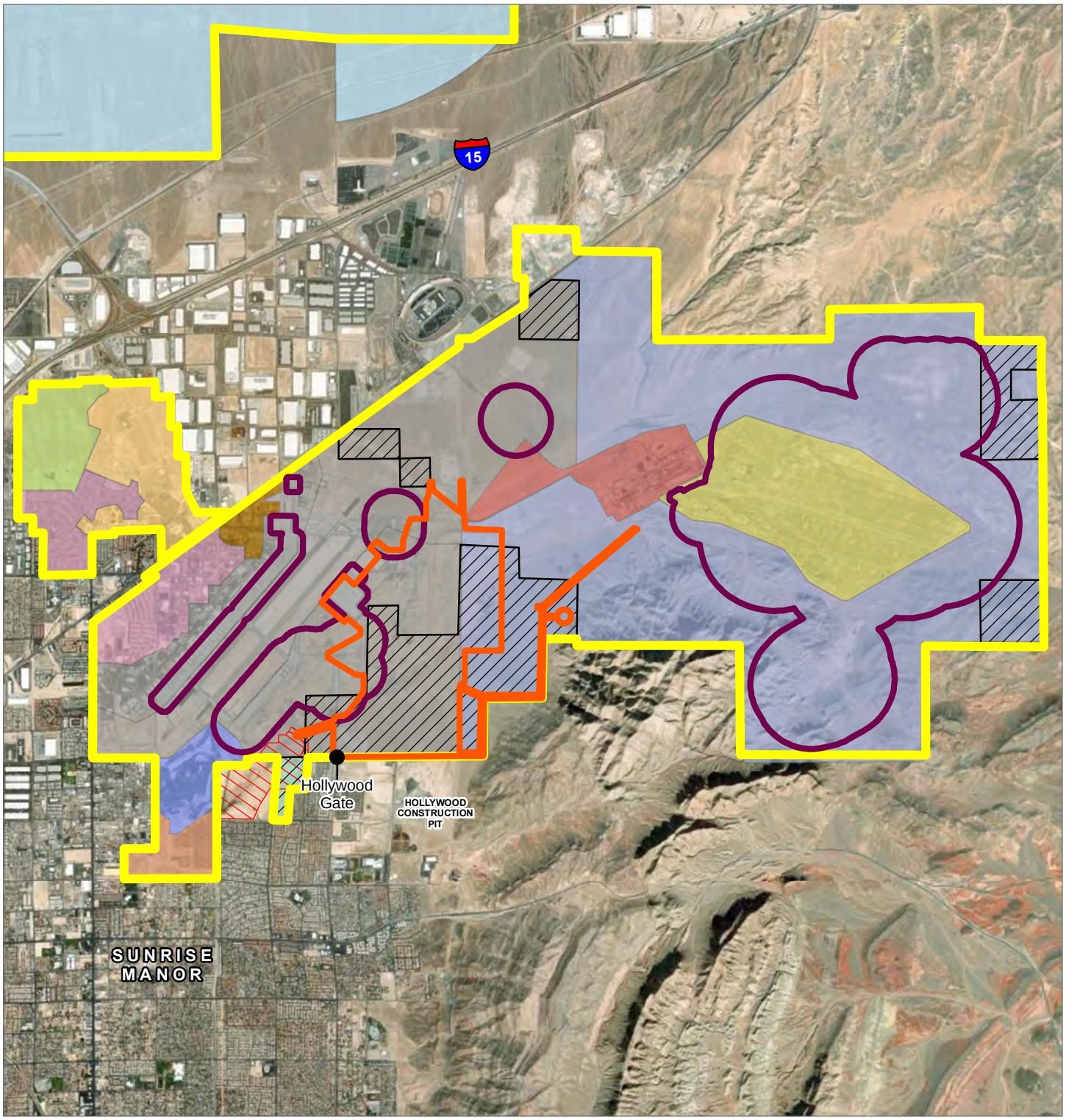


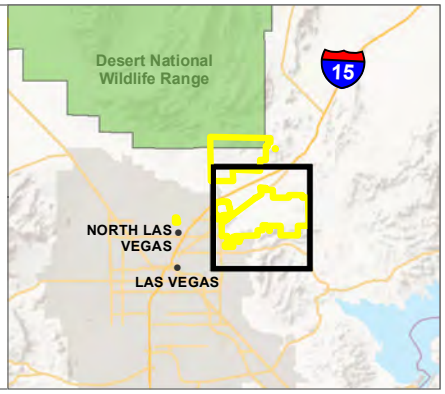
FIGURE 3-2
Land Use – Alternative 2

- Alternative 2
- BLM Withdrawn Lands
- CCRFCD
- Explosive Safety Quantity Distance Arc
- Installation Boundary
- Airfield
- Housing/Community A
- Housing/Community B
- Industrial A
- Industrial B
- Industrial C
- Industrial D
- Munitions Storage Area
- Open Space A
- Open Space B
- Open Space C
- Small Arms Range

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



3.4.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. There would be no changes to land use in the ROI beyond baseline conditions; land use within the Proposed Action area, which is currently designated as Airfield and Open Space, would remain unchanged from current conditions. No additional space would be designated for development to meet future mission requirements, including space for transportation and utility infrastructure, administrative facilities, airfield operations facilities, lodging, community support facilities, and other uses. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.4.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in long-term impacts to land use that would not be significant in the ROI—i.e., Nellis AFB. Projects identified in **Table 3-2** would involve the construction, renovation, and demolition of facilities within Nellis AFB.

The completion of the Tactical Air Support Squadron (TASS) beddown added additional, expanded ramp space and expanded the LOLA on the east side of the Installation airfield (Nellis AFB, 2017b). O'Bannon Road was realigned to allow the expansion of a ramp, and B-295 was demolished and replaced by a new building. A new headquarters building was constructed on the west side of the airfield beginning in 2020. Facilities construction and demolition projects associated with the beddown were compatible with existing land uses and did not result in any changes to land use on Nellis AFB. Indirectly, the beddown contributed to increased demand for local services and infrastructure, such as water, electricity, and sewage treatment, as well as roads, parking areas, and emergency services and placed additional strain on the limited space on the west side of the airfield.

The Nellis Reclaimed Waterline Project constructed a pipeline between the City of North Las Vegas Water Reclamation Facility (CNLV-WRF) and the Sunrise Vista Golf Course. This project resulted in no changes to land use. Completion of the project allowed the golf course, which falls under Housing/Community B land use, to continue operating, preventing future changes in land use.

Completed military construction (MILCON) projects at Nellis AFB included construction of a new Combat Rescue Helicopter Simulator; construction of a new Joint Simulation Environment Facility; construction of a new facility for the 365th Intelligence, Surveillance, & Reconnaissance Group; demolition of B-469, B-470, B-474; and construction of a new F-35A Munitions Assembly Conveyor Facility, including a sunshade, concrete pad, and administration building. These MILCON projects were completed within areas of compatible land use, including construction of facilities on both the east and west sides of the airfield.

The Nellis Aggressor project proposes the beddown of 17 F-35 aircraft, 3 F-22A aircraft, and the operation of contractor-owned, contractor-operated Adversary Air (COCO ADAIR) at Nellis AFB. The beddown would add a total of 751 personnel to Nellis AFB, requiring facility construction, demolition, renovation, and addition. The majority of these actions would occur within Area I, on the west side of the airfield, and all facility actions would occur within areas of compatible land use.

The Nellis IDP EA evaluates construction, renovation, infrastructure, and demolition activities spanning a 6-year period starting 2024 (Nellis AFB, 2022b). These activities primarily would occur on the west side of the airfield within compatible land uses, and no direct adverse impacts to land use would be anticipated. However, development would have the potential to increase demand for transportation, utilities, and emergency response. Such heightened demand might directly prompt alterations or indirect effects for planned land use in the Proposed Action area.

The Nellis Combat Support Training Range (CSTR) EA evaluates the development of a regional contingency training location within Camp Cobra, located in Area II of Nellis AFB. The DAF proposes to

repurpose existing structures at Camp Cobra and construct new buildings. Existing areas currently designated as Industrial D land use would remain in this use; however, areas currently designated as Open Space A and containing native vegetation would be converted to Industrial D land use under the action. This conversion of existing habitat and open space would place additional pressure on water resources and would result in the addition of impervious surfaces. Furthermore, the effects of this project may be compounded by those of the Proposed Action, as both projects involve the addition of impervious surfaces within the ROI (Frontier Group, 2024).

The Collaborative Combat Aircraft (CCA) project is proposed for future implementation at Creech AFB and Nellis AFB. Construction primarily would take place at Creech AFB, but there would also be a footprint at Nellis AFB. At this time, facilities requirements would include the renovation and use of existing facilities at Nellis AFB; therefore, there would be no anticipated impacts to land use. The CCRFCD project would result in indirect, beneficial impacts to land use, as it would increase usability of land within the ROI by mitigating flood risks. Clark County plans to extend the stormwater channel within Area I into the detention pond at the southern end of the Proposed Action area. This project would be expected to yield long-term benefits for land uses within the Proposed Action area by mitigating flooding risks through the diversion of stormwater away from the area.

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, adverse, direct and indirect cumulative effects, as well as beneficial, indirect effects, none of which would be significant, to land use resources would be anticipated to occur with implementation of the Proposed Action.

3.4.2.6 Other Considerations Under NEPA

Under the Proposed Action, 1,261 acres of BLM lands withdrawn for military use would be permanently developed. The withdrawal of BLM lands for use by Nellis AFB will be considered for renewal on or before the current expiration date of 10 December 2039. If the withdrawn land were not renewed for military use, any development within the withdrawn land may require demolition and additional resources to return the land to its prior state.

3.4.3 Resource-Specific Mitigation Measures and Best Management Practices

BLM policy dictates that project design should be utilized to avoid and minimize impacts to withdrawn land by minimizing the construction footprint and ecological disturbances where possible. Best management practices (BMPs) utilized during construction activities to avoid or minimize ecological disturbance to withdrawn land would include measures outlined in **Sections 3.5.3** and **3.6.3**. Nellis AFB would explore ways to adjust training exercises or operations to minimize their impact on sensitive areas within the BLM-withdrawn land. This could involve designating specific training zones to avoid critical habitats, implementing seasonal restrictions for construction and operational activities, or other activities to minimize impacts to the natural resources located within withdrawn land. No significant adverse impacts to land use would be anticipated to occur with implementation of the Proposed Action. No mitigation measures are recommended.

3.5 AIR QUALITY AND CLIMATE CHANGE

3.5.1 Affected Environment

3.5.1.1 Definition of the Resource

Air pollution is a threat to human health and damages trees, crops, other plants, lakes, and animals. It creates haze or smog that reduces visibility in national parks and cities and interferes with aviation. To improve air quality and reduce air pollution, Congress passed the *Clean Air Act* (42 USC § 7401 et seq., as amended) (CAA), which set regulatory limits on air pollutants and to help ensure basic health and environmental protection from air pollution. Most air pollutants originate from human-made sources, including mobile sources (e.g., gasoline- or diesel-fueled vehicles) and stationary sources (e.g., concrete

batch plant, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Air pollutants are also released from natural sources such as volcanic eruptions and wildfires. Air quality in a given location is defined by the concentration of various pollutants in the atmosphere.

Criteria Pollutants

Air quality is defined by ambient concentrations of specific air pollutants that the USEPA has determined may affect the health or welfare of the public. The CAA requires USEPA to set National Ambient Air Quality Standards (NAAQS) for commonly found air pollutants known as criteria air pollutants. These are pollutants the USEPA determined can affect the health or welfare of the public (USEPA, 2023a) and include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead.

Ozone is not usually emitted directly into the air but is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants, or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds that are directly emitted from a wide range of emission sources. For this reason, regulatory agencies limit atmospheric O_3 concentrations by controlling volatile organic compound pollutants (also identified as reactive organic gases) and NO_x.

Table 3-7 shows the specific concentration limits (primary and secondary) for each of the criteria pollutants that have been determined to impact human health and the environment. The primary NAAQS provide public health protection, including protecting the health of sensitive populations such as asthmatics, children, and the elderly. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings (USEPA, 2023b).

Table 3-7
National Ambient Air Quality Standards

Pollutant	Primary/Secondary[a,b]	Averaging Time	Level
Carbon Monoxide	Primary	8 hours	9 ppm
Carbon Monoxide	Primary	1 hour	35 ppm
Nitrogen Dioxide	Primary	1 hour	100 ppb
	Primary and Secondary	Annual	53 ppb
Ozone	Primary and Secondary	8 hours	0.070 ppm
$PM_{2.5}$	Primary	1 year	9.0 µg/m^3
	Primary	Annual	12 µg/m^3
	Secondary	Annual	15 µg/m^3
	Primary and Secondary	24 hours	35 µg/m^3
PM_{10}	Primary and Secondary	24 hours	150 µg/m^3
Sulfur Dioxide	Primary	1 hour	75 ppb
	Secondary	3 hours	0.5 ppm
Lead	Primary and Secondary	Rolling 3-month average	0.15 µg/m^3

Source: USEPA, 2023b

a Primary Standards: the levels of air quality necessary, with an adequate margin of safety, to protect public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the USEPA.

b Secondary Standards: the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; $PM_{2.5}$ = fine inhalable particles with diameters of 2.5 micrometers or smaller; PM_{10} = inhalable particles with diameters of 10 micrometers or smaller; ppm = parts per million; ppb = parts per billion

Greenhouse Gas Emissions

The earth's climate is changing. Multiple lines of evidence show changes in weather, oceans, and ecosystems, such as:

- changing temperature and precipitation patterns;
- increases in ocean temperatures, sea level, and acidity;

- melting of glaciers and sea ice;
- changes in the frequency, intensity, and duration of extreme weather events; and
- shifts in ecosystem characteristics, such as the length of the growing season, timing of flower blooms, and migration of birds.

Greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere. As identified by the USEPA, these gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (USEPA, 2023c).

Different GHGs can have different effects on the earth's warming as a result of their ability to absorb energy (their "radiative efficiency") and how long they stay in the atmosphere (also known as their "lifetime"). The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases.

To estimate GWP, the US quantifies GHG emissions using the 100-year timeframe values established in the Intergovernmental Panel on Climate Change Fourth Assessment Report (Intergovernmental Panel on Climate Change, 2007). All GWPs are expressed relative to a reference gas, CO_2, which is assigned a GWP equal to 1. Six additional primary GHGs with GWPs include:

- 25 for CH_4,
- 298 for N_2O,
- 124–14,800 for hydrofluorocarbons,
- 7,390 to greater than 17,340 for perfluorocarbons,
- 17,200 for nitrogen trifluoride, and
- Up to 22,800 for sulfur hexafluoride.

To estimate the CO_2 equivalency, or CO_2e, of a non-CO_2 GHG, the appropriate GWP of that gas is multiplied by the amount of the gas emitted. Emissions of a GHG are multiplied by the GWP to calculate the total equivalent emissions of CO_2. GWP-weighted emissions are presented in terms of carbon dioxide equivalent (CO_2e).

3.5.1.2 Regulatory Setting

Air Quality Control Region and Attainment Status

Under the authority of the CAA and subsequent amendments, the USEPA has divided the country into geographical regions known as air quality control regions (AQCR) to evaluate compliance with the criteria pollutant NAAQS. In accordance with CAA requirements, the air quality in each AQCR is measured by the concentration of these pollutants in the ambient air, and their concentrations are evaluated against the NAAQS. If the air quality in a geographic area meets or exceeds a national standard, it is called an "attainment" area for that criteria pollutant (designated attainment or attainment/unclassifiable); areas that do not meet the NAAQS are designated "nonattainment" areas. For some criteria pollutants, there are degrees of nonattainment. For example, O_3 nonattainment areas are further classified from marginal nonattainment to extreme nonattainment. If air quality improves in a region that is classified as nonattainment, and the improvement results in the region meeting the criteria for classification as attainment, then that region is reclassified as a "maintenance" area.

General Conformity Rule

Federal actions are required to conform with the approved SIP for those areas of the US designated as nonattainment or maintenance areas for any criteria air pollutant under the CAA (40 CFR § 93.158). The purpose of the General Conformity Rule is to ensure that applicable federal actions, such as the Proposed Action, would not cause or contribute to a violation of an air quality standard and that the Proposed Action would not adversely affect the attainment and maintenance of any NAAQS. A conformity applicability analysis must be completed for every DAF action that would be located in or include a nonattainment or maintenance area and that generates emissions to determine and document whether the proposed action

complies with the General Conformity Rule. The analysis must consider the total direct and indirect emissions, including all emission increases and decreases that are practicably controllable through an agency's continuing program responsibility and that are reasonably foreseeable at the time that the conformity applicability analysis is conducted.

In the conformity applicability analysis, the emissions thresholds that trigger the conformity requirements are called *de minimis* thresholds. The net change emissions calculated for the direct and indirect emissions are compared to these thresholds. If the emissions are below *de minimis* thresholds, the proposed project is presumed to conform to the SIP. If the net change in emissions equals or exceeds the *de minimis* conformity applicability threshold values, then a formal Conformity Determination must be prepared to demonstrate conformity with the approved SIP. *De minimis* levels are shown in **Table 3-8**.

Table 3-8
***De Minimis* Thresholds for Conformity Determinations**

Pollutant	Nonattainment or Maintenance Area Type	*De Minimis* Threshold (tpy)
Ozone (VOC or NO_x)	Serious nonattainment	50
Ozone (VOC or NO_x)	Severe nonattainment	25
Ozone (VOC or NO_x)	Extreme nonattainment	10
Ozone (VOC or NO_x)	Other areas outside an ozone transport region	100
Ozone (NO_x)	Marginal and moderate nonattainment inside an ozone transport region	100
Ozone (NO_x)	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
Ozone (VOC)	Maintenance within an ozone transport region	50
Ozone (VOC)	Maintenance outside an ozone transport region	100
CO, SO_2 and NO_2	All nonattainment and maintenance	100
PM_{10}	Serious nonattainment	70
PM_{10}	Moderate nonattainment and maintenance	100
$PM_{2.5}$	All nonattainment and maintenance	100
Lead	All nonattainment and maintenance	25

Source: 40 CFR § 93.153

CO = carbon monoxide; NO_2 = nitrogen dioxide; NO_x = nitrogen oxides; $PM_{2.5}$ = fine inhalable particles with diameters of 2.5 micrometers or smaller; PM_{10} = inhalable particles with diameters of 10 micrometers or smaller; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound

Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are pollutants for which there are no NAAQS but are still regulated under the federal CAA because of their potentially adverse effects on human health and the environment. Also known as "air toxics," these pollutants are composed of a wide array of organic and inorganic compounds (e.g., formaldehyde, 1 acetaldehyde, benzene, toluene, acrolein, 1,3-Butadiene, xylene, lead, naphthalene, and propionaldehyde). In relation to aviation sources, such emissions are present in the exhaust of aircraft, auxiliary power units, aerospace ground equipment, and motor vehicle engines, and, to a lesser extent, from boilers, fuel facilities, and other stationary sources (Federal Aviation Administration, 2015).

Prevention of Significant Deterioration New Source Review

Per the CAA, the USEPA's Prevention of Significant Deterioration (PSD) New Source Review permit program regulates criteria and certain non-criteria air pollutants for AQCRs designated as unclassified or in attainment status with respect to the federal standards. In such areas, a PSD review is required for new "major source" or "major modification of existing source" emissions. These PSD emissions include those that exceed 100 or 250 tons per year (tpy) of a criteria pollutant, depending on the type of major stationary source; or 10 tpy for an individual HAP and 25 tpy for total HAP emissions. For "minor source" emissions, a PSD review is required if a project would increase emissions for the source to a "major source" threshold.

State and Local Permit and Regulations

The Clark County DES Division of Air Quality administers the county's air pollution control program and is the permitting authority. Section 94 of the Clark County Air Quality Regulations specifies that a dust control permit is required from the Clark County DES Division of Air Quality if construction activities impact an area greater than 0.25 acre. The permit must include a dust mitigation plan and appropriate control measures as specified per the regulations (USEPA, 2023d).

Guidance for Greenhouse Gas Emissions and Climate Change

The NDEP completed a *Statewide GHG Emissions Inventory and Projections Report* for 2023 (NDEP, 2023). The report contains an updated inventory of GHG emissions in Nevada and a statement of policies to help inform the development of future policy initiatives designed to reduce GHG emissions statewide. The 2023 report includes an updated inventory of actual GHG emissions through 2021 and projection of GHG emissions through 2043 for the largest emitting sectors (i.e., transportation and electricity generation) as well as other key emitting sectors (industry, residential and commercial, waste, agriculture, and land use, land use change, and forestry).

The DoD and DAF have established various directives pertaining to climate change. DoD Directive 4715.21, *Climate Change Adaptation and Resilience* (August 2018) integrates climate change considerations into all aspects of the department. DoD components are charged with assessing and managing risks and mitigating the effects of climate change on natural and cultural resource management, force structure, basing, and training and testing activities in the field environment. The DAF released a climate action plan in 2022 that establishes goals, objectives, and key results to address the challenges and risks presented by climate change.

3.5.1.3 Region of Influence

The ROI for assessing air quality impacts from criteria pollutant emissions is Clark County, Nevada. Because the impacts of GHGs are cumulative within the entire troposphere, the ROI for GHGs and climate change is global. The existing conditions of the ROIs provide the context against which the environmental impacts of the Proposed Action and Alternatives are compared. Criteria pollutant emissions primarily impact local and regional air quality. Climactic conditions can impact the generation of pollutants through a variety of mechanisms, including secondary reactions (with sunlight, as an example) and through their dispersal over an area by wind.

3.5.1.4 Regional Climate

The climate in Clark County varies widely across the seasons, with extremely hot summers and cold winters, with dry and mostly clear conditions year-round. Over the course of the year, the temperature typically varies from 38 degrees Fahrenheit (ºF) to 105ºF. The urban heat island effect has likely increased high-temperature days in Las Vegas, where a very high rate of growth has taken place since the 1950s (National Oceanic and Atmospheric Administration, 2022; World Population Review, 2024). Precipitation is minimal, with the cooler months of December through February providing the greatest chance of precipitation; the annual average precipitation is 6 inches per year. Wind remains relatively constant throughout the year, ranging on average from 7 to 9 miles per hour (Weatherspark, 2024). Wind directions are highly seasonal in the area, with winds largely emanating from the northeast in the cooler months of October through February. By March, winds start to split between northeast and southerly directions, and by April the predominant winds are out of the south-southwest. This pattern continues until September when the winds again split between the southwest and northeast and return to the winter pattern of winds out of the northwest by October. Wind speeds tend to be greatest when coming out of the south, which occurs during the warmer periods of the year (Iowa State University, 2024).

The regional climate is being altered due to climate change. In the coming decades, the changing climate is likely to decrease the flow of water in the Colorado River and other rivers in Nevada, increase the probability of extreme heat and drought, increase the frequency and intensity of wildfires, and decrease the productivity of ranches and farms (USEPA, 2016).

Clark County maintains the following designations for the NAAQS (USEPA, 2023e):

- unclassifiable/attainment for lead, NO_2, SO_2, and $PM_{2.5}$,
- maintenance/attainment for CO and PM_{10} within the Las Vegas planning area of Clark County, and
- moderate nonattainment for the 2015 O_3 NAAQS standard within the Las Vegas planning area of Clark County.

Table 3-9 shows the *de minimis* thresholds for Clark County.

Table 3-9
General Conformity *De Minimis* Thresholds Applicable to Clark County

Pollutant	Nonattainment or Maintenance Area Type	*De Minimis* Threshold (tpy)
Ozone (VOC or NO_x)	Other nonattainment areas outside an ozone transport region	100
CO	All maintenance areas	100
PM_{10}	All maintenance areas	100

Source: 40 CFR § 93.153
CO = carbon monoxide; NO_x = nitrogen oxides, PM_{10} = inhalable particles with diameters of 10 micrometers or smaller; tpy = tons per year; VOC = volatile organic compound

A design value is a statistic that describes the air quality status of a given location relative to the level of the NAAQS. Design values are typically used to designate and classify nonattainment areas, as well as to assess progress toward meeting the NAAQS. Design values are computed and published annually by USEPA's Office of Air Quality Planning and Standards and reviewed in conjunction with the USEPA Regional Offices (USEPA, 2023f). **Table 3-10** compares the 2022 Clark County Design Values to the NAAQS.

Table 3-10
Comparison of 2022 Clark County Design Values with NAAQS

Pollutant	Maximum Design Values	Percent of NAAQS
CO	2.8 ppm (1-hr)	8
	2.3 ppm (8-hr)	26
NO_2	53 ppb (1-hr)	53
	21 ppb (Annual)	40
$PM_{2.5}$	32 µg/m^3 (24-hr)	91
	10.8 µg/m^3 (Annual)[a]	90
SO_2	4 ppb	5
PM_{10}	N/A – The NAAQS metric for PM_{10} is the annual estimated number of exceedances, averaged over three consecutive years: 4.0 for 2020–2022	---

Source: USEPA, 2023g
a On February 7, 2024, the USEPA strengthened the NAAQS for $PM_{2.5}$. Specifically, the USEPA is setting the level of the primary annual $PM_{2.5}$ standard at 9.0 µg/m^3 to provide increased public health protection, consistent with the available health science.
µg/m^3 =microgram per cubic meter; CO = carbon monoxide; NAAQS = National Ambient Air Quality Standards; NO_2 = nitrogen dioxide; $PM_{2.5}$ = fine inhalable particles with diameters of 2.5 micrometers or smaller; SO_2 = sulfur dioxide, ppm = parts per million; ppb = parts per billion

3.5.1.5 Air Emissions Sources at Nellis AFB

Nellis AFB currently maintains a Title V air quality permit for stationary source emissions (Part 70 Operating Permit, Source ID 114, 99th Civil Engineer Squadron, Nellis AFB, expires on 14 June 2026) (Clark County DES, 2024). These stationary sources include fuel storage tanks, loading racks, dispensing equipment, boilers, aggregate and concrete plants, emergency and nonemergency power generators, a hush house for engine testing, paint spray booths, media blasting equipment, degreasers, cooling towers, woodworking operations, fugitive dust, and miscellaneous chemical usage. As part of the permit requirements, Nellis AFB

must submit annual emissions inventory reports by 31 March of each calendar year. Furthermore, the permit includes emissions limits and monitoring processes for the various permitted stationary sources.

Mobile source emissions at the Installation are generated by aircraft, vehicles, construction equipment, and other sources that move or have the potential to move from place to place. Aerospace ground equipment used to service aircraft includes generators, light carts, compressors, bomb lifts, hydraulic test stands, and other portable equipment required for aircraft operations. Equipment emissions come from forklifts, backhoes, tractors, and other onsite construction equipment. On-road vehicle emissions include both government-owned and privately owned vehicles. **Table 3-11** presents the most recent stationary source emissions inventories for Nellis AFB.

Table 3-11
Nellis AFB Stationary Source Emission Summary
in Tons per Year (2022)

Emission Source	VOCs[a]	NO_x[a]	CO[a]	SO_2[a]	PM_{10}[a]	$PM_{2.5}$[a]	CO_2e[b]
Stationary Sources	6.76	21.22	10.91	0.99	3.76	1.87	8,920
Fugitive Dust[c]	---	---	---	---	15.36	2.30	---
Total	**6.76**	**21.22**	**10.91**	**0.99**	**19.12**	**4.17**	**8,920**

a Source: Nellis AFB, 2023o
b Source: Nellis AFB, undated
c Fugitive dust emissions reported for disturbed ground surfaces and haul road activity on Nellis AFB.
CO = carbon monoxide; NO_x = nitrogen oxides; PM_{10} = inhalable particles with diameters of 10 micrometers or smaller; $PM_{2.5}$ = fine inhalable particles with diameters of 2.5 micrometers or smaller; SO_2 = sulfur dioxide, VOC = volatile organic compound

3.5.2 Environmental Consequences

3.5.2.1 Evaluation Criteria

This analysis estimates direct and indirect emissions of the Proposed Action and Alternatives, including the No Action Alternative and compares those emissions with the relevant pollution standards to assess the impact of potential increases in pollutant concentrations. Although the Proposed Action and Alternatives do not include any near-term construction, for the purposes of this analysis, future construction within the various land use functional areas over a period of 7 years was assumed. This analysis evaluates short- and/or long-term increases in criteria pollutant emissions in relation to public proximity to the emissions, including sensitive populations and prevailing wind patterns. This analysis quantified GHG emission estimates and referenced those estimates to DAF climate action goals and the most recent GHG emission data for Clark County in the context of Nevada GHG reduction goals.

The air quality analysis includes CAA General Conformity Rule Applicability analyses for nonattainment and maintenance areas. For nonattainment and maintenance areas, the air quality analysis must assess whether or not a General Conformity determination is required pursuant to the General Conformity Rule (40 CFR Part 93 Subpart B).

For attainment area criteria pollutants, the air quality analysis uses the USEPA's General Conformity *de minimis* threshold of 100 tpy as an initial indicator of the local significance of potential impacts on air quality (DAF, 2023a).

As described above, Clark County is currently designated as moderate nonattainment for the 8-hour O_3 standard and is a designated maintenance area for CO and PM_{10}. To assess the applicability of General Conformity to the Proposed Action, the General Conformity Rule *de minimis* threshold of 100 tpy was used as the O_3 *de minimis* threshold for its precursors, VOCs or NO_x, and CO and PM_{10}.

It should be noted that lead is a criteria pollutant and Clark County is in attainment for the lead NAAQS. Lead was not included in the air quality analysis because there are no known sources of lead emissions associated with the Proposed Action and Alternatives. Lead emissions would typically result from metal and ore processing, combustion of aviation gasoline, lead-acid battery manufacturers, and waste incinerators.

All proposed development would occur within the footprint of the Installation. Calculations have been performed to account for each development project being completed within 12 months of the year that it is programmed (e.g., if a project is planned for implementation in FY 2025, the development is assumed to occur between January and December 2025), even though some projects would last longer than 12 months. An exception to this is the airfield development, which is extensive and has been estimated to last 3 years (2026–2028). The following assumptions were used for development projects:

- New building foundations require excavation of at least 1 foot of grade soil.
- Airfield pavements require excavation of at least 3.5 feet of grade soil.
- For the purposes of calculating emissions based on building volume (cubic feet), buildings are assumed to have an average height of 14 feet to account for some variation in the heights across all the proposed projects.
- Sidewalks for new buildings are assumed to be 10 percent of the new building footprint square footage.
- New impervious surfaces are assumed to be concrete or asphalt.

Emissions would primarily be generated by:

- diesel-powered construction equipment operating on site,
- trucks removing or delivering materials,
- trucks operating within the fence line of the proposed development area,
- construction workers commuting to and from work,
- dust created by grading and other bare earth development activities, and
- application of architectural coatings.

Development would be performed following all applicable Clark County Division of Air Quality rules, such as obtaining a dust control operating permit and preparing a dust mitigation plan prior to the start of any development activity on any site that would include 0.25 acre or more of disturbed surface area (Air Quality Rules Section 94), and renewing the permit for each year of development activity; controlling visible emissions (Air Quality Rules Section 26); and limiting idling of diesel-powered motor vehicles (Air Quality Rules Section 45). Additionally, stationary source permitting requirements (Air Quality Rules Section 12 series) would be followed for the operation of concrete batch plants, asphalt plants, generators, storage tanks, fueling operations, or other stationary emission sources located on site for use in development activities.

Detailed information on the emissions estimates and assumptions can be found in **Appendix C**.

As described in Chapter 2, there are two scenarios for development considered for the Proposed Action:

- Alternative 1 would fully utilize this undeveloped area, covering 2,000 acres, to identify areas for the future construction of facilities and infrastructure required to meet current and future mission needs over the next decade.
- Alternative 2 would include the partial development of the east side of Nellis AFB to address known facility and infrastructure deficiencies and provide Nellis AFB with the facilities and space required to accomplish its current and mid-term mission goals. Alternative 2 would include a reduced development footprint compared to Alternative 1 but would still address the 99 ABW's current mission constraints.

The environmental impact methodology for air quality impacts was derived by utilizing the same operational data as directed by AFMAN 32-7002, *Environmental Compliance and Pollution Prevention* (February 2020). The air analysis for development activities factors in the construction footprint, truck trips for material brought on and off site, and other relevant details. These data are included in the DAF Air Conformity Applicability Model (ACAM) used for analysis. ACAM (version 5.0.23a) was used to provide screening-level

emissions estimates for the Proposed Action future construction activities. The computed data are used to evaluate the potential environmental consequences of the Proposed Action on ambient air quality. The ACAM results are provided in **Appendix C** in summary reports. Those results are included in the following sections describing the possible impacts to air quality.

Figure 3-3 presents the geographic location of the area of development for Alternatives 1 and 2, as well as the location of public sensitive receptors. Sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing, and convalescent facilities. These are locations where the occupants are more susceptible to the adverse effects of exposure to air pollutants. In addition to these geographic locations, **Figure 3-3** includes a wind rose that provides a graphical indication of the predominant wind directions and speeds in the Nellis AFB vicinity throughout the year.

GHG emissions are global by nature and are addressed accordingly. The quantitative analysis of CO_2e emissions in this PEIS is for disclosing the local net effects (increase or decrease) of the Proposed Action and Alternatives and for its potential usefulness in making reasoned choices among alternatives. The net change in GHG emissions from the Proposed Action and the Alternatives is discussed in **Section 3.5.2.6**.

3.5.2.2 Alternative 1

The complete development of the east side of Nellis AFB would involve development of up to 2,000 acres of land, of which approximately 1,480 acres would be converted from largely open space to impervious surfaces. Development predominantly would include pavements, buildings, and utilities. Development activities would be ongoing from 2026 through 2032. During this period, several hundred construction workers would be working on site daily, based on similar scale construction projects (Air National Guard, 2024; Department of the Navy, 2022), and daily truck traffic would provide materials transport to and from the Installation.

Construction activities likely would include batch plant operations for the generation of large volumes of concrete to be used on site, and an asphalt plant could also be located on site for the construction period. These operations would require the storage of raw materials on site in laydown areas, and other laydown areas would be anticipated both for materials to be used on site and for the storage of excavated and demolition materials to be removed from the site.

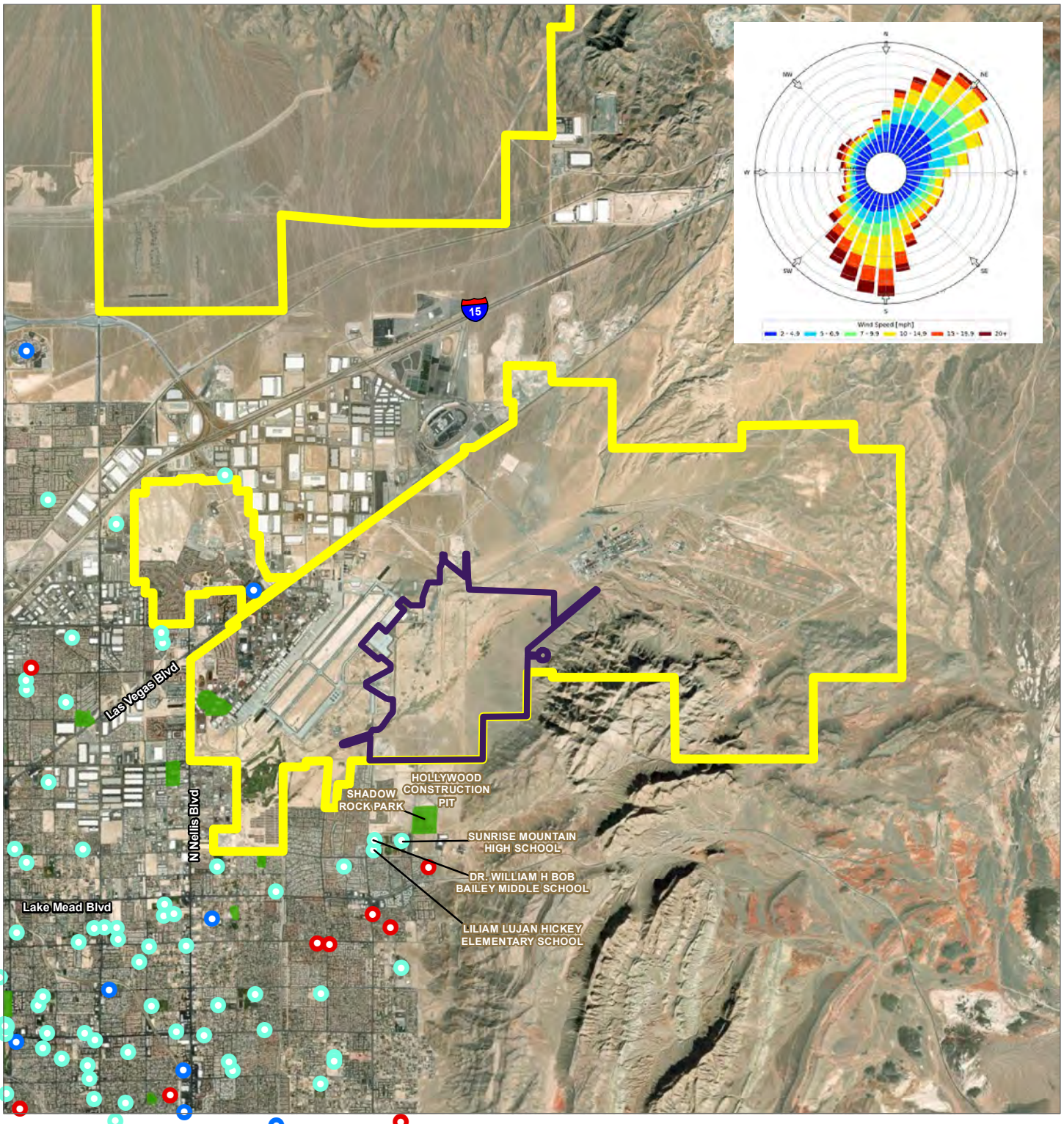


FIGURE 3-3
Air Quality – Sensitive Receptors

- Senior Living Facility
- Hospital & Medical Facility
- School & Daycare
- Installation Boundary
- Proposed Action Area
- Community Park & Playground

N

0 1.5 3 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

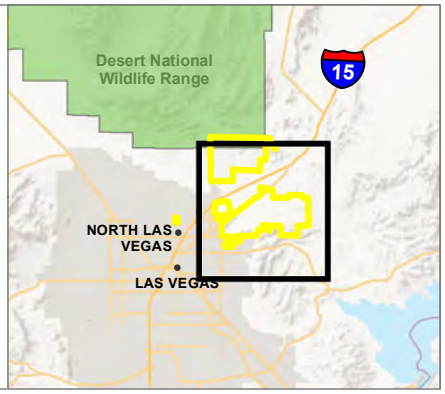


Table 3-12 presents the estimated annual emission totals for the construction period for VOCs, NO_x, CO, and PM_{10}. The results are compared to the General Conformity *de minimis* thresholds for these pollutants.

Table 3-12
Annual Estimated Construction Emissions of VOCs, NO_x, CO and PM_{10}

Construction Year	VOCs	NO_x	CO	PM_{10}
2026	7.10	6.43	12.78	31.43
2027	12.09	5.33	16.91	20.80
2028	10.75	4.46	14.93	15.29
2029	10.96	2.67	13.57	2.43
2030	11.90	2.87	14.78	4.03
2031	0.28	0.41	0.93	0.02
2032	1.62	1.17	3.19	0.56
De minimis thresholds	100	100	100	100
Exceedance in any year?	No	No	No	No

CO = carbon monoxide; NO_x = nitrogen oxides; PM_{10} = inhalable particles with diameters of 10 micrometers or smaller; VOC = volatile organic compound

As shown in **Table 3-12**, estimated construction emissions for VOCs, NO_x, CO, and PM_{10} would not exceed the General Conformity *de minimis* thresholds for these pollutants. As a result, the action would be exempt from the General Conformity requirements.

Table 3-13 presents the estimated annual emission totals for the construction period for SO_2 and $PM_{2.5}$ and the results are compared to the *de minimis* comparative indicator thresholds for these pollutants.

Table 3-13
Annual Estimated Construction Emissions of SO_2 and $PM_{2.5}$

Construction Year	SO_2	$PM_{2.5}$
2026	0.02	11.73
2027	0.02	5.22
2028	0.02	2.37
2029	0.01	0.48
2030	0.01	0.78
2031	0.00	0.01
2032	0.00	0.11
De Minimis threshold comparative indicator	100	100
Exceedance in any year?	No	No

$PM_{2.5}$ = fine inhalable particles with diameters of 2.5 micrometers or smaller; SO_2 = sulfur dioxide

Both SO_2 and $PM_{2.5}$ estimated annual emission levels would be below the comparative indicator. Based on these results, these emissions would not contribute significant impacts to ambient air quality. While neither pollutant would exceed the indicator value, it should be noted that ambient levels of $PM_{2.5}$ in Clark County are within 9 percent of the 24-hour NAAQS and 10 percent of the annual NAAQS (see **Table 3-10**).

As noted previously, winds in Clark County change direction seasonally, primarily emanating from the northeast in the cooler months and changing over to the south-southeast in the warmer months. Additionally, while winds tend to average in the range of 7–10 miles per hour, the strongest winds occur in the warmer months. These seasonal parameters can play an important role with the migration of ground-level air pollutants. As shown in **Figure 3-3** above, areas directly to the north, east, and southeast of the Proposed Action area are largely undeveloped. The Installation airfield complex lies immediately to the west and serves as a geographic buffer between the proposed development and other developed areas of the Installation.

The closest developed areas lie to the southwest and are residential areas that are not a part of Nellis AFB. The closest receptor area is Shadow Rock Park, which lies approximately 0.9 mile due south of the

southernmost extent of the Proposed Action area. Additionally, there is a cluster of public schools (Sunrise Mountain High School, Dr. William H. "Bob" Bailey Middle School, and Liliam Lujan Hickey Elementary School), just south and west of Shadow Rock Park, approximately 1.4 miles from the southernmost boundary of the Proposed Action area. A small area of residential homes abuts the Installation at the southern corner of Proposed Action area, and is also adjacent to the Hollywood Construction pit, where gravel is excavated, and concrete, asphalt, and dirt is dumped for recycling into blends of different gravel bases. The likeliest probability of ground-level air pollution migrating from work sites in the development area to offsite sensitive receptor areas would be during work on the southernmost quadrant of the Proposed Action area during the cooler months, when winds would seasonally cause air movements from the northeast toward the southwest. During the warmer months, airborne emissions would tend to migrate away from populated areas. The likelihood of significant emissions reaching the park and school areas would be low because construction activity levels would fluctuate throughout the day as well as from day to day. Localized wind conditions also vary throughout the day, while construction sources would move around the site such that potential pollutant concentration increases would not persist in any single location. As a result, any potential exposure to elevated pollutant concentrations would be limited on any given day and would be further limited to the seasonal period when winds are more likely to blow toward the southeast (October–February).

Traffic on and off the Installation would be expected to increase substantially during the construction period, as potentially hundreds of trucks and construction worker vehicles move on and off the Installation. The construction worker population would add several hundred vehicles arriving in the morning and departing in the late afternoon. Truck traffic would be more continuous throughout the day, bringing material onto the Installation or removing soil, debris, and other materials off site. These vehicles would further increase traffic along major arteries. The potential for delayed access to the Installation due to queuing at the gate that construction traffic would use could be substantial unless measures were taken to vary construction schedules away from peak gate access times or provide for separate gate access for the construction area. Queuing issues include substantial emissions from idling, which can create hot spots, or very localized areas of pollutant spikes from exhaust emissions.

Fugitive dust is highly regulated in Clark County, and a permit from the county is required before conducting ground-disturbing activities. A visible plume of dust extending more than 50 yards from the point of origin may be subject to issuance of a notice of violation including a corrective action order. A list of BMPs that likely would be included in a dust mitigation plan is included in **Section 3.5.3**.

Emissions from Alternative 1 future construction activities would occur over a 7-year period, but none of the pollutants for which the area is in nonattainment would exceed General Conformity *de minimis* thresholds. Additionally, levels of SO_2 and $PM_{2.5}$ would not exceed the comparative indicator thresholds. Significant exposures to ground-level pollutants by sensitive receptors due to pollutant migration would be unlikely given the characteristics of the construction activity, the distance from the activities to the receptor locations, and seasonality of wind direction. Accordingly, implementation of Alternative 1 would not be anticipated to result in significant adverse impacts to ambient air quality or human health. Short-term adverse impacts to air quality that would not be significant would be anticipated to occur during future construction as a result of an increase in emissions from construction equipment. Additional analysis of impacts to air quality would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

For GHGs, the ROI is global and impacts are cumulative by nature. Accordingly, potential impacts associated with GHG emissions under Alternative 1 are discussed in **Section 3.5.2.6.**

3.5.2.3 Alternative 2

Alternative 2 involves a partial development of the east side of Nellis AFB and would include a somewhat reduced development footprint compared to Alternative 1. The future construction activities within the remaining footprint would be similar to Alternative 1.

Table 3-14 presents the estimated annual emission totals for the construction period for VOCs, NO_x, CO and PM_{10}. The results are compared to the General Conformity *de minimis* thresholds for these pollutants.

Table 3-14
Annual Estimated Construction Emissions of VOCs, NO_x, CO and PM_{10}

Construction Year	VOCs	NO_x	CO	PM_{10}
2026	5.62	3.24	9.04	16.75
2027	1.70	2.23	4.26	3.99
2028	1.12	1.77	3.29	0.73
2029	0.66	1.03	2.16	0.06
De minimis thresholds	100	100	100	100
Exceedance in any year?	No	No	No	No

CO = carbon monoxide; NO_x = nitrogen oxides; PM_{10} = inhalable particles with diameters of 10 micrometers or smaller; VOC = volatile organic compound

As shown in **Table 3-14**, construction emissions for VOCs, NO_x, CO, and PM_{10} would not exceed the General Conformity *de minimis* thresholds for these pollutants, and as a result, Alternative 2 would be exempt from the General Conformity Rule requirements.

Table 3-15 presents the estimated annual emission totals for the construction period for SO_2 and $PM_{2.5}$.

Table 3-15
Annual Estimated Construction Emissions of SO_2 and $PM_{2.5}$

Construction Year	SO_2	$PM_{2.5}$
2026	0.01	3.02
2027	0.01	1.04
2028	0.00	0.15
2029	0.00	0.03
De Minimis threshold comparative indicator	100	100
Exceedance in any year?	No	No

$PM_{2.5}$ = fine inhalable particles with diameters of 2.5 micrometers or smaller; SO_2 = sulfur dioxide compound

Air quality impacts from implementation of Alternative 2 would be similar to those from Alternative 1 but would be reduced due to the reduced size and activity of the construction footprint. Additional analysis of air quality impacts would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

For GHGs, the ROI is global and impacts are cumulative by nature. Accordingly, discussion of impacts associated with GHG emissions under Alternative 2 is in **Section 3.5.2.6.**

3.5.2.4 Operational Emissions Under Both Alternatives

Developed areas would be expected to become operational in a phased timeframe while construction is ongoing. Emergency generators, boilers, industrial equipment, and other stationary sources installed in the new development were assumed to become operational in the year following construction completion. These stationary sources would require review and permitting by Clark County DES.

Electricity usage at the Installation would increase substantially because of the development. The future construction of buildings meeting high-performance and sustainable building requirements would help to mitigate the power requirements of the new buildings as compared to older buildings on the Installation. Additionally, Nellis AFB currently receives approximately 40.8 percent of its electricity through renewable sources, and this percentage would be anticipated to grow in accordance with the 2022 DAF climate action plan. As with construction, the operational impacts under Alternative 2 would be reduced compared to Alternative 1.

3.5.2.5 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.5.2.6 Cumulative Effects

Cumulative Effects With Past, Present and Reasonably Foreseeable Actions In Clark County

The cumulative effects of future construction occurring under the Proposed Action and the projects identified in **Table 3-2** would generate an overall increase in ambient air pollution in Clark County.

The Nellis AFB actions in **Table 3-2**, when combined with future construction activities occurring under the Proposed Action, would result in an increase in localized and regional emissions in Clark County. Beyond the Installation, a number of transportation construction projects are either ongoing or anticipated for the future. Each of these would undergo a Transportation Conformity Analysis prior to implementation of the action. This would ensure that the effects of construction and operation of the transportation projects would not violate Nevada SIP conditions. During the periods of construction, the cumulative effects of these projects in conjunction with the Proposed Action would result in increases in regional emissions in Clark County. Once construction is completed, emissions may be reduced overall based on the transportation improvements designed to alleviate congestion. Additionally, if the use of hybrid and electric vehicles continues to increase in the ROI (i.e., Clark County AQCR), this would have an overall net improvement in air quality.

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, short-term, adverse cumulative effects, as well as long-term, beneficial effects, none of which would be significant, to air quality resources would be anticipated to occur with implementation of the Proposed Action.

Cumulative Effects From GHGs

The ROI for GHGs is global and impacts are cumulative by nature. The cumulative analysis evaluates GHG emissions considering the existing conditions and the Proposed Action and Alternatives. Implementation of either alternative would contribute directly to emissions of GHGs from the combustion of fossil fuels. GHG emissions for the Proposed Action and Alternatives were estimated and are provided in **Table 3-16**. These estimates were prepared to provide a measure of the difference between the Proposed Action and Alternatives. Detailed calculations and assumptions are included in **Appendix C**.

Table 3-16
Total Estimated GHG Emissions from Construction by Alternative

Alternative	CO_2e (tons)	CO_2e (metric tons)
No Action – No Construction	0	0
Alternative 1 – Complete Development	13,056	11,844
Alternative 2 – Partial Development	3,379	3,065

CO_2e = carbon dioxide equivalent

Clark County has established a GHG reduction goal of 32 percent from 2019 levels by 2030, and reductions as close to zero as practical by 2050 (Clark County, 2024b). These local goals are consistent with published DAF goals of 50 percent emission reduction from 2008 levels by FY 2033 and net-zero emissions by FY 2046 (DAF, 2022). The Proposed Action would result in a temporary increase in GHG emissions while construction is ongoing. Additional operational GHGs may be emitted once the development has occurred; however, Nellis AFB is actively working to generate GHG reductions through the development of sustainable energy sources such as solar, which will help to mitigate any operational increases that may occur. For these reasons, the overall GHG impact would not be anticipated to hamper the achievement of local and DAF GHG emission goals.

3.5.2.7 Other Considerations Under NEPA

Adverse impacts to air quality would occur during future development phases of the Proposed Action. Clark County is in moderate nonattainment for the 2015 O_3 NAAQS standard and is a designated maintenance area for CO and PM_{10}. Emissions from future construction activities would not exceed General Conformity *de minimis* thresholds for any pollutants, including those for which Clark County is not in attainment.

3.5.3 Resource-Specific Mitigation Measures and Best Management Practices

Applicable construction projects must submit a dust mitigation plan, which includes the construction BMPs listed in Section 94 of the Clark County Air Quality Regulations. BMPs include, but are not limited to:

- Stabilize soil prior to, during, and after cut and fill activities.
- Apply water to stabilize disturbed soil throughout the construction site.
- Limit vehicle traffic and disturbance on soils where possible.
- Limit the size of staging areas.
- Apply water to surface soils where support equipment and vehicles will be operated.

Future construction should follow all applicable Clark County Air Quality Regulations, such as obtaining a dust control permit from the Clark County Department of Air Quality and Environmental Management for applicable construction activities, which include:

- soil-disturbing or construction projects greater than or equal to 0.25 acre,
- trenching greater than or equal to 100 feet in length, or
- mechanical demolition of any structure larger than or equal to 1,000 ft^2.

No significant adverse impacts to air quality and climate change would be anticipated to occur under implementation of the Proposed Action. No mitigation measures are recommended.

3.6 EARTH RESOURCES

3.6.1 Affected Environment

3.6.1.1 Definition of the Resource

Earth resources consist of surface and subsurface materials and their properties. Soils are the unconsolidated materials overlying bedrock or other parent material. Soils are typically described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential (the extent certain clay materials will enlarge when wet and shrink when dry), and erosion potential affect their abilities to support certain applications or uses. Soil properties must be examined for their compatibility with particular activities or types of land use. Beneficial use of earth resources can vary widely based on the location and its existing geological features.

Prime and Unique Farmland and Farmland of Statewide or Local Importance

Soil type and physical characteristics determine the growing potential of the soil. Prime farmland, as defined by the United States Department of Agriculture (USDA), is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses (USDA, 2024a). Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops (NRCS, 2012). Farmland that is of statewide or local importance, other than prime or unique farmland, is used for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate state or local government agency (NRCS, 2012).

Aggregates

Sand and gravel, whether natural or crushed, has many uses and applications in site development. Fine aggregates, or natural sand, are often used in concrete, mortar, asphalt, backfill, and construction applications. Coarse aggregates are commonly used in concrete and asphalt mixes for construction. Base course refers to aggregates with a range of particle sizes that forms a dense medium suitable for foundation for asphalt and concrete pavement, as well as backfill for pipe and underground utilities.

Minerals

The mineral resources within the soil and bedrock can comprise a wide range of minerals that could be mined for commercial use. Minerals are necessary for the manufacturing consumer and commercial goods.

3.6.1.2 Region of Influence

The ROI for earth resources is the Proposed Action area as depicted in **Figure 2-1**.

3.6.1.3 Regional Geology

Nellis AFB is located within the physiographic area known as the Basin and Range Province in the southwestern portion of the US. This area was formed as a result of tectonic extension that created normal faults oriented north to south, resulting in north-to-south-oriented mountain ranges separated by valleys or basins filled with alluvial deposits (loose clay, gravel, sand, or silt deposited by running water or similar setting). Nellis AFB is adjacent to the Lake Mead Recreational Area, which acts as a natural divide between the northern and southern portions of the Basin and Range Province (NPS, 2020). The mountain ranges surrounding Nellis AFB primarily consist of limestone with portions of sandstone, shale, dolomite, gypsum, and interbedded quartzite. The alluvial deposits found within the ROI are composed of poorly sorted gravelly, cobbly, and stony sand deposits in the upper reaches that grade to finer-textured material toward the valley floors. Basin floors are depositional areas of late-laid silt and clay and younger alluvial deposits. Most of these alluvial deposits have been transported by water and deposited on the sloping basin floors of the floodplains (Nellis AFB, 2017c).

3.6.1.4 Topography

Topography is characterized by the natural and physical representation of an area. Nellis AFB is situated in a topographic depression, lying northeast of the city of Las Vegas, Nevada. The Installation and adjacent areas are part of two major desert regions of the US—the Mojave Desert and the Great Basin Desert (Nellis, 2018a). As part of the Las Vegas Valley, Nellis AFB is located at the base of Sunrise Mountain (to the east) and the Spring Mountains (to the west). The ROI drains to the southwest; elevation of the ROI ranges from 1,800 feet in the southwestern corner up to 1,900 feet in the northeastern corner (US Geological Survey, 2024).

3.6.1.5 Soils

Nellis AFB sits atop alluvial fans and deposits with soils consisting of silty sands. These soils were formed by the erosion of the Las Vegas Mountain Range to the north and the peaks of Sunrise Mountain and

Frenchman's Peak to the east-southeast (Nellis AFB, 2018a). In the foothills of Sunrise Mountain and Frenchman's Peak, silty sands give way to carbonate rocks.

The soil types within the ROI are summarized in **Table 3-17** and illustrated in **Figure 3-4**. Soil types within the ROI include Wechech-Weiser soil association, which comprises 44 percent of the ROI, glencarb very fine sandy loam/saline (33 percent), glencarb silt loam (15 percent), glencarb very fine sandy loam (3.8 percent), Weiser-Wechech soil association (2.7 percent), Las Vegas-DeStazo complex (0.7 percent), and the Upperline-St. Thomas-Upperline association (0.1 percent). The glencarb silt loam soil, glencarb very fine sandy loam, and Las Vegas-DeStazo complex are characterized by low slopes (0–2 percent), while the Weiser-Wechech and Wechech-Weiser soil are characterized by low-to-moderate slopes (2–8 percent).

Table 3-17
Soil Types Within the ROI

Map Unit Symbol	Name	Slope (%)	Acres in ROI	Percent of ROI (%)	Runoff Potential
hqvz	Wechech-Weiser association	2–8	884.6	44	Very High
hrb9	Glencarb very fine sandy loam, saline	0–2	654.9	33	Low
hrb6	Glencarb silt loam	0–2	307.0	15	Low
1qq9c	Glencarb very fine sandy loam	0–2	76.4	3.8	Low
1tf6l	Weiser-Wechech association	2–8	53.3	2.7	Low
hrbs	Las Vegas-DeStazo complex	0–2	14.1	0.7	Very High

Source: USDA Soil Survey Geographic Database
ROI = Region of Influence

As can be seen in **Figure 3-4**, the glencarb very fine sandy loam saline soil type runs through the central portion of the ROI**.** This soil type occurs within an alluvial flats landform with a soil profile typically consisting of silt loam from 0 to 6 inches bgs, followed by stratified very fine sandy loam to silty clay loam from 6 to 60 inches bgs. This soil type is considered to have low runoff potential and is well drained (USDA, 2024b). Also depicted in **Figure 3-4**, the glencarb silt loam soil type is found mostly along the western portion of the ROI**.** This soil type occurs within an alluvial flats landform with a soil profile typically consisting of silt loam from 0 to 6 inches bgs, followed by stratified very fine sandy loam to silty clay loam from 6 to 60 inches bgs. This soil type is considered to have low runoff potential and is well drained. Glencarb silt loam has a calcium carbonate content of up to 60 percent and a gypsum content of up to 5 percent and is considered to be slightly to moderately saline (USDA, 2024b).

The glencarb very fine sandy loam soil type is found mostly along the north-central portion of the ROI (see **Figure 3-4**)**.** This soil type occurs within an alluvial flats landform with a soil profile typically consisting of very fine sandy loam from 0 to 6 inches bgs, followed by stratified very fine sandy loam to silty clay loam from 6 to 60 inches bgs. This soil type is considered to have low runoff potential and is well drained. Glencarb very fine sandy loam has a calcium carbonate content of up to 60 percent and a gypsum content of up to 5 percent and is considered to be moderately saline to strongly saline (USDA, 2024b).

The Weiser-Wechech association soil type is found in small portions along the northern portion of the ROI (see **Figure 3-4**). This soil type occurs within alluvial fan remnants and has a soil profile typically consisting of extremely gravelly fine sandy loam from 0 to 6 inches bgs, followed by extremely gravelly sandy loam from 6 to 60 in bgs. This soil type is considered to have low runoff and is well drained. Weiser-Wechech association has a calcium carbonate content of up to 40 percent. It is considered to be non-saline to very slightly saline (USDA, 2024b)The Las Vegas-DeStazo complex soil type is found along the central and western edge of the ROI (see **Figure 3-4**). This soil type occurs within an alluvial flat landform with a soil profile typically consisting of gravelly fine sandy loam from 0 to 2 inches bgs, followed by fine sandy loam from 2 to 8 inches bgs. This is often underlain by gravelly sandy clay loam from 8 to 12 inches bgs and followed by cemented material, or hardpan, starting at 12 to16 inches bgs. The hardpan layer can vary within this soil type to be as shallow as 3 inches bgs. This soil type is considered to have a very high runoff class largely due to the hardpan layer (USDA, 2024b).

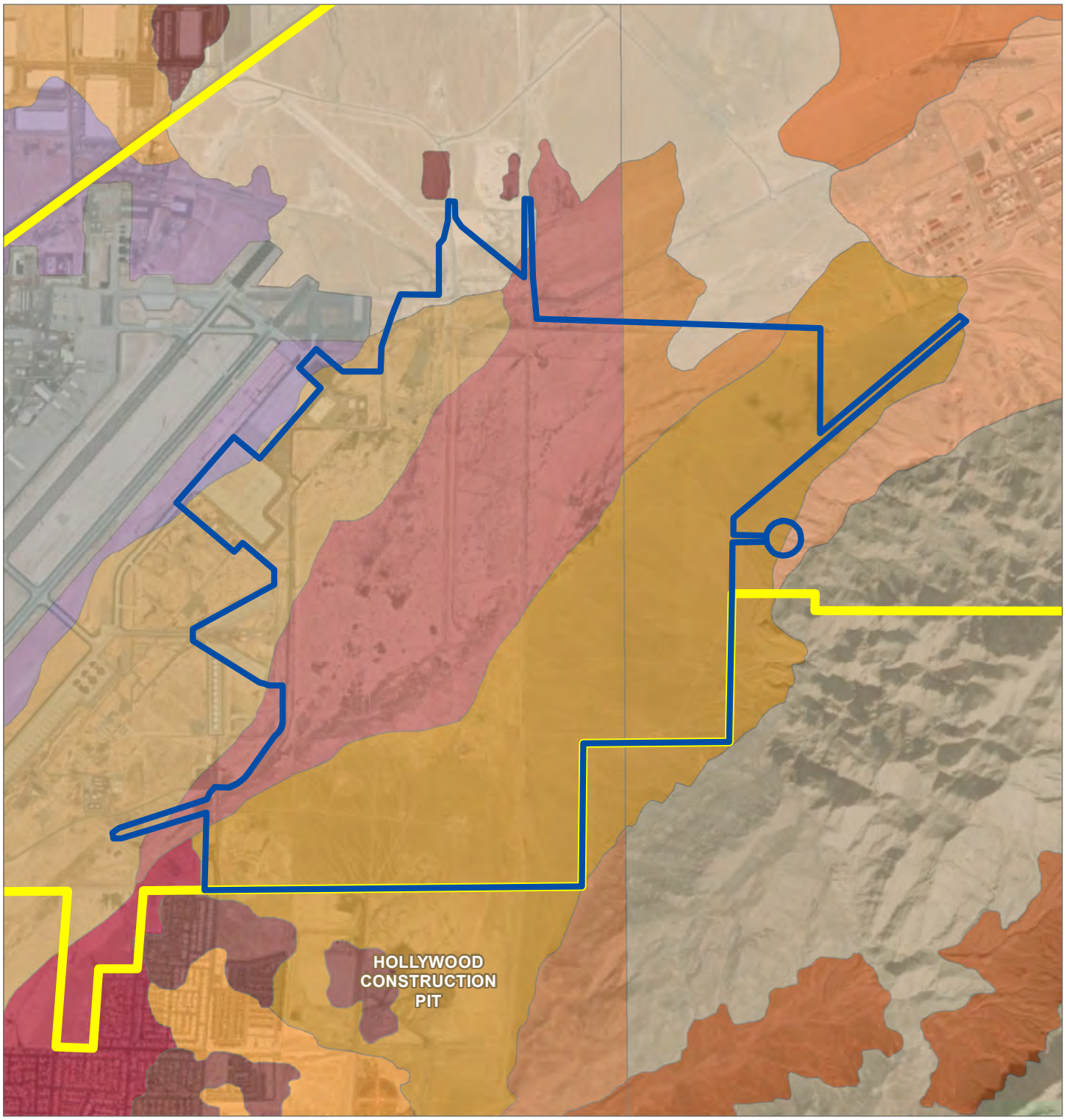


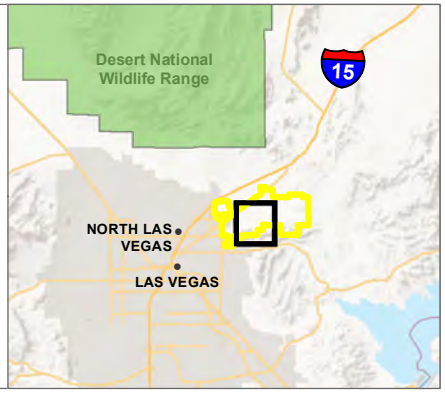
FIGURE 3-4
Soil Types – Alternative 1

- Alternative 1
- Installation Boundary
- Glenbard, Very Fine Silty Loam
- Upperline-Wiser Whitebasin Association
- Upperline St. Thomas-Upperline Association
- St. Thomas-Iceberg Rock Outcrop Association
- Caliza Very Gravelly Sandy Loam 2-8% Slope
- Glencarb Silt Loam
- Wechech-Weiser Association
- Wechech-Ifteen Association
- Glencarb Very Fine Sandy Loam, Saline
- Las Vegas-McCarran-Grapevine Complex, 0-4% Slope
- Las Vegas-DeStazo Complex, 0-2% Slope
- Weiser-Wechech Association
- Weiser Extremely Gravelly Fine Sandy Loam, 2-8% Slope
- Pits, Gravel
- Urban Land

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



The soil types within the Alternative 2 development area are summarized in **Table 3-18** and illustrated in **Figure 3-5**. Soil types include glencarb very fine sandy loam/saline, which comprises 44 percent of the ROI, Wechech-Weiser soil association (31 percent), glencarb silt loam (21 percent), Weiser-Wechech soil association (2.5 percent), the Las Vegas-DeStazo complex (1.0 percent), the glencarb very fine sandy loam (0.4 percent), and the Upperline-St. Thomas-Upperline association (0.2 percent). The glencarb silt loam soil, glencarb very fine sandy loam, and Las Vegas-DeStazo complex are characterized by low slopes (0–2 percent), while the Weiser-Wechech and Wechech-Weiser soil are characterized by low-to-moderate slopes (2–8 percent).

Table 3-18
Soil Types Within Alternative 2 Development Area

Map Unit Symbol	Name	Slope (%)	Acres in ROI	Percent of ROI (%)	Runoff Potential
hrb9	Glencarb very fine sandy loam, saline	0–2	654.9	44	Low
hqvz	Wechech-Weiser association	2–8	458.8	31	Very High
hrb6	Glencarb silt loam	0–2	307.0	21	Low
1tf6l	Weiser-Wechech association	2–8	37.6	2.5	Low
hrbs	Las Vegas-DeStazo complex	0–2	14.1	1.0	Very High
1qq9c	Glencarb very fine sandy loam	0–2	5.2	0.4	Low
hr24	Upperline-St. Thomas-Upperline association	8–30	3.0	0.2	Very High

Source: USDA Soil Survey Geographic Database
ROI = Region of Influence

3.6.1.6 Prime and Unique Farmland and Farmland of Statewide or Local Importance

As the primary use of the land on Nellis AFB is, has been, and will continue to be a DAF installation, the consideration of prime and unique farmlands and farmlands of statewide or local importance is not required. The primary soils found on the Installation are not designated as prime farmland and therefore, no adverse effects to prime farmland would be expected (USDA, 2024b). Accordingly, prime farmland is not further analyzed in this PEIS.

3.6.1.7 Aggregates

The limestone geology of the ROI is ideal for beneficial use of aggregates. The Boulder Sand & Gravel Hollywood Construction Pit, located immediately south of the ROI, supplies various aggregate products used for material that underlies building pads, parking lots, streets, sidewalks, and curb and gutter (see **Figure 3-4**). The construction pit also provides sand products that utility companies use for backfill around pipes in trenches, landscaping material, and sand on top of gravel pads before concrete is poured. Aggregate materials suitable for mining may be present within the soil underlying the Installation; however, aggregate material is not mined on Nellis AFB. Accordingly, aggregates are not further analyzed in this PEIS.

3.6.1.8 Minerals

Nevada is diverse in its natural resources and leads the nation in the value of non-fuel minerals that it produces, which in 2017 amounted to about $8.5 billion. Major commodities produced include gold, silver, lithium, copper, geothermal energy, barite, gypsum, diatomite, and aggregate (Nevada Bureau of Mines and Geology, 2024).

The mining districts closest to Nellis AFB include the Dike Mining District, 3 miles to the north, and the Las Vegas Mining District to the southeast. Gypsum and limestone have been mined in the vicinity of Nellis AFB since the 1930s, including within both of these districts. The Dike Mining District also includes lead resources and includes the Lead King Mine. The Las Vegas Mining District also includes deposits of manganese, boron, and titanium.

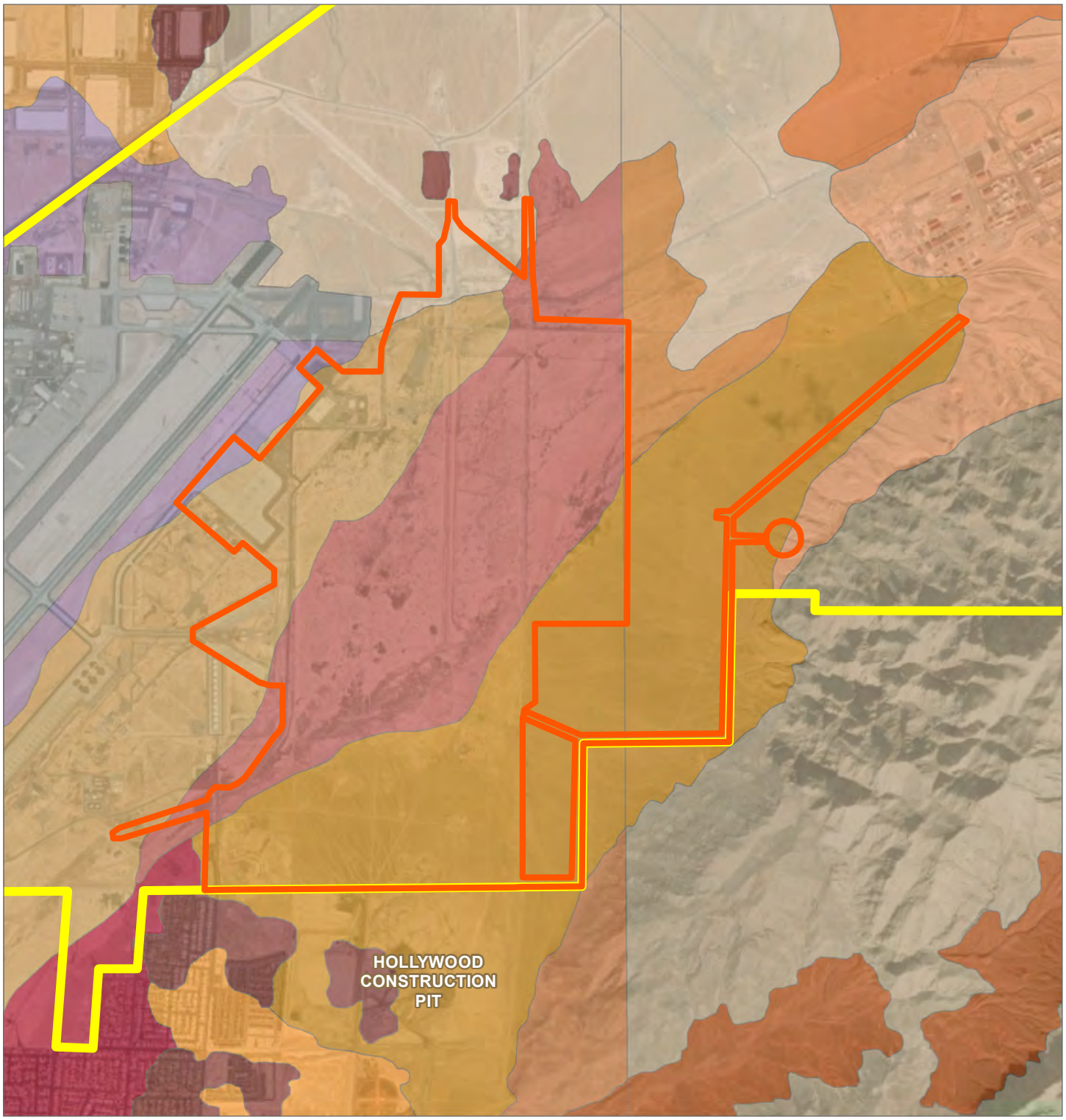


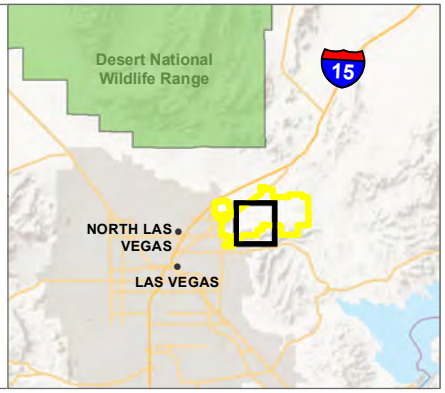
FIGURE 3-5
Soil Types – Alternative 2

- Alternative 2
- Installation Boundary
- Glenbard, Very Fine Silty Loam
- Upperline-Wiser Whitebasin Association
- Upperline St. Thomas-Upperline Association
- St. Thomas-Iceberg Rock Outcrop Association
- Caliza Very Gravelly Sandy Loam 2-8% Slope
- Glencarb Silt Loam
- Wechech-Weiser Association
- Wechech-Ifteen Association
- Glencarb Very Fine Sandy Loam, Saline
- Las Vegas-McCarran-Grapevine Complex, 0-4% Slope
- Las Vegas-DeStazo Complex, 0-2% Slope
- Weiser-Wechech Association
- Weiser Extremely Gravelly Fine Sandy Loam, 2-8% Slope
- Pits, Gravel
- Urban Land

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Mineral mining does not actively occur on Nellis AFB; however, minerals suitable for mining may be present within the geology underlying the Installation. Historic mining claims were made within the eastern portion of the ROI. Mining claims include the Airway #15 and Airway #17 placer claims made by Dorothy Smith in 1951 in the southeastern portion of the ROI, as well as the Airway #13 placer claim made by Charles House-Associates in 1951 and the HC-1 Lode Claim made by Charles Heisen in 1990 in the northeastern portion of the ROI. These claims are no longer active and are currently listed as closed (Diggings, 2024). Accordingly, minerals are not further analyzed in this PEIS.

3.6.2 Environmental Consequences

3.6.2.1 Evaluation Criteria

Potential significant adverse impacts to earth resources would occur if the Proposed Action or Alternatives:

- substantially alter unique or valued geologic or topographic conditions;
- cause soil erosion, sedimentation, and/or loss of natural function (e.g., compaction); or
- develop on soils with characteristics that do not support the intended land use.

3.6.2.2 Alternative 1

Geology/Topography

Development under Alternative 1 would include ground-disturbing activities that would have the potential to change the topography at Nellis AFB on a surface level. Development under Alternative 1 would result in up to 1,480 acres of new impervious surfaces. and would have the potential to impact additional areas through grading activities. Grading activities associated with development would have the potential to alter or eliminate areas of existing slope. However, the Proposed Action area is largely flat, and substantial changes to the underlying geology and topography would not be anticipated with implementation of Alternative 1. Grading plans for each project would be developed as part of project design. Therefore, no significant adverse impacts to geology/topography would be anticipated to occur under Alternative 1.

Soils

Under Alternative 1, up to 1,480 acres of the Proposed Action area would be covered with impervious surfaces and additional acreage would be graded. Soil disturbance increases the potential for soil erosion and sedimentation to occur during a significant rainfall event. Approximately 45 percent of soils within the Proposed Action area are considered to have very high runoff potential. Therefore, disturbance of these soils would have the potential to contribute to increased erosion and sedimentation during rainfall events. The exact sizes and types of facilities that would be located within the functional use categories for Alternative 1 are not currently known; however, if the footprint of an individual project exceeds 5,000 ft^2, contractors would be required to maintain or restore, to the maximum extent feasible, the predevelopment hydrology of the property with respect to the water temperature, rate, volume, and duration of flow. Additionally, in adherence to National Pollutant Discharge Elimination System (NPDES) regulations, projects disturbing 1 or more acres or projects that are less than 1 acre but are part of a larger common plan of development must develop low-impact development measures that would remain in effect after construction is completed.

With the use of BMPs during and post construction and design standards to manage increases in stormwater runoff and to limit opportunities for sedimentation and erosion, long-term, adverse impacts to soils that would not be significant would have the potential to occur during future development under Alternative 1. However, long-term, beneficial impacts to stormwater infrastructure would also occur under Alternative 1 through potential future stormwater drainage improvements such as the construction of a reinforced berm designed to divert stormwater from Sunrise Mountain toward the proposed expansion of the flood control basin by the CCRFCD, which would help to reduce the potential for sedimentation and erosion that would occur as a result of soil disturbance.

The limestone aggregate geology underlying the Proposed Action area could be used as aggregate backfill for development activities (US Geological Survey, 2024). However, geotechnical surveys conducted prior to future construction would provide additional information on soil suitability for the intended various land uses. Geotechnical surveys include both field exploration as well as laboratory testing to classify the onsite soils and to evaluate engineering and physical properties of the onsite soils.

The excavation of the hardpan soils within the Proposed Action area would be anticipated to generate some challenges. Excavating medium hard-to-hard hardpan soils may require a heavy-duty excavator or trencher or a dozer with the equivalent excavating characteristics of a Caterpillar D-10 with ripper. Excavation of hard-to-very hard and/or very hard cemented materials may require a dozer with the equivalent excavating/ripping characteristics of a Caterpillar D-11 (Geotechnical & Environmental Services, Inc., 2022). Use of the proper equipment would be required to overcome operational challenges associated with hardpan soil excavation.

Additional analysis of impacts to earth resources would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.6.2.3 Alternative 2

Geology/Topography

Development under Alternative 2 would include ground-disturbing activities that would have the potential to change the topography at Nellis AFB similar to Alternative 1 but within a reduced footprint. Development under Alternative 2 would result in up to 1,216 acres of new impervious surfaces. Grading activities associated with development would have the potential to alter or eliminate areas of existing slope. However, the Alternative 2 development area is largely flat, and substantial changes to the underlying geology and topography would not be anticipated with implementation of Alternative 2. Grading plans for each project would be developed as part of project design.

Soils

Under Alternative 2, up to 1,216 acres of the Alternative 2 development area would be covered with impervious surfaces and additional acreage would be graded as part of development. Soil disturbance increases the potential for soil erosion and sedimentation to occur during a significant rainfall event. Approximately 32 percent of soils within the Alternative 2 development area are considered to have very high runoff potential. Therefore, disturbance of these soils would have the potential to contribute to increased erosion and sedimentation during rainfall events. The exact sizes and types of facilities that would be located within the functional use categories for Alternative 2 is not currently known; however, if the footprint of an individual project exceeds 5,000 ft^2, contractors would be required to maintain or restore, to the maximum extent feasible, the predevelopment hydrology of the property with respect to the water temperature, rate, volume, and duration of flow. Additionally, in adherence to NPDES regulations, projects disturbing 1 or more acres or projects that are less than 1 acre but are part of a larger common plan of development must develop low-impact development measures that remain in effect after construction is completed.

With the use of BMPs during and post construction and design standards to manage increases in stormwater runoff and to limit opportunities for sedimentation and erosion, long-term, adverse impacts to soils that would not be significant would have the potential to occur during future development under Alternative 2. However, long-term, beneficial impacts to stormwater infrastructure would also occur under Alternative 2 through potential future stormwater drainage improvements such as the construction of a reinforced berm designed to divert stormwater from Sunrise Mountain toward the proposed expansion of the flood control basin by the CCRFCD, which would help to reduce the potential for sedimentation and erosion that would occur as a result of soil disturbance.

As under Alternative 1, geotechnical surveys of the Alternative 2 development area conducted prior to future construction would provide additional information on soil suitability for the intended various land uses and excavation of the hardpan soils would require use of heavy-duty earth-moving equipment, similar to a Caterpillar D-10 or D-11 excavator.

Additional analysis of impacts to earth resources would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.6.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. There would be no changes to earth resources in the ROI beyond baseline conditions. The benefits of improved stormwater drainage as related to soil erosion and sedimentation buildup would not be realized. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.6.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in long-term, adverse impacts to earth resources that would not be significant. Several of the projects listed in **Table 3-2** would include grading or construction projects of various size and scale within or in the vicinity of the ROI—i.e., the Proposed Action area.

The TASS beddown included expansion of the ramp space and LOLA on the east side of the airfield to accommodate additional aircraft (11.5 acres and 7 acres, respectively). The Nellis Reclaimed Waterline Project involved 12,100 linear feet of waterline trenching and associated grading and soil disturbance. Completed MILCON projects included the addition of approximately 204,313 ft^2 of new impervious surfaces and also resulted in soil disturbance from grading and excavation activities. The impacts to earth resources from these projects were considered not significant because of the associated scale of the grading, trenching, and soil disturbance.

The Nellis Aggressor project includes facilities construction, demolition, renovation, and addition within Area I; all facility activities would occur within previously disturbed areas on the Installation and impacts to earth resources would be expected to be short term and not significant. The Nellis IDP EA evaluates proposed future construction, demolition, and renovation projects that would include grading and earthwork construction. Activities evaluated under that EA would occur within developed portions of Nellis AFB and impacts to earth resources would be expected to be short term and not significant. The Nellis CSTR EA evaluates the proposed future construction of new facilities, renovation and repair of existing facilities, and the implementation and maintenance of infrastructure improvements across approximately 149 acres within Area II northeast of the Proposed Action area. Grading activities under that project would include the entire 149 acres, the majority of which would occur on previously disturbed land. The project would also include regrading and repair of approximately 8 miles of existing gravel and dirt roads within Area II. The Nellis INRMP EA proposes the future construction of an environmental appreciation park in Area III of Nellis AFB. Impacts to earth resources from these projects would be expected to be not significant and primarily would include grading and construction within previously disturbed areas.

The CCRFCD expansion would be anticipated to include grading and trenching to extend the stormwater channel to the detention pond. Potential impacts to earth resources from these future projects would be anticipated to be not significant and result primarily from grading and soil disturbance within previously disturbed areas.

When combined with the Proposed Action, implementation of the projects identified in **Table 3-2** would be anticipated to result in long-term, not significant, adverse impacts to earth resources at Nellis AFB through the addition of impervious surfaces and earthwork construction. While the projects in **Table 3-2** are ongoing and in various stages of development, construction sites will be required to follow BMPs to prevent significant soil erosion or sedimentation. Temporary or permanent stabilization practices would be installed on disturbed areas as soon as practicable. All disturbed areas, storage areas, or BMPs would be regularly inspected.

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, long-term, not significant, adverse cumulative effects to earth resources would be anticipated to occur with implementation of the Proposed Action.

3.6.2.6 Other Considerations Under NEPA

The Proposed Action provides space for future development that could include various construction and post-construction activities utilizing nonrenewable resources originating from the earth. Construction would require consumption of nonrenewable resources, such as jet fuel, oil, and other petroleum products. Construction and post-construction activities would utilize petroleum resources in various ways, primarily for materials, energy, and transportation. Some examples of construction activities that would involve nonrenewable resources include the use of petroleum-derived asphalt for road construction and paving, paints and coatings in construction containing petroleum-based chemicals, and petroleum-based adhesives and sealants that are widely used in construction for bonding and sealing purposes. Post-construction activities may include transportation of waste and debris, which utilizes petroleum-fueled vehicles, asphalt used in road repair that is often petroleum based, and grounds maintenance that would include equipment fueled by petroleum products. Construction and post-construction activities would rely on the use of petroleum resources, both directly and indirectly, throughout various stages of the Proposed Action. However, none of these uses would be expected to significantly decrease the availability of minerals or petroleum resources. The Proposed Action would include ground-disturbing activities that would have the potential to change the topography at Nellis AFB on a surface level. Development under the Proposed Action would cover up to 1,480 acres with new impervious surfaces and would have the potential to impact additional areas through grading activities. Grading activities associated with development would have the potential to alter or eliminate areas of existing slope that are proposed for development. The construction of roads and other transportation infrastructure can increase erosion and sedimentation in nearby waterways. The addition of impervious surfaces would have the potential to increase stormwater runoff.

3.6.3 Resource-Specific Mitigation Measures and Best Management Practices

Impacts to earth resources under the Proposed Action and Alternatives would be managed, to the extent possible, through the use of mitigation measures that could include the following:

- Minimize the total disturbed area during construction and development.
- Cluster construction within the functional use category thresholds (see **Section 2.4.1**).
- Minimize soil compaction.
- Implement design standards to manage increases in stormwater runoff and to limit opportunities for increased sedimentation and erosion.
- Comply with the *Energy Independence and Security Act* (Public Law 110-140) (EISA) and NPDES permit requirements related to maintaining or restoring to predevelopment hydrology conditions.

Future construction projects that exceed 5,000 ft^2, would require contractors to maintain or restore, to the maximum extent feasible, the predevelopment hydrology of the property with respect to the water temperature, rate, volume, and duration of flow. Additionally, in adherence to NPDES regulations, projects disturbing 1 or more acres or projects that are less than 1 acre but are part of a larger common plan of development must develop low-impact development measures that remain in effect after construction is completed.

3.7 WATER RESOURCES

3.7.1 Affected Environment

3.7.1.1 Definition of the Resource

Water resources include surface water, stormwater, groundwater, wetlands, and floodplains. The *Federal Water Pollution Control Act of 1948*, as amended by the *Clean Water Act* (33 USC § 1251 et seq.) (CWA), was enacted to protect water resources vulnerable to contamination and quality degradation. The CWA provides the authority to establish water quality standards, control discharges into surface and subsurface waters (including groundwater), develop waste treatment management plans and practices, and issue permits for discharges. An NPDES permit under Section 402 of the CWA is required for discharges into navigable waters (33 CFR § 329.4). NPDES permits in Nevada are issued pursuant to CWA Section 402 by the NDEP. Under Section 401 of the CWA, a federal agency may not issue a permit or license to conduct any activity that may result in any discharge into waters of the US (see **Section 3.7.1.3**), unless a CWA Section 401 water quality certification is issued or NDEP waives certification. CWA Section 401 allows state water quality standards to apply to federal activities, in excess of the USEPA standards. Nevada's State Water Quality Standards are promulgated in Nevada Administrative Code 445A.11704–445A.2234.

Surface Water

The USACE and USEPA define surface waters, primarily lakes, rivers, estuaries, coastal waters, and wetlands, as waters of the US (33 CFR § 328.3; 40 CFR §§ 120.2). As such, these waters are subject to regulations of the CWA. Man-made features not directly associated with a natural drainage, such as upland stock ponds and irrigation canals, generally are not regulated as waters of the US.

Stormwater

Stormwater is surface runoff generated from precipitation and has the potential to introduce sediments and other pollutants into surface waters. Stormwater is regulated under the CWA Section 402 NPDES program. Stormwater management systems are designed to contain runoff on site during construction and to maintain predevelopment stormwater flow characteristics following development through either the application of infiltration or retention practices.

Groundwater

Groundwater is water that exists in the saturated zone beneath the earth's surface in pore spaces and fractures and includes aquifers. Groundwater is an essential resource that can be used for drinking, irrigation, and/or industrial processes, and can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations.

Wetlands

The USACE (33 CFR § 328.3) and the USEPA (40 CFR § 120.2, 230.3(o)) define wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." The natural-function benefits of wetlands include flood control, groundwater recharge, maintenance of biodiversity, wildlife habitat, recreational opportunities, and maintenance of water quality.

Floodplains

Floodplains are areas of low-level ground along rivers, stream channels, or coastal waters that provide a broad area to fill with, and temporarily store, floodwater. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. The risk of flooding is influenced by local topography, the frequency of precipitation events, and the size and characteristics of the watershed that contains the floodplain.

3.7.1.2 Region of Influence

The ROI for water resources is Nellis AFB and the Las Vegas Wash (Hydraulic Unit Code [HUC] 15010015) and Lake Mead (HUC 15010005) subbasins of the Lower Colorado Region (US Geological Survey, 2017) (**Figure 3-6**).

3.7.1.3 Surface Water

Nellis AFB is located in the northwest portion of the Lower Colorado Region within the Basin and Range Province (American Rivers, 2024). Within the Lower Colorado Region, the entirety of the Proposed Action area is located within the Nellis AFB watershed portion of the Las Vegas Wash subbasin (**Figure 3-6**). No natural perennial streams, rivers, springs, or lakes occur on Nellis AFB due to low precipitation, high evaporation rates, and low humidity. Several unnamed ephemeral streams (streams that flow and contain water only for a short period of time during precipitation events) and washes occur on Nellis AFB, including known washes that traverse the Proposed Action area. Located at the base of Sunrise Mountain (to the east) and the Spring Mountains (to the west and north), Nellis AFB collects water that flows through ephemeral streams that drain southwest through various channels toward a CCRFCD retention pond located adjacent to the Installation. These unnamed ephemeral streams source headwaters from the Sunrise Mountain area (**Figure 3-7**) and the surrounding Spring Mountains (USEPA, 2023h). Permanent surface water impoundments on Nellis AFB consist entirely of artificially constructed ponds within the Sunrise Vista Golf Course located in the southwestern corner of the Installation.

Most of the ephemeral streams on Nellis AFB, which typically contain water during storm events, are connected to waters of the US (i.e., Las Vegas Wash, Lake Mead, and Colorado River) (Nellis AFB, 2019a; USFWS, 2019). However, according to the 2015 Clean Water Rule, "Definition of Waters of the United States," ephemeral streams and washes occurring within the Proposed Action area on Nellis AFB would only be considered jurisdictional if an ordinary high-water mark is present and the ephemeral stream or the wash can be shown to have a significant nexus with traditional navigable waters (80 *Federal Register* 37054; 29 June 2015). The 2015 Clean Water Rule was repealed by final rule on 29 August 2023, which clarified that ephemeral streams would not qualify as waters of the US, as they are not "relatively permanent, standing, or continuous bodies of water." These rules may continue to remain in flux if there are legal challenges to repeal them; therefore, the jurisdictional status of the ephemeral streams is subject to change.

3.7.1.4 Stormwater

In 1986, the CCRFCD was established with the intention of developing and overseeing a comprehensive flood control master plan. The master plan was intended to establish development regulations, fund and coordinate the construction of flood control facilities, and contribute to maintenance programs to alleviate local flooding concerns (CCRFCD, 2024b). A flood control basin associated with the Las Vegas Wash was established in 2010 within proximity of Nellis AFB as a result of the master planning process. The flood control basin captures the flow path of water runoff and overlaps the southern boundary and a small portion of the western part of the Proposed Action area (see **Figure 3-7**). Expansion of the flood control basin is estimated to occur in 2028–2029 (CCRFCD, 2024b, 2024c).

Stormwater within Nellis AFB municipal areas is managed through NPDES for Municipal Separate Storm Sewer System permit NV-0021911 and crosses the Installation in the form of sheet-flow or is diverted into one of several stormwater drainage channels. High-velocity flow derived from Sunrise Mountain to the east of the Installation often results in sheet-flow flooding across the undeveloped portions of Nellis AFB and the paved surfaces of the flightline. Stormwater drainage channels have been excavated within and adjacent to the Nellis AFB airfield, as well as within the residential areas to the west of the airfield (see **Figure 3-7**). These channels are both natural and man-made and include defined grass areas, bare earth, and concrete-lined structures. The Proposed Action area would cover largely undeveloped portions of Areas I and II (see **Figure 1-2**).

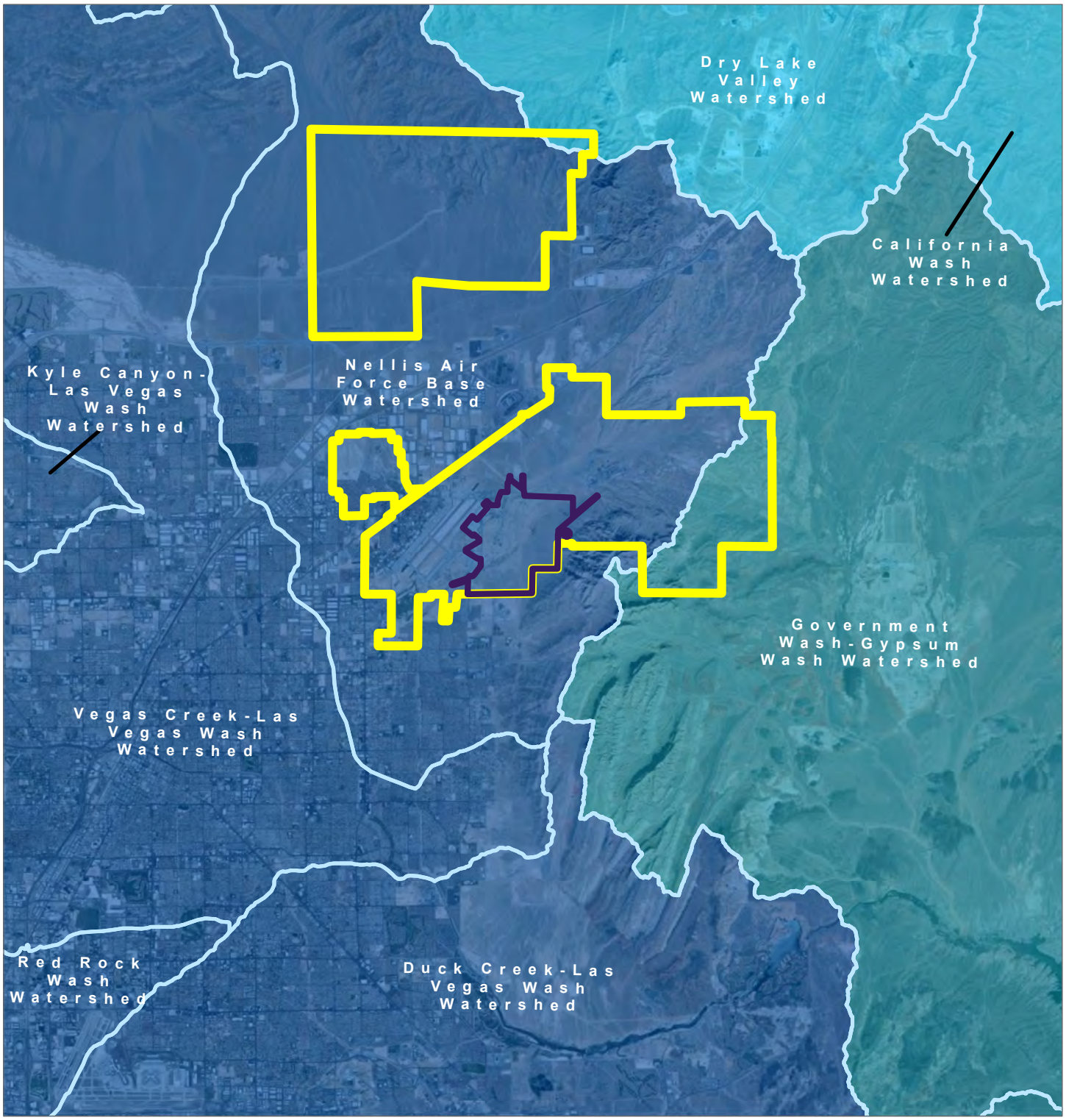


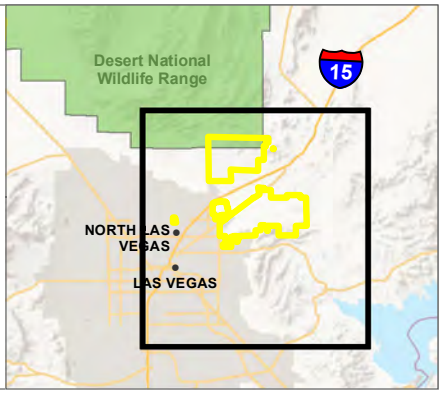
FIGURE 3-6
Watersheds

- Proposed Action Area
- Installation Boundary
- Watershed Boundary
- Lake Mead Subbasin
- Las Vegas Wash Subbasin
- Muddy Subbasin

N

0 2 4 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



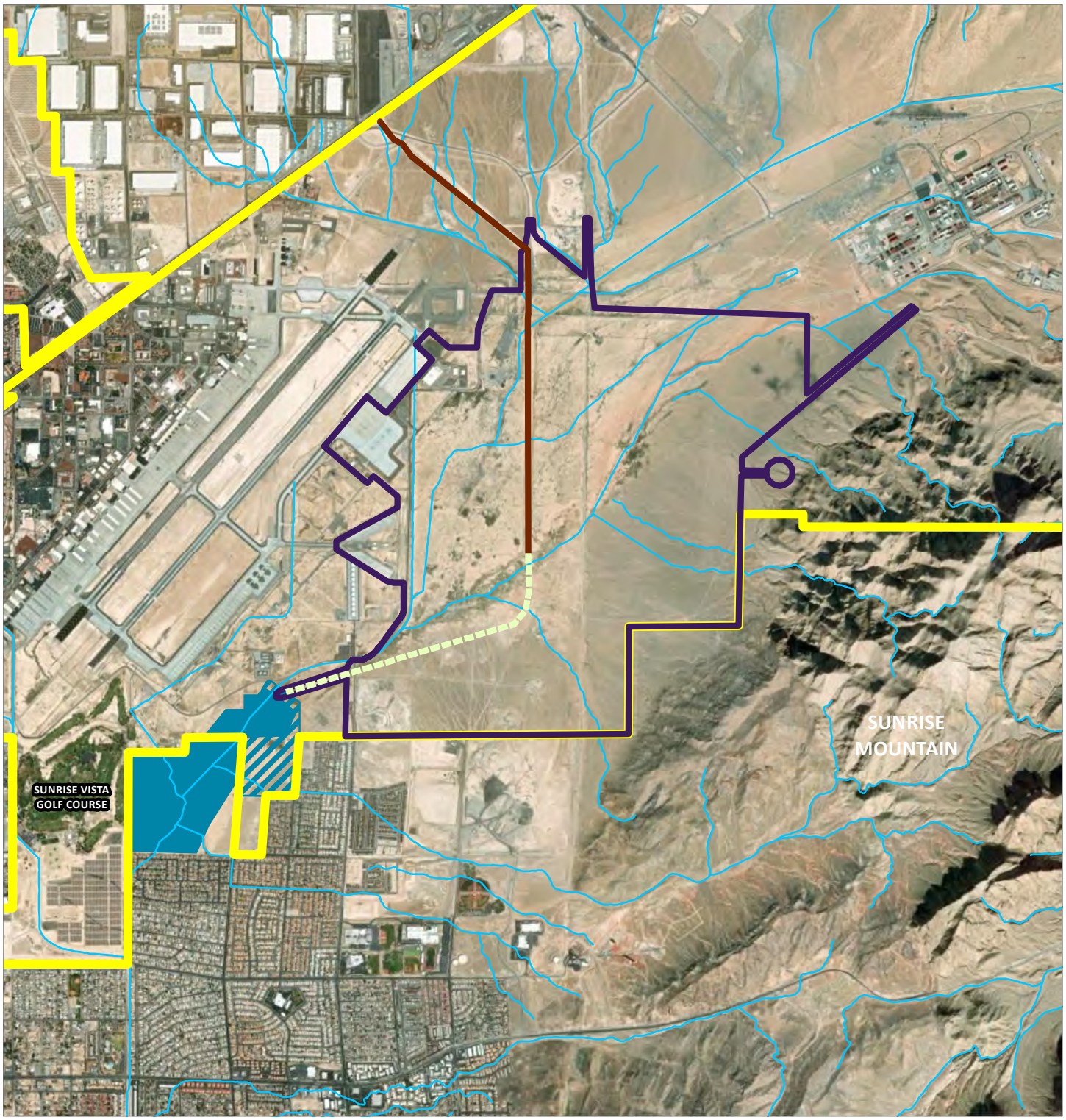


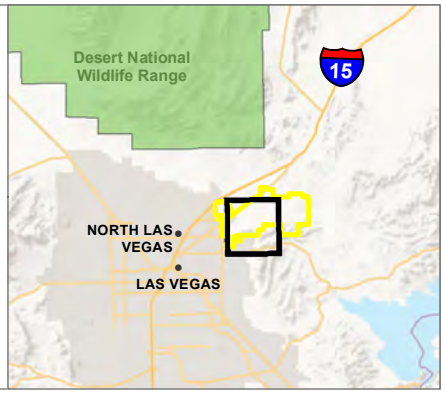
FIGURE 3-7
Water Resources

Ephemeral Stream
Stormwater Conveyance - Existing
Stormwater Conveyance - Planned
Installation Boundary
Proposed Action Area
Flood Control Basin - Existing
Flood Control Basin - Planned

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



A stormwater channel runs north to south through the Proposed Action area. However, the current stormwater channel is not constructed to connect directly to any detention pond or other outfall source and instead deposits into an undeveloped area in the middle of the Proposed Action area. A proposed expansion of this stormwater channel under a separate project from CCRFCD would connect the channel to the established flood control retention pond located southwest of the Proposed Action area (see **Figure 3-7**) (CCRFCD, 2024c). Under current conditions, paired with flightline flooding and sheet-flow flooding concerns, there is a potential for soil erosion throughout undeveloped areas.

Stormwater that is captured within drainage channels is routed into the Las Vegas Wash after being treated by the Clark County Sanitation District. Once stormwater has reached the Las Vegas Wash, it is routed to Lake Mead. The Las Vegas Wash also is connected to the Colorado River; as such, any stormwater runoff from Nellis AFB's ephemeral streams may be a conduit for debris, silt, sedimentation, or other byproducts of stormwater runoff (Nellis AFB, 2019a).

3.7.1.5 Groundwater

Groundwater is defined by the area below ground in which water is stored. In the Las Vegas Valley basin, groundwater is protected from contaminants by a thick layer of clay and fine-grained sediments and is extracted from three major aquifer zones located 300 to 1,500 ft bgs (Las Vegas Valley Water District, 2024). Groundwater, which flows west to east in the Las Vegas Valley basin, accounts for approximately 15 percent of Nellis AFB's water supply (Nellis AFB, 2019a).

As further described in **Section 3.11** of this PEIS, a plume consisting of per- and polyfluoroalkyl substances (PFAS) has been identified in groundwater adjacent to the airfield and runway. A total of 16 groundwater wells are present on Nellis AFB; 6 of which have been sampled for VOCs, nitrates, and arsenic. None of the wells exceeded thresholds for VOCs or nitrates. However, three of the wells exceeded allowable levels of arsenic; these wells are used only for golf course irrigation (Nellis AFB, 2019a).

3.7.1.6 Wetlands

The developed area of Nellis AFB and the arid scrub portions of the Proposed Action area do not contain jurisdictional wetlands (Nellis AFB, 2019a). Although there are man-made ponds located outside of the Proposed Action area on Nellis AFB's Sunrise Vista Golf Course, these ponds are not subject to wetlands protection under the CWA because they are man-made, are artificially filled with treated groundwater, are isolated, and do not connect to other water bodies (Nellis AFB, 2019a). Therefore, wetlands are not further analyzed in this PEIS.

3.7.1.7 Floodplains

Floodplains on Nellis AFB are documented in mapping by both the Federal Emergency Management Agency (FEMA) and CSU CEMML; however, a comprehensive FEMA flood insurance rate map has not been developed for Nellis AFB and the available data reflect analysis from 2011 or older (CSU, 2021). The current FEMA-mapped floodplain is not representative of the actual impacts of surface and stormwater runoff within Nellis AFB regarding flooding (CSU, 2021). As a result, most of Nellis AFB is located within FEMA Zone X: area with reduced flood risk due to levees. As shown in FEMA flood insurance rate map panels 32003C1800E, 32003C1825E, 32003C2225F, 32003C2185F, 32003C1790F, and 32003C2177F, a small portion of FEMA Zone A, which is the 100-year regulatory floodplain, has been identified in the southwestern portion of Nellis AFB; this area is outside of but directly adjacent to the Proposed Action area. FEMA has identified the remaining portions of Nellis AFB as Zone X: area with minimal flood hazard and Zone X: area with reduced flooding due to levee. FEMA has identified the 500-year floodplain approximately 3 miles southwest of the Proposed Action area (**Figure 3-8**).

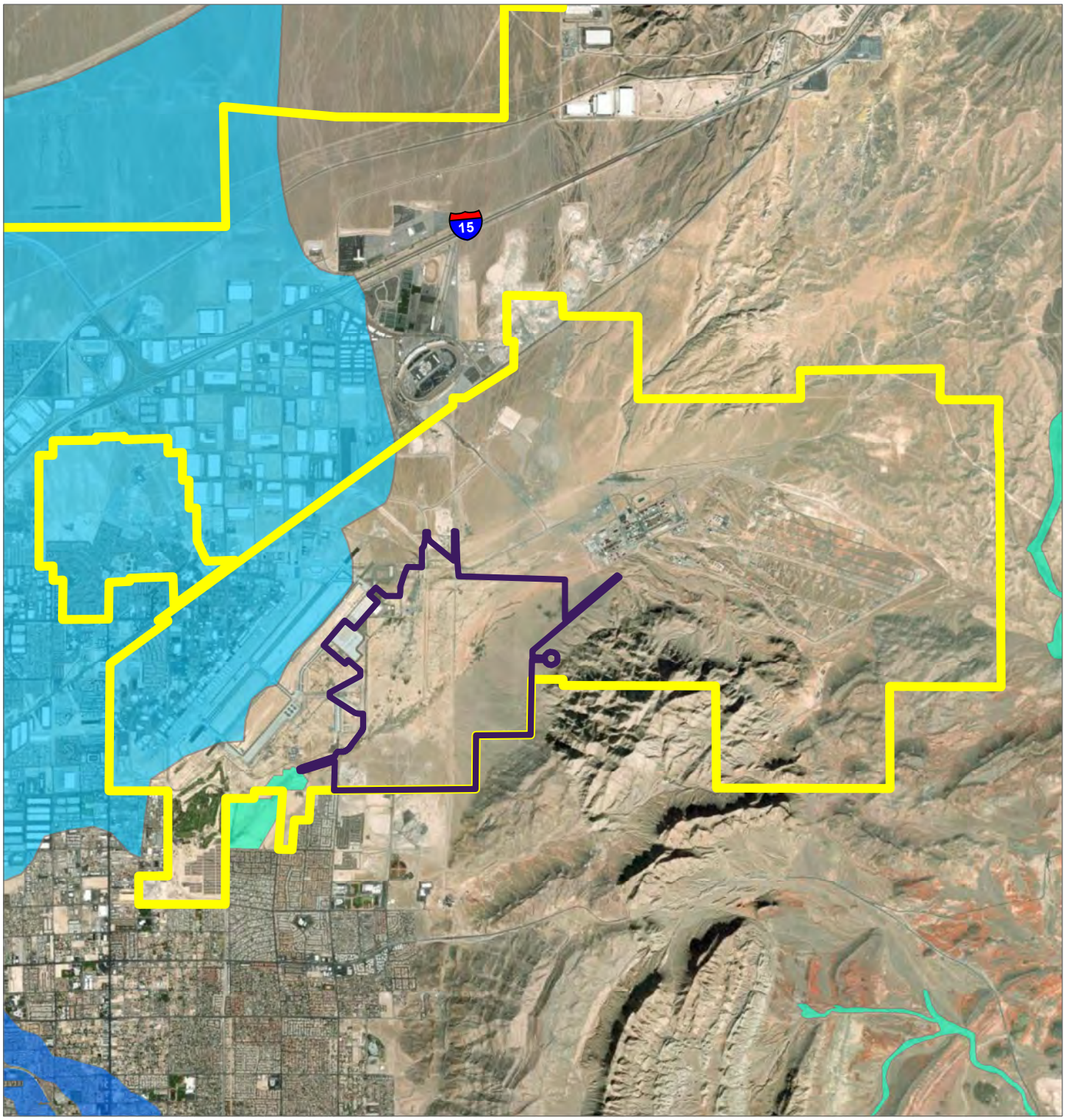


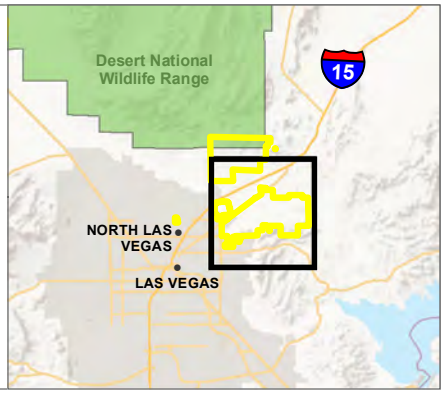
FIGURE 3-8
FEMA Regulatory Floodplains

Installation Boundary
Proposed Action Area
FEMA 100-year Floodplain
FEMA 500-year Floodplain
FEMA Area with Reduced Risk Due to Levee

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



To fill the gap of floodplain data beyond FEMA floodplain regulations, CSU CEMML conducted enhanced flood analysis across the Installation; this expanded analysis shows that the Proposed Action area is located within both the 100-year and 500-year floodplains. It comprises approximately 703 acres of 100-year floodplain and approximately 255 acres of the 500-year floodplain. The Alternative 2 development area comprises approximately 590 acres of 100-year floodplain and approximately 177 acres of the 500-year floodplain. The expanded flood analysis shows floodplains that generally bisect the Proposed Action area diagonally southwest to northeast, with the western half of the Proposed Action area most likely to experience flooding (**Figure 3-9**). The eastern portion of the Proposed Action area shows areas of scattered flooding tying into the ephemeral streams associated with Sunrise Mountain (CSU, 2021). The CSU CEMML floodplain data have been identified by Nellis AFB as the regulatory standard beyond FEMA's identified floodplains and are used as the basis for analysis in this PEIS.

While permanent, natural surface water is not present on Nellis AFB, local rainstorms can be severe enough to cause flash flooding, generating an increase in flood risk due to impermeable surfaces such as cement or hardpan or poorly drained soils. Developed nonporous surfaces, such as those in the western portion of Nellis AFB, increase flood risk by increasing the volume and flow rate of stormwater runoff in localized areas. Stormwater flows through ephemeral streams resulting in washes that often create small, localized floodplains known as alluvial fan flooding. Alluvial fans originating from the Las Vegas Range to the north and Sunrise Mountain to the southeast reach the edges of Nellis AFB resulting in gently sloping valley floods, consisting of mostly fine-grained alluvial silts. In these areas, soil tends to be more friable (easily crumbled or pulverized) and prone to erosion because water movement is usually higher than in the surrounding areas.

3.7.2 Environmental Consequences

3.7.2.1 Evaluation Criteria

Evaluation criteria for potential impacts to water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. Potential adverse impacts to water resources would occur if the Proposed Action or Alternatives:

- reduce water availability or supply to existing users,
- overdraft groundwater basins,
- exceed safe annual yield of water supply sources,
- adversely affect water quality,
- endanger public health by creating or worsening health hazard conditions, or
- violate established laws or regulations adopted to protect sensitive water resources.

3.7.2.2 Alternative 1

Surface Water

There are no permanent natural surface water sources within the Proposed Action area (see **Figure 3-7**). The nearest permanent surface water sources are artificially constructed ponds located within the Sunrise Vista Golf Course, approximately 0.75 mile southwest of the Proposed Action area. However, there are numerous ephemeral streams and washes located throughout the project area. Development occurring under Alternative 1 would have the potential to disrupt the flow of ephemeral streams and washes resulting in potentially higher rates of flow to surrounding ephemeral streams and washes; these higher rates of flow would have the potential to contribute to increased sedimentation and erosion of soils within the Proposed Action area. Impacts to surface waters would be expected to be long term and minor with implementation of Alternative 1.

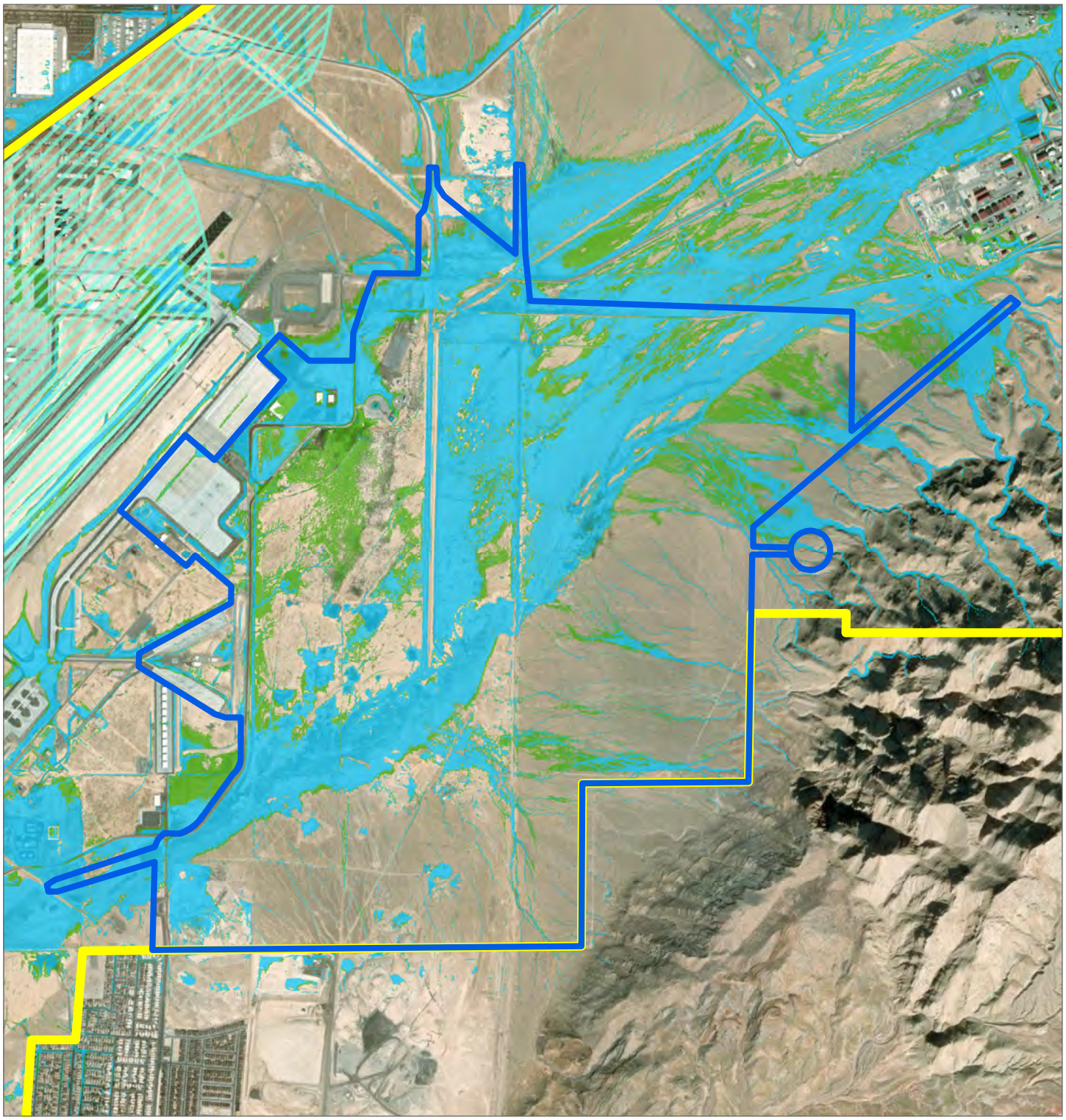


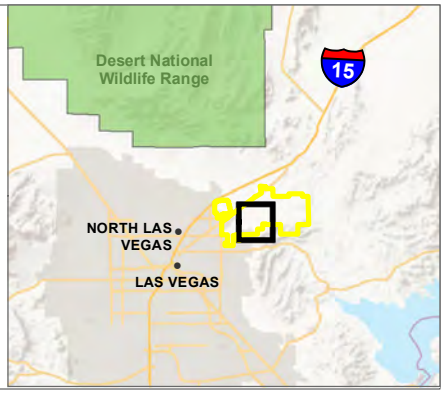
FIGURE 3-9
CSU CEMML Floodplains – Alternative 1

Alternative 1
Installation Boundary
CSU CEMML 100-year Floodplain
CSU CEMML 500-year Floodplain
Reduced Risk Due to Levee

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Stormwater

Nellis AFB used several sources to determine representative impervious surface cover percentages that would allow for conservative estimates of total impervious surface area for each functional use category. First, representative facilities and uses currently occurring under each category at Nellis AFB were determined using existing land use mapping at the Installation. Next, similar land use categories were identified from the American Planning Association and the State of California, both of which have published literature categorizing impervious surface cover by land use type (Arnold and Gibbons, 1996; State of California, 2008). Following identification of comparable impervious surface coverage estimates from the American Planning Association and the State of California, planners from the 99th Civil Engineer Squadron at Nellis AFB considered local regulations, DAF standards, and existing impervious surface coverage by typical mission functions in similar areas on the west side of the Installation to determine the best estimate for the percentage of impervious surface coverage under each functional use category (**Table 3-19**). Future development within each functional use category would be expected to occur per the impervious surface estimates shown below.

Table 3-19
Functional Use Categories and Percent Impervious Surface Coverage

Functional Use Category	Percent Impervious Surface Coverage
1. Airfield Operations/Industrial/Light Industrial	95
2. Administrative/Small-scale Administrative	85
3. Medical/Community Services/Community Commercial/Small-Scale Retail and Service	85
4. Lodging/Residential (Accompanied and Unaccompanied)	50
5. Outdoor Recreation/Open Space/Training Space	25
6. Transportation	80
7. Utilities/Infrastructure	20
8. Existing Pavements	100

Under Alternative 1, approximately 74 percent (1,480 acres) of the total 2,000 acres within the Proposed Action area would have the potential to be developed with new buildings, parking, paved areas, and other impervious surfaces. The development of all proposed functional use categories has the potential to introduce opportunities for stormwater contamination through the short-term use of construction equipment and materials.

Short-term impacts to stormwater would result from stormwater runoff that begins in Sunrise Mountain to the east and crosses the eastern portions of Nellis AFB before flowing into the concrete storm channel that bisects the Proposed Action area (see **Figure 3-7**). There is currently no connection between the storm channel and the CCRFCD retention pond located in the southern portion of the Installation. An expansion of the flood control basin and stormwater channel is estimated to begin in 2028-2029 under a separate CCRFCD project and would provide connection from the existing channel to this CCRFCD retention pond. However, increased impervious surfaces and impediments such as buildings, fencing, parking, and other types of development that would obstruct the free flow of stormwater between Sunrise Mountain and the stormwater channel would have the potential to route more runoff through the stormwater channel over the course of future construction and development under Alternative 1.

Long-term stormwater contamination would have the potential to occur depending on the use and permitted facilities that would occur under development within each functional use category. Each functional use category has associated permitted uses that would set parameters on the types of facilities that could be constructed; each with their own maximum amount of impervious surfaces (**Table 2-1**). For example, the majority of the development area under Alternative 1 (823 acres) would occur within areas designated as Airfield Operations/Industrial/Light Industrial use, which would have a maximum impervious surface cover of 95 percent (see **Figures 2-1** and **2-2**). Potential new development in this functional use category could include vehicle and aircraft maintenance, gasoline stations, and warehouses (see **Table 2-2**). An increase in these types of uses would result in potential increases in stormwater contamination in the form of runoff, sheet-flow, point source, and/or non-point source as a result of chemicals associated with operational uses, such as propylene glycol (deicer), fuels (jet fuel, diesel, motor vehicle gasoline), oils and lubricants, used oils, and other hazardous chemicals (see **Section 3.11** of this PEIS for a definition of hazardous materials and waste). Because of the lack of connection between the CCRFCD retention pond and the existing stormwater channel, increased stormwater runoff would outfall to the barren lands between the stormwater channel and the CCRFCD retention pond and increase the potential for soil erosion until expansion of the flood control basin and stormwater channel is completed under a separate CCRFCD project (estimated to begin 2028–2029) (see **Figure 3-7**).

The exact sizes and types of facilities that would be located within the functional use categories for Alternative 1 is not currently known; however, in accordance with EISA, if the footprint of an individual project exceeds 5,000 ft^2, contractors would be required to maintain or restore, to the maximum extent feasible, the predevelopment hydrology of the property with respect to the water temperature, rate, volume, and duration of flow. Additionally, in adherence to NPDES permit conditions, projects disturbing 1 or more acres or projects that are less than 1 acre but are part of a larger common plan of development must develop low-impact development measures that remain in effect after construction is completed.

The use of BMPs during and post construction (e.g., BMPs outlined in the Installation Stormwater Management, Stormwater Pollution Prevention, and Spill Prevention, Control, and Countermeasure plans), and design standards to manage increases in stormwater runoff would limit opportunities for stormwater contamination. Long-term, adverse impacts to stormwater would not be significant during future development under Alternative 1. However, long-term, beneficial impacts to stormwater infrastructure would also occur under Alternative 1 if future stormwater drainage improvements, such as the construction of a reinforced berm designed to divert stormwater from Sunrise Mountain toward the proposed expansion of the flood control basin, were implemented.

Groundwater

Under Alternative 1, future ground disturbance would have the potential to occur over a currently undeveloped area of Nellis AFB through the addition of pavements and construction of buildings and structures. In the short term, heavy machinery and chemicals could be required to support development of the functional use categories. In the long term, heavy machinery and chemicals could be used throughout the various functional use categories in support of warfighting training and testing missions. Additionally, groundwater is recharged through the permeation of surface and stormwater precipitation; as such, groundwater would have the potential to become contaminated during short-term construction and during long-term operations if contaminated stormwater reached the groundwater supply. However, the groundwater resources in the area are vast and deep and any contaminants are likely to remain in shallow groundwater resources with no historical evidence of contaminants reaching the deeper aquifer that underlies Nellis AFB. Furthermore, Nellis AFB would implement BMPs to manage stormwater runoff, thereby reducing the potential contamination of groundwater resources. Therefore, long-term, minor, adverse impacts to groundwater would be anticipated to occur with implementation of Alternative 1.

Floodplains

CSU CEMML-mapped floodplains cover approximately 48 percent (958 acres) of the 2,000-acre Proposed Action area, generally bisecting the area in a northeasterly to southwesterly direction (see **Figure 3-9**). To the extent practicable, future construction would be designed to avoid floodplains. However, if floodplains are unavoidable, any work within the floodplain adhere to applicable regulations defined by Nellis AFB and the CCRFCD as well as BMPs. Such regulations and BMPs could include, but are not limited to, the

construction of structures above the base-flood elevation (that is, the elevation of surface water that results from a flood that has a 1-percent chance of equaling or exceeding that level in any given year), dry-(preventing or limiting water from entering a building) or wet-proofing of foundations, and use of permanent tie-downs of non-structural equipment such as propane tanks or wash racks. Prior to any future construction, Nellis AFB would consult current floodplain regulations to ensure that development designs are in compliance and that the construction would not result in adverse impacts to floodplains without proper mitigation.

The Proposed Action area is also prone to sheet-flow flooding from stormwater runoff. Without proper construction designs to channel and mitigate sheet-flow flooding, adverse impacts to floodplains would have the potential to occur as an increase in impervious surfaces would further promote flooding through stormwater runoff. However, as described in the immediately preceding **Stormwater** section above, Nellis AFB would implement BMPs to manage the flow and outfall of stormwater due to increased impervious surfaces and impediments to reduce adverse impacts to floodplains.

Implementation of Alternative 1 would not be expected to result in long-term, significant, adverse impacts to floodplains because future construction would be conducted in compliance with floodplain regulations and BMPs would be implemented.

Additional analysis of impacts to water resources would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.7.2.3 Alternative 2

Surface Water

Under Alternative 2, impacts to surface water would be the same as Alternative 1.

Stormwater

Under Alternative 2, approximately 82 percent (1,216 acres) of the total 1,486 available acres would be developed with new buildings, parking, paved areas, and other impervious surfaces (see **Table 2-3**).

With the use of BMPs and design standards to manage increases in stormwater runoff and limit opportunities for stormwater contamination, impacts to stormwater would be the same as those identified for Alternative 1, albeit on a smaller scale.

Groundwater

Under Alternative 2, approximately 264 fewer acres would have the potential to be covered with impervious surfaces than under Alternative 1. With the implementation of BMPs described in **Stormwater**, the impacts to groundwater resources would be the same as those described for Alternative 1.

Floodplains

CSU CEMML-mapped floodplains cover approximately 52 percent (767 acres) of the 1,486-acre Alternative 2 development area (**Figure 3-10**). With adherence to regulations and implementation of BMPs, adverse impacts to floodplains would be the same as for Alternative 1.

Additional analysis of impacts to water resources would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.7.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. Stormwater drainage and sheet-flow flooding would continue to be an issue, resulting in flightline flooding with concerns of sedimentation and soil erosion.

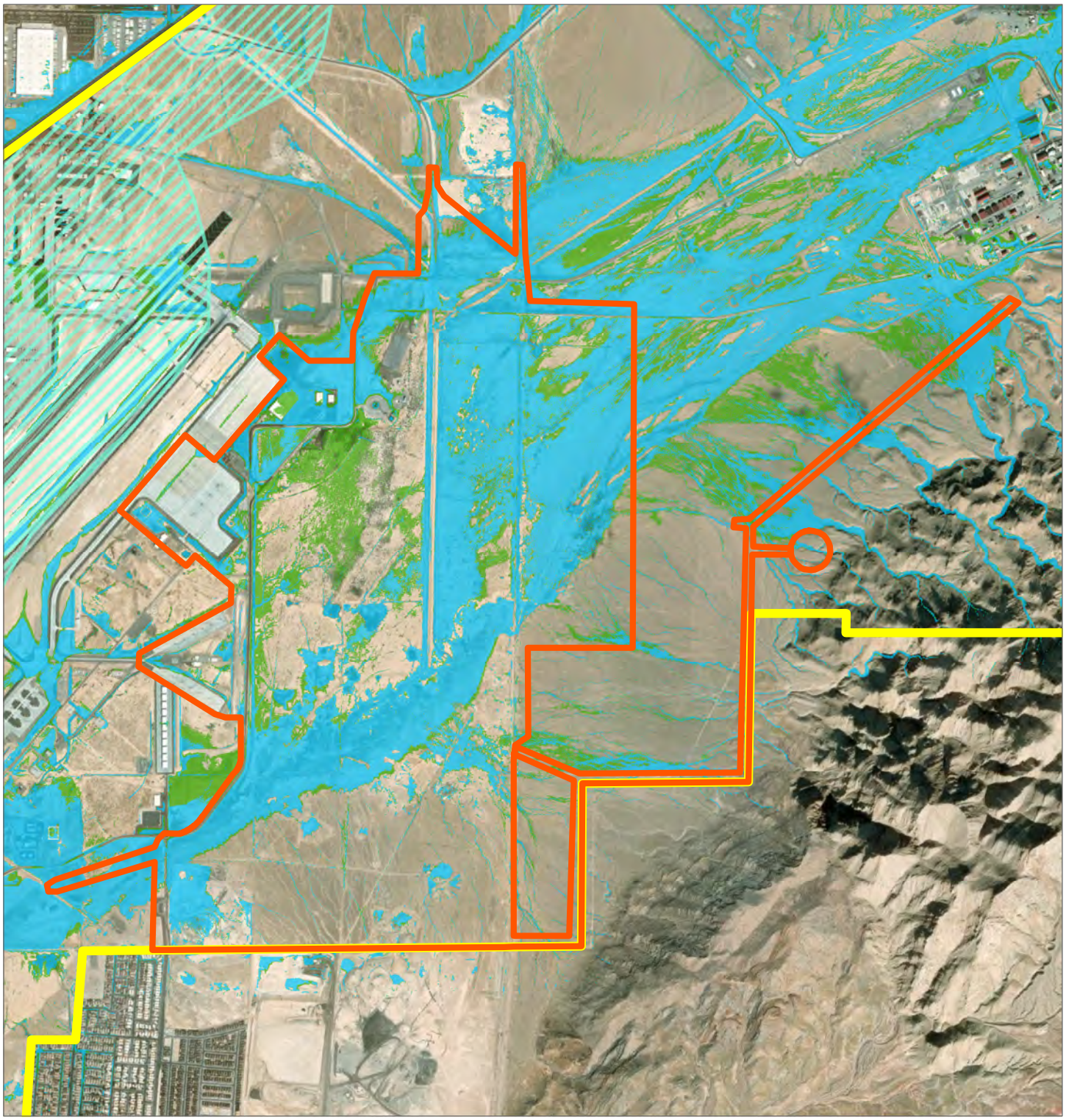


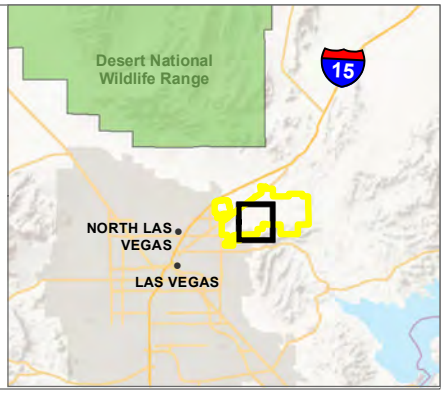
FIGURE 3-10
CSU CEMML Floodplains – Alternative 2

Alternative 2
Installation Boundary
CSU CEMML 100-year Floodplain
CSU CEMML 500-year Floodplain
Reduced Risk Due to Levee

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



There would be no changes to groundwater or surface water in the ROI beyond baseline conditions. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.7.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in long-term, adverse impacts to surface water that would not be significant; long-term, adverse impacts to stormwater that would not be significant; long-term, beneficial impacts to stormwater infrastructure that would not be significant; long-term, adverse impacts to groundwater that would not be significant; and long-term, adverse impacts to floodplains that would not be significant. The projects identified in **Table 3-2** evaluate the construction of additional facilities, parking, structures, and/or other impervious surfaces within the ROI—i.e., Nellis AFB.

The TASS beddown project involved further development of airfield pavements. The development includes the expansion of approximately 11.5 acres of airfield ramp and 7 acres of the LOLA, increasing impervious surfaces and facilities within the existing Airfield District to accommodate additional aircraft. The increase in impervious surfaces would be anticipated to increase the potential for stormwater runoff within the Proposed Action area. The Nellis Reclaimed Waterline Project constructed a pipeline between the CNLV-WRF and the Sunrise Vista Golf Course. Completed MILCON projects include the addition of approximately 204,313 ft^2 of new impervious surfaces, which have the potential to increase stormwater runoff within the Proposed Action area and Nellis AFB.

The Nellis Aggressor EA evaluated the addition of aircraft and operations, including renovations and additions to buildings at Nellis AFB. Facility construction and addition projects associated with this action would increase impervious surfaces on Nellis AFB; however, many facilities projects included demolition of existing facilities that would be replaced by new facilities, thereby limiting the increase in impervious surfaces. The Nellis IDP EA (Nellis AFB, 2022b) evaluates the addition of up to 265,805 ft^2 of new impervious surfaces on the west side of the Installation. The Nellis CSTR EA evaluates the construction of new facilities, renovation and repair of existing facilities, and the implementation and maintenance of infrastructure improvements across approximately 149 acres and approximately 942,400 ft^2 northeast of the Proposed Action area. The Nellis INRMP EA evaluates the construction of an environmental appreciation park in Area III of Nellis AFB, which would include the construction of an elevated boardwalk but would not increase impervious surfaces (refer to **Figure 1-2**). Each of the facilities construction projects associated with the aforementioned actions on Nellis AFB would increase impervious surfaces on the Installation if not offset by facilities demolition, resulting in increased potential for stormwater runoff and flash flooding concerns if corresponding improvements to stormwater infrastructure were not made.

The CCRFCD project proposes an expansion of existing flood control infrastructure located in the southwestern portion of the Installation. The expansion is currently under consideration and expected to begin design no sooner than 2028. Under the proposed expansion, the existing north/south stormwater drain would be connected to an expanded flood control basin. When combined with the Proposed Action, cumulative, beneficial impacts to stormwater drainage and infrastructure would occur.

When combined with the Proposed Action, the implementation of the projects identified in **Table 3-2** would result in permanent changes to water resources at Nellis AFB through the addition of impervious surfaces and earthwork construction. While a number of the projects are ongoing and in their development stages, proposed project footprints that exceed 5,000 ft^2 would be required to maintain or restore, to the maximum extent feasible, the predevelopment hydrology of the property with respect to the water temperature, rate, volume, and duration of flow reducing the cumulative impacts to water resources (42 USC § 17094). For projects that are less than 5,000 ft^2, should the development of these projects occur at the same time as the construction activities under the Proposed Action, there could be temporary cumulative impacts to water resources.

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, short-term, adverse cumulative effects as well as long-term, beneficial cumulative impacts that would not be significant to water resources would be anticipated to occur with implementation of the Proposed Action.

3.7.2.6 Other Considerations Under NEPA

No additional impacts to water resources were identified beyond those described above.

3.7.3 Resource-Specific Mitigation Measures and Best Management Practices

Impacts to water resources under the Proposed Action and Alternatives would be managed, to the extent possible, through the use of mitigation measures that could include the following:

- Minimize the total disturbed area during construction and development.
- Cluster construction within the functional use category thresholds defined in **Section 2.4.1**.
- Minimize soil compaction.
- Implement design standards to manage increases in stormwater runoff and to limit opportunities for stormwater contamination.
- Construct structures above the base-flood elevation, dry- or wet-proof foundations, and use permanent tie-downs of non-structural equipment such as propane tanks or wash racks.

Future construction projects that exceed 5,000 ft^2, would require contractors to maintain or restore, to the maximum extent feasible, the predevelopment hydrology of the property with respect to the water temperature, rate, volume, and duration of flow. Additionally, in adherence to NPDES regulations, projects disturbing 1 or more acres or projects that are less than 1 acre but are part of a larger common plan of development must develop low-impact development measures that remain in effect after construction is completed.

Additional mitigation measures that would minimize impacts to stormwater would include the following:

- Establish a proper connection between the stormwater channel to the CCRFCD retention pond,
- Implement of development designs that support the flow of stormwater runoff and containment, and
- Conduct ongoing maintenance of existing stormwater channels.

No significant adverse impacts to earth resources would be anticipated to occur under implementation of the Proposed Action. No mitigation measures are recommended.

3.8 BIOLOGICAL RESOURCES

3.8.1 Affected Environment

3.8.1.1 Definition of the Resource

Biological resources include native and non-native plants and animals, protected and sensitive flora and fauna species, and their associated habitats. Habitat is the resources and conditions in an area that support a defined suite of organisms. Protected species include those species that are federally listed as threatened or endangered under Section 7 of the *Endangered Species* Act of 1973, as amended (16 USC § 1531 et seq.) (ESA), migratory birds protected under the *Migratory Bird Treaty Act* of 1918, as amended (16 USC §§ 703–712) (MBTA), and eagles protected by the *Bald and Golden Eagle Protection Act of 1940* (16 USC §§ 668–668d) (BGEPA). Sensitive species or species of conservation concern do not have a legal definition or protection but may include those species that are recognized by state wildlife agencies as threatened or endangered within the state or identified by natural resources management agencies (e.g., BLM, US Forest Service) as requiring special management attention to prevent further declines in populations and potential listing as federally threatened or endangered in the future.

3.8.1.2 Region of Influence

The ROI considered in this PEIS for biological resources encompasses the areas subject to noise and physical disturbance as part of the Proposed Action (see **Figures 2-1** and **2-2**). This includes the eastern part of Nellis AFB Area I and southwest corner of Area II (see **Figure 1-2**). The ROI does not include any part of Area III or the SAR.

3.8.1.3 Vegetation and Unique Habitats

Nellis AFB occurs in the Mojave Desert. Creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) vegetation communities typically characterize much of the Mojave Desert and are adapted to the hot, dry climate. The composition of vegetation communities is influenced by soil, geomorphology, and disturbance from human activity. Nellis AFB has completed mapping of vegetation communities consistent with the United States Natural Vegetation Classification system (Wion and Olech, 2022) (**Figure 3-11**).

Vegetation communities were mapped to the alliance level of classification and, when identifiable, to the association level. Surveys for invasive and rare plants have also been completed (Nellis AFB, 2019a, 2023a). Information on vegetation communities within the ROI was also recorded during desert tortoise surveys conducted in October 2020 and April 2021.

The ROI is divided into two landforms, the Sunrise Mountain bajada (i.e., alluvial fan) extending from Sunrise Mountain and the valley floor between the bajada on the east and the existing Nellis AFB flightline on the west side. These two landforms contain distinctly different soils and vegetation communities. Within each of these landforms are areas that have been disturbed by past human activity, including excavations for sand and gravel, rock and sand spoil piles, disposal of landfill debris, and installation of an underground natural gas pipeline and a stormwater diversion channel (Nellis AFB, 2021a).

The vegetation on the bajada is dominated by creosote bush and white bursage and classified as *Larrea tridentata-Ambrosia dumosa* Bajada and Valley Desert Scrub Alliance. Creosote bush is the dominant plant species but is relatively short (1.5–3 feet) and widely spaced (3–6 feet) (**Figure 3-12**). Soils are not well developed, and the surface in many areas is a mixture of rocks and finer-textured silts and clays. Several other vegetation alliances occur on the bajada but cover much smaller areas. The *Chorizanthe rigida-Geraea canescens* Desert Pavement Alliance is characterized by unvegetated to sparsely vegetated areas (i.e., desert pavement). However, annual herbaceous species may be common in response to seasonal precipitation. Devil's spineflower (*Chorizanthe rigida*), hairy desert sunflower (*Geraea canescens*), creosote bush, and desert trumpet (*Eriogonum inflatum*) are species found in this alliance, but in sparse abundance.

Figure 3-12 Creosote Bush/White Bursage Plant Community on Sunrise Mountain Bajada

The *Hymenoclea salsola-Bebbia juncea* Mojave-Sonoran Desert Wash Scrub Alliance is found along narrow, shallow, braided channels that drain stormwater across the bajada. The shallow washes contain more fine, textured alluvial sediment and have a higher diversity of shrub species. Shrub species present include cheesebush (*Hymenoclea salsola*), sweetbush (*Bebbia juncea*), little leaf ratany (*Krameria erecta*), Mormon tea (*Ephedra nevadensis*), bladder sage (*Salazaria mexicana*), creosote bush, white bursage, and spiny menodora (*Menodora spinescens*). In some areas big, galleta grass (*Pleuraphis rigida*) occurs as an understory species. In the south end of the Proposed Action area, several areas of the bajada have been previously excavated and disturbed. Some of these areas were used for the disposal of waste rock and soil (e.g., near the former Hollywood access gate). Vegetation in these areas consists of species adapted to disturbed soils such as saltbush (*Atriplex* spp.), desert trumpet, cheatgrass (*Bromus tectorum*), brownplume wirelettuce (*Stephanomeria pauciflora*), Arabian schismus (*Schismus arabicus*), Russian thistle (*Salsola tragus*), and other annual Mojave Desert herbaceous species.

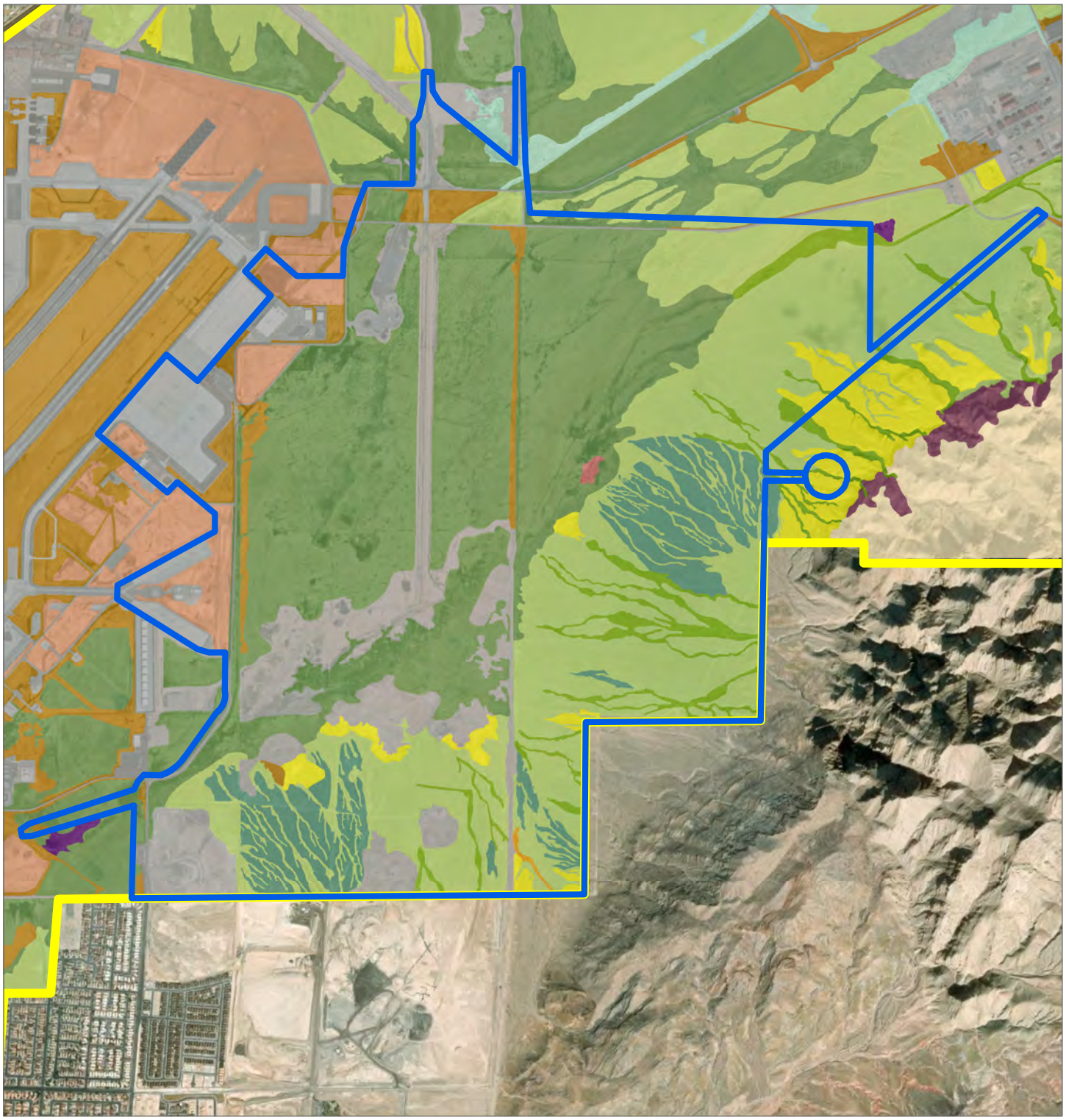


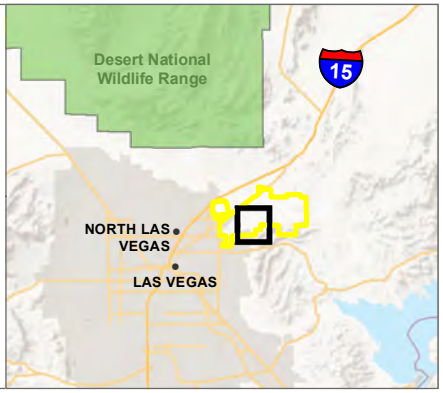
FIGURE 3-11
Vegetation – Alternative 1

- Alternative 1
- Installation Boundary
- Barren Land
- Burrobrush - Sweetbrush Mojave-Sonoran Desert Scrub Alliance
- Burrobrush Desert Dwarf Scrub Alliance
- Catclaw Acacia - Creosotebush - Burrobrush Desert Wash Shrubland Association
- Creosotebush - Burrobush Bajada & Valley Dersert Scrub Alliance
- Creosotebush Monotype Shrubland Association
- Devil's Spineflower - Hairy Desert - Sunflower Desert Pavement Alliance
- Parry's Saltbush Wet Shrubland Alliance
- Red Brome - Arabian Schismus Common Mediterranean Grass Ruderal Desert Grassland
- Urban Land

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



The northern and western portions of the ROI are on the valley floor that has distinctly different soils from the Sunrise Mountain bajada. Soils are deep alluvium of fine, textured sand, silt, and clay (**Figure 3-13**). The area drains from the north to the south and is relatively flat except for areas that have been excavated previously for sand and gravel. The dominant plant species are creosote bush and saltbush. Because of the deep soils and periodic water flows from stormwater runoff, creosote bushes are well developed and range from 5- to 8-feet tall. The vegetation is classified as *Atriplex parryi* Wet Shrubland Alliance. The plant community includes areas of open, widely spaced stands of creosote bush with an understory of Arabian schismus, areas dominated by salt bush, and mixtures of salt bush and creosote bush. The primary disturbances in this area include an access road along a natural gas pipeline, a recently constructed stormwater diversion channel, and previous excavations for sand and gravel.

Figure 3-13 Saltbush/Creosote Bush Plant Community on Valley Floor

Nellis AFB has conducted surveys for unique habitats and rare plants (Nellis AFB, 2023b, 2023c). Examples of unique habitats include cliffs and canyons, playas and ephemeral pools, sand dunes and badlands (e.g., gypsiferous soils), and desert washes. Sand dunes and badland areas occur on Nellis AFB but not in the ROI. Cliff habitats on Sunrise Mountain are located east of the ROI. One notable habitat feature occurs in the center of the Proposed Action area. An ephemeral wash, the East Tributary, runs northeast to southwest along the edge of the Sunrise Mountain bajada where it joins the valley floor. Periodic stormwater flow has created cut banks in the alluvium that are conducive to animal burrowing and supports a thick stand of tall creosote bush with occasional honey mesquite trees (*Prosopis glandulosa*) and tamarisk (*Tamarix* sp.) with areas of thick stands of big galleta grass (*Pleuraphis rigida*) (**Figure 3-14**). This area is mapped as *Larrea tridentata* Monotype Shrubland Association.

Figure 3-14 Habitat along the East Tributary with Cut Banks and Thick Vegetation Cover

3.8.1.4 Invasive Plant and Noxious Weed Species

Nellis AFB has conducted surveys for invasive plants and noxious weeds. Three state-listed noxious weeds have been found on Nellis AFB and in the ROI: salt cedar (*Tamarix* spp), African mustard (*Brassica tournefortii*), and Malta starthistle (*Centaurea melitensis*) (Nellis AFB, 2023a). Invasive species found in the ROI include cheatgrass, red brome (*B. rubens*), salt lover (*Halogeton glomeratus*), and Russian thistle (Nellis AFB, 2019a). While salt cedar, African mustard, and Malta starthistle are well established and may be impossible to eradicate, Nellis AFB has ongoing programs to identify and eradicate them (Nellis AFB 2023a).

3.8.1.5 Wildlife

Common wildlife species that occur in the ROI include reptiles (i.e., lizards, snakes, tortoises), small mammals (e.g., rodents and bats), birds, and medium-sized mammals (e.g., carnivores and jackrabbits) (Nellis AFB, 2019a). Biologists have identified 21 species of reptiles and 1 amphibian, Woodhouse's toad (*Anaxyrus woodhousii*), on Nellis AFB. Common native reptile species include the side-blotched lizard (*Uta stansburiana*), western banded gecko (*Coleonyx variegatus*), long-tailed brush lizard (*Urosaurus graciosus*), Great Basin whiptailed lizard (*Aspidocelis tigris*), Great Basin collared lizard (*Crotaphytus bicinctores*), desert iguana (*Dipsosaurus dorsalis*), desert tortoise, and sidewinder (*Crotalus cerastes*). Two non-native species of reptile known to occur on Nellis AFB include the rough-tailed bowfoot gecko (*Cyrtopodion scabrum*) and

Mediterranean gecko (*Hemidactylus turcicus*). The desert tortoise is listed as threatened under the ESA and is discussed in **Section 3.8.1.6**. The desert iguana, chuckwalla (*Sauromalus ater*), and Mojave fringed-toe lizard are known to occur on Nellis AFB and are considered sensitive species by the BLM (Nellis AFB, 2023d). The Mojave fringed-toe lizard has been found on sandy dunes north of the ROI; it is not known to occur in the ROI. The chuckwalla has been found in Area II, east of the ROI. The desert iguana likely occurs in the ROI.

A variety of small mammal species occurs within the ROI (Nellis AFB, 2019a). Common rodent species include Merriam's kangaroo rat (*Dipodomys merriami*), chisel-tooth kangaroo rat (*Dipodomys microps*), desert pocket mouse (*Chaetodipus penicillatus*), southern grasshopper mouse (*Onychomys torridus*), desert woodrat (*Neotoma lepida*), valley pocket gopher (*Thomomys bottae*), and white-tailed antelope ground squirrel (*Ammospermophilus leucurus*). Many of the small mammal species live underground and are more abundant on the valley floor in alluvial soils as evidenced by the abundance of burrows. Medium-sized mammals include desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), kit fox (*Vulpes macrotis*), bobcat (*Lynx rufus)*, and coyote (*Canis latrans*) (Nellis AFB, 2019a, 2021a). Six species of bats have been confirmed present in the ROI based on acoustic data records (greater than 20 calls) (Nellis AFB, 2020a). Calls of four additional bats species were also recorded. The most common species recorded were the canyon bat (*Parastrellus hesperus*), California myotis (*Myotis californicus*), Mexican free-tailed bat (*Tadarida brasiliensis*), western red bat (*Lasiurus blossevillii*), western yellow bat (*Lasiurus xanthinus*), and the hoary bat (*Lasiurus cinereus*). All except the western yellow bat are considered special-status species based on state of Nevada or federal agency designations (**Table 3-20**).

Most bird species are protected under the MBTA. Birds that occur in the ROI are discussed in **Section 3.8.1.7**.

3.8.1.6 Threatened and Endangered Species

Of the 16 endangered and 11 threatened species known to occur in Nevada, only the desert tortoise occurs on Nellis AFB (Nellis AFB, 2019a). The desert tortoise was listed as threatened in 1990. Nellis AFB most recently consulted with the USFWS in 2023 (Reference Number 2022-0051434) under Section 7 of the ESA regarding potential effects of future and ongoing DAF activities at Nellis AFB. The Mojave population of the desert tortoise occurs north and west of the Colorado River in desert areas of Nevada, California, Utah, and Arizona. It occupies desert flats and slopes dominated by creosote shrubs at lower elevations and blackbrush (*Coleogyne ramosissima*) and Great Basin desert ecotone vegetation at higher elevations and on the northern edge of its range. Critical habitat was designated for the desert tortoise in 1994 but does not include Nellis AFB (USFWS, 1994; Nellis AFB, 2019a). Pursuant to Section 4(a)(3)(B)(i) of the ESA, the Secretary of the Departments of Interior (USFWS) is prohibited from designating as critical habitat any lands or other geographical areas owned or controlled by the DoD, or designated for its use, that are subject to an INRMP prepared pursuant to Section 101 of the Sikes Act (16 USC § 670a) if the Secretary determines in writing that a given INRMP provides a benefit to the species for which critical habitat is proposed for designation (86 FR 41668, 2 August 2021). The Nellis AFB INRMP is updated annually and revised every five years, with the most recent revision 2024. Therefore, no federally designated critical habitat occurs on Nellis AFB or in the vicinity of the ROI.

Surveys for desert tortoises on Nellis AFB have been conducted since 1990, most were designed to determine presence/absence or for clearance for construction projects. Only a few surveys were designed to estimate relative abundance or abundance/density (Nellis AFB, 2020b, 2021a, 2023e). Most observations of desert tortoises have occurred in Area II surrounding the Munitions Storage Area (MSA), northeast of the ROI. The MSA is excluded by a tortoise-proof fence. Desert tortoises are also relatively abundant on the SAR, which is controlled and managed by the DAF but is outside the ROI.

Table 3-20
Protected and Special-Status Species That Have Been Documented on Nellis AFB and May Occur In the ROI

Common Name	Scientific Name	Federal Status	State Status
Reptiles			
Chuckwalla	*Sauromalus ater*	BLM-sensitive	SGCN
Desert horned lizard	*Phrynosoma platyrhinos*	BLM-sensitive	SGCN
Desert iguana	*Dipsosaurus dorsalis*	BLM-sensitive	SGCN
Great basin collared lizard	*Crotaphytus bicinctores*	BLM-sensitive	SGCN
Long-nosed leopard lizard	*Gambelia wislizenii*	BLM-sensitive	N/A
Long-tailed brush lizard	*Urosaurus graciosus*	BLM-sensitive	SGCN
Mojave desert tortoise	*Gopherus agassizii*	Threatened	Threatened
Mojave sidewinder	*Crotalus cerastes*	BLM-sensitive	SGCN
Birds			
American Kestrel	*Falco sparverius*	N/A	SGCN
Brewer's Sparrow	*Spizella breweri*	BLM-sensitive	Sensitive
Common Nighthawk	*Chordeiles minor*	N/A	SGCN
Le Conte's Thrasher	*Toxostoma lecontei*	BLM-sensitive	SGCN
Loggerhead Shrike	*Lanius ludovicianus*	BLM-sensitive	Sensitive
Long-billed Curlew	*Numenius americanus*	BLM-sensitive	SGCN
Peregrine Falcon	*Falco peregrinus*	BLM-sensitive	Endangered
Sagebrush Sparrow	*Artemisiospiza nevadensis*	BLM-sensitive	N/A
Western Burrowing Owl	*Athene cunicularia hypugaea*	BLM-sensitive	SGCN
Mammals			
Big brown bat	*Eptesicus fuscus*	BLM-sensitive	N/A
Brazilian free-tailed bat	*Tadarida brasiliensis*	BLM-sensitive	Protected
California myotis	*Myotis californicus*	BLM-sensitive	N/A
Canyon bat	*Parastrellus hesperus*	BLM-sensitive	SGCN
Desert pocket mouse	*Chaetodipus penicillatus*	N/A	SGCN
Hoary bat	*Lasiurus cinereus*	N/A	SGCN
Silver-haired bat	*Lasionycteris noctivagans*	BLM-sensitive	SGCN
Western mastiff bat	*Eumops perotis*	N/A	Sensitive
Western red bat	*Lasiurus blossevillii*	BLM-sensitive	Sensitive

BLM = Bureau of Land Management; N/A = not applicable; SGCN = species of greatest conservation need

Tortoise surveys that included the ROI were conducted in 2018, 2019, 2020, and 2021. The 2018 survey included the eastern half of the ROI and documented two desert tortoises in creosote bush-white bursage vegetation (Nellis AFB, 2019b). Multiple tortoise burrows were also recorded in the same area. Surveys in 2019 focused on Area II and the SAR but included two transects in the vicinity of the eastern side of the ROI. Two desert tortoises were observed in the vicinity of the proposed water tank on the east side of the Proposed Action area. The most comprehensive tortoise surveys in the ROI were conducted in October 2020 and April 2021. These surveys were designed to estimate desert tortoise abundance and evaluate the quality of tortoise habitat following guidance published by the USFWS (USFWS, 2019). A 100-percent coverage survey using transects spaced 10 meters (32.8 feet) apart was conducted in all portions of the Proposed Action area that were identified as potential desert tortoise habitat (Nellis AFB, 2021a). The surveys covered 1,400 acres and included both the creosote bush-white bursage vegetation on the Sunrise Mountain bajada and the saltbush-creosote bush vegetation on the alluvial soils of the valley floor. Similar to the surveys conducted in 2018 and 2019, only two desert tortoises were observed, both in close proximity to each other and in the same general area as previous years (**Figure 3-15**). The estimated population of

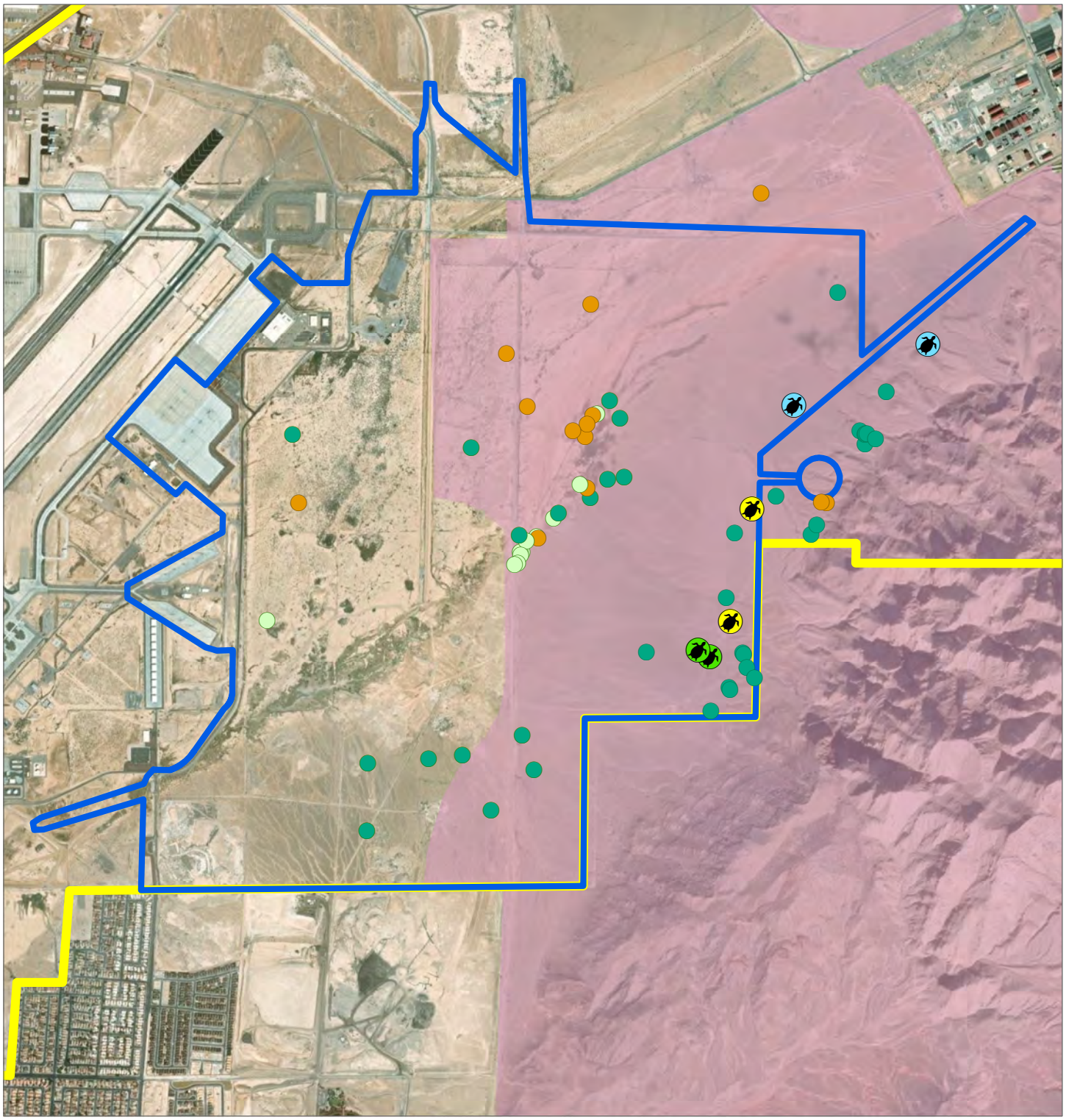


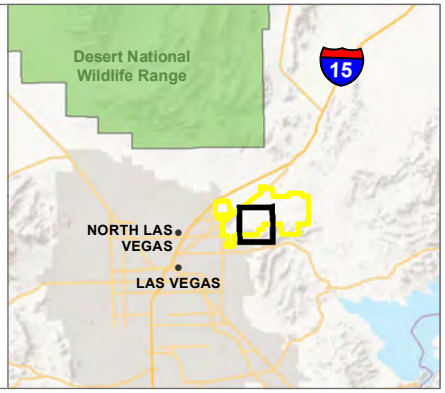
FIGURE 3-15
Desert Tortoise Habitat, Observations, and Animal Burrows
Alternative 1

- Burrowing Owl Burrow
- Predator Burrow
- Desert Tortoise Burrow
- Desert Tortoise (2018)
- Desert Tortoise (2019)
- Desert Tortoise (2021)
- Alternative 1
- Installation Boundary
- Desert Tortoise Habitat

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



adult desert tortoises[1] in the ROI was four, or 1.8 adult desert tortoises per square mile (Nellis AFB, 2021a). In contrast, the density of desert tortoises as reported in the 2019 and 2022 surveys, which focused on Area II and the SAR, was estimated at 32.4 and 15.3 adult tortoises per square mile, respectively (Nellis AFB 2020b, 2023e).

During the 2020 and 2021 tortoise surveys, the western half of the Proposed Action area was assessed as poor- or low-quality tortoise habitat and is not considered viable desert tortoise habitat. Part of the area has been previously developed along the existing flightline. The southwest corner has been largely disturbed from previous excavations, disposal of waste rock, soil, and other materials; is located in a flood channel area; and the few undisturbed areas have short, sparse stands of creosote bush with large areas of unvegetated desert pavement (see **Figure 3-11**). An area of about 140 acres of relatively undisturbed saltbush-creosote bush vegetation located between the existing flightline and the newly constructed Hollywood stormwater channel was assessed as being low-quality tortoise habitat because the area is physically isolated from desert tortoise habitat east of the stormwater channel.

The eastern half of the ROI is considered viable desert tortoise habitat and was assessed as being fair to good quality tortoise habitat. Most of this area consists of creosote bush vegetation on the bajada extending northwest from Sunrise Mountain. Soils on the bajada are extremely rocky and creosote bush vegetation is relatively short (1.5 to 3 feet) and widely spaced (see **Figure 3-12**). Most of the soil is not conducive to tortoise burrow construction except along shallow washes. On the upper most part of the bajada along the steeper slopes of Sunrise Mountain where wash channels have not yet spread out on alluvial fans, a series of small hillslopes contain deeper, finer-textured soils that are much more conducive to construction of tortoise burrows. Numerous tortoise burrows were found along this series of hillslopes on the eastern edge of the ROI (**Figure 3-15**).

The north-central portion of the Proposed Action area between the Hollywood stormwater channel and the Sunrise bajada consists of alluvial soil on the valley floor that contains a vegetation community of saltbush and creosote bush that is well developed because of the deeper soils. The soil is conducive to tortoise burrow construction. However, the more friable soil and the frequency of stormwater may reduce the life span of tortoise burrows. A unique feature of this area is the East Tributary, where stormwater has created a series of cut banks with thick vegetation (**Figure 3-14**). Tortoise burrows were found on either side of the East Tributary channel during the 2020 and 2021 surveys. Desert tortoise habitat was assessed as being fair to good in this area.

3.8.1.7 Migratory Birds

Surveys for migratory birds have been conducted at Nellis AFB since 2007 (Nellis AFB, 2023f). Observations of migratory birds were also recorded during the tortoise surveys conducted in 2020 and 2021 in the ROI. The relative abundance and presence of individual species vary seasonally because species may be year-round residents, summer residents, temporary migrants, or winter residents. Common bird species known to occur in the ROI based on stationary point counts and observations during desert tortoise surveys include American kestrel (*Falco sparverius*), black-throated sparrow (*Amphispiza bilineata*), horned lark (*Eremophila alpestris*), house finch (*Haemorhous mexicanus*), white-crowned sparrow (*Zonotrichia leucophrys*), mourning dove (*Zenaida macroura*), and Gambel's quail (*Callipepla gambelii*) (Nellis AFB, 2021a, 2023f). Several migratory birds that occur on Nellis AFB are considered special-status species (see **Table 3-20**). Of these species, the American kestrel, common nighthawk (*Chordeiles minor*), western burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), Le Conte's thrasher (*Toxostoma lecontei*), long-billed curlew (*Numenius americanus*), and sagebrush sparrow (*Artemisiospiza nevadensis*) were observed in the ROI during the 2020 and 2021 desert tortoise surveys. Le Conte's thrasher and the loggerhead shrike were observed in the central part of the Proposed Action area on the valley floor in mixed stands of creosote bush and saltbush. The long-billed curlew was observed performing

[1] Adult desert tortoises measure greater than or equal to a 7-inch (180 mm) midline carapace length (i.e., the length of the upper shell of a tortoise).

territorial displays near Munitions Road on the northern edge of the Proposed Action area in April 2021, indicating that a nest was possibly present.

Western burrowing owls are a special management interest on Nellis AFB (Nellis AFB, 2023g). Burrowing owls are declining in abundance and distribution throughout their range due to man-made threats (Smallwood and Morrison, 2018). In addition to being classified as a sensitive species by the BLM and a species of conservation concern by nine western US states, including Nevada, the burrowing owl is listed by the USFWS as a National Bird of Conservation Concern (USFWS, 2021). Nellis AFB conducts surveys and nest monitoring of burrowing owls (Nellis AFB, 2019a, 2023g). Most of the burrowing owl activity was in the southwestern part of Area I near the Sunrise Vista Golf Course. This area is approximately 1 mile southwest of the ROI and is where most of the nest monitoring studies occurred. Burrowing owls have also been observed in the central part of Area I within the Proposed Action area along the East Tributary channel, including observations recorded during the desert tortoise surveys in October 2020 when several active owl burrows were observed. Because of a bird aircraft strike incident involving a burrowing owl near Nellis AFB Runway 03, the burrowing owls located in the southwestern part of Nellis AFB and those in the ROI were relocated to the northern part of Area II in 2023 in accordance with the Nellis AFB *Bird/Wildlife Aircraft Strike Hazard Plan* (Nellis AFB, 2016a). Fifteen artificial owl burrows were constructed in Area II for the relocation effort. The relocation was performed under a depredation permit from the USFWS. Existing burrows were collapsed after relocation to prevent reuse by owls.

3.8.1.8 Bald and Golden Eagles

Bald eagles have been observed on Nellis AFB. However, the ROI does not contain bald eagle habitat. Observations are likely migrants. Lake Mead, approximately 12 miles southeast of Nellis AFB, is a wintering area for bald eagles. Golden eagles have not been observed in the vicinity of the Proposed Action area but could occur as seasonal migrants through the region.

3.8.2 Environmental Consequences

3.8.2.1 Evaluation Criteria

The level of impact on biological resources is based on the following:

- importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource;
- proportion of the resource that would be affected relative to its occurrence in the region;
- sensitivity of the resource to the proposed activities; and
- duration of potential ecological impact.

Adverse impacts on biological resources would occur if the Proposed Action and Alternatives negatively affect species or habitats of high concern over relatively large areas or if estimated disturbances cause reductions in population size or distribution of a species of high concern.

As a requirement under the ESA, federal agencies must provide documentation that ensures that the agency's proposed actions would not adversely affect the existence of any threatened or endangered species. The ESA requires that all federal agencies avoid "taking" federally threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with either a "No Effect" determination by the federal agency or a Biological Opinion from the USFWS that the Proposed Action either would or would not jeopardize the continual existence of a species.

3.8.2.2 Alternative 1

Vegetation and Unique Habitats

As described in **Section 2.4.2** and illustrated in **Figure 2-1**, the DAF would fully develop the Proposed Action area under Alternative 1. Existing vegetation within the Proposed Action area would be removed during future construction of facilities and infrastructure. Under Alternative 1, vegetation within the Proposed Action area would have the potential to be removed according to the percent impervious for the functional use. For example, the Airfield/Industrial/Light Industrial functional use category has an impervious percent threshold of 95 percent; development can occur within this category in up to 95 percent of the available space, which could include up to 100 percent of vegetation within the category being removed. Exact estimates are not known at this time; however, development within vegetated areas would be avoided as feasible during future project designs. Based on the functional use approach of this project, it would be anticipated that up to 1580 acres of vegetation would be removed under Alternative 1, resulting in permanent adverse impacts to vegetation. Appropriate mitigation measures for the impacted vegetation would be implemented as described below.

The estimated amount of each vegetation alliance within the Proposed Action Area is shown in **Table 3-21**.

The Proposed Action area measures approximately 2,000 acres. Approximately 1,580 acres of native and non-native vegetation would have the potential to be removed during project development, including construction, grading, and laydown of equipment. The remaining 420 acres is barren land (i.e., no vegetation) or urban (i.e., previously developed). Approximately 715 acres, or 56 percent, of the Parry's Saltbush Wet Shrubland Alliance vegetation that occurs on Nellis AFB would have the potential to be removed during project implementation. This vegetation association occurs on the deep alluvial soils of the valley floor in the center of the Proposed Action area. This vegetation association is less common in the Mojave Desert because it is primarily associated with alkaline basins, adjacent sand dunes, and alkaline springs. Removal of vegetation at this scale would result in long-term significant impacts to this vegetation association on Nellis AFB. Creosotebush-Burrobush Bajada and Valley Desert Scrub Alliance that occurs on the Sunrise Mountain bajada is relatively abundant on Nellis AFB, at approximately 5,588 acres. The Proposed Action would remove approximately 559 acres, or about 10 percent, of this vegetation association on Nellis AFB. In addition, Creosotebush-Burrobush Bajada and Valley Desert Scrub vegetation is widespread in the Mojave, Sonoran, and Colorado deserts and extends north into the transition zone with the Great Basin. Impacts to the Creosotebush-Burrobush Bajada and Valley Desert Scrub vegetation would be long term but minor because the vegetation is relatively common on Nellis AFB and in the Mojave Desert.

Table 3-21
Approximate Vegetation Alliance Disturbance – Alternative 1

Vegetation Alliance	Alternative 1 (acres)
Burrobrush – Sweetbush Mojave-Sonoran Desert Wash Scrub Alliance	64
Burrobush Desert Dwarf Scrub Alliance	43
Catclaw Acacia – Creosotebush - Burrobrush Desert Wash Shrubland Association	2
Creosotebush –- Burrobush Bajada and Valley Desert Scrub Alliance	559
Creosotebush Monotype Shrubland Association	2
Devil's Spineflower – HairyDesert-sunflower Desert Pavement Alliance	135
Mojave Rabbitbrush Mojave Desert Wash Scrub Alliance	4
Parry's Saltbush Wet Shrubland Alliance	715
Red Brome –- Arabian Schismus – Common Mediterranean Grass Ruderal Desert Grassland Alliance	55
Tamarisk species Ruderal Riparian Scrub Alliance	1
Barren Land	57
Urban	363
Total Acres	**2,000**

Unique habitats such as cliffs, canyons, sand dunes, and badlands would not be disturbed during project implementation. One ephemeral wash, the East Tributary, which collects and conveys stormwater from the bajada and from Area II to the southwest through the Proposed Action area, would be cleared and modified during construction. This area is located in the center of the Proposed Action area and is mapped as Creosotebush Monotype Shrubland Association (2 acres) and Parry's Saltbush Wet Shrubland Alliance.

Invasive Plant and Noxious Weed Species

Several noxious weeds and invasive species are found within the ROI. Disturbing areas of native vegetation during project implementation would create opportunities for the establishment of these species in new areas. However, disturbed areas would be developed into hardscape (i.e., buildings, roads, parking areas) or landscaped, which would prevent establishment of these species. Nellis AFB would actively manage and eradicate saltcedar, African mustard, and Malta's starthistle in the newly developed areas. Impacts from invasive and noxious weeds would be expected to be minor and short term during the construction phase of the Proposed Action when soil is disturbed. After project implementation, any noxious weeds and invasive species would be replaced by hardscape and maintained landscaping.

Wildlife

Approximately 1,580 acres of wildlife habitat occupied by a variety of reptile, mammal, and bird species would have the potential to be disturbed and removed during project development; impacts to bird species are discussed below under **Migratory Birds**. Populations of small mammals and reptiles in the Proposed Action area would be lost during vegetation removal as a result of mortality during land clearing. Species that are considered sensitive by the BLM and "species of greatest conservation need" (SGCN) by the state of Nevada that could be affected by the loss of habitat include the desert horned lizard, desert iguana, Great Basin collared lizard, long-tailed brush lizard, and Mojave sidewinder. Monitoring studies indicate that several bat species occur in the area and likely forage for insects in the Proposed Action area. Because bats are highly mobile, project development likely would not cause direct mortality of bats but would indirectly affect individuals through loss of foraging areas, particularly those areas on the valley floor with taller and more developed stands of shrubs. Larger species such as jackrabbits, coyotes, and bobcats likely would move to adjacent areas, but survival would depend on the quality of available habitat. Numerous predator burrows were documented in the ROI during desert tortoise surveys (see **Figure 3-15**). Coyotes, bobcats, and kit foxes would lose the prey base of small mammals and lizards that exists in the Proposed Action area. Impacts to reptile and small mammal populations would not be expected to be significant but would be long term from the loss of habitat. The reptile and small mammal species that occur in the ROI are relatively abundant and common in the Mojave Desert, and loss of local populations would not affect regional populations. Impacts to predatory species such as coyotes, bobcats, and kit foxes would not be expected to be significant but would be long term, as individual animals would move to adjacent habitat. Kit foxes are known to occur on Nellis AFB but have not been observed in the ROI. Coyotes are widely adaptable, and impacts would not be expected to be significant. Home ranges of bobcats are several to many square miles, much larger than the ROI and impacts would not be significant.

Threatened and Endangered Species

The Mojave desert tortoise is the only threatened or endangered species that would be affected by Alternative 1. Approximately 1,000 acres of desert tortoise habitat within the Proposed Action area would have the potential to be disturbed and developed under Alternative 1. The area defined as desert tortoise habitat occurs on the eastern half of the ROI. The western half of the ROI has been previously disturbed, developed, or isolated from desert tortoise habitat on the eastern half of the ROI. The DAF has determined that implementation of Alternative 1 would adversely affect the Mojave desert tortoise through development of tortoise habitat and the potential displacement of several desert tortoises from the Proposed Action area.

Nellis AFB maintains a PBO issued by the USFWS under Section 7 of the ESA that addresses potential impacts of DAF activities on the desert tortoise (USFWS, 2023). USFWS reissued the PBO in September 2023 based on an updated PBA documenting expected future Nellis AFB projects and activities over the next 10 years (DAF, 2023b). The USFWS concluded in the PBO that the evaluated projects and activities, as proposed, are not likely to jeopardize the continued existence of the Mojave desert tortoise. The opinion assumes that the DAF would implement all desert tortoise conservation measures in the PBO. Nellis AFB

evaluates individual proposed actions against the PBO to determine whether the specific proposed action was assessed and covered by the incidental take limits and terms and conditions of the PBO. An east-side development plan that encompasses the area and the type of projects that would occur under Alternative 1 was evaluated in the PBA and PBO. The PBO stipulates the maximum allowable acres of desert tortoise habitat that can be disturbed for each Nellis AFB program before consultation with the USFWS must be reinitiated. The allowable limit for disturbance of desert tortoise habitat for the Facilities Program, which includes the Proposed Action in this PEIS, is 1,395 acres. The estimated 982 acres of the 1,000 acres of desert tortoise habitat that would be disturbed from implementation of Alternative 1 would be covered by the PBO, provided the DAF implements all terms and conditions and reporting requirements in the PBO.

It was determined that approximately 32 acres of land in the northeast corner of the Proposed Action area classified as desert tortoise habitat are outside the boundaries of the land that was included as part of the east-side development plan in the PBA and PBO. Twenty-two of the 32 acres were included in the desert tortoise surveys in April 2021. Additional land on the west and northwest side of the ROI is also outside the east side development area but is not considered desert tortoise habitat because of previous land disturbance or development. Of the 32 acres, approximately 18 acres are designated as a potential 150-foot-wide utility corridor for water lines. The remaining 14 acres consist of a triangular area that is part of a larger area proposed for either outdoor recreation, open space, or training space. The Utilities Program evaluated in the PBO has a maximum allowable limit of habitat disturbance of 170 acres of which 150 acres may be new temporary disturbances and 20 acres of new permanent disturbances. It is estimated that approximately 3 acres of the 18 acres would be permanently disturbed for installation of water lines, storm berm, and an access road under Alternative 1. Fifteen or fewer acres of the 18 acres would be temporarily disturbed during installation of utilities. These acres would be covered in the PBO by the allowable acres under the Utilities Program. The 14 acres would be covered under the Facilities Program allowable acreage.

The estimated abundance of adult desert tortoises (greater than or equal to a 7-inch shell length) in the ROI is low compared to other areas on Nellis AFB (see **Section 3.8.1.6**). The estimated density of desert tortoises in the ROI is approximately 1.8 adult desert tortoises per square mile (Nellis AFB, 2021a). Only two adult desert tortoises have been consistently observed during surveys in the ROI. These observations have occurred on the Sunrise Mountain bajada in Creosotebush-Burrobush Bajada and Valley Desert Scrub and Burrobush-Sweet Mojave-Sonoran Desert Wash Scrub vegetation. Because small (less than 7-inch shell length) desert tortoises and tortoise eggs are difficult to find and observe, it is expected that an unknown number of small tortoises and tortoise eggs may not be found and would be killed during ground-disturbing activities, which would be allowable under the incidental take provision of the PBO. However, if small tortoises or tortoise eggs are found during preconstruction surveys, they would be relocated following procedures approved by the USFWS. The incidental take limit in the PBO for capturing and moving tortoises out of harm's way to a safe location (i.e., translocated) is 10 tortoises per year for the Facilities Program. The take limit for capturing and translocating tortoises for the Utilities Program is two tortoises per year. Based on the low abundance of tortoises in the ROI, it is expected that only two to four adult desert tortoises would be found during preconstruction surveys and moved to safe locations outside the perimeter of the Proposed Action area. Multiple desert tortoise burrows that may provide suitable relocation sites were found along the base of Sunrise Mountain during surveys on the east side of the ROI outside the potential development area (see **Figure 3-15**). The take limit for accidental injury or mortality of adult desert tortoises is two for each of the Facilities and Utilities programs. Conducting preconstruction surveys and installing tortoise-proof fencing around the project area would be expected to prevent injuries or mortality of adult tortoises.

The DAF has determined that the adverse effects of the Proposed Action under Alternative 1 on the desert tortoise from development of tortoise habitat and potential translocation of several adult desert tortoises has been fully evaluated through Section 7 consultation with the USFWS in 2023 as documented in the PBA and PBO (DAF, 2023b; USFWS, 2023). When site-specific design plans for future construction projects are developed, potential adverse impacts to desert tortoises would be minimized through the implementation of the conservation measures and adherence to the requirements in the PBO.

Migratory Birds

Approximately 1,580 acres of habitat used by a variety of migratory bird species would have the potential to be lost from development under Alternative 1. Bird species that use the ROI would be displaced to other habitats, but survival and nesting success would depend on whether suitable habitat and nesting territories are available. The MBTA makes it unlawful to take migratory birds or their parts, nests, or eggs. To avoid potential take of migratory birds, nests, or eggs, ground clearing would be conducted outside the nesting season, from March 1 through July 31 if practicable, or a preconstruction survey would be conducted during the nesting season (BLM, 2024). If nests are found, an appropriately sized buffer area would be established around the nest until the nesting attempt is completed. If no nests are found, land clearing would proceed within a designated timeframe following the survey. Birds designated as SGCN by the state of Nevada that are known to occur in the area and would be displaced during project implementation include the American kestrel, common nighthawk, Le Conte's thrasher, long-billed curlew, and sagebrush sparrow. Those species that occupy the Parry's Saltbush Wet Shrubland Alliance vegetation on the valley floor would be most impacted because approximately 56 percent of this vegetation association on Nellis AFB would be removed during construction activities occurring under Alternative 1. The short term impact on SGCN bird species would not be expected to be significant. The population size of these species in the ROI is not known but breeding and nesting habitat would be lost for some individuals.

The western burrowing owl and several owl burrows were observed in the Proposed Action area along the East Tributary wash channel during desert tortoise surveys in October 2020. As described in Section **3.8.1.7**, burrowing owls located southwest of the ROI and those in the Proposed Action area were translocated in 2023 to artificial burrows in the northern part of Area II because of a bird aircraft strike incident. Existing owl burrows were collapsed to prevent owls from returning to the same location. It is possible that owls may attempt to return to the Proposed Action area. Prior to clearing of vegetation, preconstruction surveys would be conducted to confirm the presence or absence of burrowing owls. If owls are present, Nellis AFB would coordinate with the USFWS regarding moving owls to another location. Therefore, no impacts to western burrowing owls would be anticipated under Alternative 1.

Bald and Golden Eagles

Impacts to bald or golden eagles would not be expected during or after implementation of Alternative 1. Habitat for bald eagles does not occur within the ROI. Any observations of bald eagles are of transient birds that are migrating through or wintering at Lake Mead, approximately 12 miles southeast of Nellis AFB. Golden eagles have not been observed at Nellis AFB and would not be impacted under Alternative 1.

3.8.2.3 Alternative 2

Vegetation and Unique Habitats

As described in **Section 2.4.3** and illustrated in **Figure 2-2**, the Proposed Action area would be partially developed under Alternative 2. Under Alternative 2, vegetation within the Alternative 2 development area would have the potential to be removed according to the percent impervious for the functional use. For example, the Airfield/Industrial/Light Industrial functional use category has an impervious percent threshold of 95 percent; development can occur within this category in up to 95 percent of the available space, which could include up to 100 percent of vegetation within the category being removed. Exact estimates are not known at this time; however, development within vegetated areas would be avoided as feasible during project designs. Based on the functional use approach of this project, it would be anticipated that up to 1,068 acres of vegetation would be removed during future development under Alternative 2, resulting in permanent adverse impacts to vegetation. Appropriate mitigation measures for the impacted vegetation would be implemented as described below.

Alternative 2 contains approximately 1,486 acres. The native and non-native vegetation that exists within the Alternative 2 development area would have the potential to be cleared and removed during future construction of facilities and infrastructure. Approximately 56 and 359 acres are classified as barren land and urban (i.e., existing facilities), respectively. The remaining 1,071 acres of vegetation would have the

potential to be removed during future development. The estimated amount of each vegetation alliance is shown in **Table 3-22**. Approximately 681 acres of Parry's Saltbush Wet Shrubland Alliance would have the potential to be removed (**Figure 3-16**). This represents most of the vegetation on the alluvial valley floor, or 53 percent of this alliance that occurs on Nellis AFB. This vegetation association is less common in the Mojave Desert because it is primarily associated with alkaline basins, adjacent sand dunes, and alkaline springs. As with Alternative 1, there would be long-term, significant impacts to this vegetation association on Nellis AFB under Alternative 2. Alternative 2 also would impact 212 aces of Creosotebush-Burrobush Bajada and Valley Desert Scrub Alliance vegetation, or about one-third of that under Alternative 1. This vegetation occurs on the Sunrise Mountain bajada, which would remain mostly undeveloped under Alternative 2.

Table 3-22
Approximate Vegetation Alliance Disturbance – Alternative 2

Vegetation Alliance	Alternative 2 (acres)
Burrobrush – Sweetbush Mojave-Sonoran Desert Wash Scrub Alliance	16
Burrobush Desert Dwarf Scrub Alliance	32
Catclaw Acacia – Creosotebush - Burrobrush Desert Wash Shrubland Association	<1
Creosotebush –- Burrobush Bajada and Valley Desert Scrub Alliance	212
Creosotebush Monotype Shrubland Association	2
Devil's Spineflower – HairyDesert-sunflower Desert Pavement Alliance	67
Mojave Rabbitbrush Mojave Desert Wash Scrub Alliance	4
Parry's Saltbush Wet Shrubland Alliance	681
Red Brome –- Arabian Schismus – Common Mediterranean Grass Ruderal Desert Grassland Alliance	55
Tamarisk species Ruderal Riparian Scrub Alliance	<1
Barren Land	56
Urban	359
Total Acres	**1,486**

Unique habitats such as cliffs, canyons, sand dunes, and badlands would not be disturbed during project implementation. Much of the East Tributary ephemeral wash, which collects and conveys stormwater from the bajada and from Area II to the southwest through the Proposed Action area, would be cleared and modified during construction. This area is on the east side of the Alternative 2 development area and is mapped as Creosotebush Monotype Shrubland Association (2 acres) and Parry's Saltbush Wet Shrubland Alliance. Parts of this ephemeral wash would remain undeveloped on the northeastern side.

Invasive Plant and Noxious Weed Species

As with Alternative 1, land disturbance under Alternative 2 would create opportunities for establishment of invasive and noxious weeds in new areas. These impacts would be expected to be minor and short term during the construction phase.

Wildlife

Approximately 1,071 acres of wildlife habitat occupied by a variety of reptile, mammal, and bird species would have the potential to be disturbed and removed during future development under Alternative 2; this is approximately 509 fewer acres than under Alternative 1. Impacts to birds are discussed below under **Migratory Birds**. Populations of small mammals and reptiles in developed areas would be lost during vegetation removal, proportionally more in the Parry's Saltbush Wet Shrubland Alliance on the valley floor. Species that are considered sensitive by the BLM and SGCN by the state of Nevada that could be affected by the loss of habitat include the desert horned lizard, desert iguana, Great Basin collared lizard, long-tailed brush lizard, and Mojave sidewinder. Monitoring studies indicate that several bat species occur in the area

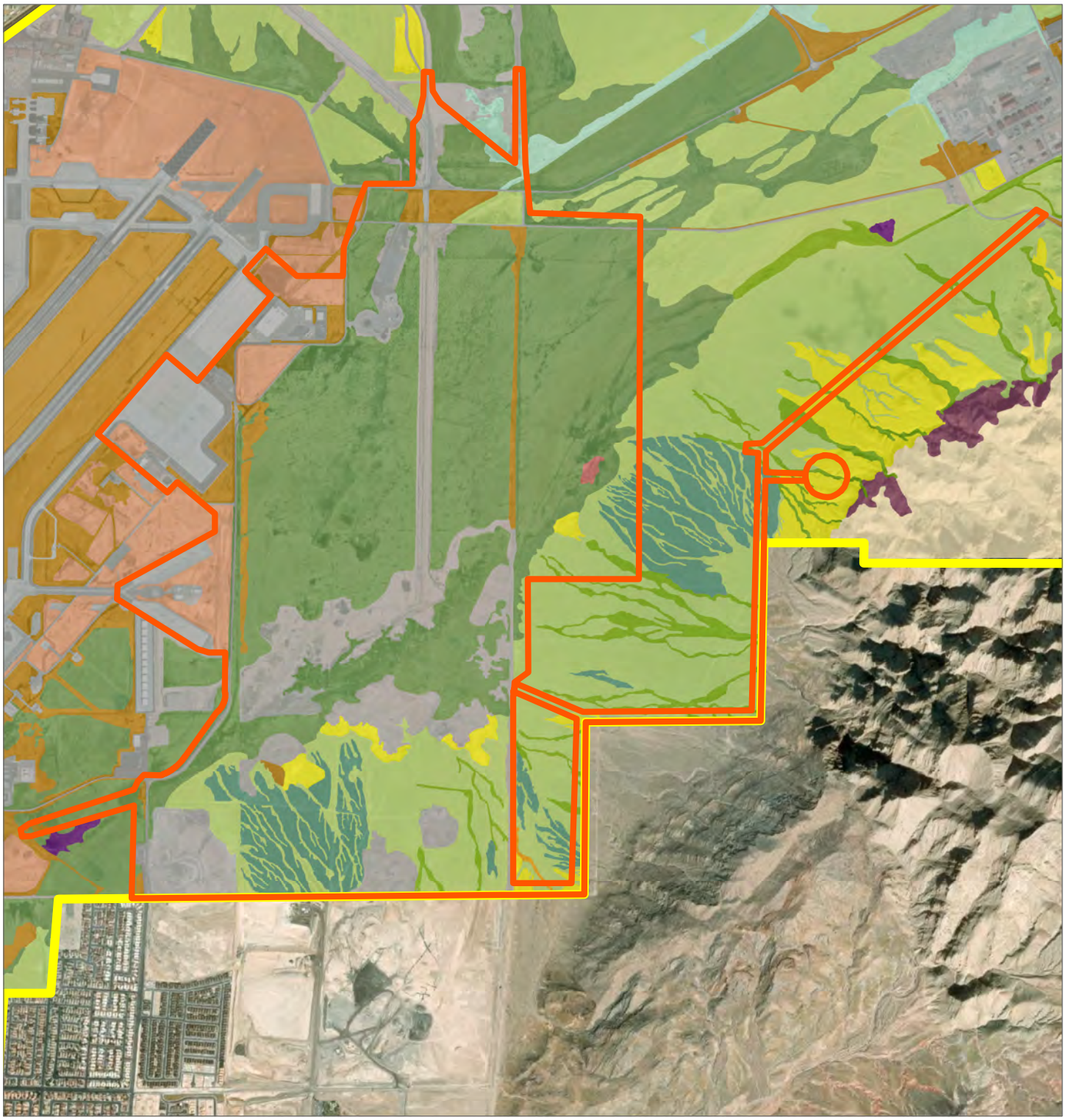


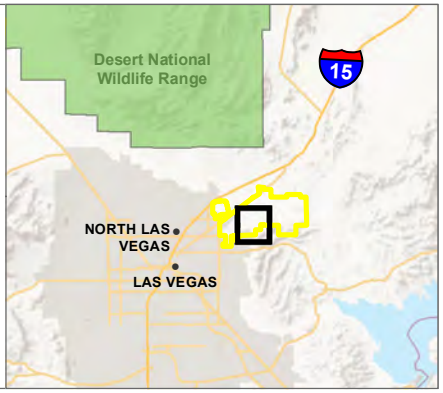
FIGURE 3-16
Vegetation – Alternative 2

- Alternative 2
- Installation Boundary
- Barren Land
- Burrobrush - Sweetbrush Mojave-Sonoran Desert Scrub Alliance
- Burrobrush Desert Dwarf Scrub Alliance
- Catclaw Acacia - Creosotebush - Burrobrush Desert Wash Shrubland Association
- Creosotebush - Burrobush Bajada & Valley Dersert Scrub Alliance
- Creosotebush Monotype Shrubland Association
- Devil's Spineflower - Hairy Desert - Sunflower Desert Pavement Alliance
- Parry's Saltbush Wet Shrubland Alliance
- Red Brome - Arabian Schismus Common Mediterranean Grass Ruderal Desert Grassland
- Urban Land

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



and likely forage for insects in the Proposed Action area. Because bats are highly mobile, development under Alternative 2 would not likely cause direct mortality of bats but would indirectly affect individuals through loss of foraging areas, particularly those areas on the valley floor with taller and more developed stands of shrubs. Larger species such as jackrabbits, coyotes, and bobcats likely would move to adjacent areas, but survival would depend on the quality of available habitat. The characteristics of the habitat on the bajada that would remain undeveloped are significantly different from the habitat on the valley floor that would be developed. Therefore, some species would not transition to adjacent undeveloped areas. Numerous predator burrows were documented in the ROI for Alternative 2 during desert tortoise surveys (**Figure 3-17**). Coyotes, bobcats, and kit foxes would lose the prey base of small mammals and lizards that exist in the developed areas. Impacts to reptile and mammal populations would not be expected to be significant but would be long term from the loss of habitat under Alternative 2. The reptile and small mammal species that occur in the ROI are relatively abundant and common species in the Mojave Desert and loss of local populations would not affect regional populations. Impacts to predatory species such as coyotes, bobcats, and kit foxes would not be expected to be significant but would be long term, as individual animals would move to adjacent habitat. Kit foxes are known to occur on Nellis AFB but have not been observed in the ROI. Coyotes are widely adaptable, and impacts would not be expected to be significant. Home ranges of bobcats are several to many square miles, much larger than the ROI and impacts would not be significant.

Threatened and Endangered Species

As with Alternative 1, the desert tortoise is the only threatened or endangered species that would be affected by implementation of Alternative 2. The DAF determined the Proposed Action under Alternative 2 would adversely affect the desert tortoise because of future disturbance of desert tortoise habitat and potential capture and translocation of tortoises found in the Alternative 2 development area. The incidental take limits for desert tortoise habitat and for potential injury or mortality of desert tortoises in the PBO are the same as described under Alternative 1. Under Alternative 2,487 acres of tortoise habitat would have the potential to be disturbed and developed; this is approximately 513 fewer acres than under Alternative 1, the majority of which occurs on the Sunrise Mountain bajada that would not be developed (see **Figure 2-2**). As with Alternative 1, a transportation and utility infrastructure corridor approximately 150 feet wide would be developed in the future across the upper part of the Sunrise Mountain bajada under Alternative 2. The area that would be developed in Alternative 2 is part of the east-side development plan that was evaluated in the PBA and included in the PBO issued by the USFWS, except for the same 18 acres in a utility corridor that is outside the east-side development plan as described under Alternative 1. The 487 acres of desert tortoise habitat that would be disturbed from implementation of Alternative 2 would fall within the incidental take limits in the PBO for the Facilities Program. This action would be covered by the PBO, provided the DAF implements all terms and conditions and reporting requirements in the PBO. The approximately 3 acres of permanent disturbance within the 18 acres of utility corridor outside of the east-side development plan and any temporary disturbances would be included in disturbed acres allowable under the Utilities Program evaluated in the PBO and as described under Alternative 1.

As described for Alternative 1, the estimated abundance of adult desert tortoises greater than or equal to a 7-inch (180 mm) mid-carapace length in the ROI is low compared to other areas on Nellis AFB (see **Section 3.8.1.6**). The potential for taking of desert tortoises by capture and translocating or through accidental injury or mortality of tortoises would be expected to be less than under Alternative 1 due to the reduced development footprint under Alternative 2. Under Alternative 2, development on the Sunrise Mountain bajada where desert tortoises have been observed during surveys would be limited to a utility corridor. Through implementation of preconstruction surveys and installation of tortoise-proof fences, direct impacts to desert tortoises from translocation or injury or mortality would not be expected to be significant under Alternative 2.

The DAF has determined that the adverse effects of the Proposed Action under Alternative 2 on the desert tortoise from development of tortoise habitat and potential relocation of several adult desert tortoises has been fully evaluated through Section 7 consultation with the USFWS in 2023 as documented in the PBA and PBO (DAF, 2023b; USFWS, 2023). Potential impacts to desert tortoises would be minimized through the implementation of the conservation measures and requirements in the PBO.

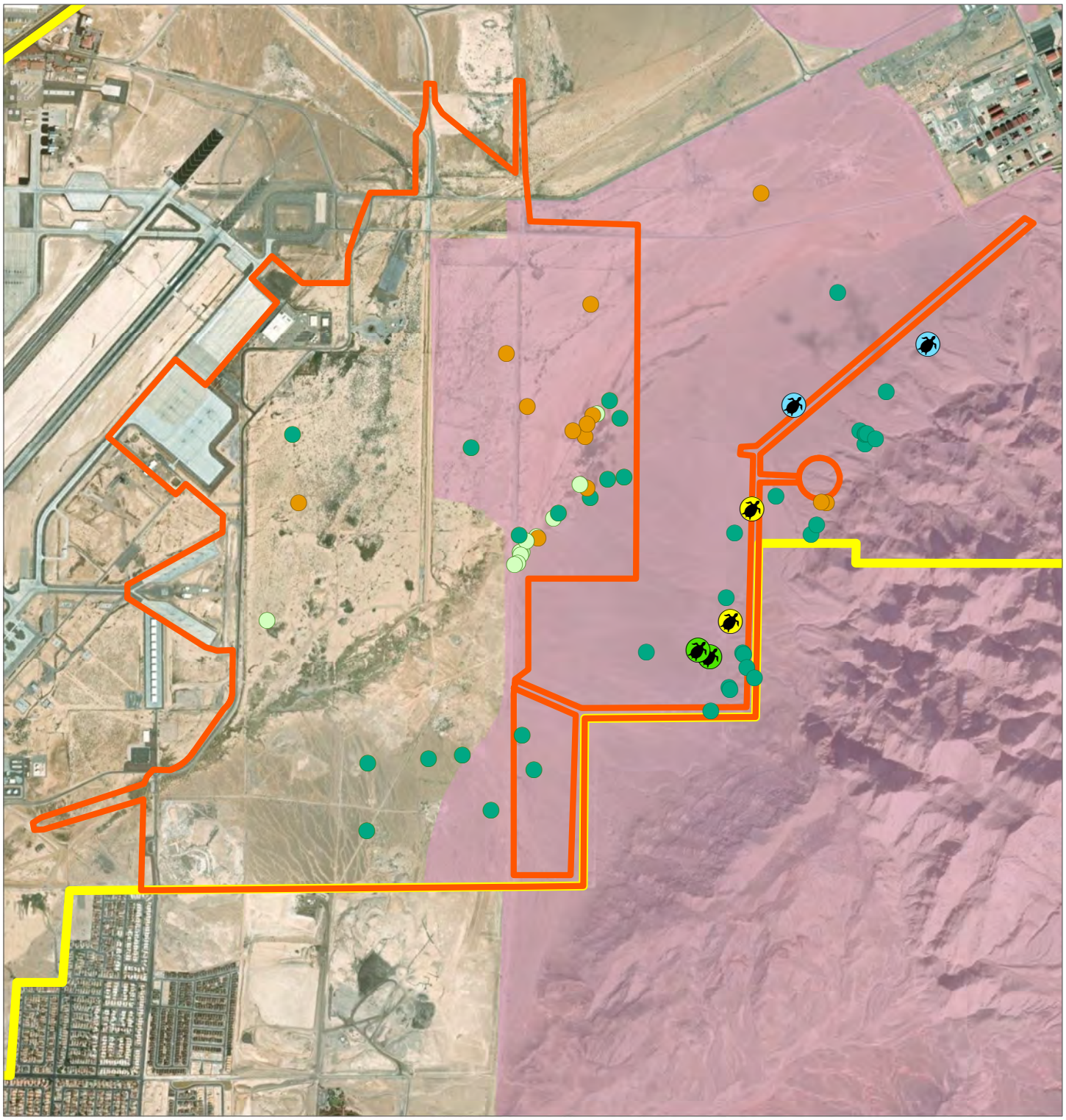


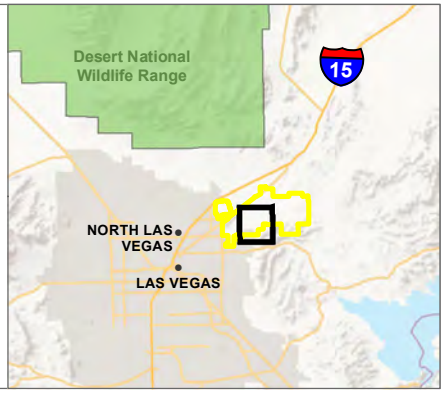
FIGURE 3-17
Desert Tortoise Habitat, Observations, and Animal Burrows
Alternative 2

- Burrowing Owl Burrow
- Predator Burrow
- Desert Tortoise Burrow
- Desert Tortoise (2018)
- Desert Tortoise (2019)
- Desert Tortoise (2021)
- Alternative 2
- Installation Boundary
- Desert Tortoise Habitat

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Migratory Birds

Approximately 1,071 acres of habitat used by a variety of migratory bird species would have the potential to be developed under Alternative 2. Bird species that use the ROI would be displaced to other habitats, but survival and nesting success would depend on whether suitable habitat and nesting territories are available. The MBTA makes it unlawful to take migratory birds or their parts, nests, or eggs. To avoid potential take of migratory birds, nests, or eggs, ground clearing would be conducted outside the nesting season, from 1 March through 31 July if feasible, or a preconstruction survey would be conducted during the nesting season (BLM, 2024). If nests are found, an appropriately sized buffer area would be established around the nest until the nesting attempt is completed. If no nests are found, land clearing would proceed within a designated timeframe following the survey. Birds designated as SGCN by the state of Nevada that are known to occur in the area and would be displaced during project implementation include the American kestrel, common nighthawk, Le Conte's thrasher, long-billed curlew, and sagebrush sparrow. Those species that occupy the Parry's Saltbush Wet Shrubland Alliance vegetation on the valley floor would be most affected because approximately 53 percent of this vegetation association on Nellis AFB would be removed under implementation of Alternative 2. The short-term impact on SGCN bird species would not be expected to be significant. The population size of these species in the ROI is not known but breeding and nesting habitat would be lost for some individuals.

The western burrowing owl and several owl burrows were observed during desert tortoise surveys in October 2020 along the East Tributary wash channel that is within the Alternative 2 development area. As described in **Section 3.8.1.7**, burrowing owls located southwest of the ROI and those in the Proposed Action area were translocated in 2023 to artificial burrows in the northern part of Area II because of a bird aircraft strike incident. Existing owl burrows were collapsed to prevent owls from returning to the same location. It is possible that owls may attempt to return to the Proposed Action area. Prior to clearing of vegetation, preconstruction surveys would be conducted to confirm the presence or absence of burrowing owls. If owls are present, Nellis AFB would coordinate with the USFWS regarding moving owls to another location. Therefore, no impacts to western burrowing owls would be expected under Alternative 2.

Bald and Golden Eagles

Impacts to bald or golden eagles would not be expected during or after implementation of Alternative 2, as habitat for bald eagles does not occur within the ROI. Any observations of bald eagles are of transient birds that are migrating through or wintering at Lake Mead, approximately 12 miles southeast of Nellis AFB. Golden eagles have not been observed at Nellis AFB and would not be impacted.

3.8.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. There would be no changes to biological resources in the ROI beyond baseline conditions. No habitat loss would occur for populations of mammals, reptiles, and birds that live in the area. Species considered sensitive or SGCN would not be affected. Impacts to desert tortoise habitat and individual desert tortoises would not occur. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.8.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in long-term, potentially significant adverse impacts to biological resources. The projects identified in **Table 3-2** evaluate the construction of additional facilities, parking, structures, and/or other impervious surfaces within the ROI—i.e., the eastern part of Nellis AFB Area I and southwestern corner of Area II.

Facility construction in support of the TASS beddown occurred within the western portion of the Proposed Action area and included the removal of 28 acres of desert habitat from biological production. Impacts to

biological resources were determined not be significant because the areas had been previously disturbed and the surrounding areas contained much higher-quality habitat.

Construction of the Nellis Reclaimed Waterline Project occurred primarily within a developed area with minimal potential for impacts to biological resources. Western burrowing owl burrows were observed within the project area and construction activities were implemented with appropriate mitigation measures to avoid potential impacts to the species.

Completed MILCON projects occurred on both the east and west sides of the airfield and primarily included construction within previously disturbed areas. Accordingly, long-term, adverse impacts to biological resources that were not significant occurred as a result of these MILCON projects.

The Nellis Aggressor would require facility demolition, renovation, construction, and addition to support the new aircraft and would occur on the west side of the airfield. Facilities construction evaluated under the Nellis Aggressor EA was determined to have impacts on wildlife, habitats, or biological resources that would not be significant.

The Nellis IDP EA evaluates construction, demolition, and renovation activities primarily located on the west side of the airfield within Area I. These activities would occur entirely within previously disturbed areas and were determined to have impacts to biological resources that were not significant.

The Nellis CSTR EA evaluates the proposed development of a regional contingency training location at Nellis AFB Area II, known as Camp Cobra. The DAF proposes to repurpose existing structures at Camp Cobra and construct new buildings. Combined with impacts to biological resources associated with the Proposed Action, development of the 149-acre Contingency Training Site would have the potential to result in cumulative impacts to biological resources. Activities evaluated under the Nellis Contingency Training Site EA would have the potential to disturb additional acres of the Parry's Saltbush Wet Shrubland Alliance and desert tortoise habit within Nellis AFB. While much of the 149-acre site has been previously disturbed, some activities would occur in areas that have not been previously disturbed. The area in which Camp Cobra is located is known to contain desert tortoise habitat; desert tortoise surveys are planned for 2024 to clarify the presence or absence of desert tortoises within the project area.

The Nellis INRMP EA evaluates the updating and revision of the INRMP for Nellis AFB and the NTTR, including implementation of projects proposed in the INRMP. Projects proposed under the INRMP would broadly benefit biological resources, including vegetation, wildlife, and protected or sensitive species, by providing updated information, gathering data to inform management decisions, and improving conditions for these species across Nellis AFB and the NTTR.

The CCRFCD project is slated to begin no sooner than 2028. This project would extend the stormwater channel within Area I into the detention pond at the southern end of the Proposed Action area. This would directly tie into the utilities and water section for proposed stormwater channel updates. Linear ground-disturbance projects with subsurface utilities would have the potential to impact burrows for desert tortoises or western burrowing owls, if present.

When combined with the Proposed Action, implementation of the projects identified in **Table 3-2** would result in significant effects to biological resources from the removal of large areas of native vegetation. The DAF has determined that the adverse effects of the Proposed Action on the desert tortoise from development of tortoise habitat and potential relocation of several adult desert tortoises has been fully evaluated through Section 7 consultation with the USFWS in 2023, as documented in the PBA and PBO (Nellis AFB, 2023; USFWS, 2023, respectively). Potential adverse impacts to desert tortoises would be minimized through the implementation of the conservation measures and requirements in the PBO.

3.8.2.6 Other Considerations Under NEPA

The conversion of up to 1,480 acres of land under the Proposed Action would represent an irreversible and irretrievable commitment of existing open space. Further, approximately 1,000 acres of desert tortoise habitat would have the potential to be converted to impervious surfaces under the Proposed Action,

reducing the available habitat for the species and require local tortoises to relocate to other areas of suitable habitat nearby. The estimated 1,000 acres of desert tortoise habitat that would be disturbed would be addressed via the PBO, provided the DAF implements all terms and conditions and reporting requirements in the PBO.

Approximately 715 acres of the Parry's Saltbush Wet Shrubland Alliance vegetation that occurs on Nellis AFB would have the potential to be removed during implementation of the Proposed Action. Removal of vegetation at this scale would represent an irreversible and irretrievable commitment of this vegetation association and would result in long-term, significant impacts. The Proposed Action would also remove approximately 559 acres of Creosotebush-Burrobush Bajada and Valley Desert Scrub. This vegetation is more common than the Parry's Saltbrush Wet Shrubland Alliance; nonetheless, conversion of this alliance would represent an irreversible and irretrievable commitment of resources.

The Proposed Action would involve clearing land for future development. This can lead to loss of natural habitats, displacement of wildlife, and increased stormwater runoff, which can degrade water quality and cause flooding. Approximately 1,580 acres of native and non-native vegetation would be removed during development of the Proposed Action. Approximately 1,000 acres of desert tortoise habitat would be developed under the Proposed Action; this impact would be addressed via the PBO, provided the DAF implements all terms and conditions and reporting requirements in the PBO.

Future short-term construction activitiescould temporarily disrupt wildlife and special-status species inhabiting the area. It is expected that approximately 1,580 acres of vegetation would be removed by the Proposed Action, leading to permanent adverse effects on vegetation. Furthermore, approximately 1,000 acres of Mojave desert tortoise habitat would be developed, potentially displacing several desert tortoises from the Proposed Action area. However, the USFWS concluded in the current PBO that the evaluated projects and activities would be unlikely to endanger the continued existence of the Mojave desert tortoise.

While the implementation of the Proposed Action would be expected to have adverse impacts that reduce environmental productivity, disrupt biodiversity, or permanently restrict the beneficial uses of the environment, potential adverse effects on vegetation and desert tortoises would be mitigated through the adoption of conservation measures and requirements outlined in the Nellis AFB PBO (see **Section 3.8.2.2**).

3.8.3 Resource-Specific Mitigation Measures and Best Management Practices

Because the Proposed Action would impact biological resources in the ROI, the DAF identified actions that would help to avoid, minimize, and mitigate such impacts to the extent practicable. These actions include measures identified through consultation with government agencies, government-recommended measures for project development, and accepted industry BMPs (**Table 3-23**).

Table 3-23
Best Management Practices for Biological Resources as Outlined in the PBO

#	Description
Desert Tortoise	
1	To extent practicable, perform land clearing in desert tortoise habitat during less active times of the year, November–February.
2	Have an authorized desert tortoise biologist available during construction to ensure that conservation measures are implemented. Responsibilities are stated in the PBO.
3	Develop a desert tortoise translocation plan in accordance with USFWS guidance. Mark all tortoises that are translocated to allow future identification.
4	Continue to implement and update the Desert Tortoise Awareness Training for all project workers.
5	Check underneath all project equipment and vehicles for desert tortoises before moving in the morning.
6	Clean and inspect all equipment before bringing on site to avoid dispersal of non-native invasive species.
7	Halt project activities if a desert tortoise is found within a project area and contact the authorized desert tortoise biologist.

#	Description
8	Conduct desert tortoise clearance surveys in accordance with USFWS protocols prior to any new land-disturbing activity. During the active tortoise season (April–May and September–October) conduct clearance surveys the day prior or the day of the new land-disturbing activity or within 7 days of the activity during less active tortoise seasons (November–March and June–August). Clearance surveys also include implementation of all USFWS protocols for excavating/collapsing tortoise burrows and translocating tortoises and tortoise eggs found during clearance surveys.
9	Follow all tortoise handling procedures as outlined in the PBO and USFWS protocols.
10	Install permanent or temporary desert tortoise fencing as appropriate in accordance with the PBO. Final project developed areas will have permanent desert tortoise fencing.
11	Install wildlife escape ramps in trenches or open excavations where desert tortoises have the potential to be trapped.
12	Conduct clearance surveys in a 200-foot minimum area surrounding any blasting site and no more than 24 hours prior to detonation.
13	Maintain vehicle speed limits to no more than 35 miles per hour on paved roads in tortoise habitat, 25 miles per hour on gravel roads, and 15 miles per hour on two-track roads or trails.
14	Prohibit off-road vehicle use unless associated with an approved, new land-disturbing activity.
15	Water serves as an attractant to tortoises during their active season. Minimize pooling of water on roads during watering for dust control to avoid attracting desert tortoises. Exercise care on roads following seasonal rainfall events.
16	Eliminate human-created water sources and control litter to discourage the presence of predators, such as coyotes, ravens, and feral dogs, that may prey on desert tortoises. Design structures to discourage nesting by ravens.
17	Implement a raven management plan and a monitoring program for ravens.
18	Implement a litter control program and minimize wildlife food subsidies (e.g., road-kill animals) to prevent attracting predators.
19	If power poles are installed, use designs that discourage use by raptors and ravens in accordance with the most current Avian Power Line Interaction Committee guidelines (Avian Power Line Interaction Committee, 2006).
20	Minimize habitat disturbance by marking the project boundaries and confining activities to the project area; use previously disturbed areas to the extent practicable.
21	Monitor and control invasive plant species.
22	As feasible, salvage native plants from disturbed areas to use in habitat enhancement elsewhere on Nellis AFB.
23	Report progress of all actions taken to protect the desert tortoise to the USFWS as specified in the Incidental Take Statement of the PBO.
24	Report all injuries or mortalities of desert tortoises immediately to the USFWS.
Migratory Birds	
25	Conduct ground clearing or other disturbances outside the migratory bird nesting season to the extent practicable to avoid the take of nesting birds including nests and eggs. The nesting season is considered to be 1 March–31 July.
26	During the migratory nesting season, qualified biologists will conduct preconstruction surveys for nesting birds no more than 7 days prior to land-clearing activities. If a nesting bird is found, a buffer will be established surrounding the nest until all nesting activity is completed.
27	If western burrowing owls are found within the project area, Nellis AFB will coordinate with the USFWS to develop a translocation plan to include creating new artificial burrows elsewhere on Nellis AFB, if needed, and trapping and moving the owls.
Vegetation	
28	Restore vegetation on previously disturbed areas no longer needed for Nellis AFB activities with emphasis on areas similar to those occupied by the Parry's Saltbush Wet Shrubland Alliance in the Proposed Action area.

3.9 CULTURAL RESOURCES

3.9.1 Affected Environment

Nellis AFB has an Integrated Cultural Resources Management Plan (ICRMP) that provides direction for the protection and management of cultural resources on the Installation in compliance with the NHPA and other legal requirements (Nellis AFB, 2017c) and describes cultural surveys undertaken by Nellis to identify historic properties. In addition to review of the ICRMP, information on cultural resources and surveys within the Area of Potential Effect (APE) was acquired by searching the Nevada SHPO's Nevada Cultural Resources Inventory System (NVCRIS).

3.9.1.1 Definition of the Resource

Cultural resources are prehistoric and historic sites, structures, artifacts, and any other evidence of a particular culture or community. They include archaeological resources, historic architectural resources, and traditional cultural properties. Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Historic architectural resources include standing buildings and other structures of historic or aesthetic significance. Architectural resources generally must be more than 50 years old to be considered eligible for National Register of Historic Places (NRHP) inclusion. However, structures less than 50 years may be considered for inclusion if shown to have historical significance, such as Cold War-era properties. Historic properties are significant architectural, archaeological, or traditional resources that are defined as eligible for NRHP inclusion (36 CFR § 60.4).

Not all cultural resources qualify as "historic properties"; i.e., those properties eligible for inclusion on the NRHP. The following criteria have been established as guidance for evaluating potential entries to the NRHP (36 CFR § 60.4). "Significance" in American history, architecture, archaeology, and culture is granted to districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that meet at least one of the following criteria:

- an association with events that have made a significant contribution to the broad patterns of history (Criterion A);
- an association with the lives of persons significant in history (Criterion B);
- embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic value; or represent a significant and distinguished entity whose components may lack individual distinction (Criterion C); or
- have yielded, or may likely yield, information important in prehistory or history (Criterion D).

Generally, architectural resources must be more than 50 years old to be considered for inclusion on the NRHP. More recent structures must meet a higher level of exceptional significance to be considered NRHP eligible (Criterion Consideration G). DoD structures of the Cold War-era (1946–1989) are evaluated under explicit guidance of NPS Bulletin 22 (USDOI, 1998).

Traditional cultural properties (TCPs) include land areas, sites, or resources associated with the cultural practices or beliefs of a present-day community (cultural group). TCPs could be plants, objects, raw material, archaeological resources, location of significant events, or hunting areas. These items link a community with its past and help to maintain the present-day cultural identity. TCPs may be eligible for NRHP inclusion.

Due to present-day community importance, the DoD American Indian and Alaska Native Policy emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The policy requires consultation with federally recognized tribes associated with a proposed action location to assess effects prior to making decisions. DoDI 4710.02, *DoD Interactions with Federally Recognized Tribes* (September 2018), implements DoD policy, assigns responsibilities, and provides procedures for DoD interactions with federally recognized tribes in accordance with its American Indian and Alaska Native

Policy and other DoD Directives. Additionally, DAFI 90-2002, *Interactions with Federally Recognized Tribes* (August 2020), provide guidance for installations to ensure compliance.

EO 13007, *Indian Sacred Sites*, defines sacred sites as any specific, discrete, narrowly delineated location on federal land that is identified by a Native American tribe or individual as sacred by virtue of its established religious significance to or ceremonial use by a Native American religious and identified as such to the land managing agency. EO 13007 also requires federal agencies to accommodate access to, and ceremonial use of, sacred sites by Native American religious practices and to avoid adversely affecting their integrity.

3.9.1.2 Region of Influence

For the purposes of cultural resources analyses, the ROI for cultural resources is considered equivalent to the APE, as defined by 36 CFR § 800.16(d): the "geographic area or areas within which an undertaking (project, activity, program, or practice) may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist," and thereby diminish their historic integrity. The terms "direct effect" and "indirect effect" are not defined in the NHPA nor in the Section 106 regulations. In March 2019, the District of Columbia circuit court issued an opinion that clarified the meaning of the term "directly" in Section 110(f) (US Court of Appeals, 2019). The opinion in National Parks Conservation Association v. Semonite concluded that:

> "…the meaning of the term 'directly' in Section 110(f) refers to the causality, and not the physicality, of the effect. This means that if the effect comes from the undertaking at the same time and place with no intervening cause, it is considered 'direct' regardless of its specific type (e.g., whether it is visual, physical, auditory, etc.). 'Indirect' effects are those caused by the undertaking that are later in time or farther removed in distance but are still reasonably foreseeable."

In other words, direct effects are not limited to those physical in nature. Visual, auditory, and atmospheric effects may be considered "direct effects" depending on the specific circumstances of each undertaking. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking.

The physical APE for this Proposed Action includes the approximately 2,000-acre area within the boundaries of Nellis AFB in which construction activities could occur (see **Figures 2-1** and **2-2**). The relatively flat physical APE is located at the northwestern base of Sunrise Mountain, along with the rest of Nellis AFB. A visual APE, which also incorporates the radius of atmospheric, auditory, and cumulative effects, has been defined by Nellis AFB Cultural Resources Program Managers. In accordance with NHPA Section 106, the DAF consulted with the Nevada SHPO, federally recognized tribes, and other agencies regarding definition of the APE. The physical and visual APEs for future projects would be established in cooperation with the SHPO and federally recognized tribes when they are eventually developed. In keeping with the programmatic nature of this EIS, future Section 106 consultations would occur on a project-by-project basis prior to beginning construction activities.

3.9.1.3 Architectural Properties

To date, one potential historic district (HD) and 104 buildings and structures have been identified within the APE. The potential Red Flag HD, located within Area I of Nellis AFB, has been recorded but not evaluated for NRHP eligibility (**Figure 3-18**). Seventy-six buildings and structures have been determined not eligible for listing in the NRHP, or non-contributing to the eligibility of larger, linear sites (with SHPO concurrence). Eight buildings and structures have been determined eligible for the NRHP and 20 are unevaluated or in-process, but will be treated as eligible for the purposes of this PEIS (**Table 3-24**). Eleven historic architectural studies have been completed within the APE (**Table 3-25**).

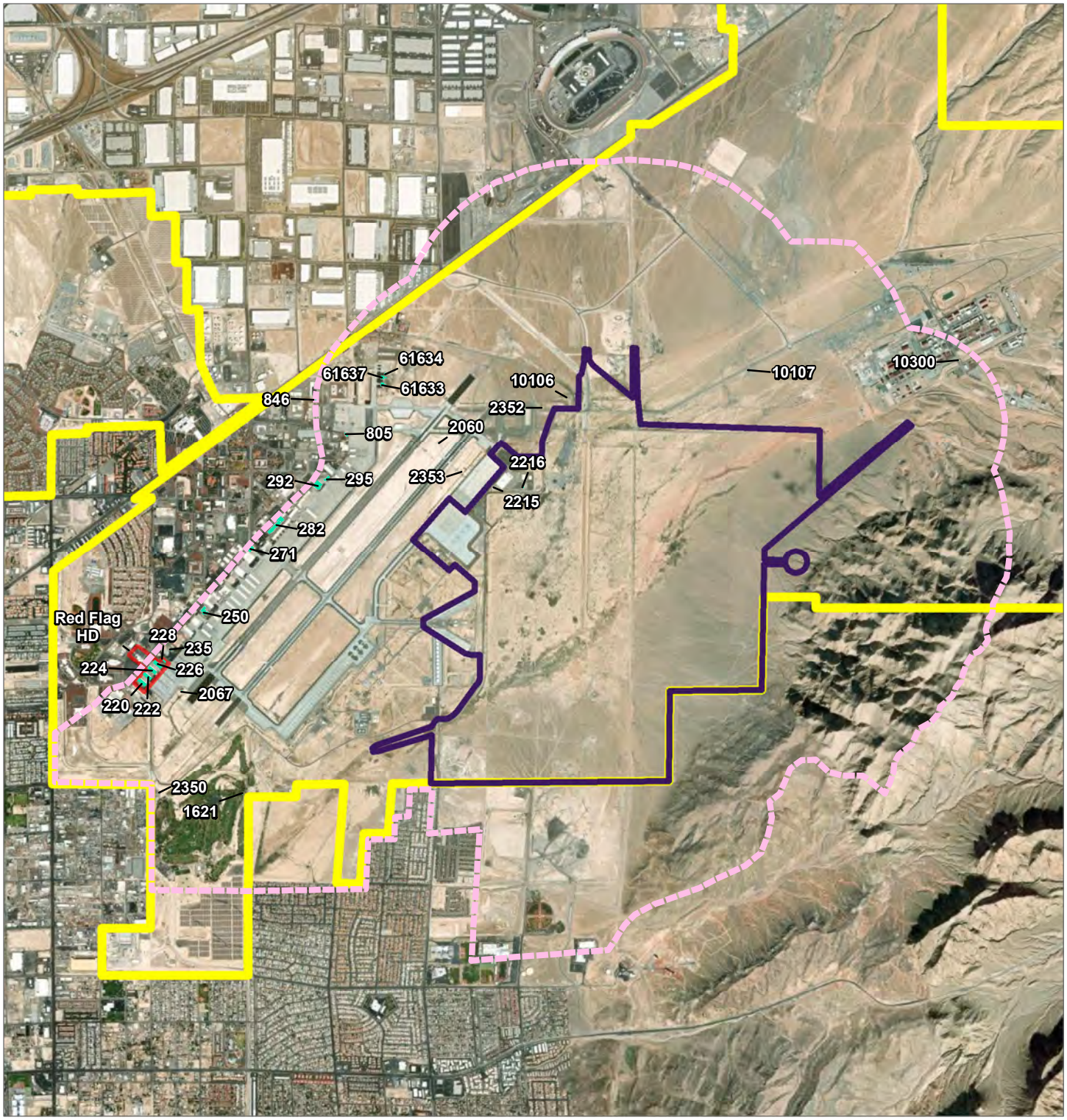


FIGURE 3-18
Cultural Resources

Table 3-24
NRHP Eligible, Potentially Eligible, and Unevaluated Architectural Resources within the APE

SHPO No.	Bldg. No.	Name	Date Built	NRHP Status	APE
B15936	220	Small Aircraft Maintenance Dock	1972	Eligible (A); Contributing to Potential Red Flag NRHD	Visual
B13548	222	Small Aircraft Maintenance Hangar	1972	Eligible (A); Contributing to Potential Red Flag NRHD	Visual
B13549	224	B-204	1972	Eligible (A); Contributing to Potential Red Flag NRHD	Visual
B13550	226	B-202	1972	Eligible (A); Contributing to Potential Red Flag NRHD	Visual
B13551	228	B-228	1989	Eligible (A); Contributing to Potential Red Flag NRHD	Visual
B13558	282	B-282	1969	Eligible	Visual
B13561	292	B-T-148, Thunderbirds Hangar	1942	Eligible	Visual
N/A	805	Base Operations (old McCarran Field Air Terminal)	1939	Eligible	Visual
N/A	235	Petroleum Operations Building	1989	Unevaluated	Visual
N/A	250	Aircraft Maintenance Shop	1971	Unevaluated	Visual
N/A	271	Aircraft Wash Rac	1959	Unevaluated	Visual
N/A	295	Squadron Operations	1970	Unevaluated	Visual
N/A	846	Water Fire Pumping Station	1970	Unevaluated	Visual
N/A	1621	Recreation Pavilion	1988	Unevaluated	Visual
N/A	2060	Tactical Air Navigation Station	1971	Unevaluated	Visual
N/A	2067	Squadron Operations	1988	Unevaluated	Visual
N/A	2215	Base Hazardous Storage	1990	Unevaluated	Physical
N/A	2216	Water Fire Pumping Station	1990	Unevaluated	Physical
N/A	2350	Navigational Aids Shop	1974	Unevaluated	Visual
N/A	2352	Electric Power Station	1974	Unevaluated	Visual
N/A	2353	Instrument Landing System Localizer	1981	Unevaluated	Visual
N/A	10106	Water Supply Building	1960	Unevaluated	Visual
N/A	10107	Water Pump Station	1954	Unevaluated	Visual
N/A	10300	Entry Control Building	1954	Unevaluated	Visual
N/A	10619	Operations Support Shed	N/A	Unevaluated	Visual
N/A	61633	Power Check with Suppressor	1987	Unevaluated	Visual
N/A	61634	Engine Test Shop and Storage Depot	1989	Unevaluated	Visual
N/A	61637	Power Check with Suppressor	1984	Unevaluated	Visual

Source: NV SHPO, 2024
(A) = eligible under Criterion A; APE = Area of Potential Effect; B- = Building (as in B-204); HD = Historic District; N/A = not applicable; NRHD = National Register Historic District

Table 3-25
Architectural Surveys Conducted within the APE

Report Number	Report Author(s)	Report Name	Year
29602	Root, Garret and Heather Miller	Historic Resources Survey and Reevaluation of Twenty-Five Facilities and Investigation of Potential Historic Districts on Nellis AFB, Clark County, Las Vegas, Nevada	2022
24132	Edwards, Erin	Historical Building Inventory of Nellis AFB, Creech AFB, and Nevada Test and Training Range, Las Vegas, Nevada	2018
23424	Oliver, Anne and Kate Hovanes (SWCA)	Historic Overview of the Nellis AFB Runway System, Las Vegas, Clark County	2018
22715	Hart, David R.	Cultural Resources Survey Associated with the Beddown of Tactical Air Support Squadron, Nellis AFB, Clark County, Nevada	2017
19822	JRP Historical Consulting, LLC	Survey and Evaluation of 121 Buildings at Nellis AFB, Clark County, Nevada	2014
N/A	Geo-Marine, Inc.	Nellis AFB Historic Evaluation of 251 Buildings	2007
175	Geo-Marine, Inc.	Nellis AFB Historic Evaluation of 9 Buildings	2006
A_740	Dobson-Brown, Debra	Wherry and Capehart Housing, Historic Building Inventory and Evaluation, Nellis AFB, Nevada	2004
N/A	Mariah Associates	A Baseline Inventory of Cold War Material Culture at Nellis AFB, Volume II	1997
N/A	Mariah Associates	A Systemic Study of Air Combat Command Cold War Material Culture, Volume I: Historic Context and Methodology for Assessment	1995
N/A	Page and Turnbull	An Inventory and Evaluation of World War II Structures at Nellis AFB and Indian Springs Auxiliary Air Force Field, Nevada	1988

N/A = not applicable

3.9.1.4 Archaeological Properties

To date, 57 archaeological sites have been identified within the APE as a result of 16 archaeological surveys (**Table 3-26**). Of these sites, 42 have been determined not eligible for NRHP listing or non-contributing to the eligibility of larger, linear sites (with SHPO concurrence). Three sites were previously determined eligible but have since been mitigated. Eleven sites have not yet been evaluated for NRHP eligibility or are in-process, and one site has no NRHP status listed in NVCRIS. **Table 3-27** lists all 12 sites. The entirety of the physical APE has been subject to archaeological survey beginning in the late 1970s.

Table 3-26
Archaeological Surveys Conducted within the APE

SHPO Report Number	Report Author(s)	Report Name	Year
In process	Johnson, et al.	United States Air Force Nellis Air Force Base Cultural Resources Inventory Negative Report: Master Plan and Installation Development EIS Three-Acre Survey Support, Nellis Air Force Base, Clark County, Nevada	2024
34541	Toussaint, M., and J. Roberson	Archaeological Inventory and Evaluation of 1,000 Acres on the Nellis Air Force Base, Clark County, Nevada	2023
34386	Younie, et al.	Class III Archaeological Inventory for Fence-to-Fence Environmental Services at Nellis Air Force Base, Clark County, Nevada	2022
In process	EAS and Stell	Final Cultural Resources Inventory Negative Report Supporting the Environmental Impact Statement for Master Plan and Mission Rebalance at Nellis AFB, Nevada	2021
23446	Wilkins, A.	Hollywood SD Project; Environmental Baseline Survey in for Proposed Flood Control Improvements to be Constructed Within the Nellis AFB	2017
23535	Smith, L.M.	Nellis AFB: Section 110 Archaeological Survey, Area II, Clark County, NV	2017
5924	Ahlstrom, Eskenazi, and Roberts	An Archaeological Survey for the Las Vegas Valley Disposal Boundary Environmental Impact Statement, Clark County, Nevada	2004
13137	Lawrence et al.	Nellis Air Force Withdrawal Lands, Clark County, Nevada	1999
MISC69A	York, A.L. and W.G. Spaulding	Phase II Archaeological Investigations at Sites 26CK4856, 26CK4864, and 26CK4867 within the Main Cantonment of Nellis Air Force Base, Clark County, Nevad	1995a
MISC69B	York, A. L. and W. G. Spaulding	Final Phase III Archaeological Investigations at Sites 26CK4856, 26CK4864, and 26CK4867 within the Main Cantonment of Nellis Air Force Base, Clark County, Nevada	1995b
MISC45	Bergin, K. A.	Archaeology of the Main Cantonment, Nellis Air Force Base, Clark County, Nevada	1993
11378	Bergin, K. A.	Archaeology of Areas II and III, Nellis Air Force Base, Clark County, Nevada	1995
MISC50	Peter, D. E.	Report of Negative Findings for Additional Survey of Area II Wastewater Service Area Sewer Line, Nellis Air Force Base, Nevada	1993
13255	Davis, G. and A. DuBarton	Clark County Regional Flood Control District Final Master Plan: 10 Year Plan Facility Cultural Resource Survey Report, Dames and Moore	1991
13825	Wirtz, H.	Sunrise Community Pit	1979a
13840	Wirtz, H.	Sunrise Community Pit Extension	1979b

Table 3-27
NRHP-Eligible and Unevaluated Archaeological Resources within the APE

Site No.	Temporal Affiliation	Description	NRHP Status	APE
CK3128	Prehistoric	Rockshelter; Looted/Vandalized	Unevaluated	Visual
CK4950	Prehistoric	Temporary Camp	Unknown	Visual
CK11134	Historic	Refuse Scatter	Unevaluated	Visual
CK11135	Historic	Refuse Scatter	Unevaluated	Visual
CK11269	Historic	Can Scatter	In process	Physical
S1823	Historic	Runway 21R/3L (Northwest Runway)	Recommended Eligible (A) by SWCA (2017)[a]; Unevaluated by SHPO	Visual
S1824	Historic	Runway 3R/21L (Southeast Runway)	Recommended Eligible (A) by SWCA (2017)[a]; Unevaluated by SHPO	Visual
S1825	Historic	Main Apron	Recommended Eligible (A) by SWCA (2017)[a]; Unevaluated by SHPO	Visual
S1826	Historic	Historic Terminal Area	Recommended Eligible (A) by SWCA (2017)[a]; Unevaluated by SHPO	Visual
S1827	Historic	Live Ordnance Loading Area	Recommended Eligible (A) by SWCA (2017)[a]; Unevaluated by SHPO	Physical
S2797	Historic	Las Vegas Speedway	In process	Visual
S2847	Historic	Ellsworth Road	Unevaluated	Visual

a SWCA, 2017, as referenced in the Nevada Cultural Resource Information System
(A) = eligible under Criterion A; SHPO = State Historic Preservation Officer

3.9.1.5 Traditional Cultural Properties

Sixteen federally recognized Native American tribes have historical ties to Nellis AFB and the surrounding area. To date, no TCPs have been identified within the APE. The following tribes were contacted in March 2023 regarding the Proposed Action:

- Utu Utu Gwaitu Paiute Tribe
- Big Pine Paiute Tribe
- Bishop Paiute Tribe
- Chemehuevi Indian Tribe
- Colorado River Indian Tribes
- Duckwater Shoshone Tribe
- Ely Shoshone Tribe
- Fort Independence Indian Tribe
- Fort Mojave Tribe
- Kaibab Band of Paiute Indians
- Las Vegas Tribe of Paiute Indians
- Lone Pine Paiute-Shoshone Tribe
- Moapa Band of Paiute Indians
- Paiute Indian Tribe of Utah
- Timbisha Shoshone Tribe
- Yomba Shoshone Tribe

3.9.2 Environmental Consequences

3.9.2.1 Evaluation Criteria

Adverse impacts to cultural resources would occur if the Proposed Action or Alternatives:

- physically altered, damaged, or destroyed all or part of a resource;
- altered characteristics of the surrounding environment that contribute to the resource's significance;
- introduced visual or audible elements that are out of character with the property or alter its setting or feeling;
- neglected the resource to the extent that it deteriorates or is destroyed; and/or
- resulted in the sale, transfer, or lease of the property out of agency ownership (or control) without adequate enforceable restrictions or conditions to ensure preservation of the property's historic significance.

For the purposes of this PEIS, an impact is considered significant if it alters the integrity of a NRHP-listed, eligible, or potentially eligible resource or potentially impacts TCPs.

3.9.2.2 Alternative 1

Cultural resources potentially affected include significant historic sites such as national landmarks or properties listed, eligible for listing, or potentially eligible for listing on the NRHP. These properties qualify because of setting or feeling; historic architectural resources; archaeological resources with standing structures that could be affected by noise or ground disturbance; national historic trails; and cultural resources that are associated with places that require isolation or quiet.

Architectural Properties

The unofficial Red Flag HD is located within the visual APE on the northern side of the western terminus of the current Nellis AFB flightline, just over 1 mile west of the physical APE. This HD, as unofficially defined by Root and Miller (2022), includes six individually eligible buildings. These buildings include a small aircraft maintenance hangar (SHPO: B13548; Nellis AFB: B-222), B-224 (B13549), Red Flag Hangar (B13550; B-226), B-228 (B13551), Suter Hall/Squadron Operations–Red Flag Headquarters (B15930, B-201), and a small aircraft maintenance dock (B15936, B-220). There is no aboveground infrastructure, topography, or vegetation that would obstruct the view of development under Alternative 1 from Red Flag HD, as the HD lies directly along the flightline. Therefore, implementation of Alternative 1 would be anticipated to result in a direct visual impact to Red Flag HD. However, future new construction would meet existing Installation standards for development and would be keeping in character with Nellis AFB's primary function as a military installation. In keeping with the programmatic nature of this EIS, Section 106 consultations would occur on a project-by-project basis prior to beginning future construction activities. With adherence to Installation facilities standards, no adverse effects would be anticipated. Should an adverse effect determination be made, measures to mitigate adverse effects to Red Flag HD would be required.

The Thunderbirds Hangar (B13561, B-292), located within the visual APE on Tyndall Avenue at the northern end of the flightline in Area I, is a 47,985-ft^2 aircraft hangar, maintenance shop, museum, and administrative office for the DAF Thunderbirds. Built in 1942, this resource has been heavily altered and lost its previous NRHP eligibility association with its World War II significance in 1988 due to loss of integrity (Page & Turnbull, 1988). However, B13561 was re-evaluated in 2014 under the Cold War-era context, and it is once again individually eligible for NRHP listing. There is no aboveground infrastructure, topography, or vegetation that obstructs the view of the Proposed Action area from the Thunderbirds Hangar, as it lies directly on the flightline. Therefore, implementation of Alternative 1 would be anticipated to result in a direct visual impact to B13561. However, future new construction would meet existing Installation standards for development and would be keeping in character with Nellis AFB's primary function as a military installation. In keeping with the programmatic nature of this EIS, Section 106 consultations would occur on a project-by-project basis prior to beginning future construction activities. With adherence to Installation facilities

standards, no adverse effects would be anticipated. Should an adverse effect determination be made, measures to mitigate adverse effects to B13561 would be required.

Additionally, the old McCarran Field Air Terminal (B-805) and B-282 individually are NRHP eligible and are located within the visual APE. These structures would have the potential to experience direct visual, auditory, and atmospheric effects associated with future development under Alternative 1.

Archaeological Properties

There are no NRHP-eligible or -listed archaeological sites within the physical APE for Alternative 1. There are 11 sites that are either unevaluated, in-process, or have unknown status for NRHP eligibility. Two of these sites are within the physical APE and could be subject to physical effects under Alternative 1 (CK11269 and S1827). For each of the sites in the visual APE (see **Table 3-27**), there likely would be no adverse effect, either direct or indirect, because the significance and integrity of resources eligible under Criterion D typically are dependent on the recovery of data important, or potentially important, to the past. Only physical disturbance likely would threaten these sites. CK11269 is a historic can scatter that is being reviewed for eligibility. However, being a historic can scatter, the site is highly unlikely to meet the significance criteria for NRHP eligibility. S1827 is also being reviewed for eligibility; however, its eligibility is more difficult to determine without the SHPO's concurrence. Therefore, implementation of Alternative 1 could be anticipated to result in an adverse effect to archaeological resource S1827 in the ROI if it is determined to be eligible for NRHP listing. CK11269 and S1827 would be treated as eligible until an eligibility determination is made.

Traditional Cultural Properties

To date, there have been no TCPs identified within, or associated with, the APE. Therefore, implementation of Alternative 1 would be anticipated to result in no effects to TCPs in the ROI.

Additional analysis of impacts to cultural resources would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation. Section 106 consultation would be conducted on a project-by-project basis as individual projects are identified; the Nevada SHPO concurred with this approach to consultation via email dated 22 November 2024.

3.9.2.3 Alternative 2

Architectural Properties

Under Alternative 2, Red Flag HD would be anticipated to experience the same direct visual impact as Alternative 1 because development under Alternative 2 would occur in the westernmost portion of the Proposed Action area, closest to the flightline. As under Alternative 1, future new construction would meet existing Installation standards for development and would be keeping in character with Nellis AFB's primary function as a military installation. In keeping with the programmatic nature of this EIS, Section 106 consultations would occur on a project-by-project basis prior to beginning future construction activities. With adherence to Installation facilities standards, no adverse effects would be anticipated. Should an adverse effect determination be made, measures to mitigate adverse effects to Red Flag HD would be required.

The Thunderbirds Hangar (B13561, B-292) would be anticipated to experience the same visual impact as Alternative 1. In keeping with the programmatic nature of this EIS, Section 106 consultations would occur at a later date on a project-by-project basis prior to beginning future construction activities. With adherence to Installation facilities standards, no adverse effects would be anticipated. Should an adverse effect determination be made, measures to mitigate adverse effects to B13561 would be required.

Archaeological Properties

Alternative 2 would have the same potential for adverse effects to archaeological properties as Alternative 1. Adverse effects could occur if archaeological resource S1827 is determined to be eligible for NRHP listing.

Traditional Cultural Properties

To date, there have been no TCPs identified within, or associated with, the APE. Therefore, implementation of Alternative 2 would be anticipated to result in no effects to TCPs in the ROI.

Additional analysis of impacts to cultural resources would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation. Section 106 consultation would be conducted on a project-by-project basis as individual projects are identified; the Nevada SHPO concurred with this approach to consultation via email dated 22 November 2024.

3.9.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. There would be no changes to cultural resources in the ROI beyond base conditions. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.9.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in direct, adverse, visual impacts to cultural resources. The projects identified in **Table 3-2** evaluate the construction of additional facilities, parking, structures, and/or other impervious surfaces within the visual and physical APE for the Proposed Action—i.e., the ROI

The Nevada SHPO's letter to DAF dated 30 June 2017 stated its concurrence with DAF's determination that the TASS beddown project would result in "No Historic Properties Affected." At the time, the LOLA (S1827) had not yet been considered for NRHP eligibility. According to SHPO records, the LOLA was recommended NRHP eligible by a consultant in 2017. SHPO has not yet made a determination on the LOLA's NRHP status, and this project's potential lasting direct and indirect effects to historic properties is currently unknown until SHPO makes an official determination of eligibility.

Completed MILCON projects at Nellis AFB resulted in adverse, direct, visual effects to cultural resources near the facilities constructed within the viewshed of historic properties.

Several cultural resources would be adversely affected by proposed construction, renovation, infrastructure, and demolition projects evaluated in the Nellis IDP EA, including demolition of the Lomie Heard Elementary School, an NRHP-eligible HD. Nellis AFB and the Nevada SHPO signed a MOA for demolition of the district that stipulates required mitigation measures for the action. Other proposed projects evaluated in that EA would continually directly and indirectly impact cultural resources. Construction projects have the most potential to physically disturb archaeological sites and historic buildings. Renovation most often impacts architectural resources, infrastructure development poses physical and environmental threats to all historic properties, if present, and demolition is most likely to affect historic buildings and the historic landscape.

The Nellis CSTR EA evaluates the proposed development of a regional contingency training location at Nelis AFB Area 4, known as Camp Cobra. The DAF proposes to repurpose existing structures at Camp Cobra and construct new buildings. This project could adversely affect cultural resources physically, visually, and sonically, depending on the location of resources in the area.

The CCA project is proposed for future implementation at Creech AFB and Nellis AFB. If renovation or demolition activities affect historic structures, adverse effects to cultural resources would occur. Ground-disturbing activities would have the potential to impact archaeological resources if performed in unsurveyed areas.

The CCRFCD project is slated to begin no sooner than 2028. This project will extend the stormwater channel within Area I into the detention pond at the southern end of the Proposed Action area. Linear ground-disturbance projects with subsurface utilities could impact archaeological resources, if present. Visual impacts to aboveground cultural resources would not be anticipated unless aboveground utilities infrastructure were constructed.

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, adverse cumulative effects to cultural resources that would not be significant would be anticipated to occur with implementation of the Proposed Action.

3.9.2.6 Other Considerations Under NEPA

Development under the Proposed Action would have the potential to result in adverse visual impacts to the Red Flag HD, B13561, S1823, S1824, S1825, S1826, S1827, and S1828. Individual buildings constructed as part of future development activities likely would be visible from these historic resources, resulting in an unavoidable adverse effect. Unavoidable adverse effects to S1827 could occur if development under the Proposed Action included future activities that would modify or improve the existing LOLA. Should the Nevada SHPO make an adverse effect determination, measures to mitigate adverse effects to these structures would be required.

3.9.3 Resource-Specific Mitigation Measures and Best Management Practices

No BMPs have been identified for the Proposed Action. However, development occurring under the Proposed Action would meet existing Installation standards for development and would be keeping in character with Nellis AFB's primary function as a military installation. Mitigation measures would be identified on a project-by-project basis should the Nevada SHPO make an adverse effect determination for any historic architectural or archaeological properties.

3.10 NOISE

3.10.1 Affected Environment

3.10.1.1 Definition of the Resource

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Noise is generally described as unwanted sound. Unwanted sound can be grounded in objectivity (e.g., hearing loss or damage to structures) or subjectivity (e.g., an individual's level of tolerance or annoyance to different sounds). Noise events elicit varying responses within a population or area based on the activity generating noise and its perceived importance and related factors, such as setting, time of day, exposure period or duration, and receptor sensitivity. In addition to humans, noise may also affect wildlife as indicated by behavioral changes during nesting, foraging, migration, or other life-cycle activities (USEPA, 1978).

3.10.1.2 Region of Influence

The ROI for noise is the area covered by the Nellis AFB AICUZ program, including portions of the cities of Las Vegas and North Las Vegas and unincorporated Clark County.

3.10.1.3 Existing Noise Environment

The AICUZ study at Nellis AFB was updated in 2017 and represents an accurate depiction of the aircraft activities through 2024. The AICUZ allows the neighboring communities to take a long-range view in land use planning surrounding the Installation (Nellis AFB, 2017b).

Aircraft operations are the primary source of noise associated with Nellis AFB. The level of noise exposure relates to a number of variables, including the aircraft type, engine power setting, altitude flown, direction of the aircraft, flight track, temperature, relative humidity, frequency, and time of operation (day/night). Aircraft assigned to Nellis AFB include the A-10 Thunderbolt, F-15 Eagle, F-16 Fighting Falcon, F-22 Raptor, F-35A, C-12 Huron, and the HH60G Pave Hawk helicopter. Aircraft that are not permanently assigned but conduct operations from the Installation on an occasional basis are referred to as transient aircraft. Transient aircraft include the F/A-18 Super Hornet, KC-135 Stratotanker, C-130 Hercules, B-1 Lancer, B-2 Spirit, and the B-52 Stratofortress. The number of annual operations, by airframe, that contribute to the existing noise environment at Nellis AFB are listed in **Table 3-28**.

Table 3-28
Annual Aircraft Flight Operations for AICUZ Noise Contours

Aircraft	Number of Operations		
	Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)	Total
F-15C/D/E	6,134	216	6,350
F-16C	6,574	417	6,991
F-22	5,573	482	6,055
F-35A	25,286	926	26,212
HH-60G	6,535	205	6,740
C-12	238	9	247
Transient	64,888	24	64,912
Totals	**115,228**	**2,279**	**117,507**

Source: Nellis AFB, 2017b

Multiple variables contribute to the overall noise environment surrounding Nellis AFB including aircraft type, engine power settings, altitude, direction, temperature, topography, humidity, and time of day. The airfield is located in the center of Area I and is generally aligned southwest to northeast (**Figure 3-19**). It includes aircraft hangars for maintenance and storage, aircraft parking ramps and taxiways, two hard-surface runways, assorted office buildings, munitions storage areas, and support facilities such as hush houses (buildings specifically designed to muffle engine noise) for engine run maintenance. Maintenance is also an integral part of any flying operation, and it requires a dedicated team of professionals to ensure that units can meet flying schedule requirements. Two key tasks in maintaining aircraft are low- and high-powered engine maintenance runs. Engine runs may be conducted at any power setting between idle and maximum power. The noise associated with these maintenance operations also contributes to the overall noise environment at Nellis AFB.

The DAF has established a program with the goal of reducing noise and vibrations from military aircraft, weapons systems, and munitions. The Nellis AFB Noise Abatement Program contains strategies, techniques, and procedures that have been put in place that help to protect people and structures from harmful effects of noise. Aircraft departing the Installation expedite their turns and climbs after takeoff for noise abatement and to avoid populated areas around the Installation (Nellis AFB, 2018a). Leadership evaluates flight operations and practices periodically as well as complaints from public use areas. Being located away from main public areas, Nellis AFB has limited the number of noise complaints (Nellis AFB, 2017b).

Per AFI 32-1015, *Integrated Installation Planning* (as amended 4 January 2021), Nellis AFB models its noise exposure using the NOISEMAP suite of computer programs containing the core computational programs called “NMAP,” version 7.3, the Advanced Acoustic Model, and “MRNMap,” version 3.0 for environmental analysis of aircraft noise. These programs generate noise planning contours, or levels, to inform future land development. These noise levels are based on the best available estimates of future mission needs and anticipated aircraft life cycles. These levels are represented in 5 decibel (dBA) increments surrounding the Nellis AFB airfield, as shown in **Figure 3-19**, and reflect anticipated aircraft

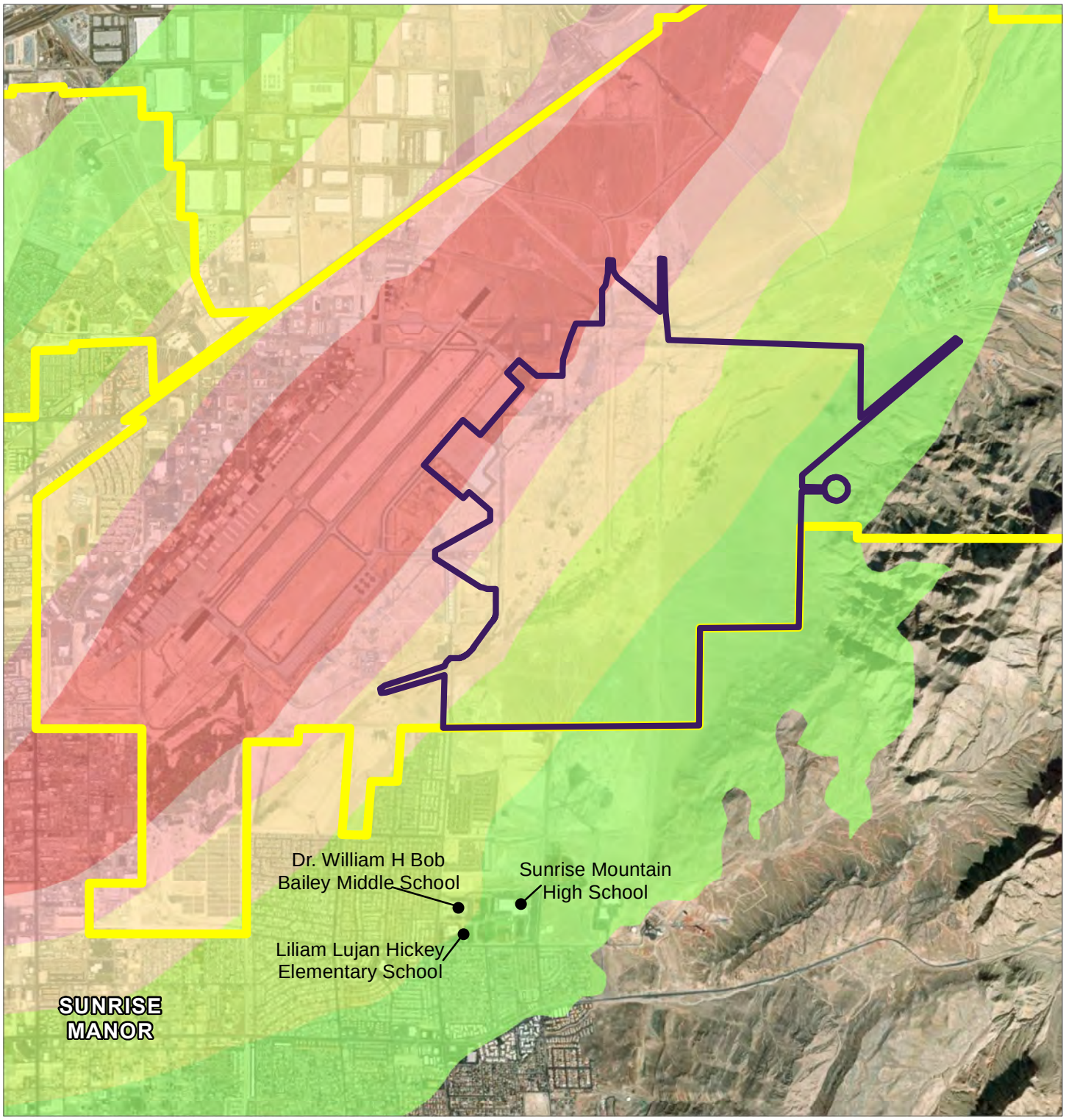


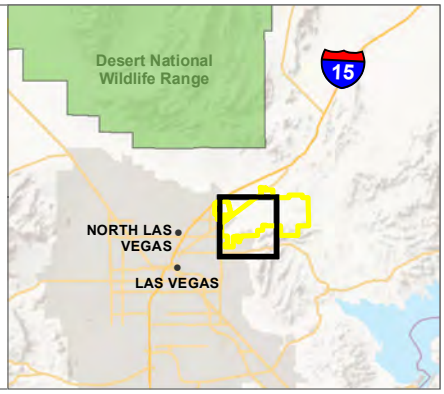
FIGURE 3-19
Noise Contours

Installation Boundary
Proposed Action Area
60 decibels
65 decibels
70 decibels
75 decibels
80 decibels

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



operations in the year 2024 (Nellis AFB, 2017b). The DAF uses the Day-Night Average Sound Level (DNL) to describe the cumulative noise exposure that results from all aircraft operations. DNL is a standard noise metric created by USEPA to describe the effects of noise on humans. This metric represents long-term exposure to noise and not on an individual occurrence.

AICUZ compatibility guidelines were established to evaluate the noise environment within common land use types. "Incompatible" land uses are areas in which developments exist in areas with noise levels higher than recommended for the parcel's intended usage. When noise levels reach greater than 65 dB, residential development becomes incompatible with the noise environment. The same is true for commercial and industrial developments in areas greater than 80 and 85 dB, respectively. Incompatible developments, as it relates to noise planning, already exist in the areas surrounding Nellis AFB. This includes portions of the cities of Las Vegas and North Las Vegas and unincorporated Clark County, all of which contain existing residential developments beneath elevated noise contours originating from the Installation's aircraft operations. Incompatible commercial and industrial developments are also found within unincorporated Clark County.

The residential community of Sunrise Manor in unincorporated Clark County is located to the south and within 1 mile of the Installation and airfield beneath elevated noise contours ranging from 60 to 75 dB (see **Figure 3-19**). This includes Sunrise Mountain High School, which is located within the 60-db noise contour, and Dr. William H. "Bob" Bailey Middle School and Liliam Lujan Hickey Elementary School, both located within the 65-db noise contour. The majority of the residential community is located under an incompatible 65 dB contour. Ongoing efforts and collaboration with the community have occurred to minimize and avoid noise impacts on these populations through the AICUZ program, public outreach, and flight restrictions. Nellis AFB works with the local community, provides best practices for planning, and continues to increase the health and safety of the public and protect the overall flying mission (Nellis AFB, 2018a).

3.10.2 Environmental Consequences

3.10.2.1 Evaluation Criteria

When evaluating noise effects, several aspects are examined:

- the degree to which noise levels generated by training and operations, as well as construction, demolition, and renovation activities, would be higher than the ambient noise levels;
- the degree to which there would be hearing loss and/or annoyance; and
- the proximity of noise-sensitive receptors (e.g., residences, schools, hospitals, parks) to the noise source.

An environmental analysis of noise includes the potential effects on the local population and estimates the extent and magnitude of the noise generated by the Proposed Action and Alternatives.

3.10.2.2 Alternative 1

Alternative 1 would involve approximately 2,000 acres of future development that would occur entirely within the boundaries of Nellis AFB. Noise modeling results indicate that existing DNLs range from 60 dB DNL to 80+ dB across Nellis AFB and range from 60 to 80 db within the Proposed Action area, with noise levels decreasing with increased distance away from the airfield (Nellis AFB, 2017a). Noise associated with the operation of construction equipment is generally short term, intermittent, and localized and would be reduced with mufflers on equipment. The analysis in this PEIS uses A-weighted decibel (dBA) metrics to provide a weighted scale for judging loudness that corresponds to the hearing threshold of the human ear. A-weighting accounts for the frequency sensitivity of the human ear. The loudest machinery typically produces peak sound pressure levels ranging from 86 to 95 dBA at a 50-foot distance from the source (**Table 3-29**). The future construction of new facilities would require earthwork and site preparation requiring the operation of heavy construction equipment. The installation of foundation, substructure materials (e.g., concrete and rebar), and structural materials (e.g., steel beams, wood, masonry, siding, and roofing) would be necessary complete development of the east side of Nellis AFB. Future construction actions may require

the operation of machinery that intermittently contributes to the noise environment at Nellis AFB and the surrounding community. Interior work, as required by either new construction or building renovation, would include drywall, insulation, plumbing, electrical, and ductwork; the operation of hand tools required for this work would not be perceptible outside of the immediate construction area.

Table 3-29
Peak Sound Pressure Level of Construction Equipment from 50 Feet

Equipment	Sound Pressure Level (dBA)
Bulldozer	85
Scraper	85
Front Loader	80
Backhoe	80
Grader	85
Crane	85

Source: Federal Highway Administration, 2006
dBA = A-weighted decibel

All future development under Alternative 1 would occur within the Installation's boundaries and would be intermixed with other existing noise-compatible activities, such as military training and aircraft operations. As a result of the existing ambient noise environment, future construction noise would not be anticipated to be noticeably louder than background noise levels. Future construction would take place between the daytime hours of 6:00 am to 10:00 pm, as defined by Clark County, Nevada, from Monday through Saturday.

Adherence to standard DAF Occupational Safety and Health regulations that require hearing protection along with other personal protective equipment and safety training would minimize the risk of hearing loss to construction workers. Activities on military installations are not subject to local noise ordinances. Individuals on the installations, such as military personnel and government contractors living and working near the sites, might notice the noise. In addition, a limited number of delivery trucks and worker vehicles would be audible along nearby roadways as they arrive at and depart from the sites. Given the temporary nature of future construction activities, distance to nearby noise-sensitive areas, and existing noise environment, these effects would be anticipated to be negligible.

Future operation of support facilities would not result in significant impacts to the existing noise environment. Future operations and maintenance activities would result in intermittent noise that would be indistinguishable from the noise generated by ongoing aircraft operations. There would be no change in the number or types of aircraft, flight training, or associated ground-based training currently occurring at Nellis AFB under Alternative 1. Therefore, no appreciable changes in the existing noise environment associated with these sources would be expected.

Noise under Alternative 1 would not result in significant impacts to noise-sensitive receptors. The residential community of Sunrise Manor, as well as Sunrise Mountain High School, Dr. William H. "Bob" Bailey Middle School, and Liliam Lujan Hickey Elementary School would remain under elevated noise contours generated by ongoing aircraft operations. Future construction actions occurring closest to the residential neighborhoods south of Nellis AFB would be for utility infrastructure and roadwork. Residential areas would be located at least 0.25 mile from any proposed facility under Alternative 1. It is anticipated that there would be no observable long-term impacts or operational increases in noise with implementation of Alternative 1; existing noise contours would be unaffected.

3.10.2.3 Alternative 2

Noise associated with development under Alternative 2 would not be anticipated to result in any significant direct or indirect impacts on noise-sensitive receptors. The overall development footprint of Alternative 2 would be approximately 514 acres smaller than that of Alternative 1, and the distance between the development areas and noise-sensitive receptors would be unchanged from Alternative 1, as future facility construction under Alternative 2 would occur on the western side of the Proposed Action area, closest to

the noise-sensitive receptors. Impacts from future construction noise would be shorter in duration under Alternative 2 due to the reduced development footprint but would still be anticipated to result in impacts to the overall noise environment, which is dominated by aircraft noise, that would not be significant. As with Alternative 1, the overall increase in noise generated during future construction activities would be nearly imperceptible to noise-sensitive receptors in the context of the ongoing aircraft operations at Nellis AFB. Future construction would take place between the daytime hours of 6:00 am to 10:00 pm from Monday through Saturday. Future construction noise would be short term and temporary and would not result in significant impacts to the noise environment with implementation of Alternative 2.

The proposed land development under Alternative 2 would be the same as that described under Alternative 1 for the areas closest to noise-sensitive receptors. Future operational noise under Alternative 2 would not result in any observable long-term impacts or operational increases to noise. The residential community of Sunrise Manor, as well as Sunrise Mountain High School, Dr. William H. "Bob" Bailey Middle School, and Liliam Lujan Hickey Elementary School, would remain under elevated noise contours due to ongoing aircraft operations. It is anticipated that there would be no observable long-term impacts or operational increases in noise with implementation of Alternative 2; existing noise planning contours would be unaffected.

3.10.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. There would be no changes to the noise environment in the ROI beyond baseline conditions, which is dominated by aircraft-related noise. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.10.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in short-term impacts to the noise environment during construction activities and would have no significant impact on the long-term noise environment at Nellis AFB. The projects identified in **Table 3-2** evaluate the addition or modification of airframes and aircraft training operations within the ROI—the area covered by the Nellis AFB AICUZ program.

The TASS beddown, Nellis Aggressor beddown, and contracted close air support (CCAS) training actions involve modifications to aircraft composition and operations, which are the primary sources of noise at Nellis AFB. New aircraft and additional sorties have the potential to increase noise and expand the footprint of the noise planning contours on the timeline evaluated in each respective environmental document; the potential impacts to the noise environment have been incorporated into planning documents. The existing Nellis AFB AICUZ noise contours include anticipated actions at the Installation through the year 2024. Future projects that could alter the composition of airframes operating out of Nellis AFB would have the potential to alter these planning guidelines. These changes would need to be accounted for in the next iteration of AICUZ documentation and would have the potential to result in changes to the existing noise contours.

Installation development actions under the proposed Nellis IDP EA, MILCON projects, Nellis CSTR projects, Nellis Reclaimed Waterline Project, and CCRFCD flood control utility projects would not be anticipated to result in significant impacts to noise from construction and demolition. Construction and demolition activities would result in short-term, temporary noise impacts, and operation of the new facilities would not be anticipated to alter the overall noise environment. Natural resources management projects proposed under the Nellis INRMP would have low potential to generate noise, although some proposed projects may involve temporary construction actions. These actions would result in short-term impacts to the noise environment that would not be significant.

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, no significant cumulative effects to the noise environment would be anticipated to occur with implementation of the Proposed Action.

3.10.2.6 Other Considerations Under NEPA

No additional impacts to the existing noise environment were identified beyond those described above.

3.10.3 Resource-Specific Mitigation Measures and Best Management Practices

Because development activities would occur within the boundaries of Nellis AFB at least 0.25 mile from the closest residences, future construction noise would not contribute significantly to the operational noise environment at Nellis AFB. Therefore, no resource-specific mitigation measures and no BMPs have been identified. However, it would be anticipated that future construction activities would occur primarily during daylight hours (7 a.m. to 6 p.m.), which would help to minimize any potential impacts to the surrounding community.

3.11 Hazardous Materials and Waste, Toxic Substances, and Contaminated Sites

3.11.1 Affected Environment

3.11.1.1 Definition of the Resource

Hazardous materials (HAZMAT) are any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, and incapacitating reversible illness, or that might pose a substantial threat to human health or the environment. HAZMAT can be encountered during development activities; environmental damage resulting from past activities may require remediation. Additionally, development must meet all applicable environmental standards applicable to both the construction and ongoing operations to eliminate HAZMAT pollution from its activities wherever possible.

Hazardous Materials and Wastes

In general, both HAZMAT and hazardous wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health and welfare or the environment when released or otherwise improperly managed. HAZMAT evaluation extends to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of HAZMAT, hazardous wastes, or petroleum products can threaten the health and wellbeing of wildlife species, botanical habitats, soil systems, and water resources.

Petroleum Products

Although a vital power source, petroleum products must be stored, used, and transported with caution to prevent releases. Due to the danger oil spills pose to public health and the environment, every effort must be made to prevent oil spills and to clean them up promptly once they occur. Petroleum products have a wide range of uses—as lubricants, for heating buildings or emergency generators, and for combustion engines for transportation. Section 311 of the CWA, as amended by the *Oil Pollution Act* (Public Law 101-380), establishes requirements to prevent, prepare for, and respond to oil discharges at specific types of facilities, including military installations. The goal of the *Oil Pollution Act* is to prevent oil from reaching navigable waters and adjoining shorelines, and to contain discharges of oil. The Act established the Spill Prevention, Control, and Countermeasure (SPCC) rule under 40 CFR Part 112. The SPCC plan establishes procedures, methods, and equipment requirements for managing the storage, transfer, and potential release of petroleum products. These plans must be prepared by or under the supervision of a professional engineer and must be designed to prevent a release from reaching navigable waters.

Asbestos

AFI 32-1001, *Civil Engineering Operations* (October 2019), provides the direction for asbestos management at DAF installations. This instruction incorporates by reference applicable requirements of 29 CFR § 1910.134, 29 CFR § 1910.1001, 29 CFR § 1926.1101, 40 CFR Part 763, 40 CFR Part 61, the *Toxic Substance Control Act* (15 USC § 2601 et seq.) (TSCA), DAFI 48-137, *Respiratory Protection Program* (May 2023), and other applicable AFIs and DoD Directives. AFI 32-1001 requires bases to develop an asbestos management plan to maintain a permanent record of the status and condition of asbestos-containing materials (ACM) in installation facilities, as well as to document asbestos management efforts. In addition, the instruction requires installations to develop an asbestos operating plan, detailing how the installation accomplishes asbestos-related projects. USEPA regulates asbestos with the authority promulgated under the *Occupational Safety and Health Act* (Public Law 91-596). Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

Lead-Based Paint

Human exposure to lead has been determined an adverse health risk by agencies such as the Occupational Safety and Health Administration (OSHA) and USEPA. Sources of exposure to lead are dust, soils, and paint. In 1973, the Consumer Product Safety Commission established a maximum lead content in paint of 0.5 percent by weight in a dry film of newly applied paint. In 1978, under the *Consumer Product Safety Act* (Public Law 101-608, as implemented by 16 CFR Part 1303), the Commission lowered the allowable lead level in paint to 0.06 percent (600 parts per million [ppm]). The Act also restricted the use of lead-based paint (LBP) in nonindustrial facilities. DoD implemented a ban on LBP use in 1978; therefore, it is possible that facilities constructed prior to or during 1978 may contain LBP.

Radon

The US Surgeon General defines radon as an invisible, odorless, and tasteless gas, with no immediate health symptoms, that comes from the breakdown of naturally occurring uranium inside the earth. Radon that is present in soil can enter a building through small spaces and openings, accumulating in enclosed areas such as basements. No federal or state standards are in place to regulate residential radon exposure at the present time, but guidelines were developed. Air Force Manual (AFMAN) 48-148, *Ionizing Radiation Protection* (July 2020), provides direction for radon management at DAF installations. All installations must have radon assessments for structures supporting housing, child development centers, and DoD Education Activity schools. Although 4.0 picocuries per liter (pCi/L) is considered an “action” limit, any reading over 2 pCi/L qualifies as a “consider action” limit. USEPA and the US Surgeon General have evaluated the radon potential around the country to organize and assist building code officials in deciding whether radon-resistant features are applicable in new construction. Radon zones can range from 1 (high) to 3 (low).

Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) are a group of chemical mixtures used as insulators in electrical equipment, such as transformers, and fluorescent light ballasts. Chemicals classified as PCBs were widely manufactured and used in the US until they were banned in 1979. The disposal of PCBs is regulated under TSCA, which banned the manufacture and distribution of PCBs, with the exception of PCBs used in enclosed systems. Per AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, all installations should have been free of PCBs as of 21 December 1998. In accordance with 40 CFR Part 761 and DAF policy, both of which regulate all PCB articles, PCBs are regulated as follows:

- Less than 50 ppm—non-PCB (or PCB-free)
- 50 ppm to 499 ppm—PCB-contaminated
- 500 ppm and greater—PCB equipment

TSCA regulates and the USEPA enforces the removal and disposal of all sources of PCBs containing 50 ppm or more; the regulations are more stringent for PCB equipment than for PCB-contaminated equipment.

Per- and Polyfluoroalkyl Substances

PFAS are a group of man-made chemicals that are very persistent in the environment and have the potential to lead to adverse human health impacts. PFAS include many individual chemical compounds, the most extensively studied of these are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). These chemicals are not naturally occurring, but low levels can be found in soils, water, packaging, and many industrial and consumer products (Military Health System, 2019).

Popular for their ability to increase heat resistance and reduce friction, PFAS have been widely used since the 1950s. In the 1970s, the DoD utilized aqueous film forming foam (AFFF) for fire suppression, which contains PFOS and PFOA. PFOS is a long-chain PFAS found in older stocks of AFFF and as a breakdown product of precursor compounds. PFOA is also a long-chain PFAS. PFOA is not an intended ingredient in AFFF but is a side product created during the manufacturing process. Many AFFF formulations contain other unintended PFAS side products that have similar health and environmental concerns (Consumer Notice, 2023).

AFFF is considered mission critical for its ability to effectively extinguish petroleum-based fires. Recently, the DoD has made efforts to phase out the use of PFAS-containing AFFF and transition to PFAS-free foams currently on the market. In 2016, the USEPA recognized the potential health risks associated with PFOS and PFOA accumulations in the human body and issued a lifetime health advisory for these compounds in drinking water (Military Health System, 2019).

Pesticides

Pesticides, herbicides, and insecticides can be used to control pest populations. Pest management programs include measures to control health-related pests (e.g., mosquitoes, ticks and fleas, bees and wasps, scorpions, spiders, venomous snakes, lice, mites, and chiggers); structural pests (e.g., termites and powder post beetles); general household/nuisance pests (e.g., ants, cockroaches and flies); weed pests (e.g., mixed vegetation and turf diseases); vertebrate pests (e.g., bats, rodents, gophers, feral animals, coyotes, and foxes); and bird pests (e.g., pigeons). Chlordane was used as a pesticide until it was banned in 1988. It is a persistent bio accumulative and toxic pesticide that was often applied to the soil around building foundations to control termites (Agency for Toxic Substances and Disease Registry, 2018).

Environmental Restoration Program

The *Superfund Amendments and Reauthorization Act of 1986* (Public Law 99-499) (SARA) established cleanup mandates for the DoD and established the DoD ERP, which comprises the Installation Restoration Program and the Military Munitions Response Program. Through the ERP, each DoD installation is required to identify, investigate, and clean up hazardous waste disposal or release sites. Remedial activities for ERP sites follow the Hazardous and Solid Waste Amendments under the *Resource Conservation and Recovery Act of 1976* (42 USC § 6901 et seq.) (RCRA) Corrective Action Program. The ERP aims to reduce risk to human health and the environment by identifying, evaluating, and responding to a release or threat of a release into the environment from DoD activities or DoD facilities. ERP sites involve releases of hazardous substances, pollutants or contaminants, hazardous waste, and petroleum products. In accordance with DoDI 4715.07, *Defense Environmental Restoration Program* (August 2018), the ERP goals are to facilitate compliance with applicable statutes, regulations, and other legal requirements.

3.11.1.2 Region of Influence

The ROI for HAZMAT and hazardous wastes is the Proposed Action area.

3.11.1.3 Hazardous Materials and Wastes

Activities at Nellis AFB require the use and storage of a variety of HAZMAT, including flammable and combustible liquids, acids, corrosives, caustics, anti-icing chemicals, compressed gases, solvents, paints, paint thinners, and pesticides.

Hazardous and toxic substances used on Nellis AFB are tracked by the Hazardous Materials Pharmacy through the procurement, handling, storage, and dispensing of hazardous substances for construction and operations. Hazardous and toxic substances disposal procedures are identified in the Nellis AFB Hazardous Waste Management Plan (Nellis AFB, 2015) and wastes are disposed of in compliance with applicable federal, state, and local regulations.

USEPA considers Nellis AFB a large-quantity generator of hazardous wastes. Hazardous waste at Nellis AFB is accumulated at an approved 90-day storage area or at satellite accumulation points. Approximately 100 satellite accumulation points and one 90-day storage area are operated at Nellis AFB (Nellis AFB, 2015). No satellite accumulation points are located within the Proposed Action area. A variety of activities on the Installation, including aircraft maintenance and support, civil engineering, and printing operations, have been identified as primary contributors to hazardous waste streams. Basic processes and waste-handling procedures for general aircraft maintenance activities are identified in the Nellis AFB Hazardous Waste Management Plan (Nellis AFB, 2015).

Illegal dumping has been known to occur within the Proposed Action area. To reduce public exposure to previously illegally dumped debris and to curb further illegal dumping, Nellis AFB installed a chain-link fence in 1999 in Area II. The debris piles that were dumped within the Proposed Action area have not been assessed to determine if they contain hazardous wastes.

3.11.1.4 Petroleum Products

The use, storage, and transportation of petroleum products is vital to the mission of Nellis AFB. Petroleum products are used to heat buildings and provide fuel for emergency generators, vehicles, and operation of airborne assets across the Installation.

Multiple bulk fuel storage facilities have been placed across Nellis AFB to ensure fuel continuity. The Kinder Morgan pipeline extends across the western boundary of the ROI. The pipeline measures more than 20,000 feet long and runs 8 inches bgs, delivering Grade Jp-8 aviation turbine fuel. The fuel is supplied from multiple 420,000-gallon ASTs located slightly north of the western edge of the ROI (**Figure 3-20**). The aviation fuel distribution piping system ensures adequate supply of aviation fuels to aircraft vital to the mission of Nellis AFB. Due to the size of the tanks and the threat of release, this distribution system is subject to the spill prevention requirements of 40 CFR Part 112.

3.11.1.5 Asbestos

Many buildings on Nellis AFB date from the 1940s through the 1980s; ACM has been identified in many of these facilities. Renovation or demolition of Installation structures is reviewed by civil engineering personnel to ensure that appropriate measures are taken to reduce potential exposure to, and release of, friable (easily crumbled or pulverized) asbestos. Nonfriable asbestos is not considered HAZMAT until it is removed or disturbed. The *Nellis AFB Asbestos Management and Operations Plan* (Nellis AFB, 2016b) and *Nellis AFB Lead-Based Paint Management Plan* (Nellis AFB, 2003a) provide guidance on the proper handling and disposal of ACM.

An Installation-wide asbestos survey is not required by the DAF, federal, state, or local environmental policy (Nellis AFB, 2021b). However, the Asbestos National Emission Standards for HAPs and local regulations (Clark County DES) require an asbestos survey of affected areas or buildings to identify the presence of ACM prior to renovation or demolition activities. An ACM survey was conducted in 1994 of one of each housing type on Nellis AFB. The survey team evaluated a total of 282 materials suspected of containing asbestos, of which 128 were either confirmed to be ACM or assumed to be ACM. These 128 materials included floor tiles, sheet linoleum flooring, textured acoustical ceiling material, sheetrock joint compound, wall coating, pipe insulation, mechanical equipment insulation, transited, and roofing materials. The field survey team collected a total of 665 samples; 156 of these samples were found or assumed to be positive. The material with the highest percent positive rate was a trowelled-on insulation found under the kitchen sinks in Installation housing. The survey report noted that no imminent danger situations were encountered during the survey (Galson Corporation, 1994).

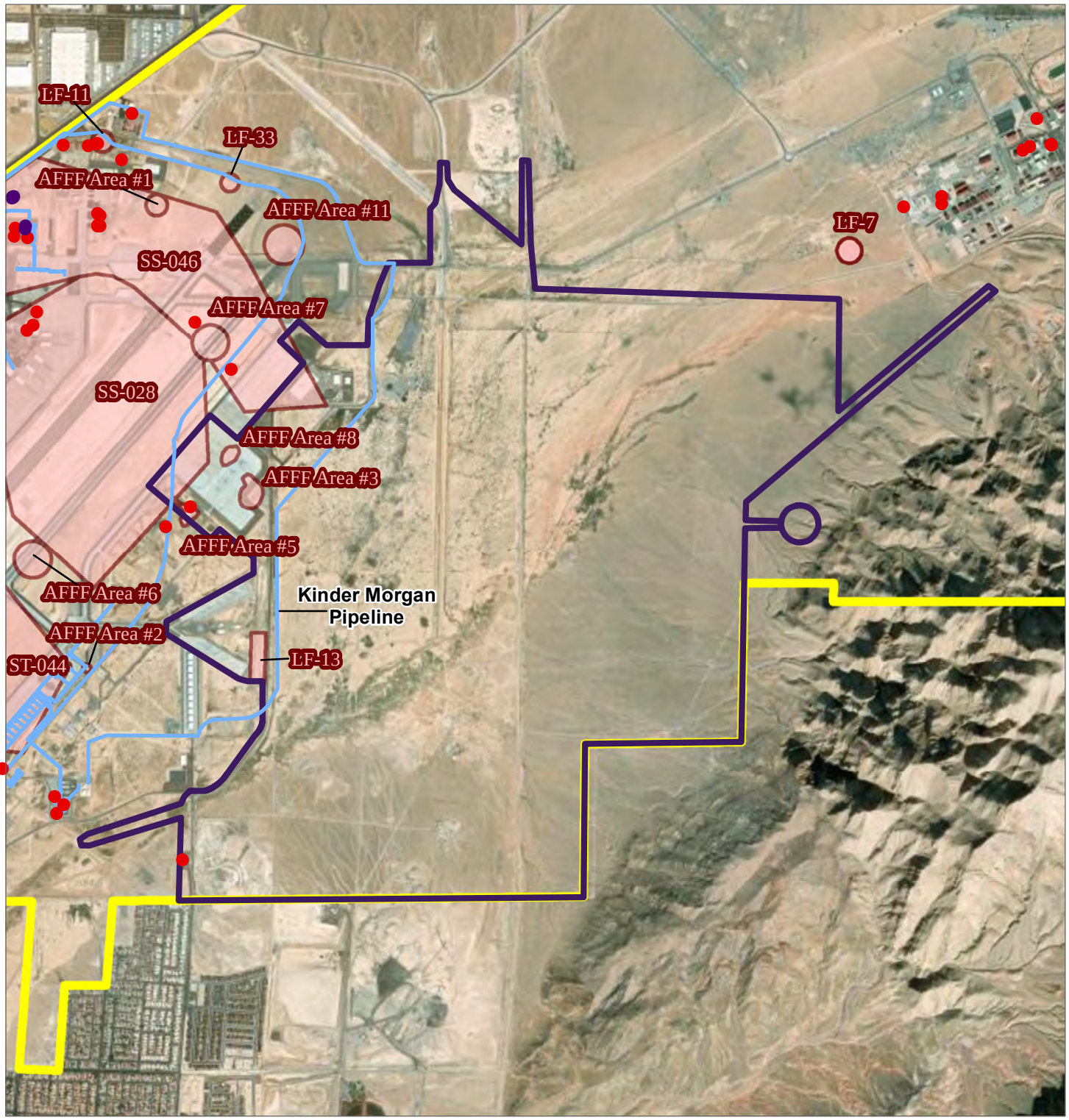


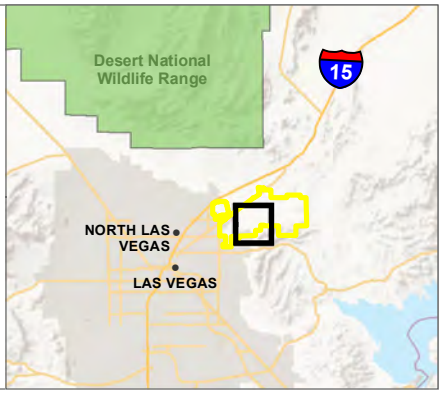
FIGURE 3-20
Hazardous Materials

- Aboveground Storage Tank
- Underground Storage Tank
- Oil Pipeline
- Installation Boundary
- Proposed Action Area
- Environmental Restoration Site

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



No demolition or renovation of existing structures would occur under the Proposed Action or Alternatives. However, Installation personnel have reported (Nellis AFB, 2024b) the presence of illegal debris dumping within the Proposed Action area. This debris has not been evaluated for the presence of ACM. The origins of the illegal dumping are unknown and therefore may contain ACM that was identified within the 1993 and 1994 surveys or ACM from other sources.

3.11.1.6 Lead-Based Paint

LBP with lead levels equal to or higher than 0.06 percent or 600 ppm was banned for residential use in the US in 1978. However, buildings constructed prior to that date may contain LBP. A LBP survey was conducted in 1993 and identified several buildings on Nellis AFB with LBP. LBP identified by the survey included exterior trim, exterior walls, and playground equipment (Dynamic Corporation, 1993). Another LBP study was conducted in 1994 and focused on military family housing units and the childcare and youth centers. The survey found that approximately 67 percent of the surveyed military family housing units tested positive for LBP in at least one surveyed component. Components that tested positive in at least one of the tested units include sheetrock ceilings, wood door frames, exterior wood doors and jambs, interior wood door jambs, thresholds, concrete facades, exterior wood soffits, exterior wood trim, exterior block windowsills, wood shelves and supports, block walls, and sheetrock walls (Galson Corporation, 1994). Components found to contain LBP included carport posts, ceilings, and rafters; doors and door components; fascia's; rafters; stucco and wooden walls; and window components, although not all of these components in each unit contained LBP (Nellis AFB, 2003b). The LBP survey did not include any of the structures located within the ROI.

The origins of the illegal dumping debris located within the Proposed Action area are unknown and therefore may contain LBP components that were identified within the 1993 and 1994 surveys or LBP from other sources. The illegal dumping debris has not been assessed for the presence of LBP.

3.11.1.7 Radon

The USEPA radon zone for Clark County, Nevada, is Zone 3 (low potential, predicted indoor average level less than 2 pCi/L); however, radon potential throughout the county can vary (USEPA, 2020). Each zone designation reflects the average short-term radon measurement that can be expected in a building without the implementation of radon control methods, such as ventilation, room pressurization, or sealing of cracks. Due to the low potential for radon within the ROI, radon is not further analyzed in this PEIS.

3.11.1.8 Polychlorinated Biphenyls

Nellis AFB has met the criteria established by the DAF as being "PCB-free." However, equipment such as transformers and electrical equipment with PCB concentrations less than 50 ppm may be present on the Installation (Nellis AFB, 2003b).

The origins of the illegal dumping debris located within the Proposed Action area are unknown and therefore may contain PCB components. The illegal dumping debris has not been assessed for the presence of PCBs.

3.11.1.9 Per- and Polyfluoroalkyl Substances

Nellis AFB is currently undertaking an extensive study of PFAS and their past use on the Installation. PFAS are known for their persistence in nature and their resistance to breaking down. PFAS are often prevalent at airports due to the use of AFFF for fire suppression. AFFF was used on Nellis AFB within the fire training areas and during fire service incidents. Eleven source areas for PFAS from AFFF have been identified on Nellis AFB, resulting in both groundwater and shallow soil contamination. Several PFAS-impacted sites with both groundwater and shallow soil contamination are located within the ROI (**Table 3-30** below and **Figure 3-20** above). Groundwater monitoring wells (MWs) have been installed within the ROI to monitor the PFAS groundwater impacts. The groundwater flows generally toward the south-southeast, from the flightline toward the Proposed Action area.

Table 3-30
AFFF Sites in the ROI

ERP	Site Description	Area Within the ROI
AT001P/AFFF Area #3	Former fire training area (FTA); FTA-2185 is located on the east side of the flightline. It was used from the 1980s through approximately 1995. AFFF was used at this unlined location. The area was remediated for total petroleum hydrocarbons in the early 2000s.	155,500 ft^2
AT002P/AFFF Area #8	Former East Fire Station; B-2092 and B-2093.	64,000 ft^2
BLDG_2069/AFF Area #5	B-2069 (East Fire Station) is east of the flightline. The building houses five vehicles equipped with AFFF systems. AFFF is removed from the vehicles only for material testing or spray testing.	4,300 ft^2

B- = Building (as in B-2069); CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*; DCE = 1,2-dichloroethane; ERP = Environmental Restoration Program; ft^2 = square feet; FTA = fire training area

A fire training area is also located within the ROI in the northwest portion of the Proposed Action area. This fire training area has not yet been evaluated for PFAS impacts to the soil or groundwater.

3.11.1.10 Pesticides

The Pest Management Program at Nellis AFB utilizes an integrated surveillance and control effort as implemented by DoDI 4150.7, *DoD Pest Management Program* (December 2019), and AFMAN 32-1053, *Integrated Pest Management Program* (August 2019). Pest management procedures are addressed in the Nellis Pest Management Plan (Nellis AFB, 2000). Pest management personnel adhere to the pesticide label directions when handling pesticides. The Pest Management personnel provide treatment for all Installation buildings and housing areas. Pest Management personnel maintain and monitor files of building and home treatments, including chemicals issued by the Facilities Improvement Center, which dispenses pest control supplies to residents through a self-help program.

No pesticide mixing, storage areas, or pesticide releases have been identified within the ROI. However, past routine, licensed application of pesticides may have resulted in contamination of the soil within the ROI. Chlordane was formerly applied to the soil around building foundations to control termites. Entomology shop records indicate that chlordane was used at Nellis AFB between 1985 and 1988. Records of usage prior to 1985 are not available. Although all uses of chlordane were banned in 1988, it is a persistent bio accumulative (gradual accumulation of substances, such as pesticides in an organism) and toxic chemical that is still present in the soils.

Based on the age of the structures currently standing within the ROI, all of which were constructed after 1985, it is unlikely that chlordane was applied around the building foundations of the existing buildings. However, it is possible that chlordane was applied to B-10103, which was constructed in 1954 and was previously located within the north-central portion of the ROI. B-10103 has since been demolished with its concrete slab remaining in place. No chlordane investigations of the soil surrounding the foundation of B-10103 are known to have been conducted. Several areas of illegal dumping debris are located across the southcentral and southwestern portions of the ROI. The origins of the dumping debris are unknown and therefore may have originated from areas where chlordane was applied.

Soil samples collected from the Nellis AFB in August 2002 were tested for pesticides. The pesticides chlordane, dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethylene (DDE), dichlorodiphenyltrichloroethane (DDT), dieldrin, endrin, and heptachlor were detected; however, only chlordane was detected in every sample. Chlordane and heptachlor were the only pesticides detected in concentrations exceeding USEPA Region IX residential preliminary remediation goals. Chlordane concentrations in five samples (1.7, 1.8, 260, 460, and 580 milligrams per kilogram [mg/kg]) exceeded the preliminary remediation goal of 1.6 mg/kg, and heptachlor and heptachlor epoxide in one sample each (0.4 mg/kg and 1.3 mg/kg, respectively) exceeded their respective preliminary remediation goals of 0.11 mg/kg and 0.053 mg/kg (Nellis AFB, 2003b).

3.11.1.11 ERP and Contaminated Sites

There are 46 ERP sites at Nellis AFB. These sites include former landfills, dump areas, the former sewage treatment plant, disposal and pit areas, fuel spills, the fire training area, radioactive waste storage, bulk jet fuel storage tanks, and USTs. Twelve sites required remediation and nine of those are still being remediated (Nellis AFB, 2018a). The remaining sites require no further action.

Four ERP sites (SS028, ST044, SS046, and L-13) are located within the ROI and are concentrated in the vicinity of the existing airfield (**Table 3-31** below and **Figure 3-20** above) Depths to groundwater in this area have typically ranged from 30 to 70 ft bgs. Shallow groundwater flow is generally to the southeast from the flightline toward the Proposed Action area.

Table 3-31
Environmental Restoration Program Sites in the ROI

ERP	Site Description	Status	Total Area Within the ROI
SS028	Historic fuel spill located near B-941. Remedial action operations are ongoing for extraction of product in ground water and long-term monitoring to ensure CERCLA compliance.	Open	589,000 ft^2
ST044	Historic fuel leak from two USTs at the aerospace ground equipment service island.	Open	None
SS046	Located east of the propulsion maintenance building. Contains groundwater plume of dissolved chlorinated hydrocarbons (TCE, PCE, and DCE).	Open	446,000 ft^2
L-13	Demolition landfill.	Closed	198,000

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*; DCE = 1,2-dichloroethane; ERP = Environmental Restoration Program; ft^2 = square feet; PCE = perchloroethylene; TCE = trichloroethene; UST = underground storage tank

Site SS028 is a historic fuel spill located near B-941. The fuel-dispensing facility was demolished in 2007 and construction of a new aircraft hangar was completed in 2009. Two 2,000-gallon JP-4 fuel spills as well as waste oils and petroleum products that may have been leaking from former USTs at former B-941 and B-914 are considered the primary source of the releases at the site (Versar-Arcadis, 2022a). Remedial action operations are ongoing for extraction of product/groundwater and long-term monitoring to ensure CERCLA compliance. Benzene levels near the origin of the spill are above 2,200 µg/L, above the USEPA maximum contaminant level of 5 µg/L. However, the groundwater plume does not currently extend under the Proposed Action area, and levels of benzene in MW-82 and MW-81 between the ROI and the contaminant plume are below the USEPA maximum contaminant level.

Site ST044 is located within the aircraft operations and maintenance areas of Nellis AFB, along the western side of the flightline, and includes various aircraft maintenance and support facilities. Solvent releases have impacted the soil and groundwater within the area of the flightline with trichloroethene (TCE), which was first identified in 1992. The source of these plumes has been attributed to past solvent disposal practices, including discharging solvents directly to the ground surface, drains, and sewers (Versar-Arcadis, 2022b). Remedial action operations continue with the injection of potassium permanganate to further degrade onsite contamination. The groundwater TCE plumes extend southeast toward the Proposed Action area. TCE levels near the origin of the spill are above 40 µg/L, above the USEPA maximum contaminant level of 5 µg/L. However, the groundwater plume does not currently extend under the Proposed Action area, and levels of TCE in MW-124 between the ROI and the contaminant plume are below the USEPA maximum contaminant level.

Site SS046 is a release that created a groundwater plume of dissolved chlorinated hydrocarbons including TCE, perchloroethylene (PCE), and 1,2-dichloroethane (DCE). Past solvent disposal practices have been identified as the source of the halogenated VOC plume extending from the Propulsion Maintenance Shop (B-858) to the flightline (Runway 21R). *In-situ* chemical oxidation using potassium permanganate began at

the site in October 2006 and concluded in August 2008 (URS, 2020). The groundwater TCE plume extends toward the southeast into the Proposed Action area. Approximately 446,000 ft^2 of the delineated SS046 site is within the Proposed Action area.

A former demolition landfill, L-13, is located on the west side of the Proposed Action area. The landfill site contains demolition debris from the 1960s and is closed. L-13 is 4.57 acres in size, and 99 percent, or 4.54 acres, of L-13 is within the Proposed Action area. In March 1997, land use restrictions and long-term monitoring requirements were placed on L-13 in order to support a No Further Action decision document, which was issued in 1992. The land use control prohibits residential use, sensitive use, human groundwater consumption, drinking water wells, and agricultural groundwater use. Land uses not prohibited under the land use restrictions include soil exposure and sediment exposure. The site is not limited to industrial or commercial use, and agricultural or park use is not prohibited. An Installation Restoration Program Phase I study determined that the characteristics of the waste dumped at the site were not hazardous. Site L-13 was not considered to present significant environmental concerns, with no evidence of a release or contamination, and was closed out under the DAF ERP. A technical memorandum presenting rationale for unlimited use and unrestricted exposure at the site was presented to the NDEP in 2013 (URS, 2013). The NDEP reviewed the report and had no comments on the recommendation to designate the site for unlimited use and unrestricted exposure (NDEP, 2013). Accordingly, there are no remaining restrictions on uses of property within the boundaries of L-13.

3.11.2 Environmental Consequences

3.11.2.1 Evaluation Criteria

Impacts on HAZMAT management would be considered adverse if future development under the Proposed Action or Alternatives resulted in noncompliance with applicable federal and state regulations or increased the amounts generated or procured beyond current Nellis AFB waste management procedures and capacities.

Impacts to ERP sites would be considered adverse if future development under the Proposed Action or Alternatives disturbed (or created) contaminated sites resulting in adverse effects on human health or the environment. Physical development of contaminated sites could expose construction and maintenance workers, visitors, occupants, or ecological systems to potential hazards associated with contaminants.

3.11.2.2 Alternative 1

Hazardous Materials and Wastes

The use of certain HAZMAT would be required during future development associated with Alternative 1; HAZMAT that could be used include paints, welding gases, solvents, preservatives, sealants, and pesticides. Construction contractors would be responsible for monitoring exposure to HAZMAT. Adherence to the Nellis AFB Hazardous Waste Management Plan would minimize impacts from the handling and disposal of hazardous substances and ensure compliance with state and federal HAZMAT regulations (Nellis AFB, 2015). Potential impacts from the accidental release of such products would be minimized by following response procedures specified in Nellis AFB's Facility Response Plan (Nellis AFB, 2021c). Short-term, adverse impacts that would not be significant would be anticipated to result from the use of HAZMAT with implementation of Alternative 1.

Illegal dumping has occurred in a number of locations across the Proposed Action area. The debris piles that have been dumped within the Proposed Action area have not been assessed to determine if they contain hazardous wastes. If hazardous wastes are encountered during future excavation or grading activities during development, they could potentially expose construction and maintenance workers to potential hazards associated with contaminants. Long-term adverse impacts could occur if workers are exposed to HAZMAT detrimental to human health. Additionally, adverse impacts could occur if the quantity of hazardous wastes encountered was beyond current Nellis AFB capabilities to dispose of the volume of wastes in accordance with waste management procedures and capacities.

Petroleum Products

The use of certain petroleum products would be required during future development associated with Alternative 1. Hydraulic fluids and petroleum products, such as diesel and gasoline, would be used in construction and grading vehicles. Construction contractors would be responsible for monitoring exposure to HAZMAT. Short-term, adverse impacts that would not be significant would be anticipated to result from the use of petroleum products with implementation of Alternative 1.

Future infrastructure improvements would be necessary to support operations following development. Fuel tanks would be needed for emergency generators. Additionally, as discussed in **Section 3.11.1.4**, the Kinder Morgan pipeline extends across the western boundary of the Proposed Action area. The development of Alternative 1 could require future rerouting of the Kinder Morgan pipeline. Short-term, adverse impacts that would not be significant would be anticipated to result from the petroleum products operations and infrastructure improvements with implementation of Alternative 1.

Asbestos

No buildings would be demolished under Alternative 1; however, the illegal dumping debris across the Proposed Action area has not been evaluated for the presence of ACM. The origins of the illegal dumping are unknown and therefore may contain ACM. If ACM is encountered during excavation or grading activities during future development under Alternative 1, it could potentially expose construction and maintenance workers to potential hazards associated with ACM. Potential ACM would have to be confirmed through sampling and laboratory testing. If ACM is detected from laboratory testing, the Installation Asbestos Management and Operations Plan would be implemented for proper handling, management, and disposal of ACM (Nellis AFB, 2021b). Long-term, adverse impacts could occur with implementation of Alternative 1 if workers are exposed to ACM, as it is detrimental to human health.

Lead-Based Paint

No buildings would be demolished under Alternative 1; however, the illegal dumping debris across the Proposed Action area has not been evaluated for the presence of LBP. The origins of the illegal dumping are unknown and therefore may contain LBP. If LBP is encountered during excavation or grading activities during future development under Alternative 1, it could potentially expose construction and maintenance workers to potential hazards associated with LBP. Long-term, adverse impacts could occur with implementation of Alternative 1 if workers are exposed to LBP, as it is detrimental to human health.

Polychlorinated Biphenyls

PCBs are not anticipated to be encountered within any of the existing transformers or electrical equipment on Nellis AFB under Alternative 1. However, the origins of the illegal dumping debris located on Alternative 1 are unknown and therefore may contain PCB components. Long-term adverse impacts could occur with implementation of Alternative 1 if workers are exposed to PCBs, as they are detrimental to human health.

Per- and Polyfluoroalkyl Substances

PFAS and PFOS are known to occur within the soils and groundwater in the northwest corner of the Proposed Action area. Eleven total AFFF sites are known to occur within the flightline area, three of which occur within the Proposed Action area. Soil disturbance and excavation within these areas have the potential to expose construction workers to PFAS in a way that could lead to adverse human health impacts. Additionally, the fire training area has not yet been analyzed for PFAS and could be another exposure route for construction workers. Short-term, adverse impacts that would not be significant would be anticipated to result from PFAS with implementation of Alternative 1.

Pesticides

No evidence of chlordane use or other pesticide contamination was identified; therefore, no impacts from pesticides would be anticipated to occur with implementation of Alternative 1.

ERP and Contaminated Sites

Three ERP sites, SS028, SS046, and L-13, are located within the Proposed Action area. Soil excavation occurring within the boundaries of these ERP sites under Alternative 1 would not be anticipated to result in any adverse impacts because no known soil contamination is associated with these sites. Contaminant plumes from ERP sites SS028 and ST044 flow toward the Proposed Action area but are not currently underneath the Proposed Action area. The contaminant plume of ERP site SS046 flows toward and underneath the Proposed Action area. The depth to groundwater in this location is anticipated to be 40–60 feet bgs and would not be anticipated to be impacted during future construction activities. Although short-term, adverse impacts to Sites SS028, ST044, and SS046 would be anticipated to occur with development under Alternative 1, these impacts would not be significant.

Closed demolition landfill L-13 is located within the Proposed Action area along the western boundary. Future excavation or grading on L-13 could potentially expose construction workers to the buried waste beneath the site. However, this waste has been sampled and is not known to be hazardous (URS, 2013). Short-term, adverse impacts that would not be significant would be anticipated from development within L-13 with implementation of Alternative 1.

Additional analysis of impacts to HAZMAT, toxic substances, and contaminated sites would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.11.2.3 Alternative 2

As with Alternative 1, under Alternative 2, there could be impacts related to HAZMAT and hazardous wastes. Increased activities related to development of the east side of Nellis AFB may involve future construction, maintenance, and operations, which could result in the generation of HAZMAT and hazardous wastes. This could include materials such as construction debris, chemical solvents, fuels, oils, and other substances commonly associated with military operations.

Additionally, the future construction of new facilities and infrastructure could require the relocation or disposal of existing HAZMAT and hazardous wastes, potentially leading to environmental risks if not managed properly. Future operational activities on the expanded east side could also result in ongoing generation of HAZMAT and hazardous wastes, necessitating appropriate management practices to mitigate potential impacts to environmental and human health.

Impacts to ERP sites would be the same under Alternative 2 as would occur under Alternative 1, as the footprint of the ERP sites within the Alternative 2 development area would be the same.

Long-term, adverse impacts related to HAZMAT and hazardous waste, toxic substances, and contaminated sites that would not be significant would be anticipated to occur with implementation of Alternative 2.

Additional analysis of impacts to HAZMAT, toxic substances, and contaminated sites would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.11.2.4 No Action Alternative

Under the No Action Alternative, no development on the east side of Nellis AFB would occur. While the No Action Alternative would not directly introduce new hazards, it could exacerbate existing issues related to HAZMAT and hazardous wastes management. Further, the illegal dumping and potential hazardous sites within the Proposed Action area would remain in place without assessment or identification.

The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current

missions to continue to operate in deficient facilities. As the demand for these facilities outpaces their capacity, there could be challenges in managing and properly disposing of HAZMAT and hazardous wastes, which could pose risks to environmental and human health. Additionally, inadequate facilities could lead to inefficient handling and storage of HAZMAT, increasing the likelihood of accidents or spills.

3.11.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in long-term, adverse impacts to HAZMAT, hazardous waste, toxic substances, and contaminated sites. The projects identified in **Table 3-2** would have the potential to generate new hazardous wastes during construction, demolition, and renovation activities within the ROI—i.e., the Proposed Action area.

Hazardous wastes associated with the TASS beddown, completed MILCON projects, Nellis Aggressor beddown, Nellis IDP projects, Nellis CSTR, CCA Experimental Operations Unit (EOU) beddown would be managed in accordance with the Nellis AFB Hazardous Waste Management Plan. Adherence to the Nellis AFB Hazardous Waste Management Plan would minimize impacts from the handling and disposal of hazardous substances and ensure compliance with state and federal HAZMAT regulations (Nellis AFB, 2015). Potential impacts from the accidental release of such products would be minimized by following response procedures specified in Nellis AFB's Facility Response Plan (Nellis AFB, 2021c). Construction activities proposed within contaminated sites would be managed in accordance with the RCRA Corrective Action Program.

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, no significant, adverse cumulative effects to HAZMAT, hazardous waste, toxic substances and contaminated sites would be anticipated to occur with implementation of the Proposed Action.

3.11.2.6 Other Considerations Under NEPA

No additional impacts to HAZMAT, hazardous waste, toxic substances, and contaminated sites were identified beyond those described above.

3.11.3 Resource-Specific Mitigation Measures and Best Management Practices

Impacts to hazardous resources under the Proposed Action and Alternatives would be managed, to the extent possible, through the use of BMPs that could include the following:

- Coordinate with NDEP regarding land use controls at L-13 prior to future construction.
- Identify the extent of PFAS-impacted soils for AT001P/AFFF Area #3, AT002P/AFFF Area #8, B-2069/AFF Area #5, and the fire training area prior to future construction.
- Characterize the unidentified debris dumped within the Proposed Project area prior to future construction, and coordinate with NDEP to properly manage or dispose of any wastes that are identified.
- Create and implement soil and water management plans in compliance with NDEP requirements.
- Implement measures to stockpile contaminated soils to prevent further impacts.
- Adhere to the Nellis AFB Hazardous Waste Management Plan, Lead Based Paint Management Plan, and Asbestos Management and Operations Plan.

3.12 INFRASTRUCTURE, INCLUDING TRANSPORTATION AND UTILITIES

3.12.1 Affected Environment

3.12.1.1 Definition of the Resource

Infrastructure consists of the systems and structures, such as utilities and transportation, that enable a population in a specified area to function. Utilities include such amenities as water, power supply, and waste management. Transportation refers to roadway and street systems, the movement of vehicles on roadway networks, pedestrian and bicycle traffic, and mass transit. Infrastructure is wholly man-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as developed. The availability of infrastructure and its capacity to support more users, including residential and commercial expansion, are generally regarded as essential to the economic growth of an area.

3.12.1.2 Region of Influence

The ROI for infrastructure primarily comprises Nellis AFB, with additional information presented herein for the surrounding vicinity where relevant, including local and municipal sources of natural resources and energy. The infrastructure components for this analysis include the potable water system, wastewater system, stormwater management system, electrical system, telecommunications system, natural gas system, hydrant fuel system, and transportation system. The existing infrastructure supporting the greater Nellis AFB area is discussed only as it relates to or supports the Proposed Action area. The ROI by infrastructure system is listed below:

- Potable Water System: Nellis AFB and the North Las Vegas Water District (NLVWD) and Southern Nevada Water Authority (SNWA) service area
- Wastewater System: Nellis AFB and the Clark County Water Reclamation District (CCWRD) service area
- Stormwater Management System: Nellis AFB and the Las Vegas Valley
- Electrical System: Nellis AFB and Nevada Energy (NVE) Las Vegas Valley service area
- Telecommunications System: Nellis AFB and the Lumen Technologies service area
- Natural Gas System: Nellis AFB and the Southwest Gas Southern Nevada service area
- Hydrant Fuel System: Nellis AFB and the Kinder Morgan pipeline

As this document is analyzing a programmatic planning action (i.e., development of the east side of Nellis AFB), the potential increase in 2,500 personnel at Nellis AFB is not part of the Proposed Action for this PEIS. Rather, the increase in personnel is a potential future action and would be covered under separate NEPA analysis when it is determined those personnel would be transferred to Nellis AFB.

Potable Water System

The Proposed Action area currently has no existing potable water infrastructure, with the exception of potable water main lines that run along the north and west sides, as shown in **Figure 3-21**. The northern water main lines, composed of 10-inch asbestos cement, are the closest existing water main line connections to the Proposed Action area. The northern and western lines are supplied through the North Las Vegas Water District (NLVWD) supply connection, which consists of 10-inch plastic lines (AECOM, 2015).

The potable water system at Nellis AFB provides water for domestic, irrigation, and fire protection uses. The existing potable water infrastructure contains primarily 10-, 12-, and 14-inch water main lines consisting of cast iron, copper, asbestos cement, and high-density polyethylene (HDPE) or polyvinyl chloride (PVC) plastic totaling approximately 337,750 linear feet of pipe.

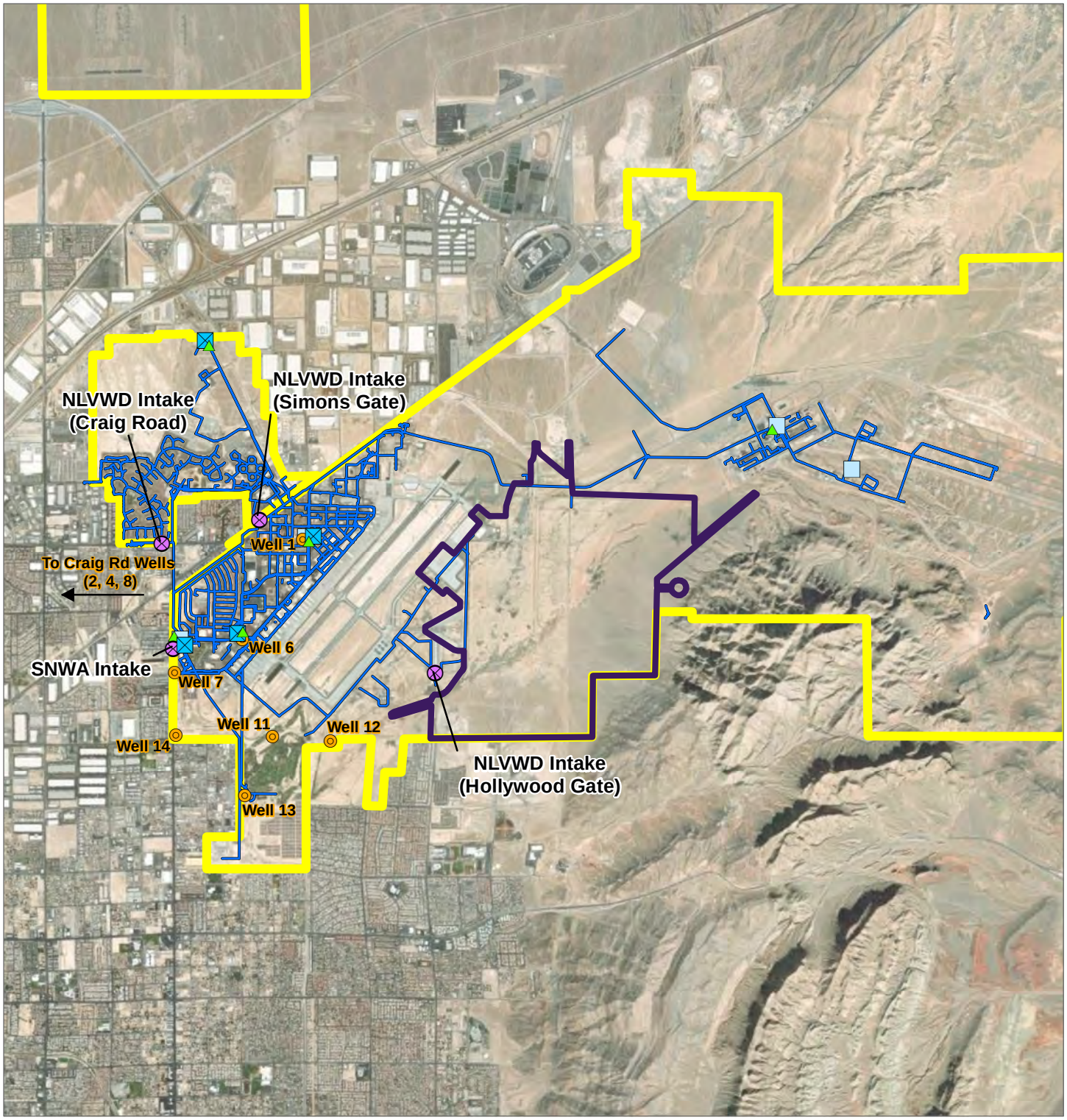


FIGURE 3-21
Existing Potable Water System

- Elevated Storage Tank
- Ground Storage Tank
- Pump Station
- Supply Connection
- Well
- Potable Water Main Line
- Installation Boundary
- Proposed Action Area

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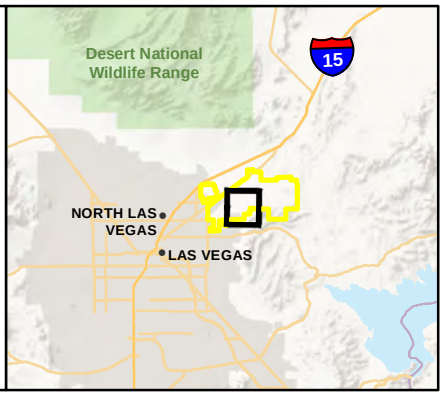
Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Most of Nellis AFB's original water distribution system was constructed in the 1950s. Largely, the water distribution system has only been upgraded when necessitated by breaks or other repair requirements. The Main Base (Area I) distribution network is generally adequate to meet existing Installation needs; however, the condition of the distribution network is poor (Nellis AFB, 2020c). The potable water infrastructure in the MSA and Area II is in especially poor condition with sections of pipe that are oversized and un-looped, creating unsafe potable water conditions. These lines are routinely flushed to maintain an appropriate flow for water potability and pressure for fire suppression, incurring unnecessary water waste and cost (Nellis AFB, 2020c). The potable water distribution system is currently rated as unsatisfactory; considered to be in poor condition due to age, pipe material, and sedimentary buildup; and at maximum capacity without the ability to accommodate future development or mission expansion (Nellis AFB, 2020d).

Water Supply Intakes

There are four existing water supply intakes on Nellis AFB: one SNWA intake and three NLVWD intakes (see **Figure 3-21**). The SNWA intake is located on North Nellis Boulevard and serves as the primary water supply for Nellis AFB. The Hollywood Gate NLVWD intake, which is the closest intake to the Proposed Action area, is primarily reserved as an emergency connection for Nellis AFB (AECOM, 2015). The second NLVWD intake is located near the water tower adjacent to Simons Gate along the intersection of Las Vegas Boulevard and Mike O'Callaghan Medical Center. This connection is utilized as a backup service for the Medical Center. The third NLVWD intake is located along Craig Road, west of the intersection of Craig Road and Nellis Boulevard and is utilized as a backup service for Area III. The Medical Center and Area III are primarily served by the Installation-wide potable water system via the SNWA intake. The existing SNWA intake also services the Proposed Action area.

Groundwater Wells

Groundwater supply at Nellis AFB is a secondary water source for the Installation and is withdrawn from the Las Vegas Valley Aquifer. As shown in **Figure 3-21** above and **Table 3-32**, Nellis AFB owns and operates 10 wells located on and off the Installation, of which two (Wells 2 and 8) are utilized to supplement additional potable water demands (Nellis AFB, 2020c, 2020d). Wells 1, 6, 7, 11, 12, 13, and 14 have high

Table 3-32
Nellis AFB Groundwater Wells

Well Number	Well Location	Operational Status	Production Issues
1	Ellsworth Avenue/Swab Boulevard	Not working	Unknown/high arsenic levels
2	Craig Road	Working/potable; currently used to supplement potable water	None
4	Craig Road	Not working	Unknown
6	Tyndall Avenue/Duffer Drive	Not working	Unknown/high arsenic levels
7	Near I Street Gate	Not working/potable	Dry/high arsenic levels
8	Craig Road	Working/potable; currently used to supplement potable water	None
11	Perimeter Road	Not working; produced groundwater to supplement potable water prior to 2017	Collapsed/high arsenic levels
12	Next to B-1602	Currently supplies greywater irrigation to the Sunrise Vista Golf Course	High arsenic levels
13	South of Main Base	Not working; produced greywater irrigation for the Sunrise Vista Golf Course prior to 2007 – Well 13 currently has no permitted water rights and would not be considered for future water supply	High arsenic levels
14	Southwest corner of Main Base	Not working; produced greywater irrigation for the Sunrise Vista Golf Course prior to 2014	High arsenic levels

Source: Nellis AFB, 2020d

arsenic concentrations that makes them unfit for potable water use. Wells 1, 4, 6, 7, 11, 13, and 14 are not currently working and are unused. Well 12 is utilized to supplement greywater and wastewater effluent irrigation at the Sunrise Vista Golf Course (Nellis AFB, 2020d). There are no groundwater wells located within the Proposed Action area.

Water Storage

Nellis AFB currently maintains a potable water storage capacity of approximately 7.2 million gallons. As shown in **Figure 3-21** above and **Table 3-33**, five tanks that collectively store 3.8 million gallons are located within Area I; one tank that stores 3.0 million gallons is located within Area III, and two tanks that store 0.4 million gallons are located within Area II. Each tank is assembled with a pump station (AECOM, 2015). The potable water storage tanks on the Installation have been minimally maintained and require clean out and restoration (Nellis AFB, 2020d).

Table 3-33
Potable Water Storage Tanks at Nellis AFB

Area	Tank No.	Location	Type	Capacity (Million Gallons)
Main Base (Area I)	491	Well 6, Near Nellis Terrace Housing	Ground	0.5
	561	West of Ellsworth Avenue, At Well 1	Ground	0.2
	562	West of Ellsworth Avenue, At Well 1	Elevated	0.5
	1725	South of Nellis Terrace, near Sunrise Vista Golf Course	Ground	2.3
	1721	South of Nellis Terrace, near Sunrise Vista Golf Course	Elevated	0.3
Area II	10420	Weapons Storage Area	Elevated	0.1
	10113	Near Red Horse	Ground	0.3
Area III	1999	North of Caffarelli Court, Near Range Road	Ground	3.0
Total				**7.2**

Source: AECOM, 2015

Water Quality

Nellis AFB routinely experiences chlorine degradation at multiple sites throughout the Installation. Modeling in 2015 predicted chlorine residuals were generally above 0.05 mg/L (AECOM, 2015). Operators do not currently fill the 3-million-gallon ground-based storage tank (Tank 1999) to capacity due to water quality concerns related to chlorine degradation. As a result, the Installation is deficient in available potable water storage to meet existing requirements (e.g., peak hour equalization, fire, and operational storage) for Area I (AECOM, 2015).

It is likely that most of the wells at Nellis AFB have a high arsenic concentration that makes them unfit for potable water use (see **Table 3-33**).

There are currently several PFAS-impacted sites, including both groundwater and shallow soil sites, within the boundary of the Proposed Action area with associated groundwater monitoring wells. For additional information on PFAS-impacted sites, refer to **Section 3.11.1.1**.

Fire Protection

Nellis AFB has approximately 7.2 million gallons of potable water storage that is also used for fire protection water storage (AECOM, 2015). Nellis AFB personnel have not indicated any existing deficiencies in available storage for fire protection water (Nellis AFB, 2023h). Supply is adequate and the distribution network is in adequate condition (Nellis AFB, 2020c).

The lack of sufficient water distribution limits the developable opportunities and existing mission expansions on the Installation, as new facilities would not meet current fire code; therefore, Nellis AFB is not postured to adequately support future mission growth. In addition, the fire and potable water lines are combined,

contributing to low chlorine residuals. Water lines must frequently be flushed to improve water quality (Nellis AFB, 2020c).

Based on model simulations, available fire flow is adequate to meet the non-sprinklered building fire flow requirements at approximately 81 percent of the fire hydrants while maintaining a residual pressure of 20 pounds per square inch (psi). Model simulations indicate that the fire protection system is unable to meet the requirements of approximately 42–61 percent of sprinkler systems, depending on actual pressure and hose stream requirements of those systems (AECOM, 2015).

Field test and hydraulic model results suggest firefighting capacity in Area II is very limited due to system hydraulics and tank operation and volume (AECOM, 2015). In addition, tank volume deficits related to Tank 1999 result in reduced firefighting capacity in Area III. Currently, a project is underway to rebuild the pumphouse and modify the tank in Area III to improve firefighting capacity to this area.

Existing Water Supply and Demand

The existing Nellis AFB available potable water supply from SNWA is 7.8 million gallons per day (MGD) with an average daily usage of 1.1 MGD for FY 2021 and 0.9 MGD for FY 2022 (Nellis AFB, 2023i).

Potable water supply for Nellis AFB is primarily supplied from Lake Mead, which is fed by SNWA-contracted water from the lower Colorado River. From Lake Mead, water is transmitted to Nellis AFB via two water treatment plants (Alfred Merritt Smith Water Treatment Facility and/or the River Mountains Water Treatment Facility) followed by a series of large-diameter pipelines, regulating tanks, reservoirs, and surge towers. In FY 2023, groundwater from Wells 2 and 8 on Craig Road accounted for 11.5 percent of Nellis AFB potable water usage, and water from the NLVWD intakes accounted for less than 1 percent of potable water use (see **Appendix D** of this PEIS for further detailed analysis).

The existing available groundwater yield is estimated at 0.6 MGD (Nellis AFB, 2020d). In calendar year (CY) 2023, Wells 2 and 8 produced 96 acre-feet (31,136 thousand gallons, 0.9 MGD) of water for Nellis AFB (Nellis AFB, 2020d).

There are no current water supply concerns regarding potable water supply from Lake Mead, and Nellis AFB currently has adequate water supply for the current demand (Nellis AFB, 2023h). Long-term concerns due to Lake Mead's capacity exist, as Lake Mead's water level has been at an all-time low due to record drought conditions. The combination of an ongoing drought, lower water levels in Lake Mead due to smaller snowpack in the Colorado Rocky Mountains, and increased population in the Las Vegas Valley have contributed to Lake Mead dropping to a minimum elevation of 1,040 feet in 2022 and triggering the first-ever shortage of water in the Colorado River (Bureau of Reclamation, 2023).

3.12.1.3 Wastewater System

Existing Infrastructure

As shown in **Figure 3-22**, the Proposed Action area currently has no existing wastewater system infrastructure, with the exception of several existing wastewater lines along the western side of the Proposed Action area that connect with the existing system. Wastewater infrastructure on the Installation is owned by Nellis AFB and offsite wastewater conveyance and treatment is provided by CCWRD. South of the Hollywood Gate, CCWRD maintains sanitary sewers and pump stations for the residential areas outside the Installation.

Nellis AFB wastewater lines are currently in need of replacement due to the age of the system; the oldest lines are over 90 years old (AECOM, 2015). Nellis AFB personnel have not reported any deficiencies with the main connection from the SNWA intake along Nellis Boulevard, and CCWRD has reported sufficient capacity in the existing system (Nellis AFB, 2023h).

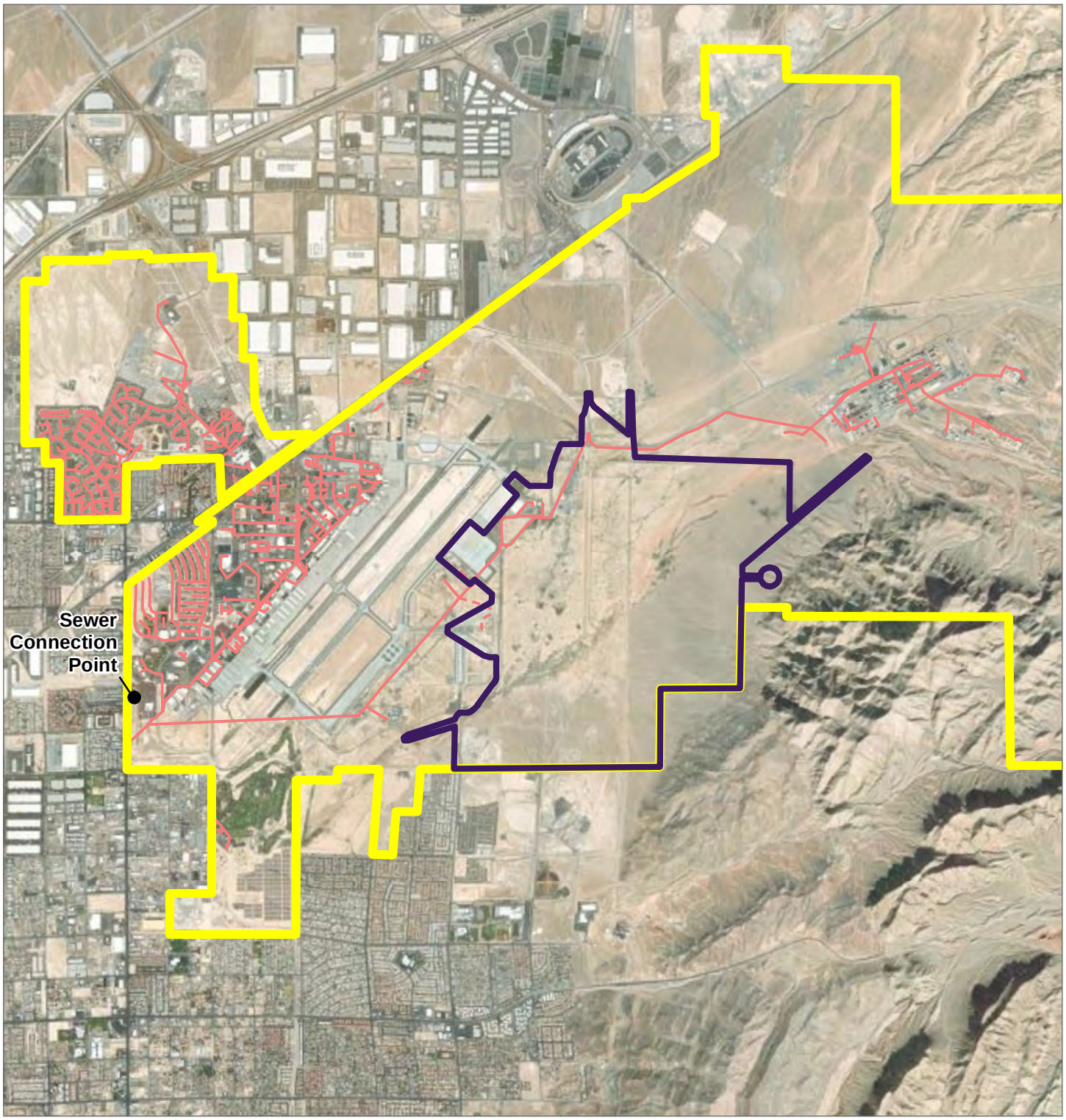
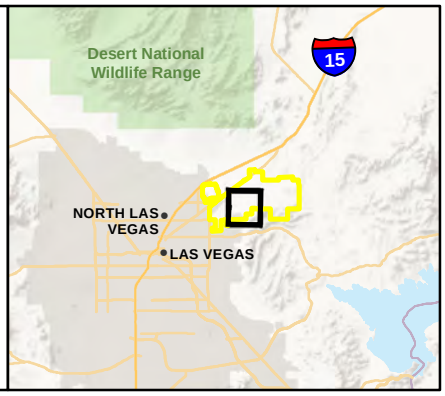


FIGURE 3-22
Existing Wastewater Utilities

Wastewater Gravity Main Line
Wastewater Pressurized Main Line
Installation Boundary
Proposed Action Area



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Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

Existing Wastewater Load

Presently, the Installation generates sewage at rates of approximately 1.2 MGD (average), and 1.6 MGD (peak) with no reported capacity concerns (Nellis AFB, 2020d). Wastewater is adequately serviced in Area I by the existing vitrified clay pipe, concrete, and PVC sewage conveyance system originally constructed in the 1940s and 1950s (Nellis AFB, 2023j). The connection along Nellis Boulevard to the CCWRD wastewater conveyance system has capacity for 26 MGD (Nellis AFB, 2020d). No wastewater is presently generated within the Proposed Action area.

3.12.1.4 Stormwater Management System

Existing Infrastructure

As shown in **Figure 3-23**, the Proposed Action area currently has no existing stormwater system infrastructure, with the exception of a CCWRD-built stormwater flume that runs north to south, ending approximately in the center of the Proposed Action area. This flume is a reinforced concrete channel measuring approximately 51-feet wide by 10-feet deep and drains into a riprap apron prior to discharge off site. As shown in **Figure 3-23**, a confluence basin located south of the Installation receives stormwater directed to it from the currently undeveloped areas. A proposed modification to the existing stormwater confluence basin is under consideration by CCRFCD, which is anticipated to begin design no sooner than 2028 (CCRFCD, 2024d).

The existing landscape of the Proposed Action area is mostly homogeneous (i.e., of the same kind) desert landscape. Nellis AFB lies within the Range Wash Watershed, which includes lands under the jurisdictions of unincorporated Clark County, the BLM, and the City of North Las Vegas. The branches of the Range Wash enter Nellis AFB and flow from north to south through Nellis AFB, east of the runways, and ultimately discharge into the confluence detention basin (**Figure 3-23**).

Storm drainage at Nellis AFB is predominantly surface channels with limited underground infrastructure, including open drainage lines, culvert lines, gravity lines, discharges areas, and stormwater storage reservoirs. The system consists of a combination of corrugated metal pipes, culverts, natural swales, and concrete troughs. These conveyances move the stormwater runoff toward the southeast to ground absorption areas or drainage channels (Nellis AFB, 2018b). Area I contains stormwater channels and culverts, which are directed to a large flume on the southwest side of the Installation that flows off site, ultimately to the Las Vegas Wash (Nellis AFB, 2020d).

Flows in the Range Wash are ephemeral, occurring only during rainfall events; storms can bring up to 1 inch per hour. Flood flows are generally unconfined and widespread following the natural terrain through Nellis AFB toward the confluence detention basin. Currently, flood flows from the Range Wash overtop Las Vegas Boulevard, Ellsworth Avenue, and Munitions Road. The Hollywood Branch combines with the East Tributary to form a wide natural wash that crosses Nellis AFB south of Munitions Road (Nellis AFB, 2018b).

Nellis AFB, including the Proposed Action area, operates under NPDES Municipal Separate Storm Sewer System Permit NV-0021911, which has been issued for the entire Las Vegas Valley, the city of Las Vegas, and Clark County.

Existing stormwater management capacity is adequate for the Installation; however, the existing stormwater management conveyance network of pipes and drainage swales is in poor condition and in need of rehabilitation (Nellis AFB, 2020c). During storm events, Nellis AFB personnel have reported that flooding of the flightline is common (Nellis AFB, 2023k). Other areas of the Installation, including roadways, flood during larger rainfall events (Nellis AFB, 2023k). During large storm events, the flightline and surrounding areas experience standing water, which impedes Installation operations. Currently, overflows prevent safe passage for vehicles to cross the Hollywood Branch at Las Vegas Boulevard, Ellsworth Avenue, and Munitions Road, and decrease flood security for the Nellis AFB occupants, runways, and associated infrastructure (Nellis AFB, 2018b).

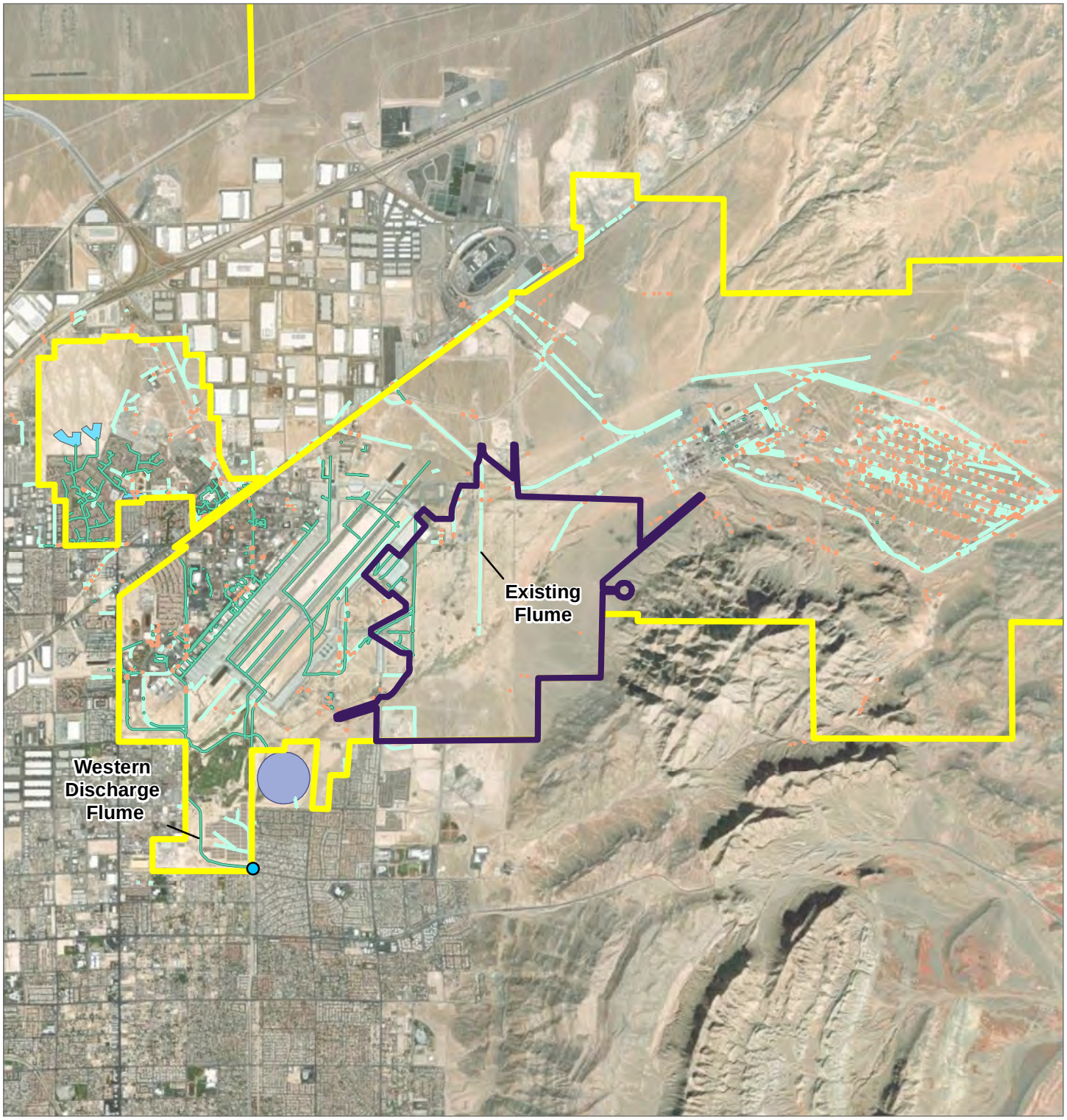

FIGURE 3-23
Existing Stormwater Management System

- Stormwater Discharge Point
- Stormwater Culvert
- Stormwater Gravity Line
- Stormwater Open Drainage Line
- Installation Boundary
- Proposed Action Area
- Stormwater Confluence Basin
- Stormwater Storage Reservoir

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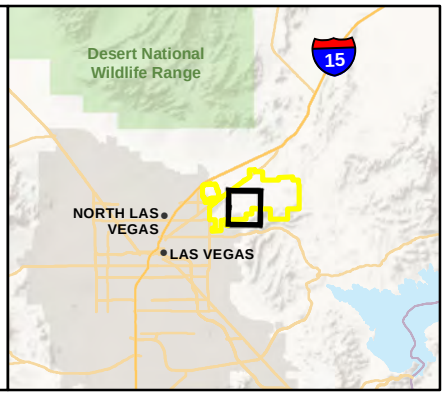
0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



3.12.1.5 Electrical System

Existing Infrastructure

As shown in **Figure 3-24**, the Proposed Action area currently has no existing electrical system infrastructure. There are several primary overhead and underground electrical lines along the western and northern edges of the Proposed Action area that connect to Areas I and II.

The principal electrical utility service provided to Nellis AFB is from NVE via a 69-kilovolt (kV) sub-transmission feeder to the Nellis AFB-owned Northgate distribution substation. The Northgate substation is located within the Installation at the corner of Las Vegas Boulevard North and Beale Avenue. Overall, the electrical distribution system at Nellis AFB is considered to be in fair condition. The Installation's degraded and undersized sections of wiring are in the process of being repaired, upgraded, or replaced (Nellis AFB, 2020c).

In 2007, a privately owned 15-megavolt-ampere (MVA) utility-scale solar photovoltaic (PV) array, Nellis Solar Array (NSA) I, was installed on leased property in Area III. This array is owned and managed by Solar Star NAFB, LLC, and Brookfield Renewable Partners. In 2015, NVE was granted a property lease at the south end of the Installation, between the Sunrise Vista Golf Course and East Carey Avenue, to install a second 15-MVA solar array, a photovoltaic farm named NSA II (NVE NSA II PV array). As part of the lease agreement, NVE installed a new 22-MVA Clinton distribution substation at the southwest corner of the NSA II array and extended a distribution feeder from the off-Installation, NVE-owned, Carey Avenue substation into the southern end of Area I. The Clinton and Carey Avenue substations provide resiliency to the electrical distribution system and can provide power to the Installation when the Northgate distribution substation is disabled or requires maintenance. The onsite generation of renewable energy from NSA I and NSA II enables the Installation to meet the daytime summer season peak power requirements (Nellis AFB, 2020c).

Existing Electrical Load

Nellis AFB electrical energy demand and consumption vary seasonally and are primarily dependent upon climatic conditions, with the peaks attributed to the cooling requirements of the warmer months. From June 2022 through September 2023, the Installation reported a maximum monthly consumption of 12,258,634 kilowatt-hours from NVE in July 2023; the maximum monthly energy generation from the NVE NSA II PV array was 4,295,348 kilowatt-hours in June 2022.

The NVE metered peak monthly demand from the Installation was 23.1 MVA in July 2023. Currently, the Northgate substation has a peak demand spare capacity of about 12 MVA to support mission growth (Nellis AFB, 2023l).

Overall, NSA I produces the power required for 16 percent of the Installation-wide consumed kilowatt-hours and the NVE NSA II PV array produces the power required for 26 percent of the Installation-wide consumed kilowatt-hours, resulting in the combined power produced from both arrays accounting for approximately 42 percent of the Installation-wide consumed kilowatt-hours (Nellis AFB, 2023l).

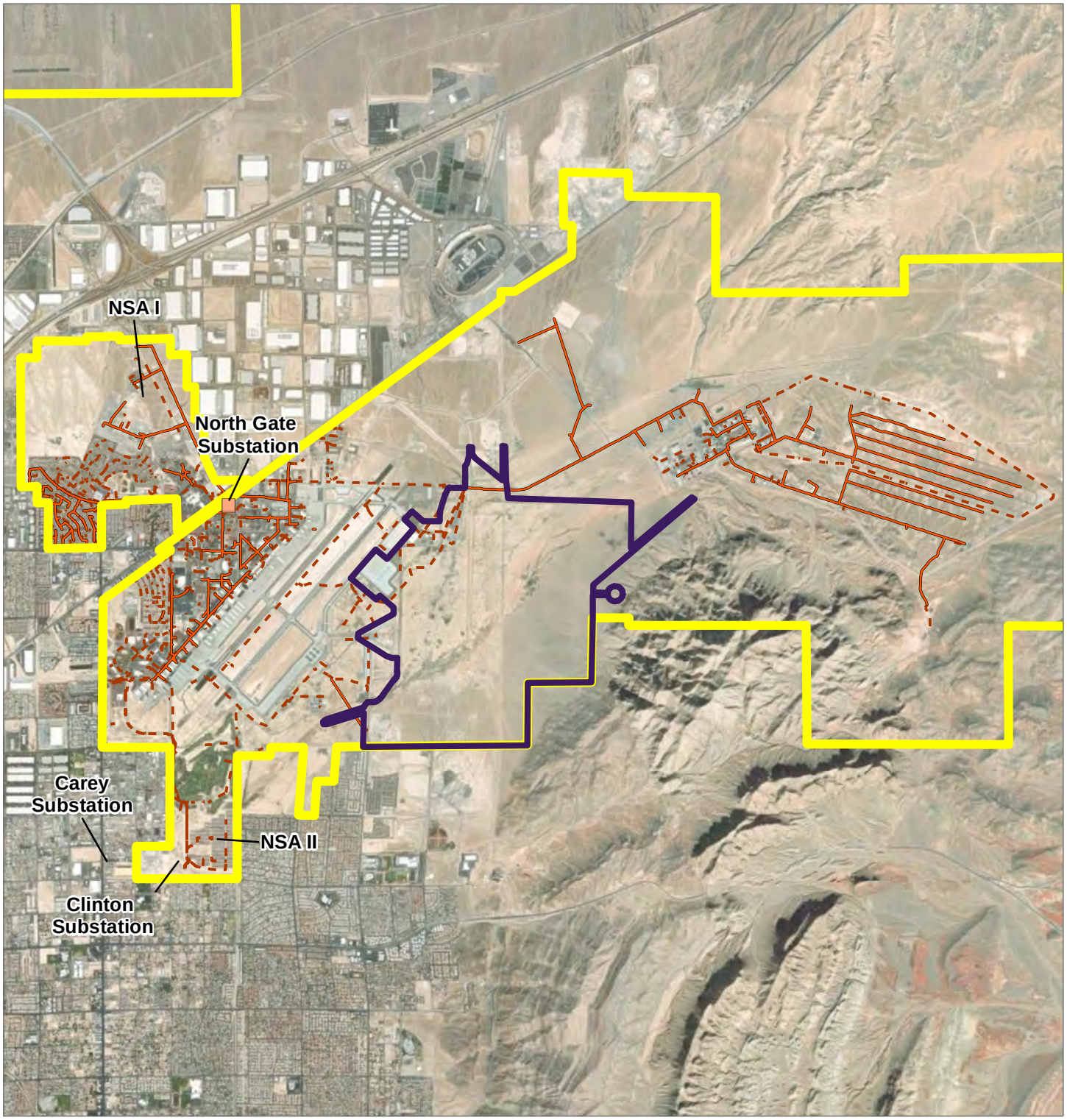


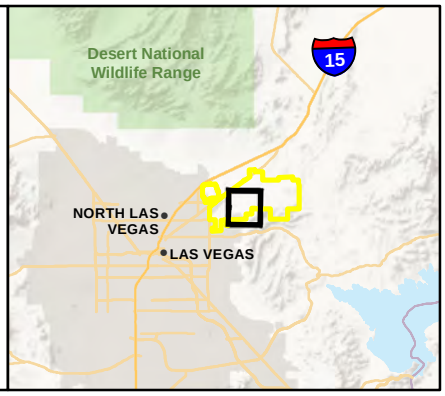
FIGURE 3-24
Existing Electrical System

Existing Substation
Primary Overhead Electrical Line
Primary Underground Electrical Line
Installation Boundary
Proposed Action Area

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



3.12.1.6 Telecommunications System

Existing Infrastructure

As shown in **Figure 3-25**, there is no existing telecommunications system infrastructure within the Proposed Action area. There are several communications cable lines to the west and north along the western and northern edges of the Proposed Action area that connect to Areas I and II.

The communications infrastructure consists of an underground fiber optic network system. All existing copper infrastructure systems have been removed or have been abandoned (Nellis AFB, 2023m). The data/communications utility provider is Lumen Technologies.

Existing Telecommunications Demand

The demand for communications infrastructure is projected to intensify with the growth in F-35A aircraft, the development of simulator training capabilities, advancement of cyber warfare and security requirements, and expansion to the proposed east-side development area. Investment in the communications infrastructure is necessary to meet the current and growth demand of the mission at Nellis AFB (Nellis AFB, 2020c).

Communications infrastructure has reached saturation with limited capacity remaining in select locations on the Installation. Nellis AFB has a critical shortage of floor space available for communications equipment in certain communications hubs (i.e., a location serving as a central point for distribution of communication services). The availability of floor space is a constraint to the new and growing mission requirements. Underground duct congestion is further constraining the capacity of Nellis AFB's communications infrastructure. As the ducts become saturated, no new communications lines/fiber can be run, limiting the ability for Nellis AFB to be able to accommodate additional growth/demand in select areas of the Installation.

As shown in **Figure 3-26**, the Installation is currently working with Verizon on projects to install three long-term-evolution-enhanced cell service towers. Two of these towers will be located in Area I and the third will be installed in Area II (Verizon, 2023). In addition, a new information transfer building (ITB), B-2892, located on the east side of the flightline near the existing tower is currently under construction. This ITB could support future development of the airfield apron, hangars, and operational spaces within the Proposed Action area at the north end of the flight line.

3.12.1.7 Natural Gas System

Existing Infrastructure

As shown in **Figure 3-27**, there is no existing Nellis AFB-owned natural gas infrastructure within the Proposed Action area. There is one natural gas distribution line, owned by Southwest Gas, that runs through the center of the Proposed Action area that services Area II; the Area II natural gas system is not connected to Area I.

Nellis AFB is serviced by natural gas from Southwest Gas via an 8-inch buried coated supply line under Nellis Boulevard; a single meter is utilized for gas billing. System pressure is maintained at 35 psi. Natural gas is supplied to Area I along Las Vegas Boulevard North and to Areas II and III along Hollywood Boulevard and Craig Road. Twenty buildings east of the flightline are heated with electricity, as there currently is no available gas connection.

The existing natural gas demand at Nellis AFB is met by current infrastructure. The distribution network is in good condition and should continue to adequately serve the Installation with regular maintenance (Nellis AFB, 2020c).

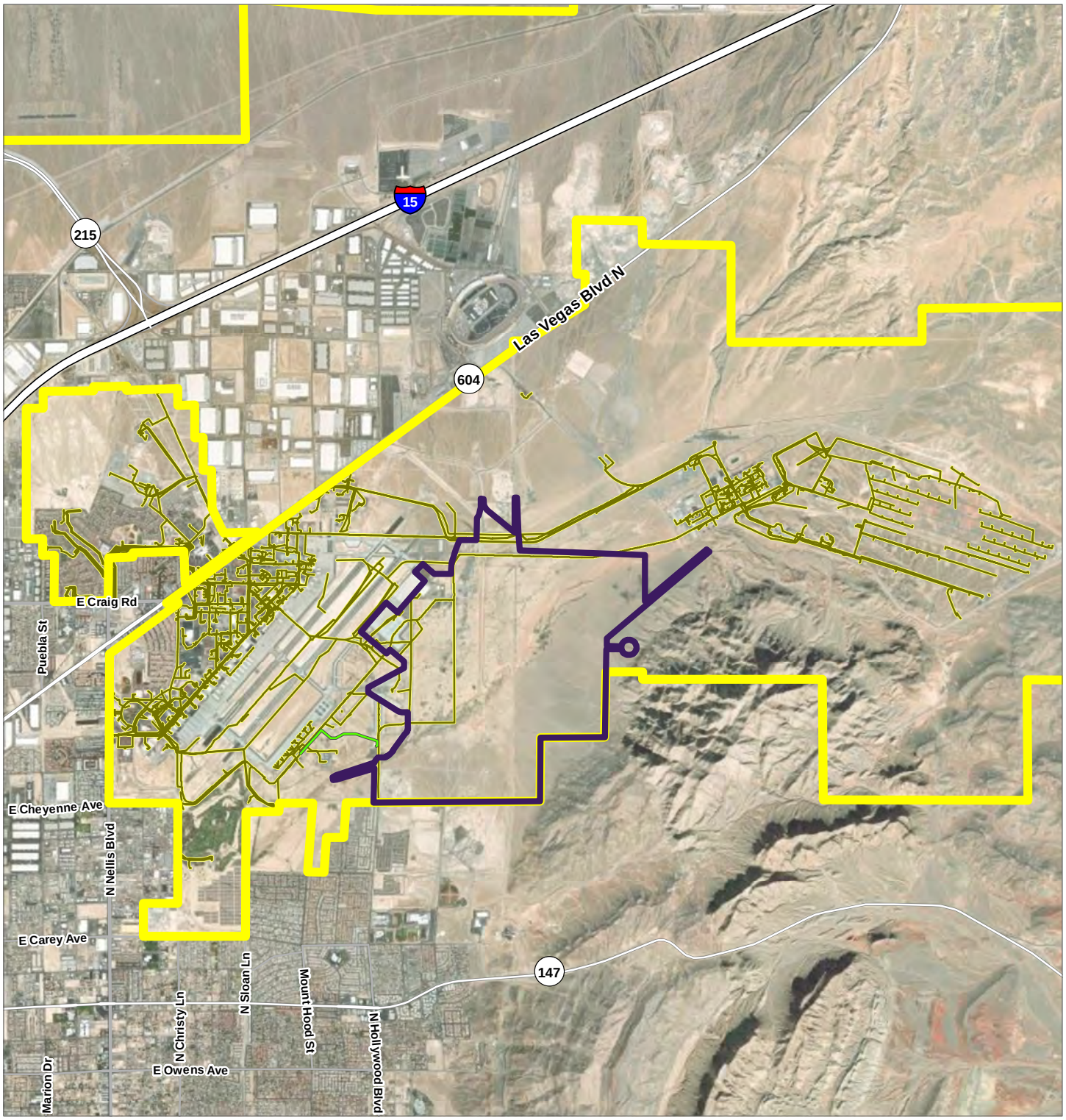
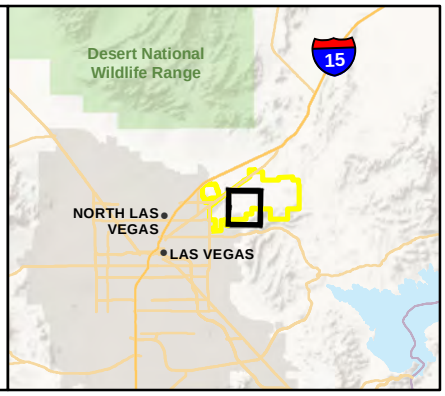


FIGURE 3-25
Existing Telecommunications System

Communication Cable Line
Communication Duct Line
Interstate Highway
Major Road
State Highway
Proposed Action Area
Installation Boundary

N
0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



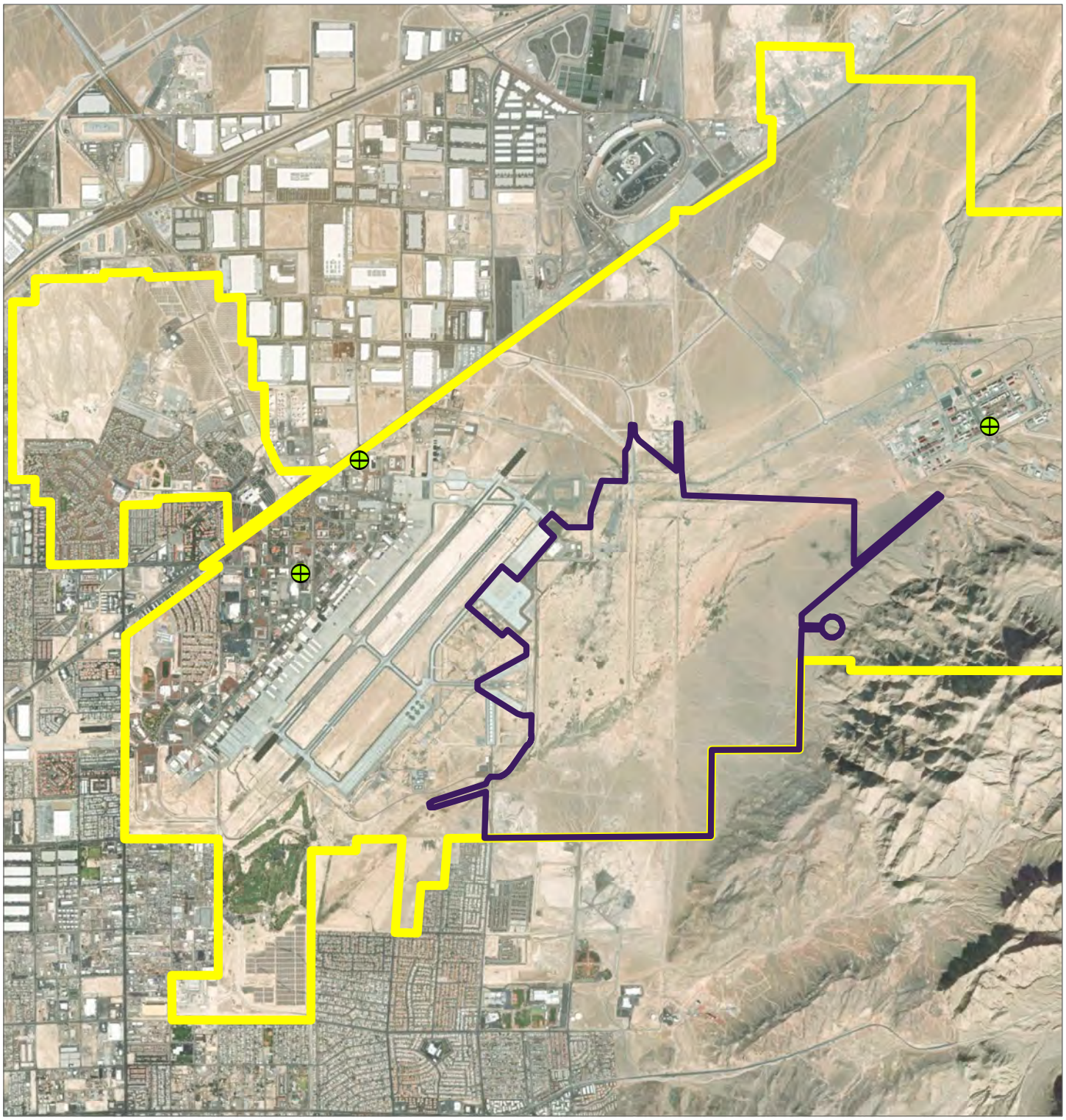


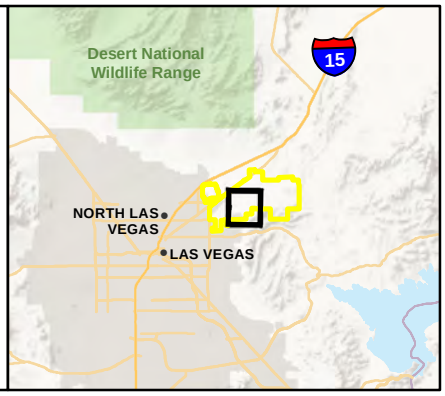
FIGURE 3-26
Proposed Cell Towers

Proposed Cell Tower
Proposed Action Area
Installation Boundary

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



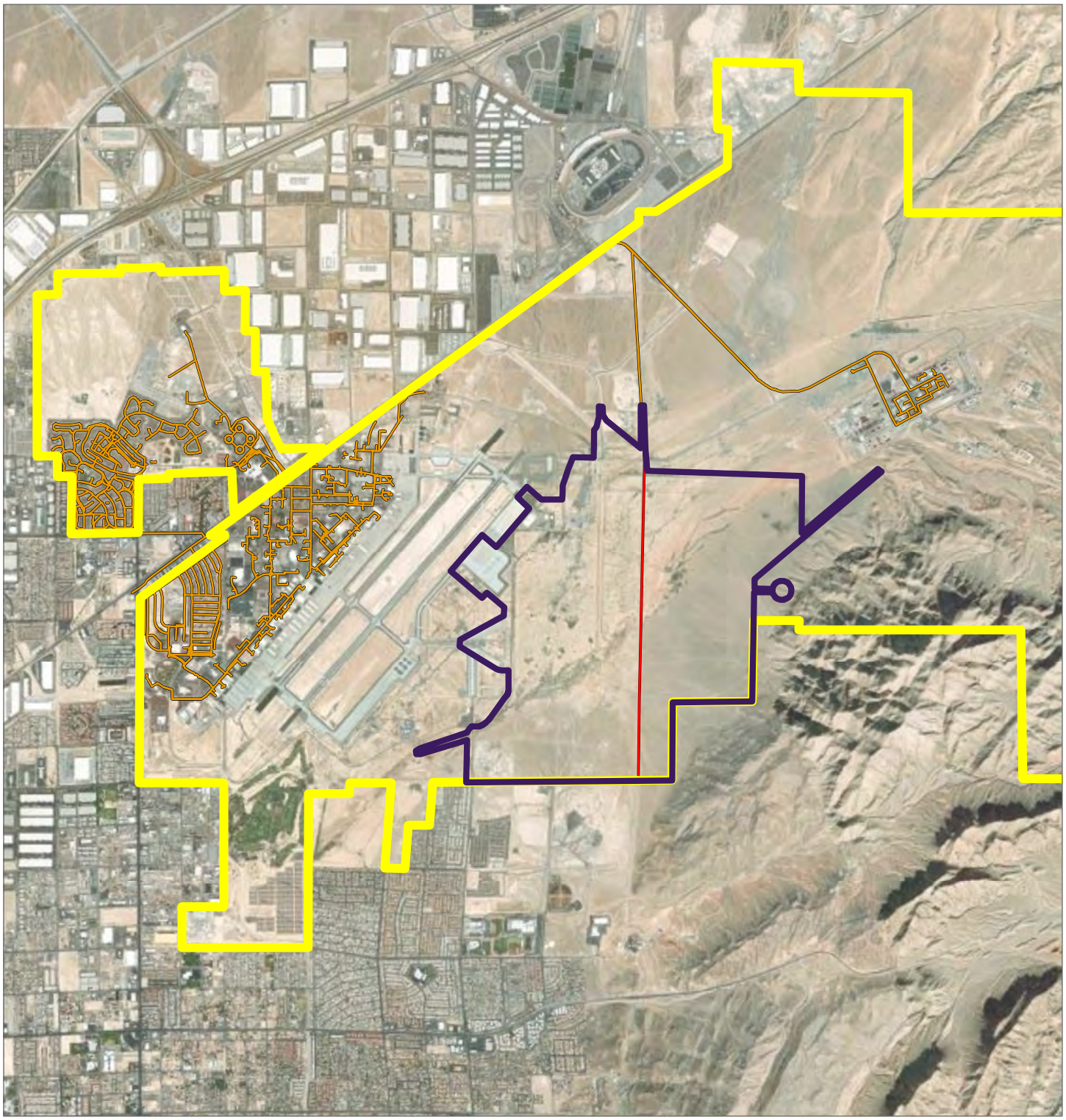


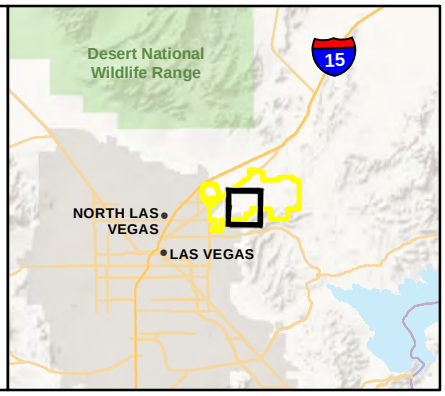
FIGURE 3-27
Existing Natural Gas System

Nellis AFB Owned Natural Gas Distribution Line
Southwest Gas Owned Natural Gas Line
Installation Boundary
Proposed Action Area

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Existing Natural Gas Demand

Natural gas demand was approximately 174,000 cubic feet per day in FY 2023 with an available supply of over 21 million cubic feet per day (Nellis AFB, 2020c). The supply of natural gas is adequate for present needs (Nellis AFB, 2020c).

3.12.1.8 Hydrant Fuel System

Existing Infrastructure

As shown in **Figure 3-28**, the Proposed Action area has existing hydrant fuel infrastructure with hydrant fuel distribution pipelines along the western edges of the Proposed Action area that connect to Area I. Hydrant fuel (Jet-A) storage on the Installation is provided by two operating storage tank facilities, including two 20,000-barrel tanks at the west transient ramp operational storage facility and two 10,000-barrel tanks on the east-side revetment operational storage facility (Nellis AFB, 2020c). Jet-A bulk storage owned by Nellis AFB consists of four ASTs with a total capacity of 47,400 barrels.

Jet fuel is conveyed under North Las Vegas Boulevard to the aircraft service areas. Jet fuel, diesel, and gasoline are delivered to Nellis AFB via the Kinder Morgan pipeline. The existing fuel system is considered to be in adequate condition. Existing and long-term hydrant fuel needs for the Installation are met by current infrastructure (Nellis AFB, 2020c).

Hydrant Fuel System Existing Demand

During FY 2021 and FY 2022, an average of 25 million gallons of fuel per year was purchased to support Installation needs and mission support (Nellis AFB, 2023i).

3.12.1.9 Transportation System

Existing Infrastructure

The transportation infrastructure located within the Installation is owned and maintained by Nellis AFB. Nellis AFB is in the process of completing a transportation management plan (TMP) that provides an in-depth analysis of the physical and operational condition of the existing transportation system (Nellis AFB, 2023n). The majority of Nellis AFB's transportation network was created in the 1950s. The transportation infrastructure has grown and evolved to meet the growing demands at Nellis AFB over time, which has led to inefficient traffic patterns, higher traffic during peak hours, and conflict between vehicular and pedestrian traffic, in addition to AT/FP concerns (Nellis AFB, 2020c).

Nellis AFB has approximately 147 miles of paved roads within the boundaries of the Installation. Las Vegas Boulevard, which runs northeast to southwest through Nellis AFB and separates Area I from Area III, is a major regional artery connecting the Installation with downtown Las Vegas. East Craig Road intersects Las Vegas Boulevard North at the Nellis AFB Main Gate. It is also a major artery that funnels traffic from I-15 north of the Installation to Las Vegas Boulevard North. Area I is bounded on the west by North Nellis Boulevard, which is a major north-to-south-oriented road that connects south Las Vegas to the city of North Las Vegas and Nellis AFB. The Area II Gate provides access from North Nellis Boulevard to Area I.

Intersections are controlled by stop signs, which can cause minor traffic delays. Unpaved roads are located in Areas II and III, with the majority located along the perimeter of the Installation and minimally used for fence maintenance and security.

As shown on **Figure 3-29** below, the Proposed Action area currently has limited roadway infrastructure, with the following four exceptions:

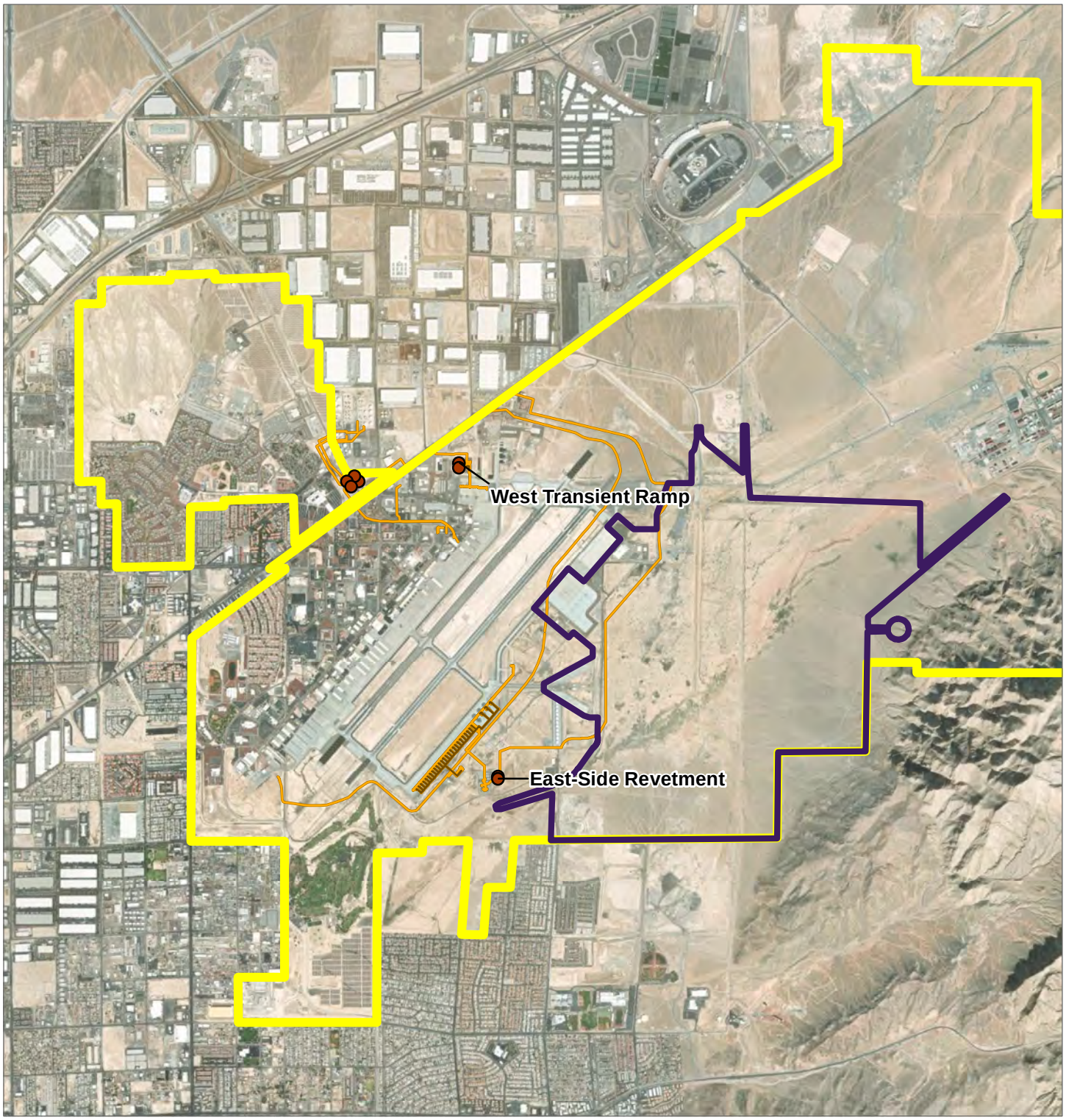
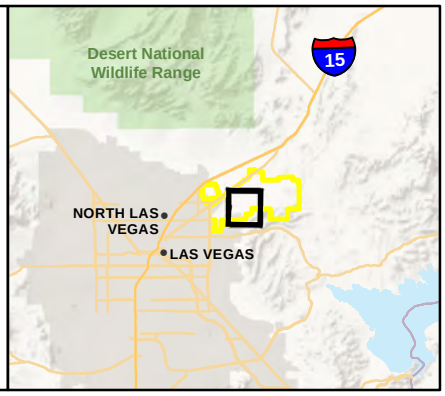


FIGURE 3-28
Hydrant Fuel System

Hydrant Fuel Storage Tank
Defueling Line
Hydrant Fuel Distribution Pipeline
Installation Boundary
Proposed Action Area

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



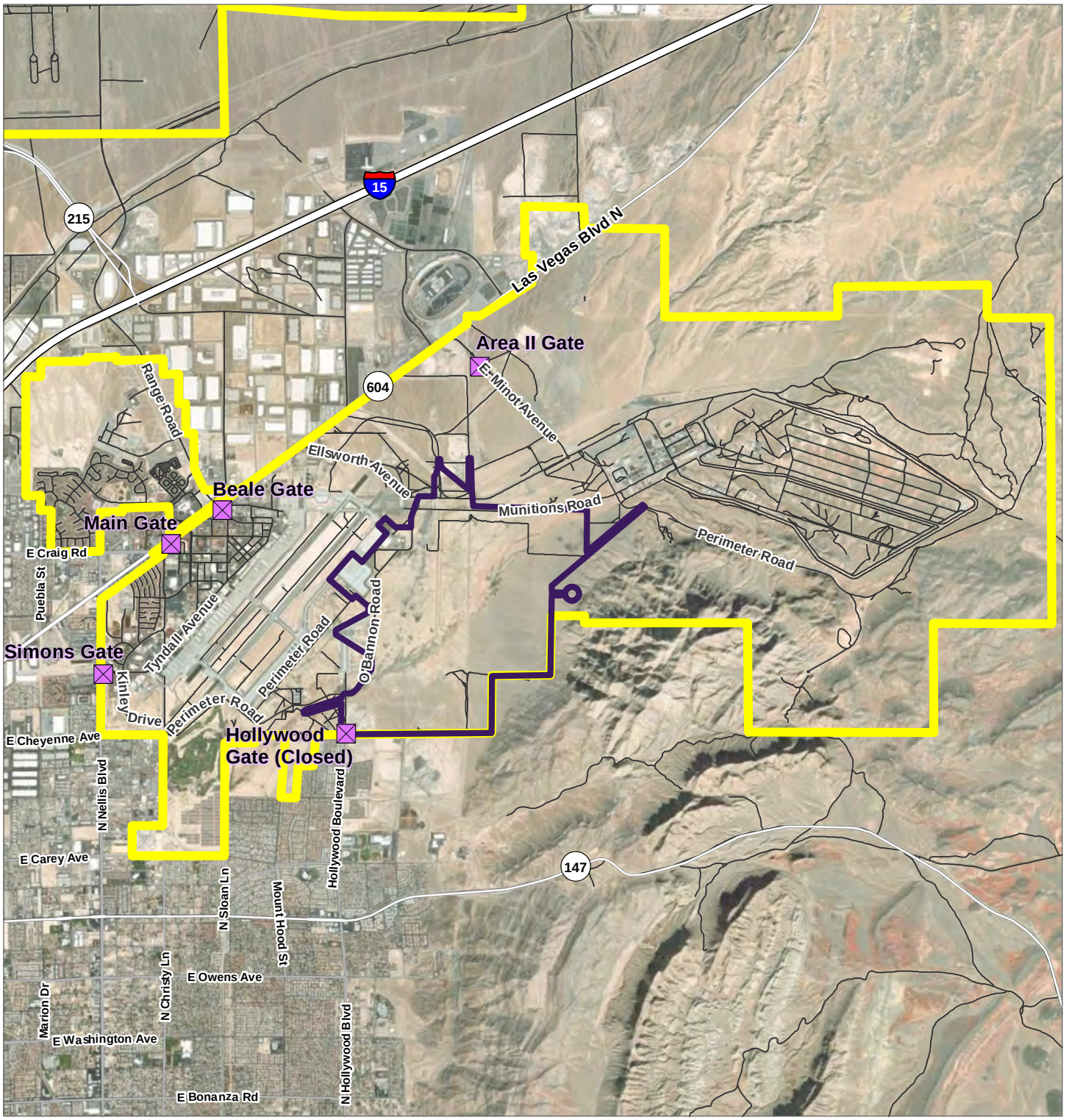


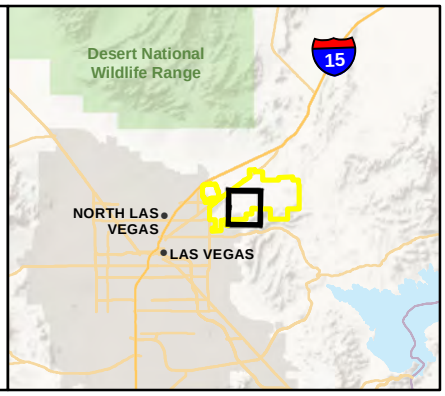
FIGURE 3-29
Existing Transportation Network

- Entry Gate
- Existing Base Road
- Interstate Highway
- Major Road
- State Highway
- Installation Boundary
- Proposed Action Area

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Munitions Road is a 2-lane, paved, uncurbed roadway that runs on the north side of the Proposed Action area, providing access to the MSA and Area II.

- Perimeter Road is a 2-lane, paved, uncurbed roadway connecting the southwest side of Nellis AFB to the northeast side. Perimeter Road begins at Kinley Drive near the Sunrise Vista Golf Course and ends at O'Bannon Road on the northeast side of the runway.
- O'Bannon Road is a 2-lane, paved, uncurbed roadway connecting the southwest side of Nellis AFB to the northeast side. While Perimeter Road runs adjacent to the tarmac, O'Bannon Road runs completely outside the airfield operations. The roadway intersects Hollywood Boulevard with a roundabout providing access to the currently closed Hollywood Gate.
- Hollywood Boulevard is 2-lane, paved, uncurbed roadway connecting Hollywood Gate to O'Bannon Road and the east side of Nellis AFB.

Existing Level of Service

Level of service (LOS) is an industry-accepted metric for quantifying the traffic operations at an intersection. The LOS is a grade-based system with scores A through F primarily based on average vehicle delay during the peak hour. LOS scores between A through C are considered acceptable by most standards. LOS D generally is acceptable in urban situations. LOS E and F generally are not acceptable. The Highway Capacity Manual defines the LOS grading for signalized and unsignalized intersections as a function of the average vehicle control delay (**Table 3-34**) (National Academies of Sciences, Engineering, and Medicine, 2022).

Table 3-34
Highway Capacity Manual Level of Service Definitions

LOS	Signalized Intersection	Unsignalized Intersection
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	>80 sec	>50 sec

Source: National Academies of Sciences, Engineering, and Medicine, 2022
≤ = less than or equal to; LOS = level of service

The LOS from the TMP intersection numbers are shown geographically in **Figure 3-30** and listed in **Table 3-35**. Intersections within Area II and III were not included, as transportation infrastructure in these areas would largely not be impacted by the Proposed Action. All intersections within Area I function at a LOS D or greater, indicating no existing intersections are over capacity. However, the intersection of Washington Boulevard and Fitzgerald Boulevard does not operate at an acceptable LOS during the evening peak hour. The LOS D at the Washington Boulevard and Fitzgerald Boulevard would continue to be monitored to determine if conditions continue to degrade to unacceptable levels.

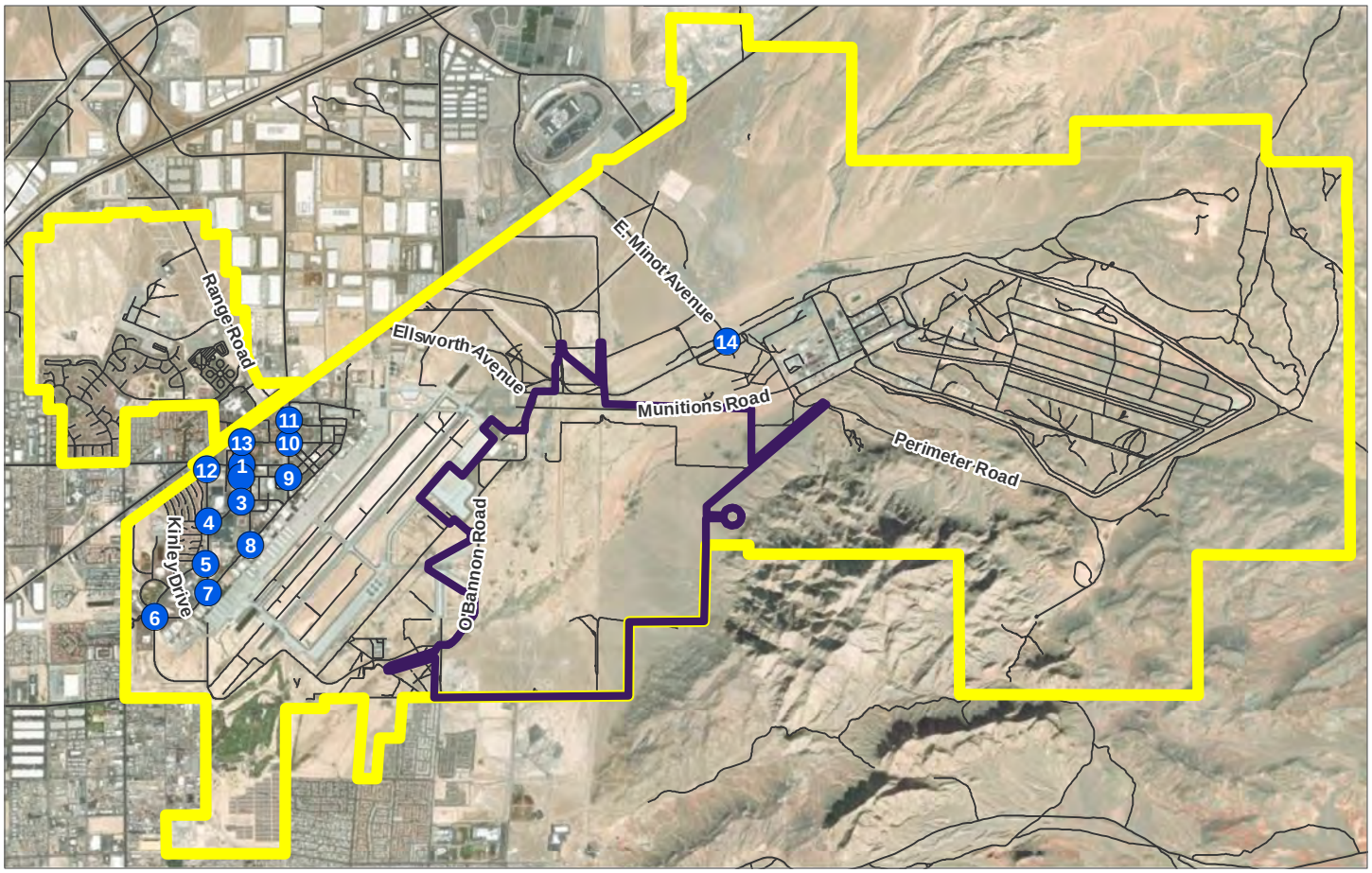


FIGURE 3-30
Existing Intersection Traffic Count Locations

Intersection Traffic Count Location
Existing Base Road
Installation Boundary
Proposed Action Area

N
0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

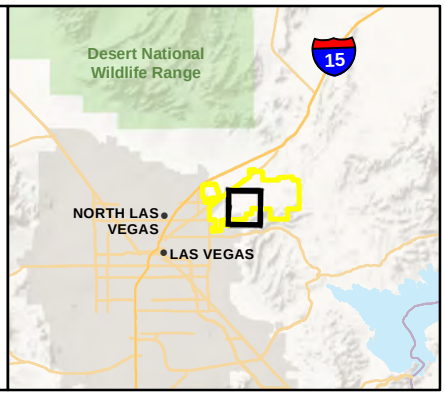


Table 3-35
Existing LOS at Intersections within Area I at Nellis AFB (2023)

#	Intersection	a.m. Peak Hour	p.m. Peak Hour
1	Washington Boulevard & Swab Boulevard	B	C
2	Washington Boulevard & Devlin Drive	B	B
3	Washington Boulevard & Rickenbacker Road	B	B
4	Rickenbacker Road & Duffer Drive	A	B
5	Kinley Avenue & Duffer Drive	A	B
6	Kinley Avenue &Tyndall Avenue	A	A
7	Tyndall Avenue & Duffer Drive	A	A
8	Tyndall Avenue & Griffis Avenue	A	A
9	Ellsworth Avenue & Devlin Road	A	A
10	Ellsworth Avenue & Fitzgerald Boulevard	C	A
11	Ellsworth Avenue & Beale Avenue	A	C
12	Swab Boulevard & Duffer Drive	A	A
13	Washington Boulevard & Fitzgerald Boulevard	B	D
14	O'Bannon Road & Minot Drive	A	A

Source: Nellis AFB, 2023n
a.m. = morning; LOS = level of service; p.m. = evening

Gate Access

As shown on **Figure 3-30** above, there are five gates that provide access to Nellis AFB east of Las Vegas Boulevard North:

- Main Gate – The Main Gate is the primary access point to Area I and is constructed to current AT/FP standards. This gate provides access to the Installation 24 hours a day, 7 days a week. Large vehicles are not permitted to enter the Installation at this location. The Main Gate currently requires additional lanes to meet operational requirements based on the current traffic volume.
- Simons Gate – Simons Gate provides access to Area I and is constructed to current AT/FP standards. This gate is open Monday–Friday, 0530–0830 and 1530–1730 for personal vehicle access. No trucks may enter the Installation at the Simons Gate.
- Beale Gate – Beale Gate provides access to Area I and is constructed to current AT/FP standards. This gate is open Monday–Friday, 0530–1730 for personal vehicle access. No trucks may enter the Installation at Beale Gate. The Beale Gate requires additional lanes to meet operational requirements based on the current traffic volume.
- Area II Gate – The Area II Gate provides access to Area II and does not meet current AT/FP standards. The Area II Gate is the large vehicle inspection station and the required entrance for large vehicles entering Nellis AFB. The hours for commercial vehicles are Monday–Friday, 0530–1300. The gate is open to personal vehicles Monday–Friday, 0530–1700, and Saturday, 0800–1200.
- Hollywood Gate – Hollywood Gate is currently closed. Prior to its closure, the Hollywood Gate provided access to the east side of the Installation, including portions of the Proposed Action area.

The TMP includes counts and average processing time for the four open gates at Nellis AFB and an analysis of the lanes required to effectively process the peak hour traffic at each gate (**Tables 3-36** and **3-37**, respectively). The TMP concludes that both the Beale Gate and the Main Gate require additional lanes to meet operational requirements. The counts in **Table 3-36** represent the external intersection a.m. and p.m. peak hour volumes and the entry analysis reports whether the inbound peak hour queue at each gate extends upstream into the previous external intersection (i.e., Las Vegas Boulevard N or North Nellis Boulevard).

Table 3-36
Existing Traffic Counts at Nellis AFB Access Gates (2023)

Gate	a.m. Peak Hour			p.m. Peak Hour	
	Entry	Exit	Entry Analysis	Entry	Exit
Area II Gate	244	26	Pass	11	310
Beale Gate	728	187	Fail	184	815
Main Gate	663	238	Pass	253	815
Simons Gate	398	51	Pass	44	344
Totals	**2,033**	**502**		**492**	**2,284**

Source: Nellis AFB, 2023n, 2025
Pass = Queue space accommodates vehicle queue.
Fail = Queue space cannot accommodate vehicle queue, queue spilling into external intersection.
Volumes represent external peak hours (a.m.: 7:00–8:00; p.m.: 3:15–4:15).
a.m. = morning; N/A = not applicable; p.m. = evening

Table 3-37
Existing and Required Lanes at Nellis AFB Access Gates (2023)

Gate	Design Demand (vph)	Existing Lanes	Required Lanes[a]
Main Gate	754	2	3
Simons Gate	400	2	2
Beale Gate	744	2	3
Area II Gate	291	3	1

Source: Nellis AFB, 2023n
a As the "Required Lanes" value is based on data collection through SMART evaluators, this tool does not consider the platoon effect for inbound gates caused by the nearby traffic light temporarily suspending the flow of inbound traffic. Future development of the gate design would rely on a dynamic traffic model to best inform the lane geometry plan.
vph = vehicles per hour

3.12.2 Environmental Consequences

3.12.2.1 Evaluation Criteria

Impacts on infrastructure from a proposed action are evaluated for their potential to generate additional requirements or demand for energy or water consumption and impacts to resources such as sanitary sewer systems as well as disrupt or improve existing levels of service in the ROI.

Adverse impacts related to utilities/services would occur if the Proposed Action or Alternatives required more than the existing infrastructure could provide or if required services conflict with adopted plans and policies for the area.

Adverse impacts to transportation would occur if the Proposed Action or Alternatives:

- substantially increased traffic generation, causing a decrease in the LOS,
- substantially increased the use of the connecting street systems or mass transit, or
- did meet on-Installation parking demand by projected supply.

Impacts may arise from physical changes to circulation or utility corridors, construction activity, introduction of construction-related traffic and utility use, or the addition of personnel stationed at Nellis AFB. As this document is analyzing a programmatic planning action for the east side development area, individual construction projects and the potential increase in 2,500 personnel at Nellis AFB over the next 10 years are not part of the Proposed Action for this PEIS. Rather, individual construction projects and the increase in personnel are potential future actions to be covered under separate NEPA analysis.

3.12.2.2 Methodology

Effects as a result of energy and natural resources consumption may include disruption, degradation, or improvement of existing LOS's or potential change in demand for energy or natural resources. Adverse impacts on roadway capacities would be significant if roads with no history of capacity exceedance had to operate at or above their full design capacity as a result of an action. Transportation effects may arise from changes in traffic circulation, delays due to construction activity, or changes in traffic volumes.

The anticipated growth in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same under Alternative 1, Alternative 2, and the No Action Alternative. Therefore, impacts to utilities as a result of the increase in personnel would be similar across all alternatives; however, Alternative 1 provides additional lodging/residential facilities on the Installation. This analysis assumes that lodging/residential facilities capable of accommodating 1,500 additional personnel eventually would be constructed within the Proposed Action area, and an additional 1,000 personnel would live off the Installation. Under Alternative 2 and the No Action Alternative, it is assumed that potentially 2,500 additional accompanied and unaccompanied military personnel would live off the Installation, as no new lodging facilities would be constructed.

3.12.2.3 Alternative 1

Potable Water System

Under Alternative 1, future development would require the construction of a new potable water system to include approximately 43,000 linear feet of PVC water supply main, as shown in **Figure 3-31**. Twelve-inch diameter water supply mains would be required near the connections to the existing southern portion of Area I and to the northern connection point at Area II.

The water supply would be interconnected/looped with Areas I and II to alleviate existing water quality issues resulting from dead ends in the system at Area II and improve Installation-wide pressure. The proposed loop would connect the existing water supply lines from Areas I and II, and water would be supplied to the Proposed Action area through the existing SNWA intake located on North Nellis Boulevard (**Figure 3-31**). The existing NLVWD intake near Hollywood Gate would remain as an emergency or backup connection. Any expansion of the public water system would be coordinated with the Nevada Bureau of Safe Drinking Water.

To help support the additional potable water demand and fire protection needs that could be required for future development under Alternative 1, a 2.0-million-gallon water tank, as shown in **Figure 3-31**, would be constructed. The future construction of a water storage tank would also help alleviate Installation-wide pressure concerns within the water system.

There are several PFAS-impacted sites, including both groundwater and shallow soil sites, with associated groundwater monitoring wells located within the boundary of the Proposed Action area. All water and soil disturbance activities associated with construction would include testing for the presence of PFAS, as these compounds are known to have adverse effects on human and animal populations and, if discovered, would be remediated (USEPA, 2024).

Development of the east side of the Installation would increase potable water demand by approximately 0.3 MGD, which represents an increase of approximately 18 percent over existing demand of 1.7 MGD (2020) (Nellis AFB, 2023i). This increase in demand is based on an average daily use of 120 gallons per day per person to accommodate an estimated additional 2,500 personnel over the next 10 years (Nellis AFB, 2023i).

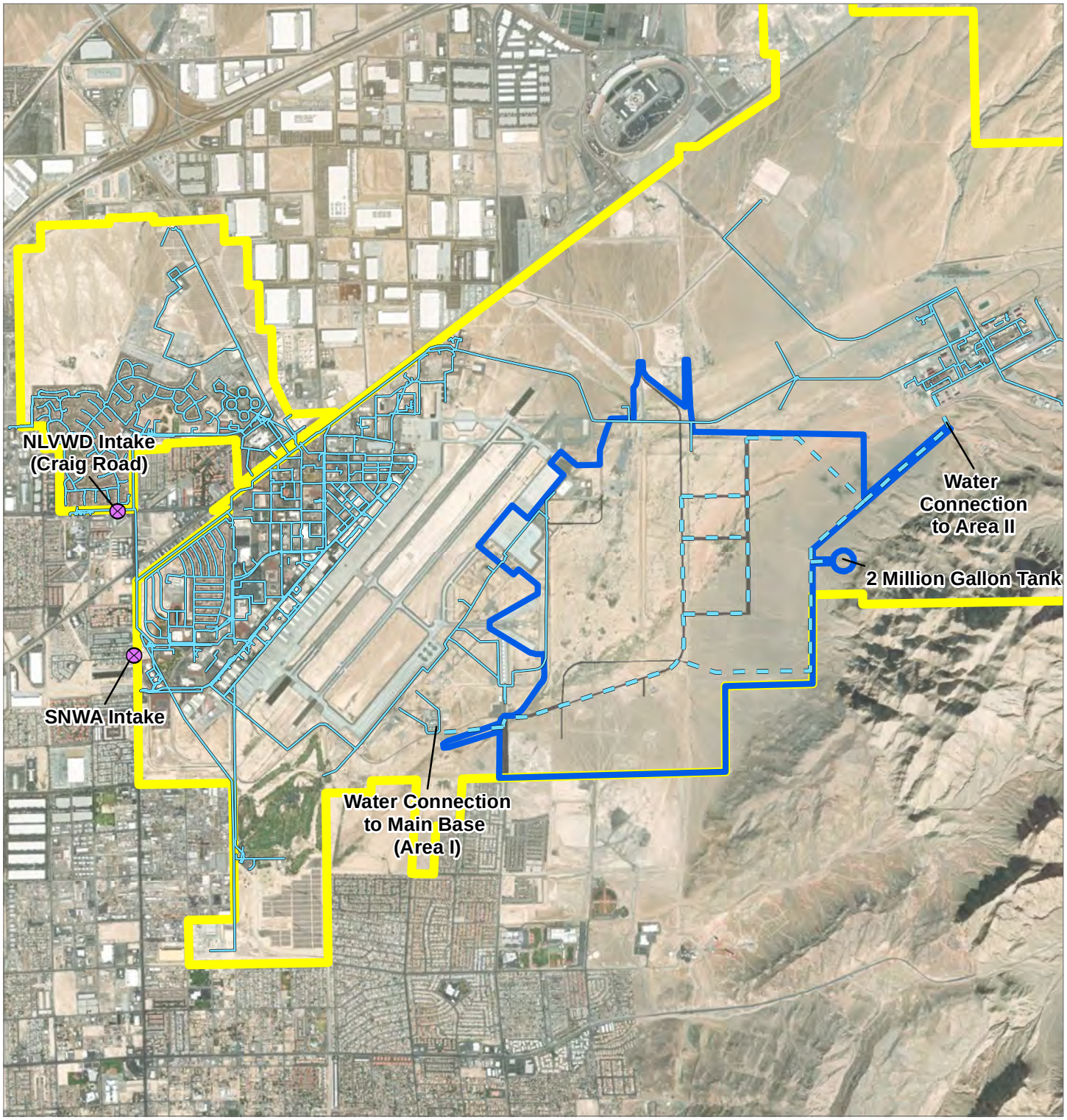


FIGURE 3-31
Proposed Potable Water System – Alternative 1

Existing Potable Water Main Line
Proposed Potable Water Line
Alternative 1
Installation Boundary
Transporation (Proposed)

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

Development occurring under Alternative 1 would have the potential to further strain the long-term potable water availability on Nellis AFB. The Installation relies on a steady water supply from Lake Mead, a water source supporting Arizona, California, Nevada, and portions of Mexico. As a result of a long-term drought and climate change, Lake Mead has been reaching historic lows in water availability and could present implications to future water security for Nellis AFB. All future mission growth would consider climate impacts in relation to mission resiliency, redundancy, security, and water supply (Nellis AFB, 2020d). Therefore, although long-term, adverse impacts to the potable water supply would be anticipated to occur with implementation of Alternative 1, these impacts would not be considered significant.

Wastewater System

The wastewater system for the Proposed Action area would be constructed in the future as a separate system with a separate discharge point into the CCWRD Sloan Basin (Nellis AFB, 2023h); the system would not be connected to the existing wastewater system at Nellis AFB. As shown in **Figure 3-32**, development of the east side of the Installation would require approximately 25,000 linear feet of sewage piping to be constructed in the future under Alternative 1. Wastewater lines would be anticipated to run south under the Hollywood Gate to the CCWRD-owned lines under Hollywood Boulevard.

The future estimate of approximately 2,500 personnel would result in an estimated 300,000 gallons per day of wastewater, or 120 gallons per day per person (Nellis AFB, 2023i). Discussions with CCWRD included understandings that planned future development (separate from that of the Proposed Action) south of the Hollywood Gate may impact CCWRD-owned lift stations and that the current gravity mains outside of the fence may need to be upgraded for proper operation prior to the development of the east side of the Installation (Nellis AFB, 2023h). Further design would then be required to determine if lift stations are required to discharge wastewater under the Proposed Action after the proposed upgrades. Prior to construction of the Proposed Action, the DAF would submit civil improvement plans to CCWRD for review and approval when proposing to tie into, contribute flow to, or modify CCWRD sewer infrastructure. The CCWRD would conduct a review of the sewer infrastructure improvements, including review of the point of connection, to ensure capacity in the public connection system (CCWRD, 2025). Overall, changes in regional demand would be minimal and the wastewater treatment system would have the capacity required to meet increased demands under Alternative 1. Therefore, no significant adverse impacts to the wastewater system would be anticipated to occur with implementation of Alternative 1.

Stormwater Management System

Future development activities would result in the future creation of up to 1,480 acres of impervious surfaces and potential grading impacts on additional areas (see **Table 2-2**).

As shown in **Figure 3-33**, stormwater rate control would be managed within the Proposed Action area by the future construction of stormwater culverts, open-top flumes, and other stormwater management features per Nevada General Permit NVR100000. A stormwater detention facility in the southwest corner of the Proposed Action area would be necessary in the future to accommodate development of the east side of the installation. This basin would not store water between storm events and would be required to manage the increase in peak rate between each of the 1- through 100-year storm events. It is estimated that the basin would be 10 feet deep with a top area of approximately 20 acres. A future 14,000-linear foot flume would be constructed as a continuation of the existing flume previously constructed by CCRFCD. The flume would discharge to the proposed stormwater detention basin.

Any increase in impervious surface could result in an associated increase in stormwater runoff volume and intensity and total suspended particulates to nearby surface waters. However, the integration of low-impact development design concepts and stormwater management to maintain predevelopment runoff rates and volumes would further minimize potential adverse impacts. In addition, implementing low-impact development into the design of future projects would avoid or minimize conflicts with city, county, state, or federal regulations and prevent adversely affecting adjacent properties and/or the project area itself.

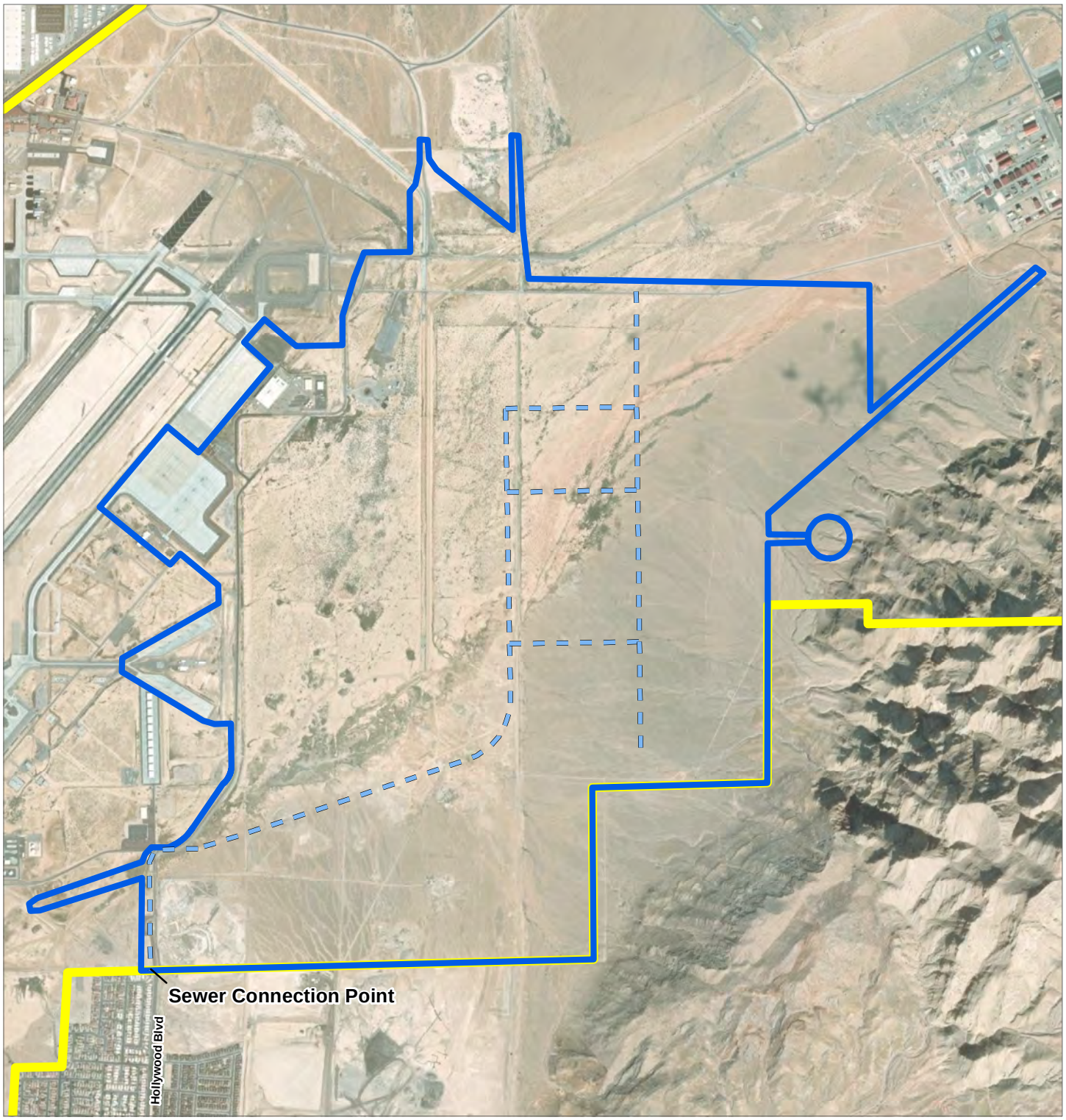
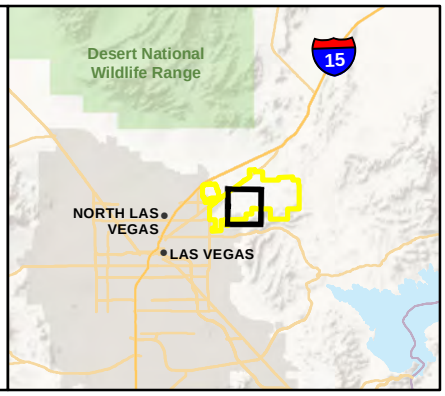


FIGURE 3-32
Proposed Wastewater System – Alternative 1

Proposed Wastewater Line
Alternative 1
Installation Boundary

N
0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



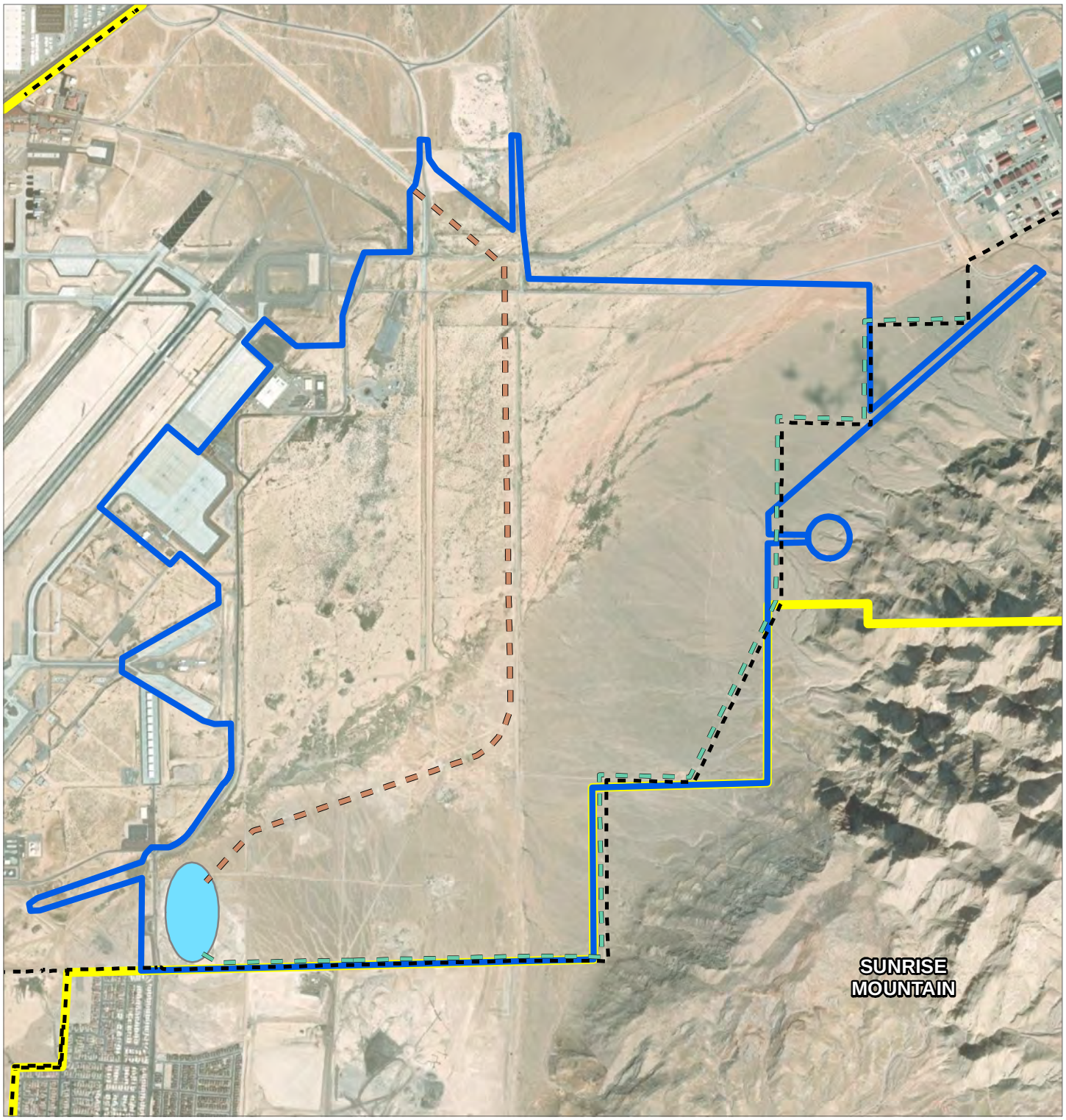


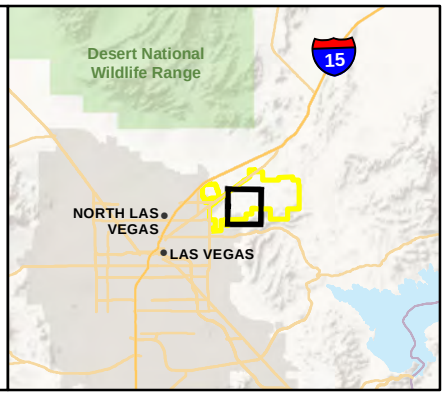
FIGURE 3-33
Proposed Stormwater Management System – Alternative 1

- Existing Fenceline
- Proposed Diversion Berm
- Proposed Flume
- Alternative 1
- Installation Boundary
- Proposed Stormwater Basin

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



All future facilities would be in compliance with the Nevada Multi-Sector General Permit (Industrial Stormwater Permit NVR05000) and associated SWPPP. Future construction of the stormwater infrastructure upgrades described above would ensure that adverse impacts to the stormwater management system would not be significant. Currently, stormwater funneled within the existing stormwater flume discharges to an undeveloped area in the center of the Proposed Action area. Continuation of the existing stormwater flume to the proposed stormwater detention basin could help to alleviate flooding of the flightline during major flood events, providing a long-term, beneficial impact.

Nellis AFB must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (General Permit Order NVR100000) prior to the construction of future projects. To obtain coverage, Nellis AFB would need to submit a Notice of Intent, SWPPP, other required documents, and permit fee to NDEP. Construction activities subject to this permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation.

Nellis AFB maintains an active *Bird/Wildlife Aircraft Strike Hazard (BASH) Plan* (Nellis AFB, 2016a), as required under DAFI 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program* (April 2023), that is continually updated to address any potential changes in conditions at Nellis AFB. The goal of the BASH plan is to reduce the likelihood of an aircraft colliding with a bird or other wildlife, thereby causing potentially catastrophic damage to the aircraft and pilots. Future stormwater practices would have the potential to increase the number of wildlife at the future stormwater detention basin and the stormwater flume during or after stormwater events. Future stormwater management facilities would not have permanent pools or be vegetated, which would reduce the likelihood of an increase in BASH incidents.

Additionally, stormwater diversion would be required due to flooding encountered from Sunrise Mountain, located to the east of the Installation. As shown in **Figure 3-33** above, a future reinforced berm within the fence line would be constructed to safely divert stormwater runoff from Sunrise Mountain around the Proposed Action area toward the future stormwater basin. The future stormwater infrastructure would convey flood flows from Sunrise Mountain in a controlled manner, providing safe passage for vehicles to cross Las Vegas Boulevard, Ellsworth Avenue, and Munitions Road without standing water, and provide improved flood security for Nellis AFB occupants, roadways, runways, and associated infrastructure. Accordingly, a long-term, beneficial impact to stormwater infrastructure would be anticipated to occur with implementation of Alternative 1.

Electrical System

Under Alternative 1, development would require construction of a future new electrical system, including a substation and main feeder lines, as shown in **Figure 3-34**. The increase in electrical demand for development within the Proposed Action area under Alternative 1 would be approximately 28 MVA. This number is 133 percent greater than the existing available Northgate substation unutilized capacity without taking any other possible mission growth into consideration. This excess demand would require the future installation of a new Nellis AFB-owned distribution South substation in the southeastern corner of the Proposed Action area; future construction of this substation would double the overall electrical capacity of the Installation to 80 MVA. The future infrastructure improvements would ensure that the electrical system would have the capacity required to meet new demands for development under Alternative 1; therefore, no significant adverse impacts to the electrical system would be anticipated to occur with implementation of Alternative 1.

Telecommunications System

Under Alternative 1, development would require construction of a future new telecommunications system, as shown in **Figure 3-35**. Future construction would include two new ITBs (ITB #1 and ITB #2) with a minimum 1,000-square-foot floor space with backup generators, new manholes, and handholes and approximately 85,000 linear feet of underground duct bank telecommunications infrastructure. The future data/communications fiber optic system would originate from existing ITBs B-1740 in Area I and B-10215 in Area II. These future infrastructure improvements would ensure that the telecommunications system would have the capacity required to meet new demands from development under Alternative 1; therefore, no significant adverse impacts to the telecommunications system would be anticipated to occur with implementation of Alternative 1.

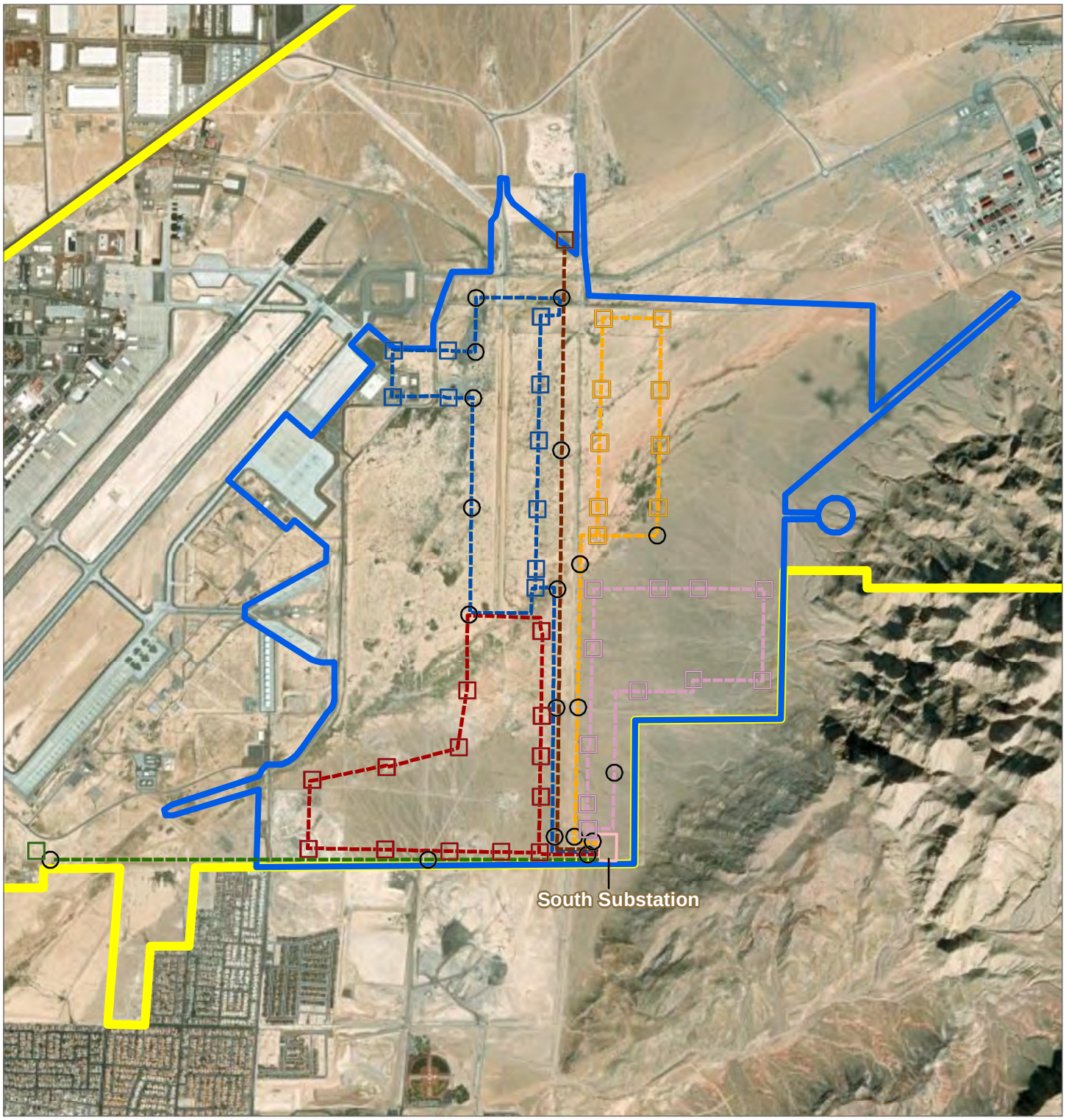


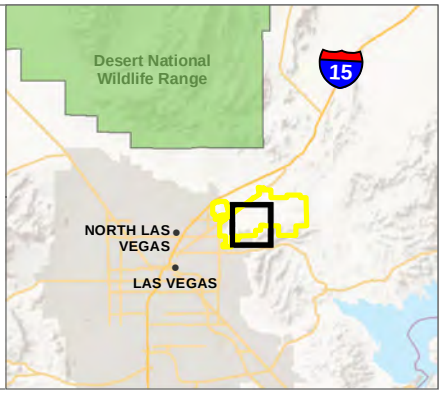
FIGURE 3-34
Medium Voltage Infrastructure Site Plan – Alternative 1

- Electrical Vault
- Double Sided VF1 Vacuum Fault Interupter Switchgear
- Feeder 11
- Feeder 12
- Feeder 13
- Feeder 14
- Feeder 15
- Feeder 16
- Alternative 1
- Installation Boundary

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



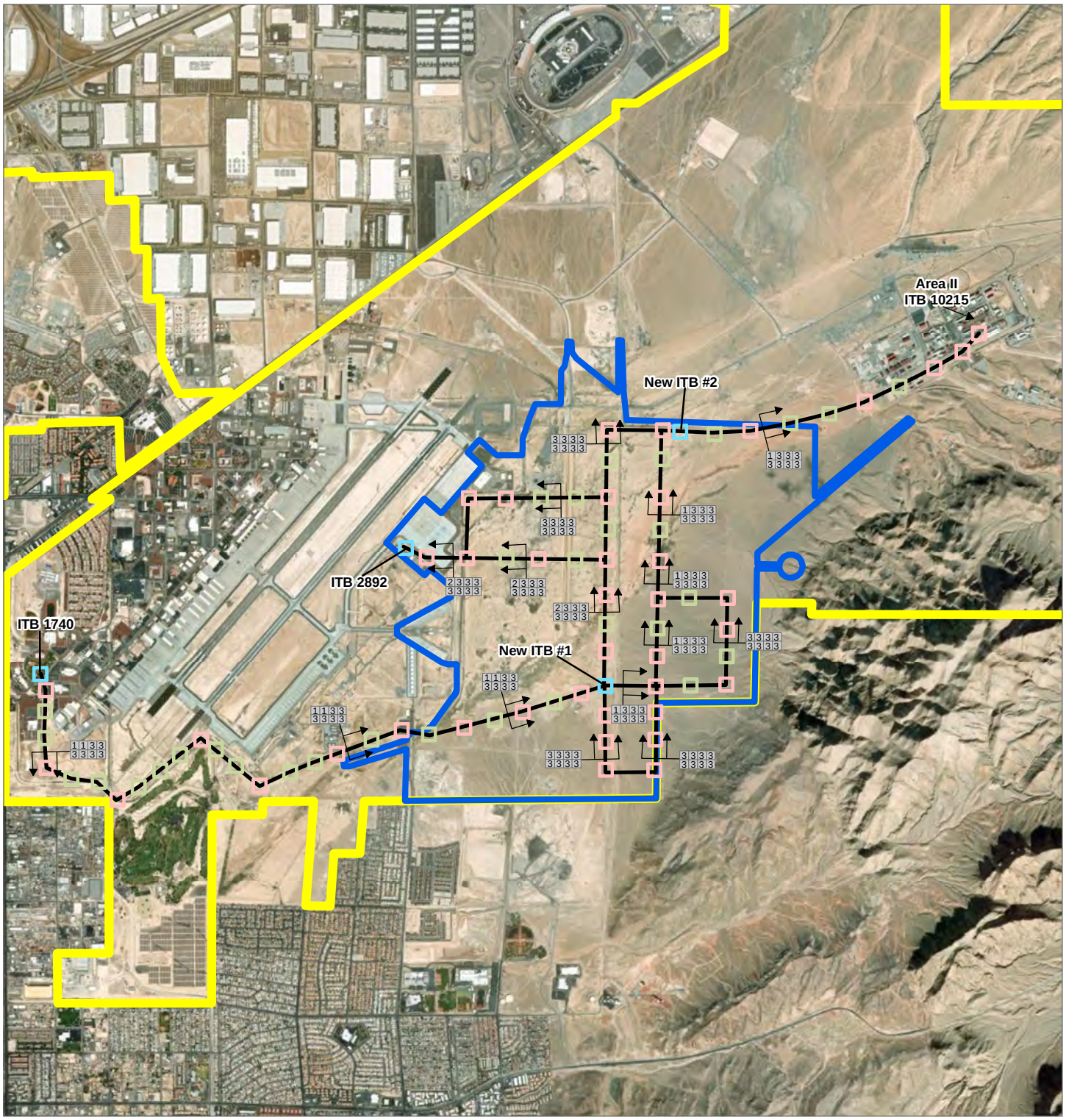


FIGURE 3-35
Communications Infrastructure Site Plan – Alternative 1

Natural Gas System

Under Alternative 1, development would require the future construction of a new natural gas system, including approximately 21,000 linear feet of natural gas lines, as shown in **Figure 3-36**; the existing distribution line within the Proposed Action area would be utilized for the proposed development (Nellis AFB, 2023k). A future natural gas system that is completely independent from the rest of the Installation would be constructed and would consist of 8-inch minimum HDPE tubing installed under the roadway.

Natural gas demand for the Proposed Action area would be anticipated to increase by a peak of approximately 1.6 trillion British thermal units (BTU), assuming the whole year is run at peak demand, which is an approximate 1-percent increase over existing natural gas demand of 152 trillion BTU in 2022. This increase is based on peak natural gas loads estimated at a peak demand of 192 million BTU per hour based on approximately 3.8 million square feet of building, a heating peak rate of 32 BTU per hour per square feet, and a water heating rate of 20 BTU per hour per square feet. Changes in demand would not be significant and the natural gas supply system would have the capacity required to meet new demands under Alternative 1; therefore, no significant adverse impacts to the natural gas system would be anticipated to occur with implementation of Alternative 1.

Hydrant Fuel System

Under Alternative 1, development would require construction of a future new hydrant fuel system, as shown in **Figure 3-37**. Future construction would include 11,000 linear feet of 8-inch steel fuel lines, and four 500,000-gallon (approximately 12,000-barrel each) tanks would be installed and connected to proposed flightline facilities for airframe use and interconnected with the existing system.

Hydrant fuel demand would be based on the number of airframes stationed at the Installation under future basing scenarios. Approximately 2 million gallons of new hydrant fuel storage for future airframes would be required, and all new tanks would be owned by Nellis AFB rather than leased (Nellis AFB, 2023). Infrastructure improvements would ensure that the hydrant fuel system would have the capacity required to meet new demands under Alternative 1; therefore, no significant adverse impacts to the hydrant fuel system would be anticipated to occur with implementation of Alternative 1.

Transportation System

As this document is analyzing a programmatic planning action for the east side development area, individual construction projects and the proposed increase in 2,500 personnel at Nellis AFB over the next 10 years are not part of the Proposed Action for this PEIS. Rather, individual construction projects and the increase in personnel are potential future actions to be covered under separate NEPA analysis. Prior to future proposed construction and personnel loading, a transportation analysis, to include queuing impacts, would be performed to identify potential impacts to the surrounding community and transportation system. In addition, the proposed roadways would require a complete street design and conformance with the compatible functions and planning standards as established in the Nellis AFB Installation Facility Standards outlined in AFI 32-1015, *Integrated Installation Planning*.

Traffic Projections

Under Alternative 1, development would require construction of future facilities to accommodate 1,500 additional personnel within the Proposed Action area. Housing and transportation are inextricably linked, and an increase in lodging/residential facilities would have the potential to change current traffic on the Installation. The anticipated growth in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same under Alternative 1, Alternative 2, and the No Action Alternative.

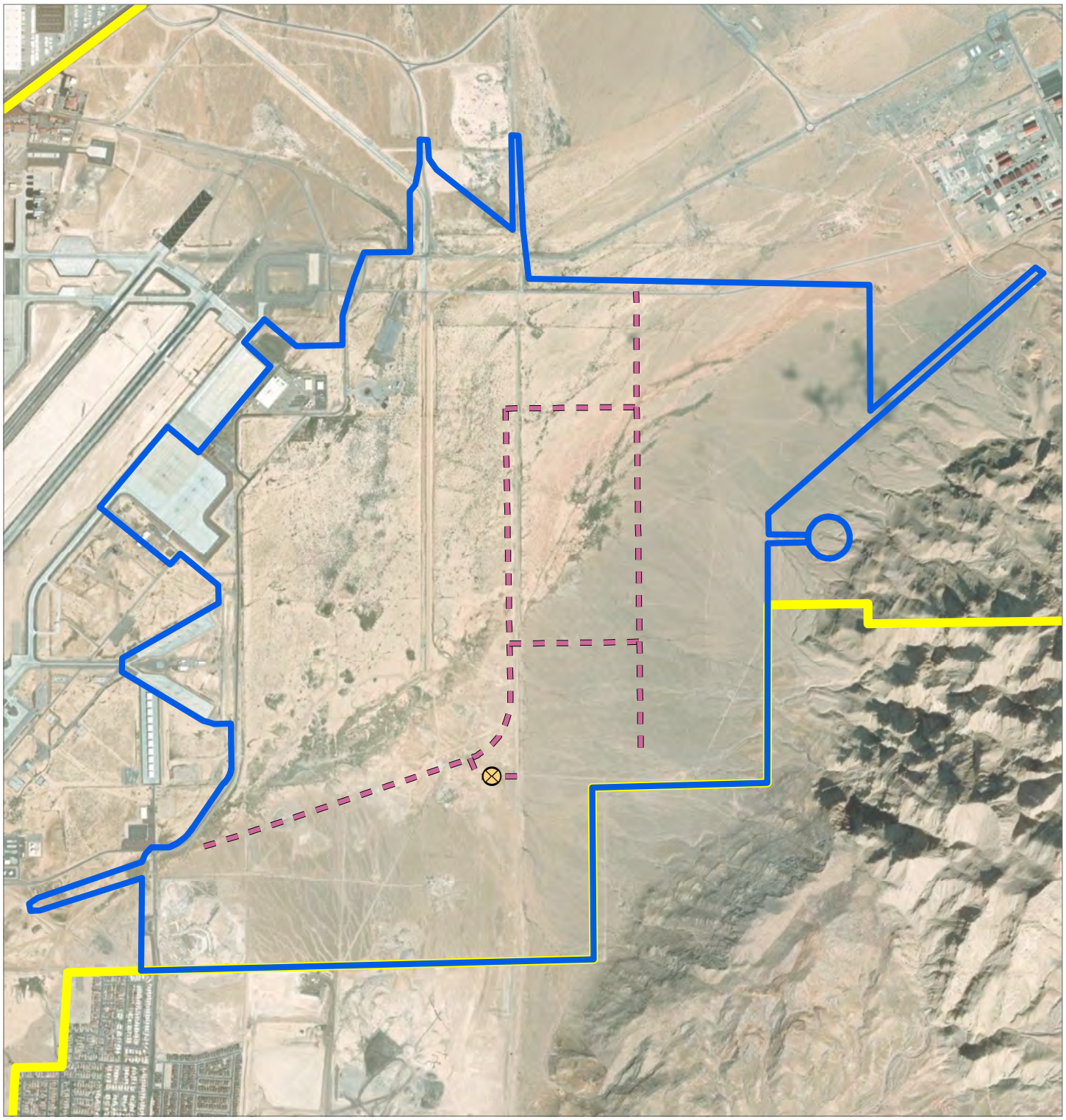


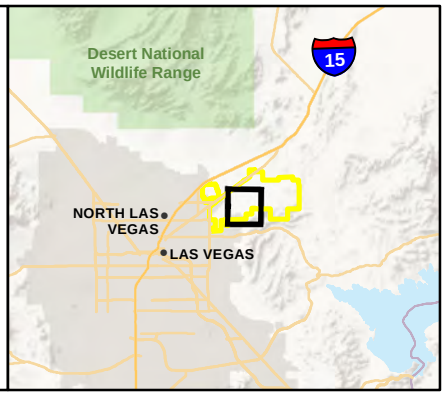
FIGURE 3-36
Proposed Natural Gas System – Alternative 1

Proposed Gas Meter
Proposed Natural Gas Line
Alternative 1
Installation Boundary

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



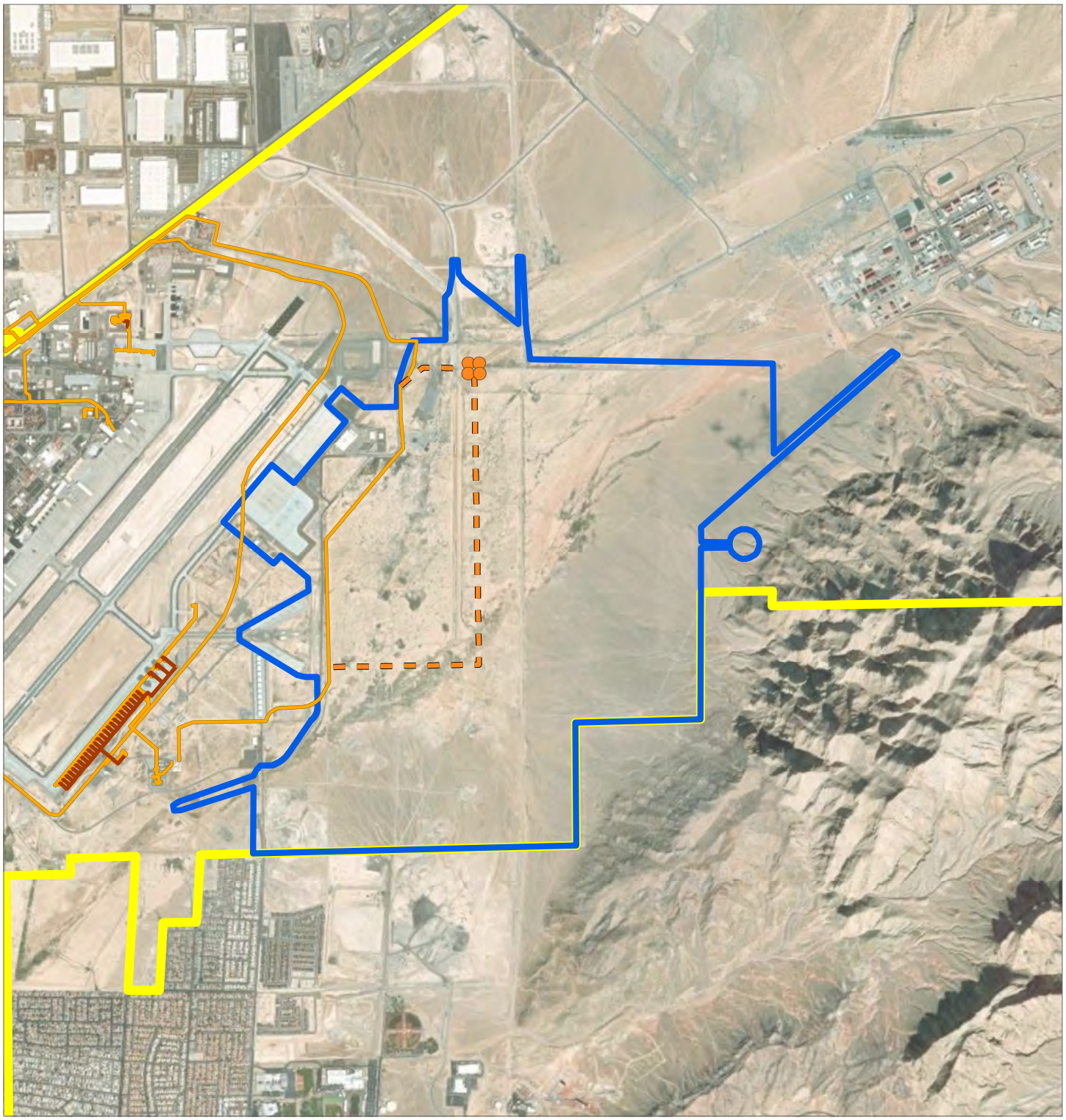


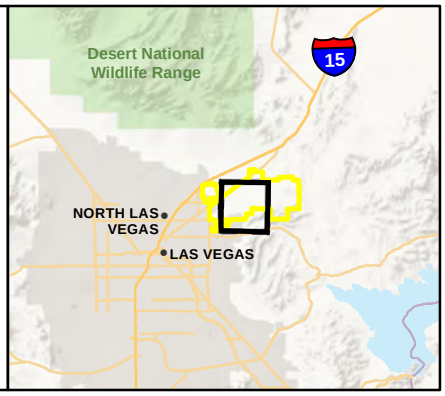
FIGURE 3-37
Proposed Hydrant Fuel System – Alternative 1

- Proposed Hydrant Fuel Tanks
- Proposed Aviation Fuel Line
- Existing Aviation Fuel Distribution Pipeline
- Alternative 1
- Defueling Line
- Installation Boundary

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



The LOS at existing intersections within Area I based on projected future growth in 2033, which would occur under the No Action Alternative, is reflected in **Table 3-40** (in **Section 3.12.2.5**).

Several locations would experience unacceptable LOS with future projected growth without improvements to the existing infrastructure. The TMP identified the following recommendations for intersection improvements (Nellis AFB, 2023h):

- Construct a roundabout at Washington Boulevard and Swabb Boulevard.
- Construct a roundabout at Washington Boulevard and Rickenbacker Road.
- Construct a roundabout at Washington Boulevard and Devlin Drive.
- Construct a roundabout at Washington Boulevard and Fitzerald Boulevard.

With the exception of the Ellsworth Avenue and Beale Avenue intersection and the Ellsworth Avenue and Fitzgerald Boulevard intersection, which were not addressed in the TMP, recommended improvements under Alternative 1 would increase the LOS to a C or better to accommodate the proposed growth. Therefore, a long-term, beneficial impact to transportation infrastructure would be anticipated to occur with implementation of Alternative 1.

Proposed Gate Access

Under Alternative 1, it is expected that up to 75 percent of the additional 2,500 personnel would live off the Installation, increasing the total gate volume across Nellis AFB by approximately 8 percent. This assumes personnel would access the Installation twice a day during the weekday (see **Appendix D** of this PEIS; note that this appendix was prepared prior to development of this PEIS. This transportation analysis reflects updated data relative to that information reflected in **Appendix D**). Actions described below are conceptual in nature only and would be analyzed under separate NEPA analyses in the future when design plans are available. Hollywood Gate would be the primary access gate for those personnel living on or working within the Proposed Action area. Hollywood Gate, which is currently closed, would re-open in the future and be reconstructed to current AT/FP standards, including future construction of two lanes to accommodate morning and evening peak hour traffic as identified in **Table 3-38**. It is assumed that some drivers who currently access the Installation through other gates would relocate to Hollywood Gate upon its reopening. Impacts to traffic at the gates were analyzed compared to the No Action Alternative (Nellis AFB, 2025) (see **Section 3.12.2.5**); no significant queuing impacts at the Nellis AFB gates (as shown in **Table 3-38**) would be expected under Alternative 1 with implementation of the proposed improvements, including future construction of Hollywood Gate. Traffic at the gates under Alternative 1 would be expected to improve when compared to the No Action Alternative (refer to **Table 3-40** in **Section 3.12.2.5**).

Prior to future construction of the proposed reopening of Hollywood Gate, a transportation study would be performed to identify potential impacts to the surrounding community and transportation system.

Proposed Roadway Infrastructure

Under Alternative 1, development would require future construction of a completely new transportation system to support the Proposed Action as follows and shown in **Figure 3-38**:

- The primary throughway for the Proposed Action area would be the future extension of Ellsworth Avenue from its current end at O'Bannon Road to Hollywood Boulevard. The future roadway would be a 2-lane, paved roadway with open drainage that would provide access to Area I. The proposed Ellsworth Avenue would provide access to Area II via O'Bannon Road and Munitions Road.
- Future east-to-west feeder roads connected to the extended Ellsworth Avenue would be constructed to provide access to the future development within the Proposed Action area.

It would be anticipated that the majority of the future roadways would be constructed with closed drainage systems and would include traffic calming based on the proposed design speed. The future roadways would require a complete street design and would need to conform to the compatible functions and planning standards as established in the Nellis AFB Installation Facility Standards outlined in AFI 32-1015, *Integrated Installation Planning*. Overall, the transportation infrastructure improvements would ensure that the

transportation system would have the capacity required to meet new demands; therefore, no significant adverse impacts to the transportation system would be anticipated to occur with implementation of Alternative 1.

Table 3-38
Alternative 1 Proposed Gate Counts and Queuing Impacts at Nellis AFB at an 8 Percent Growth Rate

Gate	Diversion to Hollywood Gate[a]	a.m. Peak Hour			p.m. Peak Hour		Queue Impact Comparison to No Action[b]
		Entry	Exit	Entry Analysis	Entry	Exit	
Area II Gate	5%	232	25	Pass	11	295	No change
Beale Gate	25%	546	141	Pass	138	612	Would improve operation
Main Gate	10%	597	215	Pass	228	734	Would improve operation
Simons Gate	25%	299	39	Pass	33	258	Would improve operation
Hollywood Gate	N/A	525	127	Pass	124	571	N/A
Totals (Includes 8% Growth)		**2,199**	**547**	**N/A**	**534**	**2,470**	**N/A**

Source: Nellis AFB, 2025
Pass = Queue space would accommodate vehicle queue.
Fail = Queue space would not accommodate vehicle queue, queue spilling into external intersection.
a Based on the existing number of people utilizing each gate and geography, the Main Gate diversion was estimated to be 10% versus 25% as it has a much higher utilization rate than the Beale Gate.
b Based on preliminary queuing analysis (Nellis AFB, 2025), impacts to traffic at the gates were analyzed compared to the No Action Alternative. Queuing is in reference to the line of cars waiting to proceed at each gate.
a.m. = morning; N/A = not applicable; p.m. = evening

Off-Installation Infrastructure

The four gates that currently allow access to Nellis AFB (Area II, Beale, Main, and Simons gates) are situated on high-traffic public roadways that terminate at the Installation gates or are utilized primarily for commercial and industrial traffic. It can be reasonably concluded that intersections outside of the Installation that lead to the four currently available gates would see an increase in traffic commensurate with their connecting gates. Hollywood Gate is currently closed; prior to construction of the proposed reopening of Hollywood Gate, a transportation study would be performed to identify potential impacts to the surrounding community and associated transportation systems.

Other Travel Modes

Assuming a percentage of the 2,500 estimated future personnel would travel by bicycle or carpool, the future intersection LOS and gate operations could improve and reduce the need for roadway mitigation. The Clark County Master Plan (Clark County, 2021) provides guidance for planned expansions to high-capacity transit lines and pedestrian and bicycle connections to Nellis AFB and nearby communities and surrounding areas. In addition, the Regional Transportation Commission of Southern Nevada's Bicycle and Pedestrian Plan (Regional Transportation Commission, 2017) supports proposed future shared-use path lanes serving neighborhoods adjacent to Nellis AFB. It is anticipated that an average of 10 percent of the proposed personnel may utilize alternative methods of transportation (e.g., bicycle, carpool, vanpool), which is considered a minor benefit to the transportation network in and around Nellis AFB. The most conservative scenario (no alternative modes of transportation) was used to capture all possible impacts.

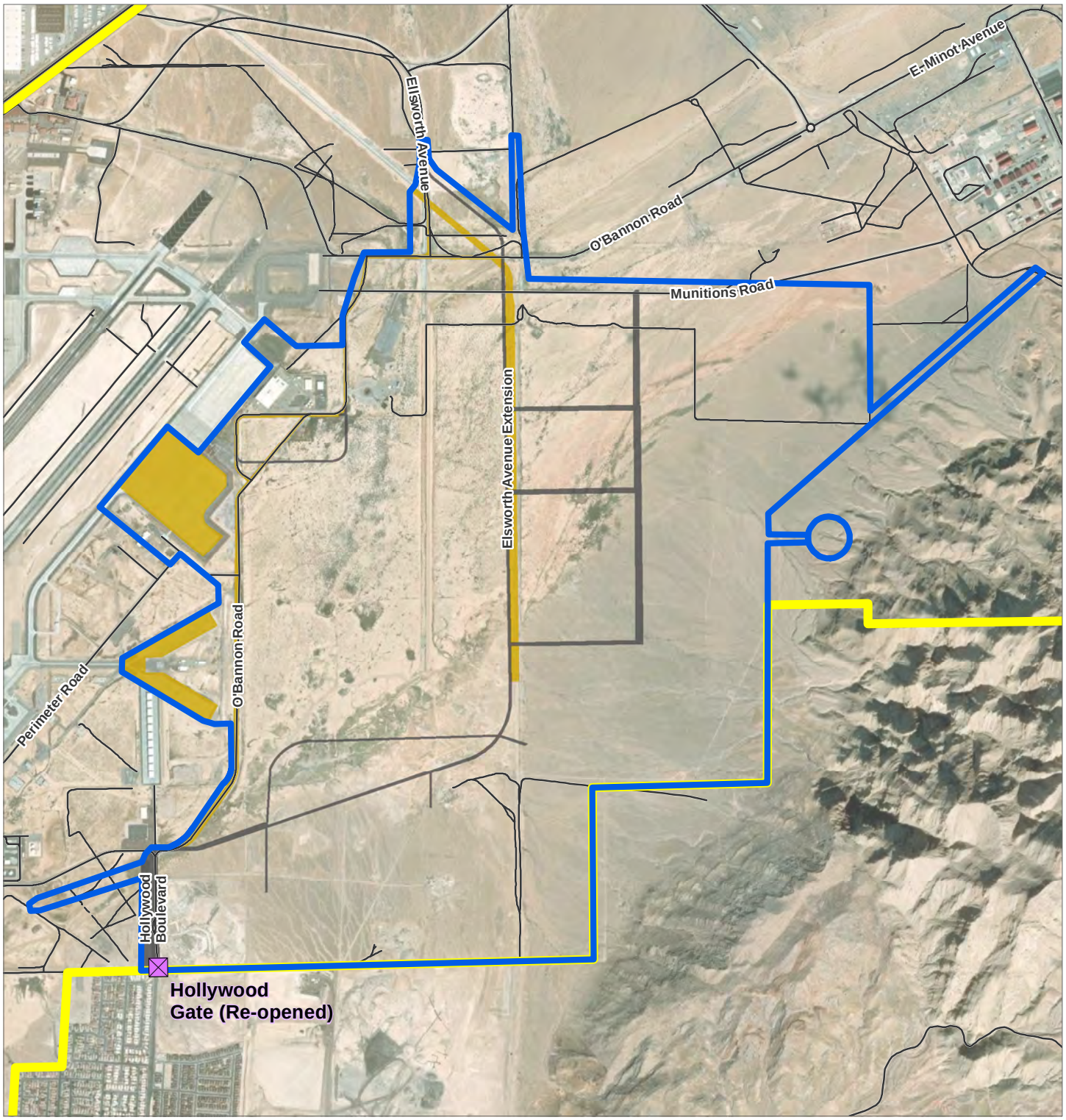


FIGURE 3-38
Proposed Transportation Network – Alternative 1

Entry Gate
Existing Base Road
Alternative 1
Installation Boundary
Existing Pavements
Transporation (Proposed)

N
0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

Construction Impacts

While impacts associated with future construction are not analyzed under this PEIS, future construction projects could result in short-term impacts to the local transportation network in and around Nellis AFB. The extra vehicles stationed during construction, including construction and concrete trucks and daily workers commuting into/out of the Installation, would increase traffic and reduce circulation, but the effects would be temporary. Future construction would require the development of a traffic control plan by the construction contractor.

3.12.2.4 Alternative 2

Potable Water System

As shown on **Figure 3-39**, it is anticipated that approximately 41,000 linear feet of future water main line would be required for development associated with Alternative 2. Since the potable water generation would be based on a per capita generation, the size of the lines would not be anticipated to differ from the Alternative 1 configuration. Long-term, adverse impacts to the potable water supply that would not be significant would be anticipated to occur with implementation of Alternative 2, albeit on a smaller scale because of the reduced development footprint.

Wastewater System

As shown on **Figure 3-40**, approximately 23,000 linear feet of sewage piping would be required for the future development proposed under Alternative 2, approximately 8 percent less than under Alternative 1. Since the sewage generation is based on a per capita generation, the size of the lines would not be anticipated to differ from the Alternative 1 configuration. Therefore, no significant adverse impacts to the wastewater system would be anticipated to occur with implementation of Alternative 2.

Stormwater Management System

As shown on **Figure 3-41**, stormwater infrastructure required for development under Alternative 2 would be the same as Alternative 1. The estimated increase in the amount of impervious surface under Alternative 2 would be 1,216 acres, 18 percent less impervious surface than Alternative 1. Therefore, a long-term, beneficial impact to stormwater infrastructure would be anticipated to occur with implementation of Alternative 2.

Electrical System

As shown on **Figure 3-42**, up to 2.4 million square feet of future development would occur under Alternative 2. This would result in an additional demand of 24 megawatts, 15 percent less than Alternative 1. Electrical infrastructure upgrades required for development under Alternative 2 would be the same as those described under Alternative 1, including the installation of a new, 40-megawatt Nellis AFB-owned electrical distribution South substation in the southeastern corner of the Proposed Action Area and medium voltage distribution infrastructure throughout the functional areas. Therefore, no significant adverse impacts to the electrical system would be anticipated to occur with implementation of Alternative 2.

Telecommunications System

As shown on **Figure 3-43**, approximately 2.4 million square feet of future development would occur under Alternative 2. To support this growth, future construction of one new communications hub and approximately 70,000 linear feet of underground duct bank telecommunications infrastructure pathways would be required, 20 percent less than under Alternative 1. Therefore, no significant adverse impacts to the telecommunications system would be anticipated to occur with implementation of Alternative 2.

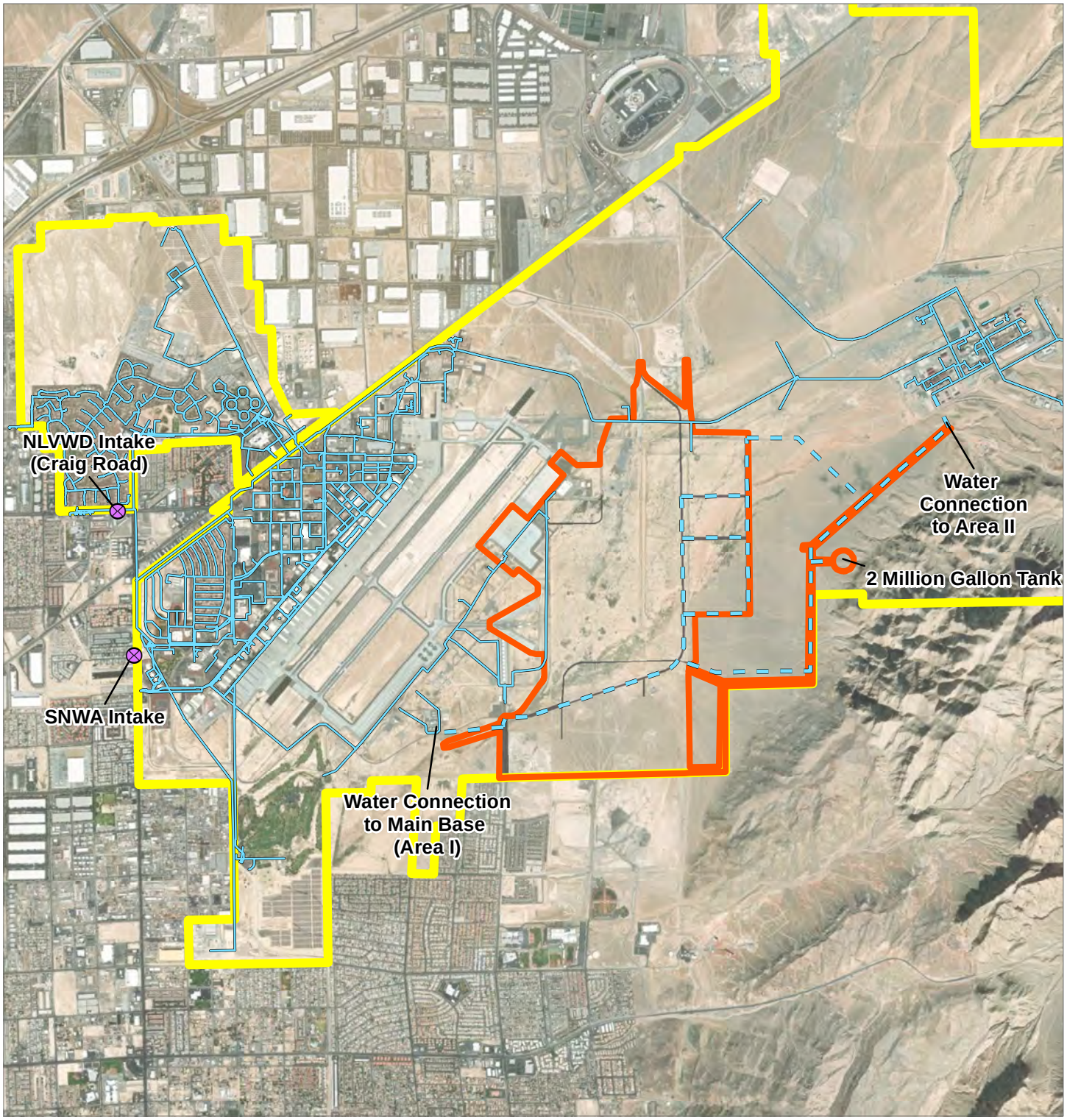


FIGURE 3-39
Proposed Potable Water System – Alternative 2

Existing Potable Water Main Line
Proposed Potable Water Line
Alternative 2
Installation Boundary
Transporation (Proposed)

N
0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

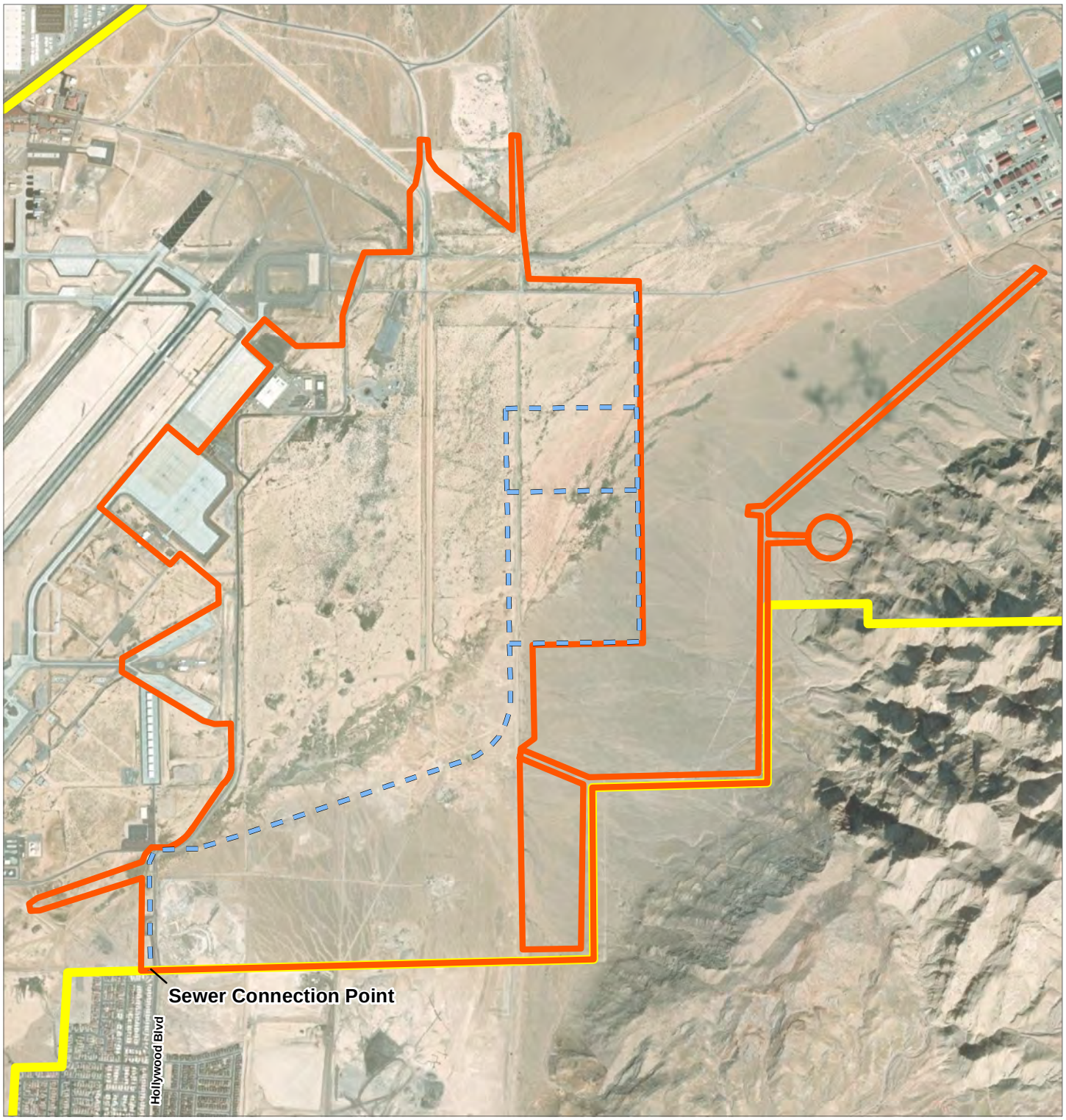
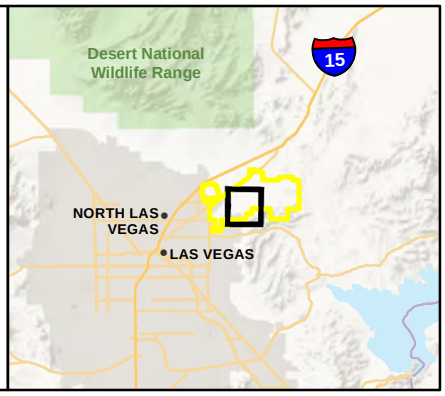


FIGURE 3-40
Proposed Wastewater System – Alternative 2

Proposed Wastewater Line
Alternative 2
Installation Boundary

N
0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



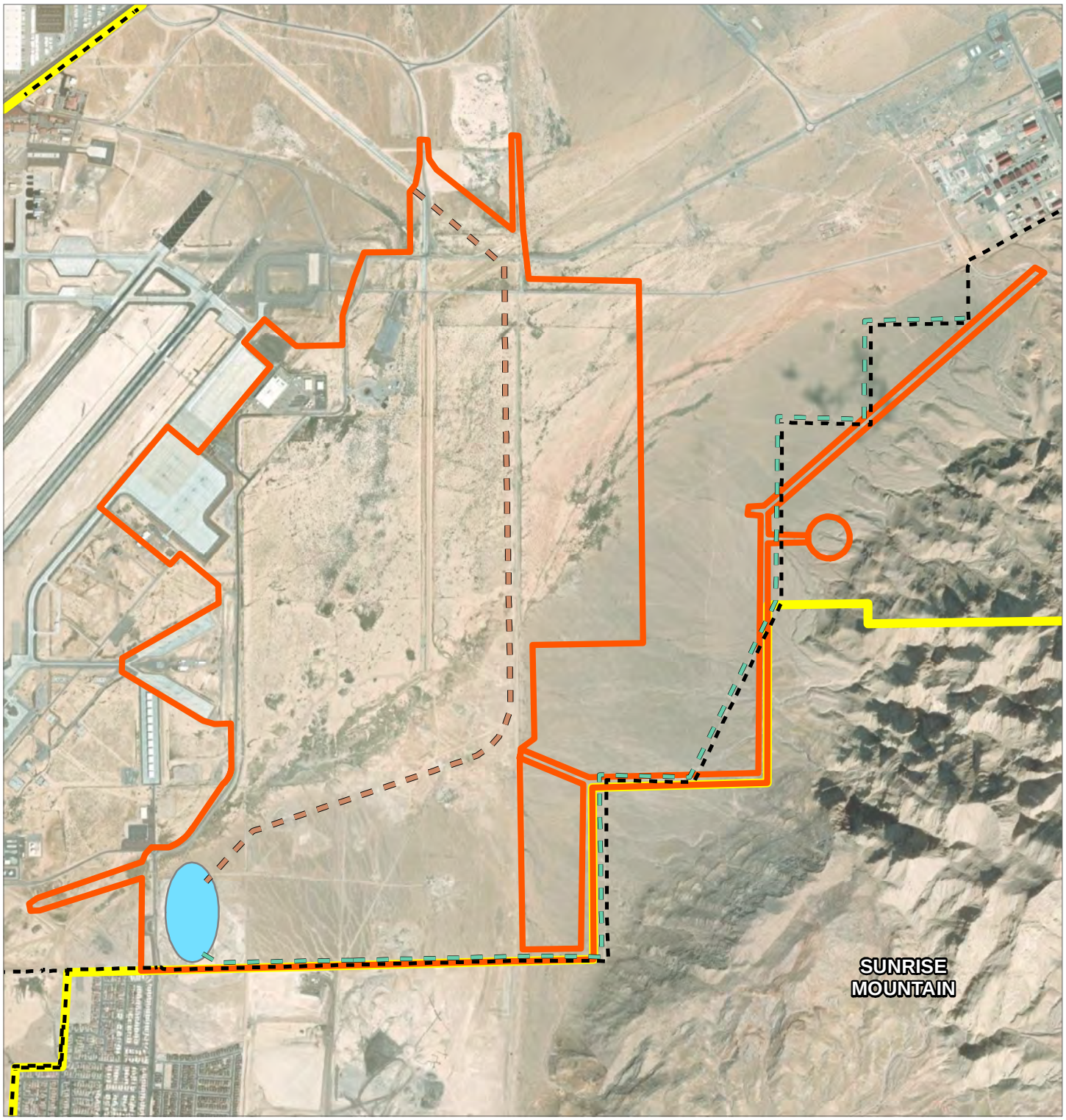


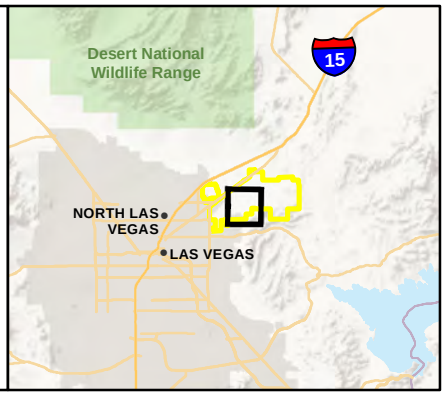
FIGURE 3-41
Proposed Stormwater Management System – Alternative 2

- Existing Fenceline
- Proposed Diversion Berm
- Proposed Flume
- Alternative 2
- Installation Boundary
- Proposed Stormwater Basin

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



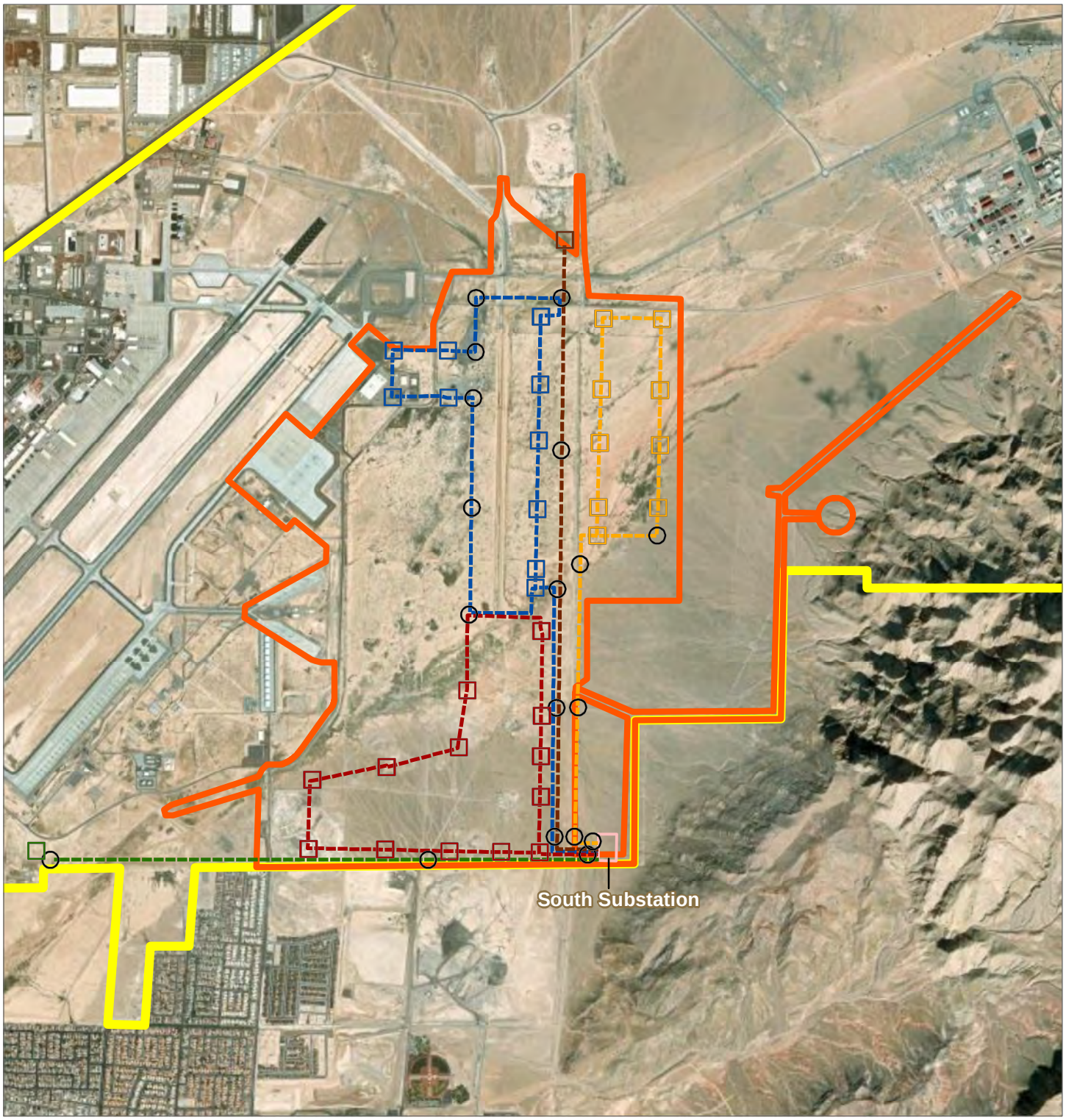


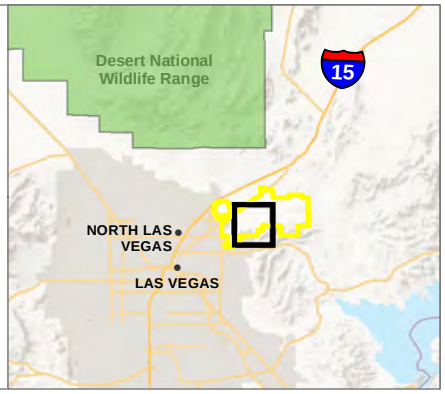
FIGURE 3-42
Medium Voltage Infrastructure Site Plan – Alternative 2

- Electrical Vault
- Double Sided VF1 Vacuum Fault Interupter Switchgear
- Feeder 12
- Feeder 13
- Feeder 14
- Feeder 15
- Feeder 16
- Alternative 2
- Installation Boundary

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



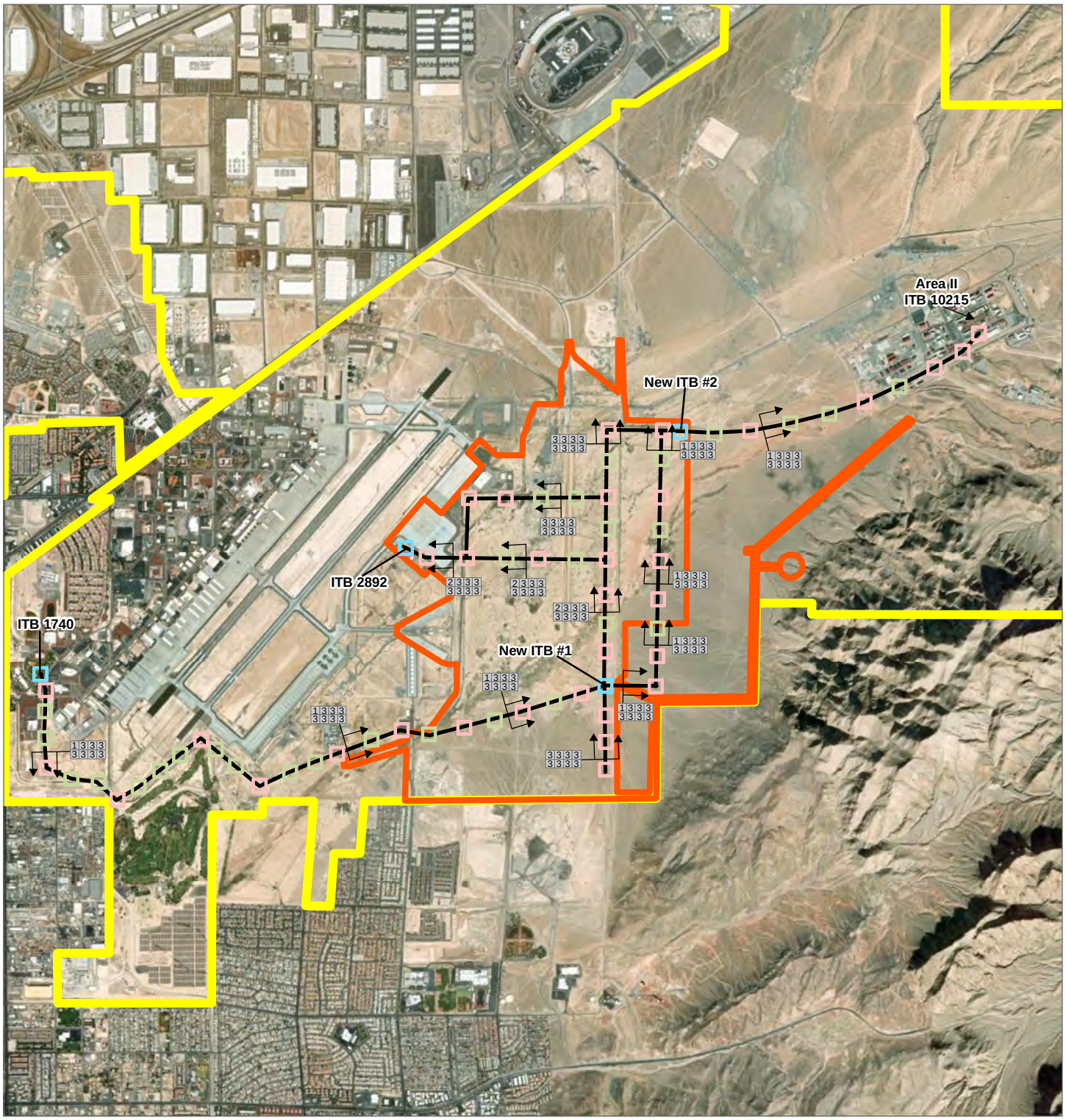


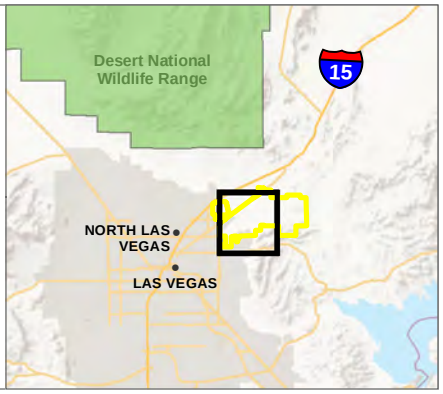
FIGURE 3-43
Communications Infrastructure Site Plan – Alternative 2

- Communications Handhole
- Communications Manhole
- Information Transfer Building (ITB)
- Duct Line
- Alternative 2
- Installation Boundary

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



Natural Gas System

As shown on **Figure 3-44,** natural gas demand for the Alternative 2 development area would increase by approximately 1.1 trillion BTU, assuming the whole year is run at peak demand, which is an approximate 0.7-percent increase compared to existing natural gas demand of 152 trillion BTU in 2022. This increase is based on peak natural gas loads estimated at a peak demand of 192 million BTU/H based on approximately 2.4 million ft^2, 40 percent less than Alternative 1. Approximately 19,500 linear feet of future natural gas lines of 8-inch minimum HDPE tubing would be installed under the roadway, approximately 7-percent less than Alternative 1. Therefore, no significant adverse impacts to the natural gas system would be anticipated to occur with implementation of Alternative 2.

Hydrant Fuel System

As shown on **Figure 3-45,** hydrant fuel infrastructure required for development under Alternative 2 would be the same as Alternative 1. Therefore, no significant adverse impacts to the hydrant fuel system would be anticipated to occur with implementation of Alternative 2.

Transportation System

As this document is analyzing a programmatic planning action for the east side development area, individual construction projects and the potential future increase of 2,500 personnel at Nellis AFB over the next 10 years are not part of the Proposed Action for this PEIS. Rather, individual construction projects and the increase in personnel are potential future actions to be covered under separate NEPA analysis. Prior to future proposed construction and personnel loading, a transportation analysis, to include queuing impacts, would be performed to identify potential impacts to the surrounding community and transportation system. In addition, the proposed roadways would require a complete street design and conformance with the compatible functions and planning standards as established in the Nellis AFB Installation Facility Standards outlined in AFI 32-1015, *Integrated Installation Planning*.

As shown on **Figure 3-46,** transportation improvements, including roadways, required for development under Alternative 2 would be the same as Alternative 1, albeit on a smaller scale. The anticipated growth in the number of military and civilian personnel who live and work on the Installation over the next decade would remain the same as under Alternative 1. However, under Alternative 2, all 2,500 additional personnel would be assumed to live off the Installation, as no new lodging facilities would be constructed; therefore, total gate volume would increase by 10 percent. It is assumed that up to 10 percent of the trips on and off the Installation would eventually divert to Hollywood Gate with construction of two lanes to accommodate potential growth. Alternative 2 would have an increase in traffic at morning and evening peak hours when compared to Alternative 1 due to the increase in traffic volume at Installation gates. However, improvements to the transportation infrastructure system under Alternative 2 would be anticipated to maintain an acceptable LOS and no significant adverse impacts to transportation infrastructure would occur with implementation of Alternative 2.

While impacts associated with future construction are not analyzed under this PEIS, future construction projects could result in short-term impacts to the local transportation network in and around Nellis AFB. The extra vehicles stationed during construction, including construction and concrete trucks and daily workers commuting into/out of the Installation, would increase traffic and reduce circulation, but the effects would be temporary. Future construction would require the development of a traffic control plan by the construction contractor.

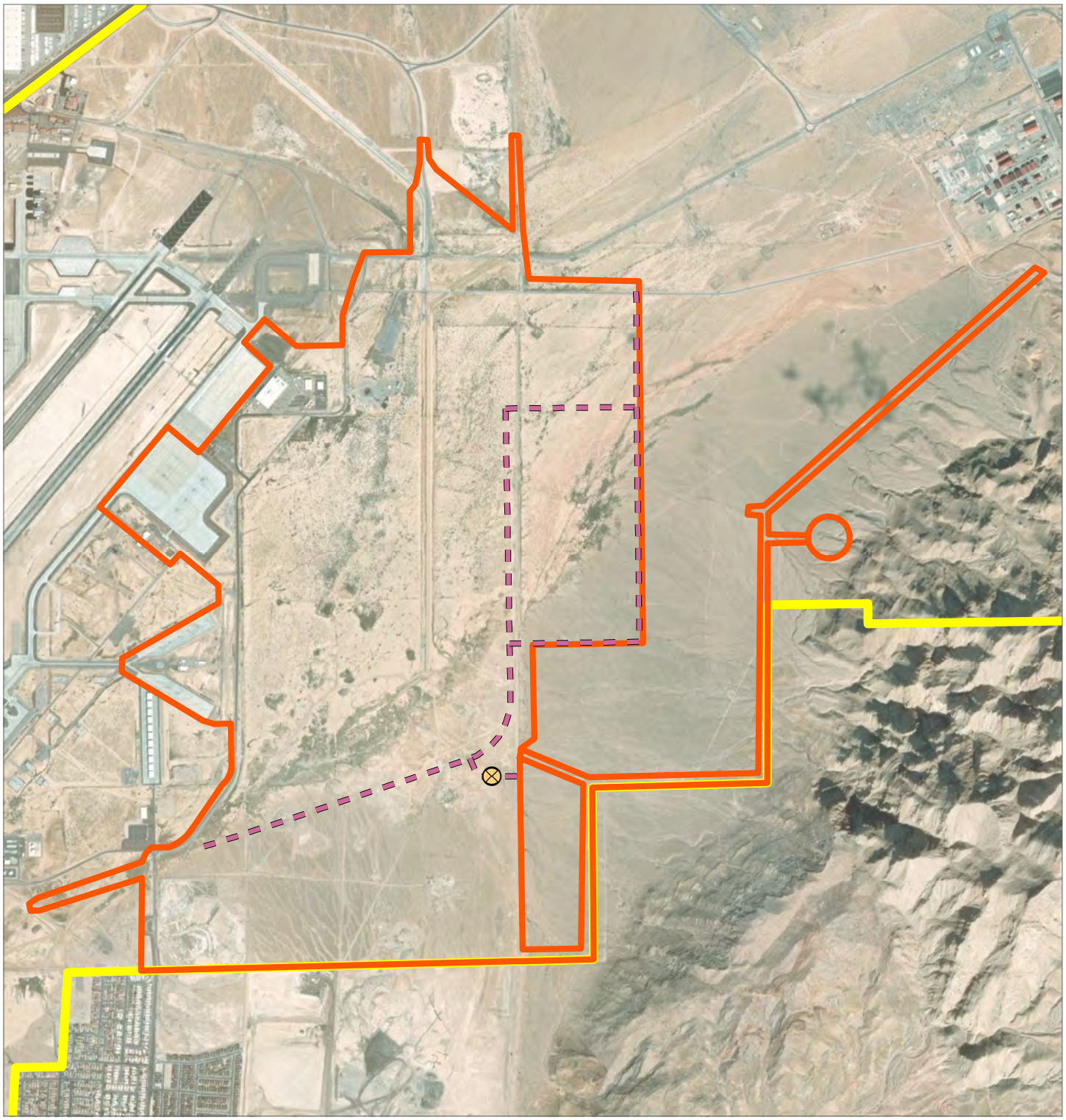


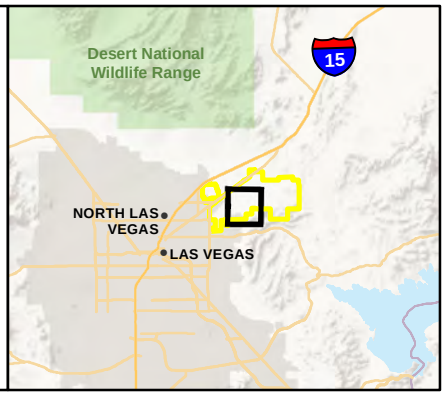
FIGURE 3-44
Proposed Natural Gas System – Alternative 2

Proposed Gas Meter
Proposed Natural Gas Line
Alternative 2
Installation Boundary

N

0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



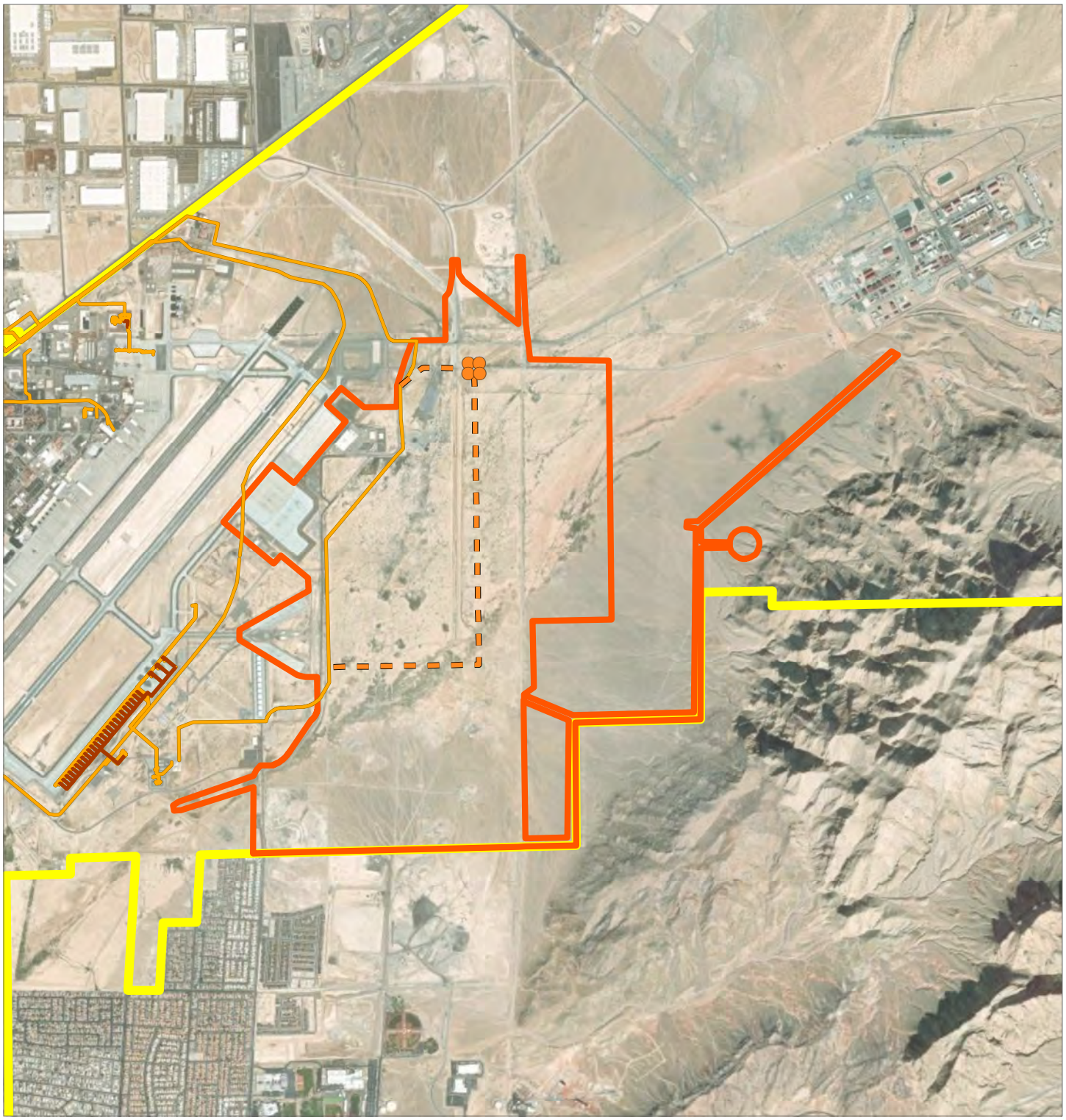


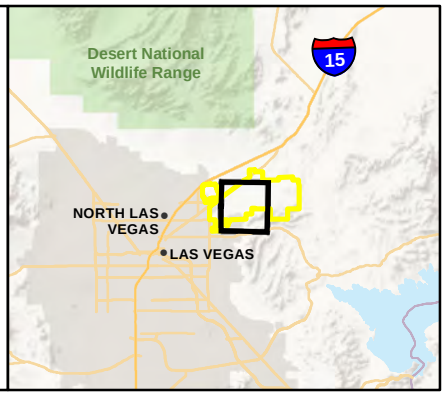
FIGURE 3-45
Proposed Hydrant Fuel System – Alternative 2

- Proposed Hydrant Fuel Tanks
- Proposed Aviation Fuel Line
- Existing Aviation Fuel Distribution Pipeline
- Alternative 2
- Defueling Line
- Installation Boundary

N

0 0.5 1 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



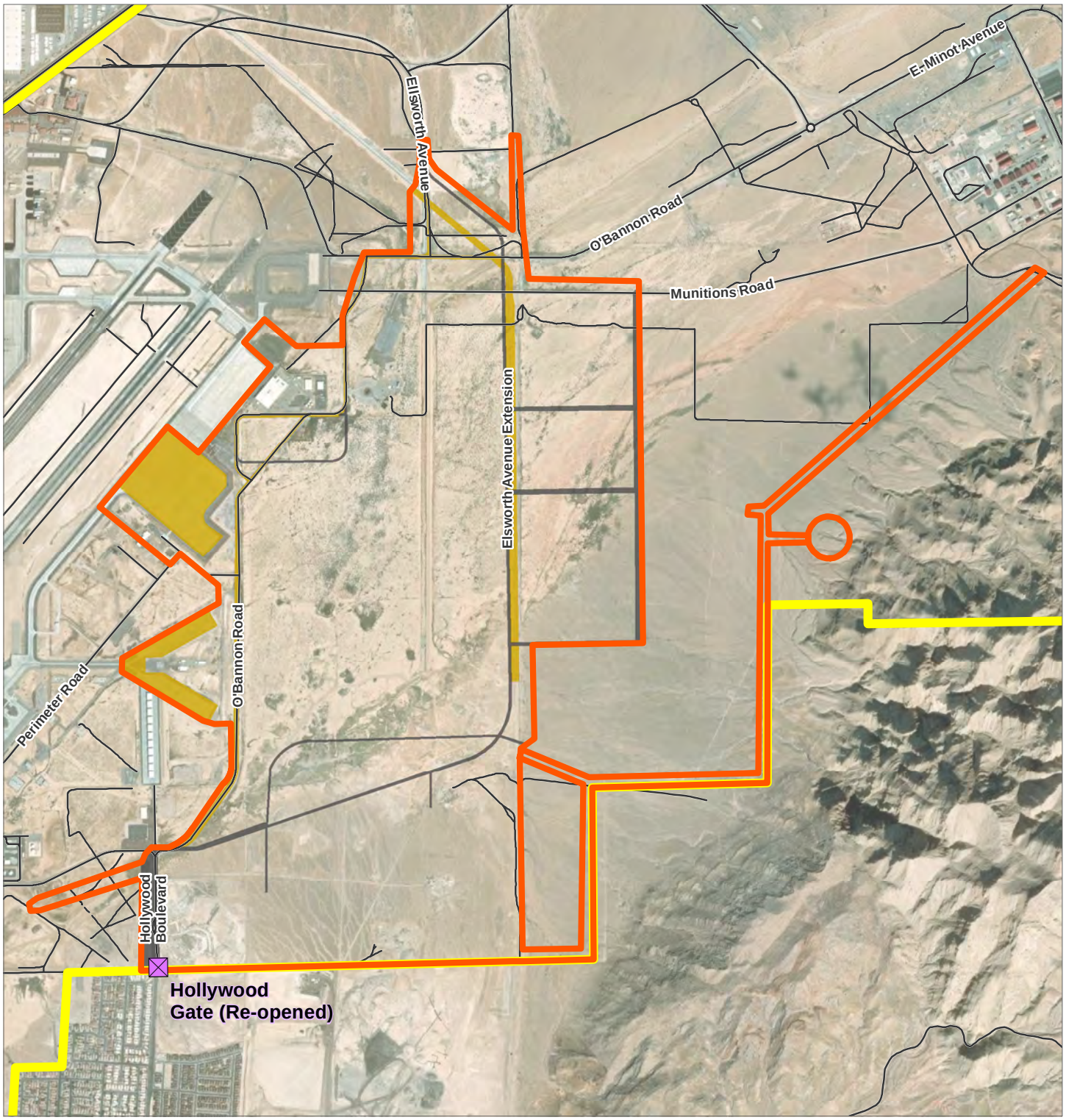


FIGURE 3-46
Proposed Transportation Network – Alternative 2

Entry Gate
Existing Base Road
Alternative 2
Installation Boundary
Existing Pavements
Transporation (Proposed)

N
0 0.25 0.5 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

Alternative 2 would have an increase in traffic at a.m. and p.m. peak hours when compared to Alternative 1. **Table 3-39** shows the expected vehicle counts at each gate under Alternative 2. Impacts to traffic at the gates were analyzed compared to the No Action Alternative (Nellis AFB, 2025) (see **Section 3.12.2.5**); no significant queuing impacts at the gates (as shown in **Table 3-39**) would be expected under Alternative 2 with implementation of future improvements, including construction of Hollywood Gate. Traffic at the gates under Alternative 2 would be expected to improve when compared to the No Action Alternative (**Table 3-40**).

Table 3-39
Alternative 2 Proposed Gate Counts and Queuing Impacts at Nellis AFB at a 10-Percent Growth Rate

Gate	Diversion to Hollywood Gate[a]	a.m. Peak Hour			p.m. Peak Hour		Queue Impact Comparison to No Action[b]
		Entry	Exit	Entry Analysis	Entry	Exit	
Area II Gate	5%	231	25	Pass	10	295	No change
Beale Gate	25%	546	140	Pass	138	611	Would improve operation
Main Gate	10%	597	214	Pass	228	734	Would improve operation
Simons Gate	25%	299	38	Pass	33	258	Would improve operation
Hollywood Gate	N/A	565	136	Pass	133	616	N/A
Total (Includes 10% Growth)		**2,238**	**553**	**N/A**	**542**	**2,514**	**N/A**
Change from Alternative 1		**39**	**6**	**N/A**	**8**	**44**	**N/A**

Source: Nellis AFB, 2025
Pass = Queue space would accommodate vehicle queue.
Fail = Queue space would not accommodate vehicle queue, queue spilling into external intersection.
a Based on the existing number of people utilizing each gate and geography, the Main Gate diversion was estimated to be 10% versus 25% as it has a much higher utilization rate than the Beale Gate.
b Based on preliminary queuing analysis (Nellis AFB, 2025), impacts to traffic at the gates were analyzed compared to the No Action Alternative. Queuing is in reference to the line of cars waiting to proceed at each gate.
a.m. = morning; N/A = not applicable; p.m. = evening

3.12.2.5 No Action Alternative

Under the No Action Alternative, proposed development of the east side of Nellis AFB would not occur. There would be no changes to utilities or infrastructure improvements in the ROI beyond baseline conditions. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and missions continue to grow. Beneficial impacts from stormwater infrastructure improvements would not occur under the No Action Alternative.

Table 3-40 shows the LOS at existing intersections within Area I with projected future growth in 2033. Several locations would experience unacceptable LOS with future projected growth under the No Action Alternative.

Additionally, the Hollywood Gate would continue to remain closed. **Table 3-41** shows the expected vehicle counts at each gate under the No Action Alternative. The volume of traffic at the gate entrances would continue to increase in relation to the 10 percent increase in personnel and the existing four gates would continue to be inadequate to support anticipated growth.

Table 3-40
Expected LOS with 10-Percent Growth at Intersections within the Main Base (Area I) at Nellis AFB (2023)

#	Intersection	a.m. Peak Hour	p.m. Peak Hour	2033 Improvements[a] a.m. Peak Hour/ p.m. Peak Hour
1	Washington Boulevard & Swaab Boulevard	B	E	A/C
2	Washington Boulevard & Devlin Drive	B	C	A/B
3	Washington Boulevard & Rickenbacker Road	B	C	A/A
4	Rickenbacker Road & Duffer Drive	B	C	B/C
5	Kinley Avenue & Duffer Drive	B	B	B/B
6	Kinley Avenue &Tyndall Avenue	A	A	A/A
7	Tyndall Avenue & Duffer Drive	A	A	A/A
8	Tyndall Avenue & Griffis Avenue	A	A	A/A
9	Ellsworth Avenue & Devlin Road	A	A	A/A
10	Ellsworth Avenue & Fitzgerald Boulevard	D	B	D/B
11	Ellsworth Avenue & Beale Avenue	E	E	E/E
12	Swaab Boulevard & Duffer Drive	A	A	A/A
13	Washington Boulevard & Fitzgerald Boulevard	C	F	C/B
14	O'Bannon Road & Minot Drive	A	A	A/A

Source: Nellis AFB, 2023n
a This column represents the LOS after the intersection improvements identified in the 2023 TMP are constructed.
a.m. = morning; LOS = level of service; p.m. = evening

Table 3-41
No Action Alternative Proposed Gate Counts and Queuing Impacts at Nellis AFB at a 10 Percent Growth Rate

Gate	Diversion to Hollywood Gate*	a.m. Peak Hour			p.m. Peak Hour	
		Entry	Exit	Entry Analysis	Entry	Exit
Area II Gate	0%	269	29	Pass	12	341
Beale Gate	0%	801	206	Fail	202	897
Main Gate	0%	730	262	Fail	279	897
Simons Gate	0%	438	56	Fail	49	379
Total (Includes 10% Growth)		**2,238**	**553**	**N/A**	**542**	**2,514**
Change from Existing Conditions		**205**	**51**	**N/A**	**50**	**230**

Source: Nellis AFB, 2025
Pass = Queue space would accommodate vehicle queue
Fail = Queue space would not accommodate vehicle queue, queue spilling into external intersection
a.m. = morning; N/A = not applicable; p.m. = evening

Under the No Action Alternative, demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.12.2.6 Cumulative Effects

Implementation of the Proposed Action would be anticipated to increase the demand for transportation and utilities at Nellis AFB but would also result in long-term, beneficial impacts to infrastructure, including transportation and utilities, as a result of future infrastructure improvements. The projects identified in **Table 3-2** would result in an overall increase in the demand for utilities that service the ROI—i.e., Nellis AFB and the surrounding communities.

The TASS beddown, Nellis Aggressor beddown, Nellis IDP projects, Nellis CSTR, and CCA EOU beddown projects would result in long-term, adverse impacts related to the overall increase in demand for utilities. However, several identified past, present, and reasonably foreseeable projects would address existing infrastructure deficiencies and result in beneficial impacts to infrastructure. The I-15/CC-215 Northern Beltway Interchange Project in North Las Vegas would design new flyovers and street connections to complete a system-to-system interchange configuration where the northern I-15 meets the Clark County 215 Las Vegas Beltway. The SR 160 Widening Project would widen a 6-mile stretch of SR 160 from Mile Marker 16.3 to Mile Marker 22 from two to four lanes in Clark County. The US 95 Northwest Corridor Improvements Project in Las Vegas would bridge the transportation gap in northwest Las Vegas with the substantial completion of the US 95/CC 215 interchange, also known as the Centennial Bowl. The Stewart Avenue Complete Streets Project would improve the Stewart Avenue Corridor from 6th Street to Nellis Boulevard with bus stop improvements and amenities as well as improvements to cyclist and pedestrian infrastructure.

The Nellis Reclaimed Waterline Project created a new pipeline between the CNLV-WRF and the Sunrise Vista Golf Course to deliver non-potable reclaimed water for irrigation, resulting in beneficial impacts to wastewater infrastructure. The CCRFCD project proposes an expansion of existing flood control infrastructure located in the southwestern portion of the Installation. The expansion is currently under consideration and expected to begin design no sooner than 2028. Under the proposed expansion, the existing north/south stormwater drain would be connected to an expanded flood control basin, resulting in beneficial, cumulative impacts to stormwater infrastructure.

Cumulative infrastructure impacts that would be anticipated to occur include potential increases in energy use, water consumption, and wastewater generation. The demands on facilities and utilities (potable water, wastewater, stormwater, electrical, telecommunications, natural gas, hydrant fuel, and transportation) of the projects listed in **Table 3-2**, in combination with the demands from the Proposed Action, would be accommodated by the existing infrastructure and proposed infrastructure upgrades of the Proposed Action. Furthermore, other cumulative projects on Nellis AFB would add improvements throughout the ROI, including the updating and addition of facilities or infrastructure, which would generally improve the condition, efficacy, and lifespan of the infrastructure. Specifically, the Proposed Action would include improvements to stormwater infrastructure such as construction of a stormwater detention basin and stormwater flume. Cumulative impacts to infrastructure would not be significant.

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, no significant, adverse cumulative effects to infrastructure would be anticipated to occur with implementation of the Proposed Action.

3.12.2.7 Other Considerations Under NEPA

Development under the Proposed Action would involve the permanent allocation of energy resources, for an extended period, thus making them unavailable for other uses. Building or expanding facilities to support future mission requirements would require a permanent allocation of resources, including land and materials. Once constructed, these facilities would be dedicated to supporting the operations of Nellis AFB. Although land and materials would be made unavailable for other uses, these impacts would not be considered significant as the resources associated with the Proposed Action are designated for this particular use.

3.12.3 Resource-Specific Mitigation Measures and Best Management Practices

To prolong the availability and use of potable water at Nellis AFB, the following measures are considered mitigation measures for the Proposed Action area to decrease potable water demand:

- Ensure future landscaping design is water efficient.
- Ensure low-flow plumbing fixtures are integrated into the design of the new facilities.
- Eliminate potable water for outdoor use/irrigation.

- Curtail waste by minimizing unrecoverable potable water losses:
  - termination of the Area II flushing system with a future looped system that would connect the existing water supply lines from Areas I and II
  - implementation of hardening strategies for the water distribution system, including a deeper burial of distribution pipes
  - improving the overall management of the distribution system by future installation of a Supervisory Control and Data Acquisition system.

To reduce potential impacts to water quality, all ground-disturbing activities at Nellis AFB must comply with the current USEPA Construction Stormwater General Permit. BMPs must be consistent with applicable stormwater management manuals or guidance. Standard erosion control measures to prevent stormwater pollution would be implemented during future construction activities to minimize soil disturbance and prevent erosion and sedimentation at the work site.

Under EISA Section 438, federal agencies are required to reduce stormwater runoff from federal development and redevelopment projects to protect water resources. Low-impact development and other long-term stormwater management features would require continued maintenance, which would be addressed in the installation's SWPPP. Federally required design principles, such as UFC 1-200-02, *High Performance and Sustainable Building Requirements*; UFC 3-210-10, *Low Impact Development*; and Section 438 of the EISA would be followed and require project sites to maintain or restore disturbed sites to preconstruction hydrologic conditions.

To minimize potential impacts associated with erosion, runoff, and sedimentation, BMPs identified in a site-specific SWPPP, to be prepared in compliance with the Construction General Permit, would be implemented during and following the future construction period. These measures could include straw bales, sandbags, silt fencing, earthen berms, tarps or water spraying, soil stabilization, temporary sedimentation basins, and re-vegetation with native plant species, where possible, to decrease erosion and sedimentation. Following future construction, disturbed areas not covered with impervious surface could be reestablished with appropriate vegetation and native seed mixtures and managed to minimize future erosion potential. The future construction activities could temporarily impact the quality of stormwater runoff. However, implementation of appropriate standard construction practices, preventative maintenance, and periodic inspections and sampling to detect risk to stormwater, especially during active construction activity, would minimize these potential impacts.

3.13 SAFETY AND OCCUPATIONAL HEALTH

3.13.1 Affected Environment

3.13.1.1 Definition of the Resource

Ground Safety

Ground safety considers issues associated with ground operations and maintenance activities that support unit operations within and near the airfield. Ground safety also considers the safety of personnel and facilities on the ground that may be placed at risk from flight operations in the vicinity of the airfield and in the airspace. CZs and APZs around the airfield restrict the public's exposure to areas where there is a higher accident potential. Although ground and flight safety are addressed separately, in the immediate vicinity of the runway, risks associated with safety-of-flight issues are interrelated with ground safety concerns.

Foreign object damage (FOD) refers to any damage to an aircraft engine, aircraft system, component, tire, munitions, or support equipment caused by a foreign object, which is any particle or substance alien to an aircraft or system. External FOD hazards include BASH, hail, ice, sandstorms, or objects left on a runway or flight deck. Aircraft jet engines can suffer major damage from small objects such as rocks and other debris if those items are sucked into the engine.

Explosives Safety

Explosives safety relates to the management and safe use of ordnance and munitions. Explosives safety also applies to ensuring there is an adequate safety buffer zone between explosive, ordnance, and munitions storage and hazard areas and the on- and off-Installation populated areas.

Flight Safety

Flight safety considers aircraft flight risks such as midair collision, BASH, and in-flight emergencies. The DAF has safety procedures and aircraft-specific emergency procedures produced by the original equipment manufacturer of the aircraft. Basic airmanship procedures also exist for handling any deviations to air traffic control procedures due to an in-flight emergency; these procedures are defined in Volume 3 of AFMAN 11-202, *General Flight Rules (Supplement)* (June 2021), and established aircraft flight manuals defined in AFPD 11-2, *Aircraft Operations* (January 2019).

Construction Safety

Construction safety is largely a matter of adherence to regulatory requirements for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. Safety and accident hazards can often be identified and reduced or eliminated. Construction site safety risks on or near an airfield can include issues associated with transportation; construction, maintenance, and repair activities; mishaps from equipment; and being exposed to extremely noisy environments.

The health and safety of onsite military and civilian workers are safeguarded by numerous DoD and DAF regulations designed to comply with OSHA and USEPA standards. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits in the workplace. Under 32 CFR § 989.27, the EIAP for an action must assess direct and indirect impacts of the Proposed Action and Alternatives on the safety and health of DAF employees and others at a work site.

3.13.1.2 Region of Influence

The ROI includes Nellis AFB and areas immediately adjacent to the Installation.

3.13.1.3 Ground Safety

The safety of the public with respect to aircraft operations at Nellis AFB is a primary concern for the DAF. The areas surrounding Nellis AFB have established AICUZ guidelines to define those areas with the highest potential for aircraft accidents and aircraft noise impacts, and to establish flight rules and flight patterns that would minimize safety and noise impacts on the civilian population of Las Vegas and North Las Vegas. With regard to potential aircraft accidents, CZs and APZs have been established to identify the areas with the greatest risk for aircraft accidents and to guide off-Installation development away from these higher-risk areas.

As shown in **Figure 3-47**, airfield CZs extend approximately 3,000 ft from the end of each runway and are completely contained within Nellis AFB. APZ I is an extension of the CZ; it is approximately 4,000 ft wide and 5,000 ft long (i.e., extends 8,000 ft from the end of the runway). APZ II retains the width of 4,000 ft but extends another 7,000 ft from the end of APZ I. The greatest potential for aircraft accidents occurs within the CZ; risks are reduced as distances from the runway increase. Thus, the potential for aircraft accidents is considered less in APZ I than the CZ and less in APZ II than APZ I. While aircraft accident potential within APZ I and APZ II, which are mostly located off-Installation, does not warrant land acquisition by the DAF, land use planning and controls are strongly encouraged in these areas for the protection of the public (Nellis AFB, 2017b). There are 5.41 acres of CZs and 4.98 acres of APZ I in the Proposed Action area (**Figure 3-47**).

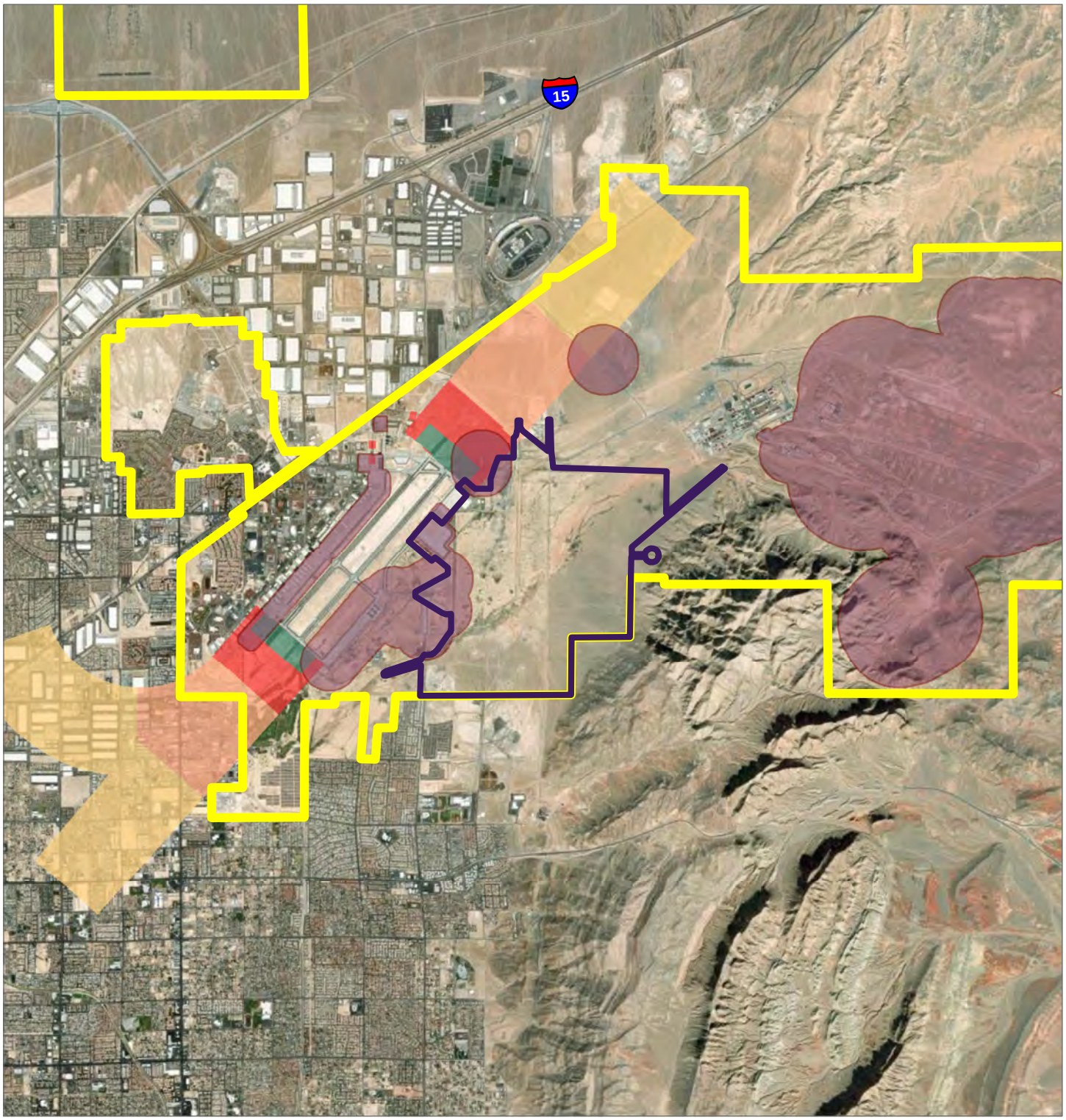


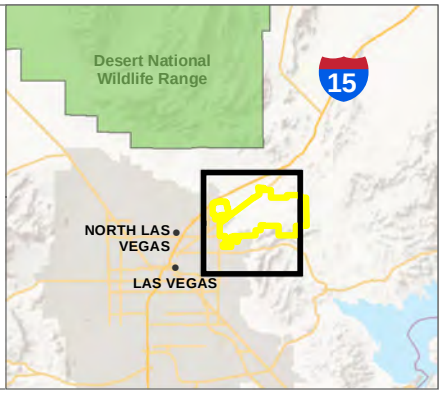
FIGURE 3-47
Safety

- Installation Boundary
- Proposed Action Area
- APZ I
- APZ II
- CZ
- ESQD Arc
- Graded Area

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



3.13.1.4 Explosives Safety

There are several explosive safety zones on Nellis AFB, including within and near the Proposed Action area. These explosive safety zones are associated with the MSA, LOLAs, and hot cargo and arm/de-arm pads (Nellis AFB, 2018a).

ESQD arcs provide a buffer between potentially hazardous areas and both on- and off-Installation populated areas. Defined distances are maintained between MSAs, LOLAs, and a variety of other types of facilities. These distances, called ESQD arcs, are determined by the type and quantity of explosive material to be stored. Each explosive material storage or handling facility has ESQD arcs extending outward from its sides and corners for a prescribed distance. Within these ESQD arcs, development is either restricted or prohibited altogether to ensure personnel safety and to minimize potential for damage to other facilities in the event of an accident.

Approximately 214 acres of ESQD arcs are located within the western and northwestern portions of the Proposed Action area (see **Figure 3-47**). Each of the ESQD arcs extends approximately 0.5 mile into the Proposed Action area.

3.13.1.5 Flight Safety

Nellis AFB maintains an active BASH plan, as required under DAFI 91-212. This plan is continually updated to address any potential changes in conditions at Nellis AFB. The goal of the BASH plan is to reduce the likelihood of an aircraft colliding with a bird or other wildlife, thereby causing potentially catastrophic damage to the aircraft or potentially the loss of life of the pilot from the damage. BASH avoidance measures include notices to pilots of bird activity within the area, seasonal notifications during bird migrations, and wildlife management within the airfield environment. Nellis AFB has minor BASH issues from resident and migratory bird species. Nellis AFB and its vicinity do not include migratory corridors or areas supporting major concentrations of birds. Sunrise Mountain and Frenchman's Peak protect Nellis AFB from the major bird attractants in the area, such as Lake Mead. Over the past 5 years, Nellis has averaged 16.6 BASH incidents per year. Nellis AFB reported a total of 24 BASH incidents in FY 2021, 9 incidents in FY 2022, and 14 incidents in FY 2023. The majority of BASH incidents reported on Nellis AFB involve small animals (less than 3.9 ounces), such as bats or perching birds (Nellis AFB, 2024c).

The safety of the public with respect to aircraft operations at Nellis AFB is a primary concern for the DAF. The areas surrounding Nellis AFB have established AICUZ guidelines to define those areas with the highest potential for aircraft accidents and aircraft noise impacts and to establish flight rules and flight patterns that would have the least impacts on the civilian population of the surrounding areas with regard to safety effects.

3.13.1.6 Construction Safety

All construction contractors at Nellis AFB must follow ground safety regulations and worker's compensation programs to avoid posing any risks to workers or personnel on- or off-Installation. Construction contractors are responsible for reviewing potentially hazardous workplace operations, monitoring exposure to workplace chemicals (e.g., asbestos, lead, HAZMAT), physical hazards (e.g., noise propagation, slips, trips, falls), and biological agents (e.g., infectious waste, wildlife, poisonous plants). Construction contractors are required to recommend and evaluate controls (e.g., preventative, administrative, engineering) to ensure that personnel are properly protected and to implement a medical surveillance program to perform occupational health physicals for those workers subject to any accidental chemical exposures.

Day-to-day operation and maintenance activities conducted at Nellis AFB are performed in accordance with applicable DAF safety regulations, published DAF Technical Orders, and standards prescribed by DAF occupational and environmental safety, fire protection, and health program requirements. These are intended to reduce occupational risks to government personnel and contractors and to protect other individuals that reside on, visit, or are near the Installation.

3.13.2 Environmental Consequences

3.13.2.1 Evaluation Criteria

Safety-related impacts from a proposed action are assessed according to the potential to increase or decrease safety risks to personnel, the public, property, or the environment. Adverse impacts related to safety would occur if the Proposed Action or Alternatives resulted in DAF and/or OSHA criteria being exceeded or the improper implementation of established or proposed safety measures, creating unacceptable safety risk to personnel. Adverse impacts would occur if the Proposed Action or Alternatives:

- substantially increased risks associated with the safety of construction personnel, contractors, military personnel, or the local community;
- substantially hindered the ability to respond to an emergency; or
- introduced a new health or safety risk for which the Installation is not prepared or does not have adequate management and response plans in place.

3.13.2.2 Alternative 1

Ground Safety

Ground safety issues are associated with ground maintenance and operational activities for operations near the airfield. Ground safety would also consider the safety of personnel that can be at risk from flight operations around the airspace and airfield. CZs and APZs are areas of restriction around the airfield that limit access to areas that have a high potential for accidents. Future construction would not occur within the CZ and future construction within the APZ would be in compliance with existing guidance. Three portions of the CZ totaling 5.41 acres overlap the Proposed Action area and 4.98 acres of APZ I overlap the Proposed Action area.

Ground safety concerns also include potential FOD incidents that have the potential to damage aircraft, including aircraft engine and aircraft systems. External FOD hazards include BASH incidents, hail, ice, sandstorms, or objects left on a runway or flight deck. To minimize FOD and BASH occurrences, Nellis adheres to its BASH plan, as required under DAFI 91-212, *Bird/Wildlife Aircraft Strike Hazard (BASH) Management Program*, which may reduce the likelihood of an aircraft colliding with a bird or other wildlife. Avoidance measures to reduce BASH incidents include notices to pilots when there are indications of bird activity in the area and notification of migration patterns of birds (Nellis AFB, 2017b).

The Nellis AFB airfield is managed and monitored for potential FOD concerns as part of the FOD Prevention Program. From March 2019 to March 2024, Nellis AFB reported 39 preventable FOD incidents and 54 non-preventable FOD incidents that resulted in a total cost of approximately $3.9 million in required repairs (Nellis AFB). The Proposed Action area is mostly undeveloped and includes paved and unpaved transportation networks and utility corridors and several discarded aggregate debris piles, which are known to contain potential FOD materials.

Some future development activities under Alternative 1, including those associated with Airfield/Industrial/ Light Industrial functional uses, would take place in close proximity to the airfield. Debris associated with future construction of new facilities in this area would have the potential to create additional FOD hazards. Future construction activities would be conducted in accordance with the Nellis AFB FOD Prevention Program, which would help to prevent and minimize FOD incidents. Therefore, no significant impacts to ground safety would be anticipated to occur with implementation of Alternative 1. However, temporary, adverse impacts related to the potential increase for FOD incidents that would not be significant could occur with implementation of Alternative 1.

Explosives Safety

Future construction activities under Alternative 1 would comply with established ESQD arcs as defined by the DAF Guidance Memo to DESR 6055.09_AFMAN 91-201, *Explosive Safety Standards*. ESQD arcs

establish the minimum distance between sites that contain or handle explosive materials and specified exposures (e.g., storage and handling facilities, aircraft) (Nellis AFB, 2018a). No changes to existing ESQD arcs would be anticipated to occur with implementation of Alternative 1. Should future development occurring under Alternative 1 include facilities that handle explosive materials and specified exposures, new ESQD arcs would be established in compliance with DAF regulations. All storage and handling of munitions at Nellis AFB are carried out by trained and qualified Munitions Flight personnel and in accordance with DAF-approved technical orders; these activities would continue under the Proposed Action. Therefore, no impacts to explosives safety would be anticipated to occur with implementation of Alternative 1.

Flight Safety

The presence of construction equipment, materials, and workers in proximity to runways, taxiways, and airspace can create hazards such as FOD, visual obstructions, and changes in air traffic patterns. These factors can increase the likelihood of runway incursions, bird strikes, and other safety incidents that pose risks to aircraft operations. Furthermore, construction-related noise and vibrations may also affect pilots' concentration and communication with air traffic control, potentially compromising situational awareness and flight operations. To address these concerns, rigorous safety protocols, temporary flight restrictions, and communication protocols between construction teams and air traffic control are essential to minimize disruptions and ensure the continued safety and efficiency of flight operations.

The majority of future development proposed near the airfield would include Airfield Operations/Industrial/ Light Industrial functional uses (see **Figure 2-1**). Future construction activities would not be anticipated to increase the risk of BASH incidents or other incidents with the potential to impact flight safety. There would be no changes to existing flight safety procedures; therefore, no impacts to flight safety would be anticipated to occur with implementation of Alternative 1.

Additional analysis of impacts to safety and occupational health would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.13.2.3 Alternative 2

Ground Safety

As with Alternative 1, some future development activities under Alternative 2, including those associated with Airfield/Industrial/Light Industrial functional uses, would take place in close proximity to the airfield. Debris associated with future construction of new facilities in this area would have the potential to create additional FOD hazards. Future construction activities would be conducted in accordance with the Nellis AFB FOD Prevention Program, which would help to prevent and minimize FOD incidents. Therefore, no significant impacts to ground safety would be anticipated to occur with implementation of Alternative 2; however, temporary, adverse impacts related to the potential increase for FOD incidents that would not be significant could occur with implementation of Alternative 2.

Explosives Safety

As with Alternative 1, future construction activities within areas proposed for development under Alternative 2 would comply with established ESQD arcs as defined by the DAF Guidance Memo to DESR 6055.09_AFMAN 91-201. ESQD arcs establish the minimum distance between sites that contain or handle explosive materials and specified exposures (e.g., storage and handling facilities, aircraft) (Nellis AFB, 2018a). No changes to existing ESQD arcs would be anticipated to occur with implementation of Alternative 2. Should future construction include facilities that handle explosive materials and specified exposures, new ESQD arcs would be established in compliance with DAF regulations. All storage and handling of munitions at Nellis AFB are carried out by trained and qualified Munitions Flight personnel and in accordance with DAF-approved technical orders; these activities would continue under the Proposed Action. Therefore, no impacts to explosives safety would be anticipated to occur with implementation of Alternative 2.

Flight Safety

The majority of future facilities constructed in proximity to the airfield would include Airfield Operations/ Industrial/Light Industrial functional uses (see **Figure 2-2**). Future construction activities under Alternative 2 would not be anticipated to increase the risk of BASH incidents or other incidents with the potential to impact flight safety. There would be no changes to existing flight safety procedures; therefore, no impacts to flight safety would be anticipated to occur with implementation of Alternative 2.

Additional analysis of impacts to safety and occupational health would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.13.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. There would be no change to safety conditions, including current ESQD arcs, FOD concerns, and BASH concerns, within the ROI beyond baseline conditions. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and mission continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.13.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in long-term, potentially significant adverse impacts to safety and occupational health resources. The projects identified in **Table 3-2** have the potential to increase safety hazards related to air and ground safety within the ROI—i.e., Nellis AFB and areas immediately adjacent to the Installation.

Several projects, including the TASS beddown, Nellis Reclaimed Waterline Project, CCAS training actions, completed MILCON projects, and the CCRFCD project would have the potential to increase FOD risks in the vicinity of the airfield, as each of these projects included or would have the potential to include construction within the Proposed Action area.

The TASS beddown project included expansion of the LOLA and aircraft ramp within the Proposed Action area. These activities included construction within existing ESQD arcs and were required to comply with the DAF Guidance Memo to DESR 6055.09_AFMAN 91-201. All storage and handling of munitions at Nellis AFB are carried out by trained and qualified Munitions Flight personnel and in accordance with Air Force-approved technical orders; these activities would continue under the Proposed Action.

For ground safety hazards, the use of live ordnance or pyrotechnics across different actions could potentially have an adverse effect on ground safety because of increased fire risk (JPARC, 2013). Nellis AFB would continue utilizing fire response, prevention, and protection resources that are currently available to address cumulative effects from simultaneous activities in accordance with DAFMAN 91-203, *Safety* (March 2022). Ground safety FOD incidents could potentially increase because construction activities typically involve the movement of equipment, vehicles, and personnel around the construction site. This increased activity could inadvertently lead to more debris being generated. Ground operations and activities would continue to utilize safety procedures throughout construction and post-construction activities within Nellis AFB in accordance with DAFMAN 91-203.

Overall, cumulative effects on safety resources at Nellis AFB would result from the compounding effects of various factors, including operational demands, resource limitations, and environmental factors. These impacts can strain the Installation’s ability to maintain optimal safety standards across its operations. Increased aircraft movements, frequent training exercises, and expanding mission requirements can lead to heightened risks and the need for more robust safety measures (FHA, 2024).

When considered in conjunction with the effects of past, present, and reasonably foreseeable actions at Nellis AFB, adverse cumulative effects to safety resources would be anticipated to occur with implementation of the Proposed Action. However, these effects would not be significant.

3.13.2.6 Other Considerations Under NEPA

No additional impacts to safety and occupational health were identified beyond those described above.

3.13.3 Resource-Specific Mitigation Measures and Best Management Practices

Future construction activities would be conducted in accordance with the Nellis AFB FOD Prevention Program, which would help to prevent and minimize FOD incidents. Should future construction include facilities that handle explosive materials and specified exposures, new ESQD arcs would be established in compliance with DAF regulations. All storage and handling of munitions at Nellis AFB are carried out by trained and qualified Munitions Flight personnel and in accordance with DAF-approved technical orders; these activities would continue under the Proposed Action. No significant adverse impacts to safety and occupational health would be anticipated to occur under implementation of the Proposed Action. No mitigation measures are recommended.

3.14 SOCIOECONOMICS

3.14.1 Affected Environment

3.14.1.1 Definition of the Resource

Socioeconomics is the relationship between economics and social elements, such as population levels and economic activity. Several factors can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of dependents living below the poverty level, employment, and housing data. Employment data identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region. Socioeconomic data are typically presented at county, state, and national levels to characterize baseline socioeconomic conditions in the context of regional, state, and national trends.

3.14.1.2 Region of Influence

The Proposed Action would occur on an undeveloped parcel of land on the east side of Nellis AFB, which is in North Las Vegas and adjacent to the unincorporated township of Sunrise Manor in Clark County, Nevada. The Proposed Action area includes land uses designated for Airfield and Open Space and abuts a portion of an industrial land use area situated to the northeast (see **Figure 3-1**). The Proposed Action would be located directly north of an area zoned for industrial use outside of the Installation and on the edge of a residential Sunrise Manor neighborhood that sits to the southwest. It is assumed that Clark County would provide a substantial portion of the labor pool necessary to implement construction of the Proposed Action, although communities in Lincoln and Nye counties that are within commuting distance of Nellis AFB could also contribute to the labor pool. Additionally, Clark County supports various industrial and commercial businesses and service providers that could fill some project needs for things such as equipment, materials, and contractors. As it is assumed most of the labor and service needs for the Proposed Action could be filled by resources from within Clark County, no other counties are considered in this analysis.

Due to the number of personnel that would need to report to the Proposed Action area during construction, and due to the number of people that work on Nellis AFB and would subsequently utilize facilities constructed on the east side of the Installation under the Proposed Action, it has been assumed that the majority of socioeconomic impacts would occur in the census tracts (CTs)/neighborhoods directly on and immediately adjacent to Nellis AFB (approximately 3-mile radius). It can also be assumed that construction personnel working on site would spend a sizeable amount of time and income within those CTs while on the job.

The ROI for the assessment of potential impacts consists of 30 CTs that are within or intersect with a 3-mile area of the Proposed Action area (**Figure 3-48**).

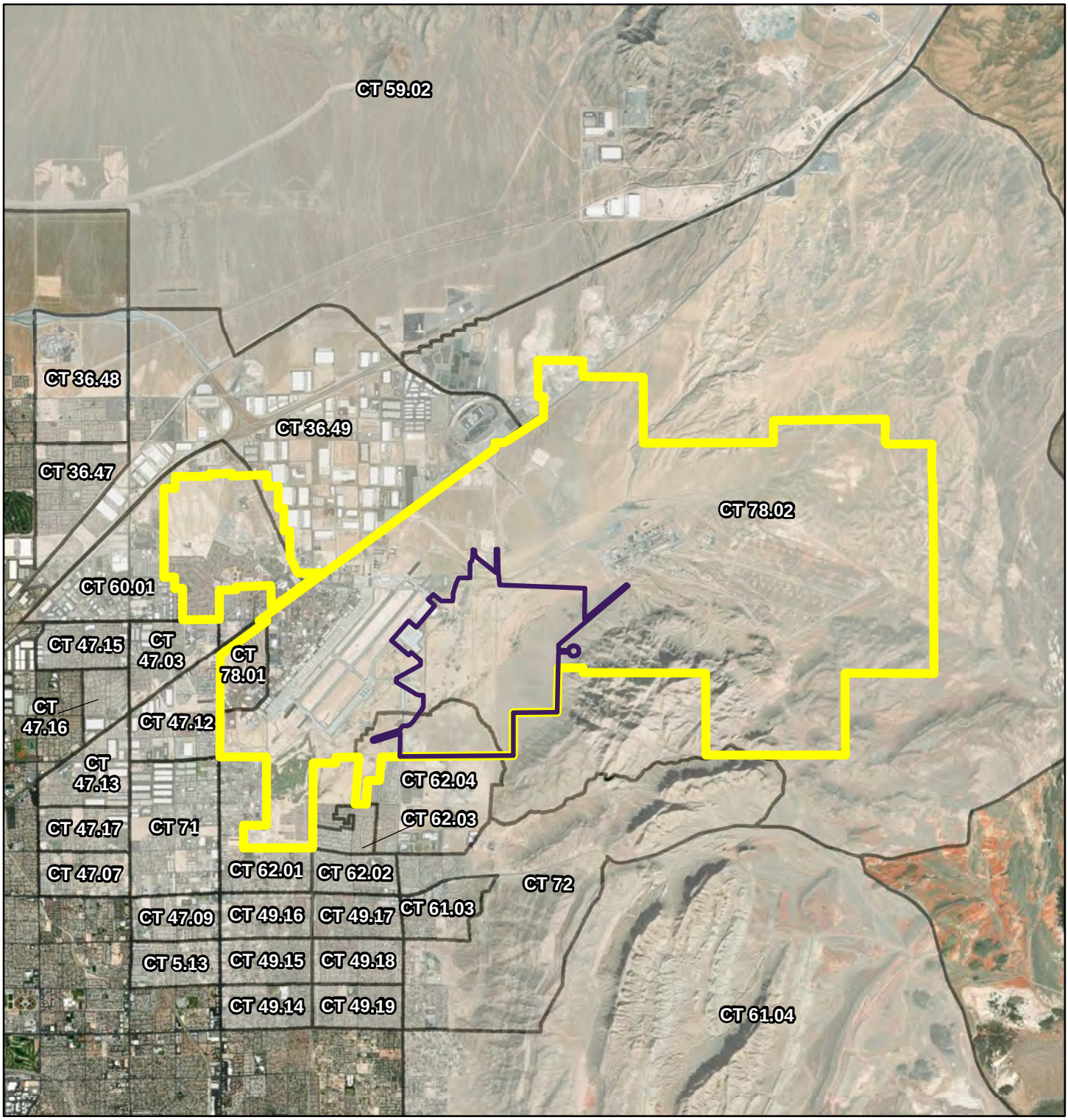


FIGURE 3-48
Socioeconomics Region of Influence

Installation Boundary

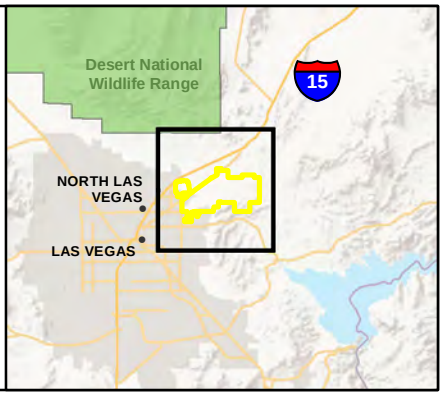
Proposed Action Area

Census Tract (CT)

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



3.14.1.3 Population

Clark County is the most populated county in Nevada, containing approximately 73 percent of the state's total population with an estimated 2,704,204 people. Together, the 30 CTs in the ROI contain approximately 5.3 percent of Clark County's total population, with an estimated 120,753 people (US Census Bureau [USCB], 2022a).

Table 3-42 shows the population estimates in the ROI in 2012 and 2022, as well as the total percent change in population growth (percent growth rate) and annual average population growth rates over this 10-year period. CT 36.28 and CT 78 were subdivided after 2012; therefore, the USCB does not provide 2022 population estimates for either tract. Instead, 2022 population estimates were calculated using the combined populations of the new tracts created by the subdivision. These values were used to calculate percent growth and average annual growth rates for CT 36.28 and CT 78.

Table 3-42
Population Estimates

Location	2012	2022	PGR	AAGR
United States	309,138,711	331,097,593	7.1	0.7
Nevada	2,704,204	3,104,817	14.8	1.5
Clark County	1,954,773	2,265,926	15.9	1.6
CT 5.13	4,382	3,467	-20.9	-2.1
CT 36.28[a]	8,517	12,790	50.2	5.0
CT 47.03	4,917	6,391	30.0	3.0
CT 47.07	2,916	3,258	11.7	1.2
CT 47.09	6,820	5,593	-18.0	-1.8
CT 47.12	7,524	5,084	-32.4	-3.2
CT 47.13	4,728	4,414	-6.6	-0.7
CT 47.15	5,802	6,491	11.9	1.2
CT 47.16	2,903	3,581	23.4	2.3
CT 47.17	2,524	3,615	43.2	4.3
CT 49.14	2,428	2,287	-5.8	-0.6
CT 49.15	3,605	3,164	-12.2	-1.2
CT 49.16	2,749	2,598	-5.5	-0.5
CT 49.17	3,099	3,710	19.7	2.0
CT 49.18	4,199	3,993	-4.9	-0.5
CT 49.19	4,549	3,941	-13.4	-1.3
CT 59.02	1,069	1,113	4.1	0.4
CT 60.01	4,213	9,057	115.0	11.5
CT 61.03	2,791	3,217	15.3	1.5
CT 61.04	3,528	5,284	49.8	5.0
CT 62.01	4,045	4,717	16.6	1.7
CT 62.02	3,858	4,760	23.4	2.3
CT 62.03	3,136	3,197	1.9	0.2
CT 62.04	4,916	4,984	1.4	0.1
CT 71	3,122	3,566	14.2	1.4
CT 72	3,690	4,776	29.4	2.9
CT 78[b]	2,894	1,705	-41.1	-4.1

Source: USCB, 2012, 2022a

a 2022 values were calculated using the combined 2022 populations of CTs 36.47, 36.48, and 36.49 as a comparison to the 2012 population of CT 36.28.

b 2022 values were calculated using the combined 2022 populations of CTs 78.01 and 78.02 as a comparison to the 2012 population of CT 78

AAGR = annual average growth rate; CT = Census Tract; PGR = percent growth rate

The population increased in 17 of the 30 CTs in the ROI between 2012 and 2022, as well as in Clark County and Nevada. The remaining 13 CTs experienced population decline (**Table 3-42** above and **Figure 3-49** below). The largest increase was seen in CT 60.01, where the population grew by approximately 115 percent over the 10-year period between 2012 and 2022 at a rate of approximately 11.5 percent per year. CT 60.01 is partially within the Nellis AFB boundary, and this growth supports the Installation's documented growth during this period and the projected increase in active-duty and civilian personnel living and working on Nellis AFB over the next decade (**Figure 3-49**).

Generally, CTs adjacent to the Installation increased in population from 2012 to 2022, with the exception of CT 47.12. The largest decrease in population (excluding those calculated from previous CT 78 to its division into 78.01 and 78.02) was seen in CT 47.12, which declined by 32.4 percent at a rate of approximately -3.2 percent per year (USCB, 2012, 2022a).

3.14.1.4 Income and Employment

In Clark County, the top industries by percentage of employment in 2022 were accommodation and food services, government and government enterprises, and healthcare and social assistance. Of government and government enterprises, approximately 12.3 percent of employees in the county work in federal civilian positions, including civilian positions at Nellis AFB, and approximately 14.4 percent are employed by the military (Bureau of Economic Analysis [BEA], 2022a). The top industries by employment in Clark County mirror those of the state of Nevada, with accommodation and food services, government and government enterprises, and healthcare and social assistance comprising the top three, respectively (BEA, 2022b).

Nellis AFB is responsible for approximately 36,490 jobs that directly and indirectly employ military and civilian personnel on and off the Installation (**Table 3-43**) (Nellis AFB, 2022c). In addition to providing employment that is directly tied to the DAF mission, Nellis AFB supports a variety of businesses located near the residential areas on its western side that provide services to personnel living on the Installation. These businesses include restaurants, tattoo parlors, cafes, hotels, auto shops, banks, barber shops, and various retail stores that employ people living in nearby areas.

Table 3-43
Nellis AFB Local Employment

Job Type	Number of Employees
Military and Civilian Personnel	15,055
Indirect jobs from household spending	11,495
Indirect jobs from expenditures	9,940

Source: Nellis AFB, 2022c

Unemployment Rate

The estimated unemployment rate in Clark County in 2022 was 7.7, approximately 0.7 percent higher than the state of Nevada's estimated unemployment rate of 7, and approximately 2.4 percent higher than the US estimated unemployment rate of 5.3 (USCB, 2022b).

Income

The median household income for each CT is presented below in **Table 3-44**, and the distribution of median household income as a percentage of median county household income is presented in **Figure 3-50**. The lowest median household income is recorded in CT 78.01, which is contained entirely by Nellis AFB and has a median household income of approximately $31,845 (45.6 percent of the county median household income). The CT with the highest median household income is CT 61.04, at approximately $104,951, which is 150 percent of the county median household income (USCB, 2022c).

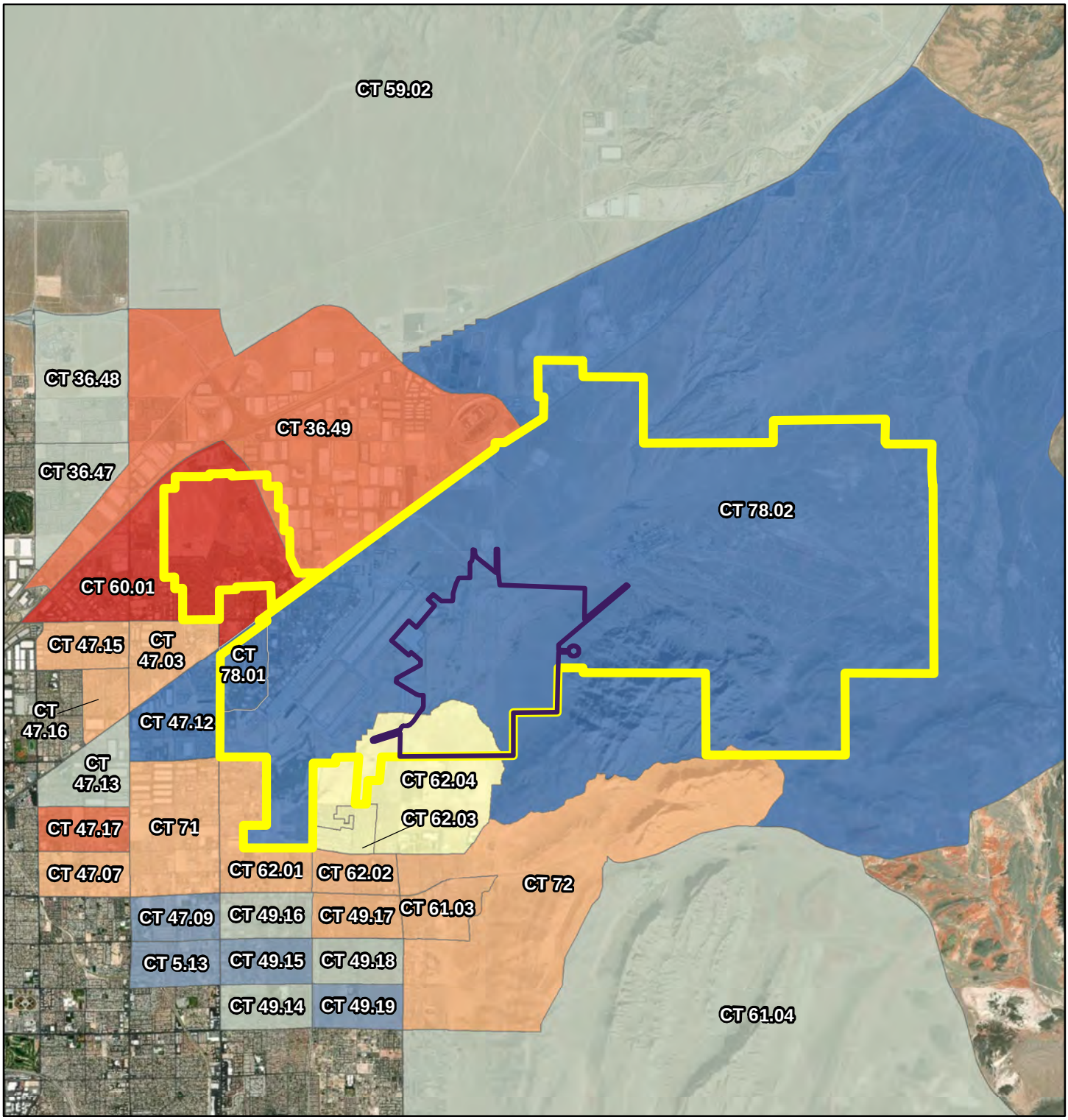


FIGURE 3-49

Population Growth Rate (percent) by Census Tract (CT) 2012–2022

- Installation Boundary
- Proposed Action Area
- < -32.4
- -32.3 to -12.2
- -12.1 to 0.0
- 0.1 to 8.6
- 8.7 to 30.0
- 30.1 to 50.2
- > 50.3

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East

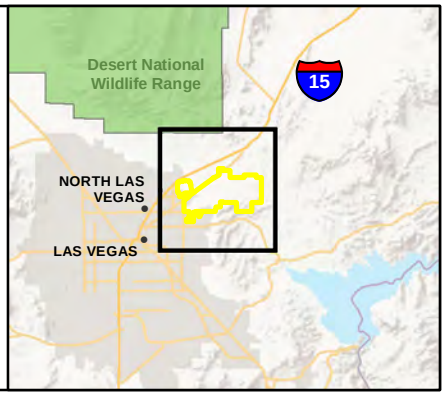


Table 3-44
Median Household Income

Location	Median Household Income ($)
United States	75,149
Nevada	71,646
Clark County	69,911
CT 5.13	39,631
CT 36.47	92,989
CT 36.48	91,325
CT 36.49	88,600
CT 47.03*	49,464
CT 47.07	41,875
CT 47.09	45,172
CT 47.12	35,317
CT 47.13	40,195
CT 47.15	53,750
CT 47.16	61,066
CT 47.17	67,782
CT 49.14	66,442
CT 49.15	72,188
CT 49.16*	74,408
CT 49.17	68,799
CT 49.18	90,625
CT 49.19	71,491
CT 59.02	65,813
CT 60.01	46,523
CT 61.03	58,961
CT 61.04	104,951
CT 62.01	45,947
CT 62.02	60,915
CT 62.03	87,426
CT 62.04	69,375
CT 71	39,356
CT 72	53,615
CT 78.01	31,845
CT 78.02	(a)

Source: USCB, 2022c
a indicates that an estimate could not be computed because there was an insufficient number of sample observations.

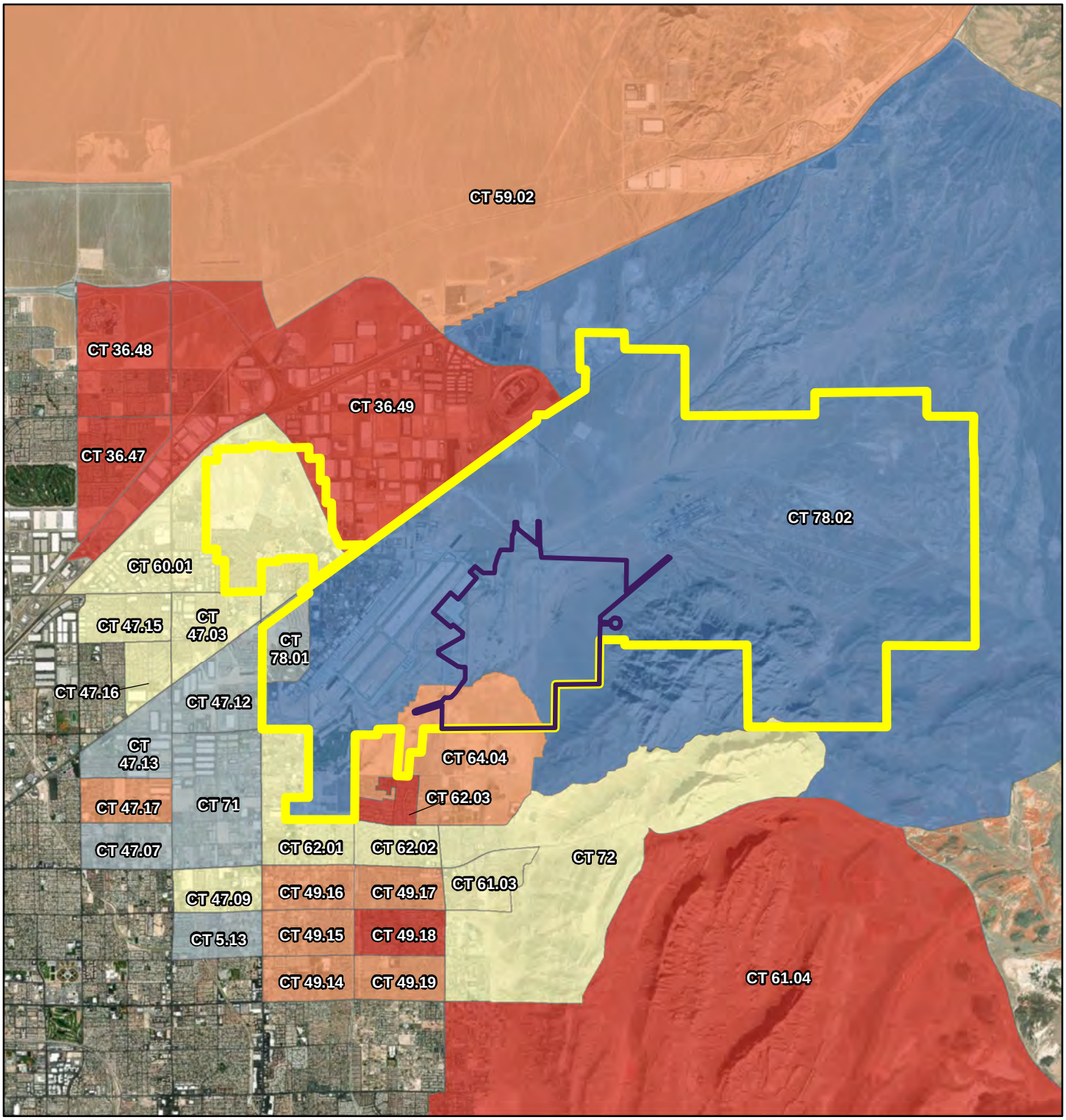


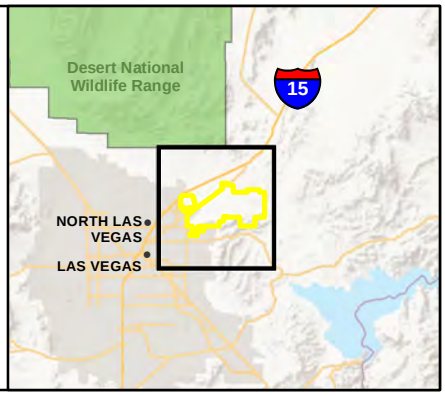
FIGURE 3-50
Median Household Income – Percent of County Income by Census Tract (CT)

Installation Boundary
Proposed Action Area
Estimate Not Available
30-60 %
60-90 %
90-120 %
120-150 %

N

0 1 2 Miles

Imagery: ESRI, 2022.
Coordinate System: NAD 83 State Plane Nevada East



3.14.1.5 Housing

Housing characteristics for the ROI are presented in **Table 3-45**. CTs 78.01 and 78.02 consist entirely of on-Installation housing, while CT 60.01 partially consists of on-Installation housing. The mean percentage of occupied units in the 30 CTs is 85.1, although the individual percentages of occupied units for each tract vary, some with a higher percentage of occupied units than the county and state and some with a lower percentage. The CTs in the ROI display a range of percentages of vacant units, with a mean percentage of 8.4. The rental vacancy rate in the ROI is generally higher overall than the homeowner vacancy rate, indicating that there are more unoccupied rental units than off-market homes that are vacant but not currently being rented out. This suggests that there is housing available in the area, although there are more rental units than homes for sale (USCB, 2022d).

The CTs with the lowest percentage of vacant units (potential available housing) were CTs 61.03 (4.1 percent), 71 (4.5 percent), and 62.03 (4.7 percent). The CTs with the highest percentage of vacant units were CTs 72 (11.2 percent), 60.01 (12.3 percent), 78.01 (18.5 percent), and 47.12 (21.5 percent). The CT with the highest median home value was CT 61.04 at $396,100, a higher median value than homes in the county and state by more than $20,000.

There are approximately 2,360 active-duty personnel and their families living on the Installation. The housing on Nellis AFB, both dormitories and privatized housing, adequately meets existing mission requirements and has opportunities for development and mission expansion (Nellis AFB, 2018a). The remainder of active-duty personnel and their families live off the Installation and use housing resources in the surrounding community.

3.14.1.6 Schools

Nellis AFB is within the Clark County School District, the fifth largest in the US with an enrollment of more than 322,000 students. The Clark County School District operates 261 elementary schools, 59 middle schools, and 68 high schools in addition to providing a before- and after-school program, special and occupational education programs, adult education programs, and home education requirements. Primary and secondary education opportunities on the Installation consist of the Coral Academy of Science, a Kindergarten through 8 grade charter school that accepts students based on a lottery system (DoD, 2023). Children living on the Installation are zoned for J.E. Manch Elementary School, Mary and Zel Lowman Elementary School, Carroll M. Johnston Middle School, and Mojave High School. Other schools in proximity to Nellis AFB include Sunrise Mountain High School, Dr. William H. “Bob” Bailey Middle School, and Liliam Lujan Hickey Elementary School, which are located approximately 1.4 miles from the southernmost boundary of the Proposed Action area.

Higher education facilities in the area include the Southern Nevada Community College located on Nellis AFB, the College of Southern Nevada, Sierra Nevada College, Las Vegas College, Carrington College, Nevada State University, and the University of Nevada Las Vegas and its Reno Extension, as well as the Northwest Career College.

Table 3-45
Housing Characteristics

Location	Total Housing Units	Occupied Units (%)	Vacant Units (%)	Homeowner Vacancy Rate (%)	Rental Vacancy Rate (%)	Median Home Value ($)
United States	140,943,613	89.2	10.8	1.1	5.5	281,900
Nevada	1,288,357	90.3	9.7	9.7	6.9	373,800
Clark County	923,275	90.2	9.8	1.3	7.5	368,800
CT 5.13	1,356	83.7	16.3	3.9	18.6	241,100
CT 36.47	2083	90.4	9.6	0	12.1	373,700
CT 36.48	1,369	95.5	4.5	0	0	324,400
CT 36.49	688	93.3	6.7	0	0	336,900
CT 47.03	1,847	94.4	5.6	0	0	257,100
CT 47.07	1,140	91.8	8.2	5.1	1.4	239,900
CT 47.09	1,842	92.3	7.7	0	6.6	265,800
CT 47.12	2,163	78.5	21.5	0	8	20,700
CT 47.13	2,006	85.6	14.4	0	6.3	(a)
CT 47.15	2,228	89.4	10.6	0	9.6	254,100
CT 47.16	917	97.3	2.7	0	0	261,900
CT 47.17	971	96.3	3.7	0	0	262,300
CT 49.14	759	93.4	6.6	0	0	297,800
CT 49.15	1,025	86	14	0	8.6	288,400
CT 49.16	818	92.8	7.2	4.2	0	281,800
CT 49.17	1,107	92.1	7.9	1.8	0	314,800
CT 49.18	1,153	100	0	0	0	350,000
CT 49.19	1,390	89.2	10.8	2.2	9.1	386,700
CT 59.02	590	74.2	25.8	3.7	6.4	295,200
CT 60.01	2,877	87.7	12.3	6.8	6.8	206,400
CT 61.03	1,387	95.9	4.1	0	2.8	232,100
CT 61.04	1592	98.6	1.4	(b)	(b)	396,100
CT 62.01	1,492	93.4	6.6	0	2.5	161,600
CT 62.02	1,394	93.4	6.6	6.1	0	258,300
CT 62.03	962	95.3	4.7	0	0	226,200
CT 62.04	1,694	92.6	7.4	2.2	0	282,400
CT 71	1,042	95.5	4.5	0	2.2	(a)
CT 72	1,955	88.8	11.2	0	3.4	256,200
CT 78.01	701	81.5	18.5	(a)	6.6	(a)
CT 78.02	4	100	0	(a)	0	(a)

Source: USCB, 2022d
a An estimate could not be computed because there was an insufficient number of sample observations.
b The estimate or margin of error is not applicable or not available.
CT = Census Tract

3.14.2 Environmental Consequences

3.14.2.1 Evaluation Criteria

Consequences to socioeconomic resources were assessed in terms of the potential impacts on the local economy from implementation of the Proposed Action and Alternatives. The level of impacts from expenditures associated with the Proposed Action and Alternatives was assessed in terms of direct impacts on the local economy and indirect impacts on other socioeconomic resources (e.g., housing, employment). The magnitude of potential impacts can vary greatly depending on the location of an action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area but might have significant impacts in a rural region. In addition, if potential socioeconomic changes from a Proposed Action result in substantial shifts in population trends or in adverse effects on regional spending and earning patterns, such changes may be considered adverse.

3.14.2.2 Alternative 1

Population

Alternative 1, complete development of the east side of Nellis AFB, would not include the addition of military and civilian personnel and their families beyond normal mission personnel changes and projected growth as described under the No Action Alternative and would not change the current population of the Installation. Future construction activities associated with Alternative 1 would require the temporary addition of construction personnel; however, no new regional in-migration would be anticipated to occur because there are enough existing construction personnel in the ROI, Clark County, and adjacent counties to support those positions. Alternative 1 would be anticipated to have short-term, adverse impacts that would not be significant and no long-term impacts to population levels within the ROI.

Income and Employment

The estimated FY 2023 economic impact of Nellis AFB includes a total economic impact of $4.499 billion, including 35,328 jobs created (Nellis AFB, 2024d). Projected growth of 12 percent at Nellis AFB over the next decade would be expected to increase the total economic impact and created jobs associated with the Installation; however, the exact totals associated with the increase would not be known until further details regarding proposed development and mission relocation became available.

Local construction personnel would be needed to complete future construction actions associated with Alternative 1, which would create a short-term, beneficial impact on regional employment that would not be significant. No other employment positions would be added or removed under Alternative 1. The exact number of temporary personnel is unknown and would be anticipated to vary depending on the number of concurrent projects and their size.

Expenditures associated with future demolition and construction activities, including acquiring raw materials and compensating construction personnel, as well as subsequent spending on Nellis AFB and in the surrounding community by construction personnel during the course of their contracts, would have the potential to result in short-term, beneficial impacts. Impacts on the economy included in the ROI and in Clark County overall would not be significant.

Development of the east side of Nellis AFB under Alternative 1 would have the potential to result in long-term, beneficial impacts that would not be significant on the economy in the ROI and in Clark County. Future new facilities, particularly those included under Functional Use Category 3, Medical/Community Services/Community Commercial/Small-Scale Retail and Service (see **Table 2-2**), would require employees to support their functions and would be anticipated to create a number of new service industry jobs. Alternative 1 would allocate approximately 102 acres to the Community Services and Community Commercial functional categories.

Alternative 1 would have the potential to result in short-term, beneficial impacts that would not be significant to income and employment in the ROI. The future need for construction personnel and the expenditures associated with implementing the Proposed Action would be temporary. Alternative 1 would also have the

potential to result in long-term, beneficial impacts that would not be significant due to the number of jobs needed to support the future development.

Housing

Under Alternative 1, dormitories would be constructed in the future for accompanied and unaccompanied personnel. However, this alternative would not include the addition of military and civilian personnel and their families beyond normal mission personnel changes and projected growth as described under the No Action Alternative. Personnel relocating to Nellis AFB would also be able to utilize off-Installation rental units within the ROI. Therefore, Alternative 1 would be anticipated to have no adverse impacts on the quality or availability of housing resources in the ROI. A long-term, permanent, beneficial impact to housing availability on Nellis AFB would occur under Alternative 1 as a result of the construction of the dormitories.

Schools

Implementation of Alternative 1 would not be anticipated to impact school population levels in the ROI. No addition of military and civilian personnel and their families beyond normal mission personnel changes and projected growth would occur under Alternative 1, and there would be no potential for increased demand of educational resources in the ROI, either on or off Installation, under this alternative. Should a future mission with known numbers of military and civilian personnel be proposed for Nellis AFB, the addition of these personnel, their dependents, and the subsequent impacts to on- or off-Installation housing would be evaluated under separate NEPA analysis and supporting studies. Alternative 1 would not be anticipated to impact educational resources in the ROI.

Additional analysis of impacts to socioeconomics would be accomplished under separate NEPA analysis in the future as individual projects and new missions are identified for implementation.

3.14.2.3 Alternative 2

Population

Impacts to population under Alternative 2 would be the same as Alternative 1, with the exception that Alternative 2 would have a smaller development footprint, likely requiring fewer future construction personnel. Alternative 2 would be anticipated to have short-term, adverse impacts that would not be significant on the population in the ROI.

Income and Employment

Impacts to income and employment under Alternative 2 would be anticipated to be similar as Alternative 1. Under Alternative 2, the development footprint for the Proposed Action would be smaller than under Alternative 1 and likely would require fewer future temporary construction personnel. In turn, any short-term, beneficial impacts to income and employment as a result of expenditures associated with the Proposed Action and money being spent in the ROI by future construction personnel would occur at a smaller scale. Alternative 2 would allocate 34 acres to the Community Services and Community Commercial functional categories (as opposed to 102 acres under Alternative 1). Therefore, it would be anticipated that there would be fewer service and commercial jobs created than under Alternative 1. Alternative 2 would be anticipated to have short- and long-term, beneficial impacts that would not be significant to income and employment in the ROI.

Housing

Under Alternative 2, no dormitories would be constructed in the future, and accompanied and unaccompanied military personnel would utilize existing on-Installation living quarters or live in off-Installation vacant housing. Nellis AFB previously found that both on-Installation and privatized housing met mission requirements and offered opportunities for mission expansion (Nellis AFB, 2018a); however, constraints on housing availability could occur over the next 10 years as a result of projected growth. Because Alternative 2 would not involve future construction of dormitories, personnel working in buildings constructed on the east side of the flightline would be required to commute across the Installation, resulting in the potential for extended commute times and increased traffic (see **Section 3.12.2.4** for a discussion of

potential transportation-related impacts). Therefore, Alternative 2 would be anticipated to result in long-term, adverse impacts to housing availability that would not be significant.

Schools

As with Alternative 1, there would be no impacts to educational resources under Alternative 2.

Additional analysis of impacts to socioeconomics would be accomplished under separate NEPA analysis in the future as individual projects are identified for implementation.

3.14.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. There would be no changes to the socioeconomic environment of the ROI beyond baseline conditions, and the estimated addition of 2,500 personnel in alignment with the previous decade's growth would still occur. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and missions continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.14.2.5 Cumulative Effects

Implementation of the Proposed Action would be anticipated to result in impacts to socioeconomic resources that would not be significant. The projects identified in **Table 3-2** evaluate the construction, demolition, and renovation activities within the ROI—i.e., 3-mile radius around the Proposed Action area.

The TASS beddown has been completed and beddown of personnel contributes a total of 293 personnel to the population at Nellis AFB, plus their dependents. A total of 751 personnel and their dependents would be added under the Nellis Aggressor project once that beddown has been completed. The CCA EOU beddown would contribute an additional 40 personnel at Nellis AFB. This growth would be within the projected increase in personnel anticipated to occur at Nellis AFB over the next decade as described in this PEIS.

Beneficial impacts occurring as a result of economic stimulation from construction, demolition, and renovation activities would have the ability to compound if these actions occurred concurrently. Development on the west side of the Installation evaluated in the Nellis IDP EA would also require short-term commitment of construction resources within the local area. Construction, demolition, and renovation activities evaluated under the IDP EA could occur concurrently with construction evaluated under the Proposed Action, as could construction activities proposed for the Nellis CSTR project. Construction activities evaluated as part of the Nellis Aggressor beddown are currently underway and could overlap with construction activities under the Proposed Action. Construction, demolition, and renovation activities proposed for the CCA EOU beddown would have the potential to occur during the same timeframe as the development for the Proposed Action.

When considered in conjunction with the effects of other past, present, and reasonably foreseeable actions at Nellis AFB, no significant cumulative impacts to socioeconomic resources would be anticipated to occur with implementation of the Proposed Action.

3.14.2.6 Other Considerations Under NEPA

No additional impacts to socioeconomics were identified beyond those described above.

3.14.3 Resource-Specific Mitigation Measures and Best Management Practices

No BMPs or mitigation measures have been identified for impacts to socioeconomic resources under the Proposed Action.

3.15 PROTECTION OF CHILDREN

3.15.1 Affected Environment

3.15.1.1 Definition of Resource

Federal agencies are directed by EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks,* to consider impacts to children, defined as any person under the age of 18. Children are vulnerable to environmental exposure, and potential health and safety impacts to children are considered herein.

Children that could be disproportionately impacted by the project are addressed for the ROI and are compared with those populations in Clark County, state of Nevada, and the US.

3.15.1.2 Region of Influence

The ROI for the protection of children is Nellis AFB and the 12 CTs that directly border the Installation and are closest to the Proposed Action area (**Figure 3-51**). These areas would be the most likely to experience the effects of the Proposed Action, particularly from noise and fugitive dust associated with construction activities.

3.15.1.3 Child Populations

Ten of the CTs in the ROI have higher percentages of children than Clark County, Nevada, and the US: CTs 36.59, 47.03, 47.12, 60.01, 62.01, 62.02, 62.03, 71, and 72 (**Table 3-46**). These 10 CTs have a higher percentage of the population under the age of 18 than Clark County, Nevada, and the US, with percentages ranging from 23.6 percent (0.9 percentage points higher than Clark County) to 37.9 percent (15.2 percentage points higher than Clark County). Nellis family housing is located in CT 60.01, which likely accounts for the higher percentage of children reported (USCB, 2022a).

Table 3-46
Protection of Children

Location	Total Population	Children (%)[a]
United States	331,097,593	22.1
Nevada	3,104,817	22.2
Clark County	2,265,926	22.7
CT 36.49	2,616	**24.8**
CT 47.03	6,391	**36.2**
CT 47.12	5,084	**35.9**
CT 60.01	9,057	**37.9**
CT 62.01	4,717	**28.4**
CT 62.02	4,760	**28.8**
CT 62.03	3,197	**23.6**
CT 62.04	4,984	**23.7**
CT 71	3,566	**30.9**
CT 72	4,776	**27.0**
CT 78.01	1,235	20.8
CT 78.02	470	0.0

Source: USCB 2022a, 2022c
a The USCB categorizes all people under the age of 18 as "youth"; this EIS uses "children" for the same group.
CT = census tract

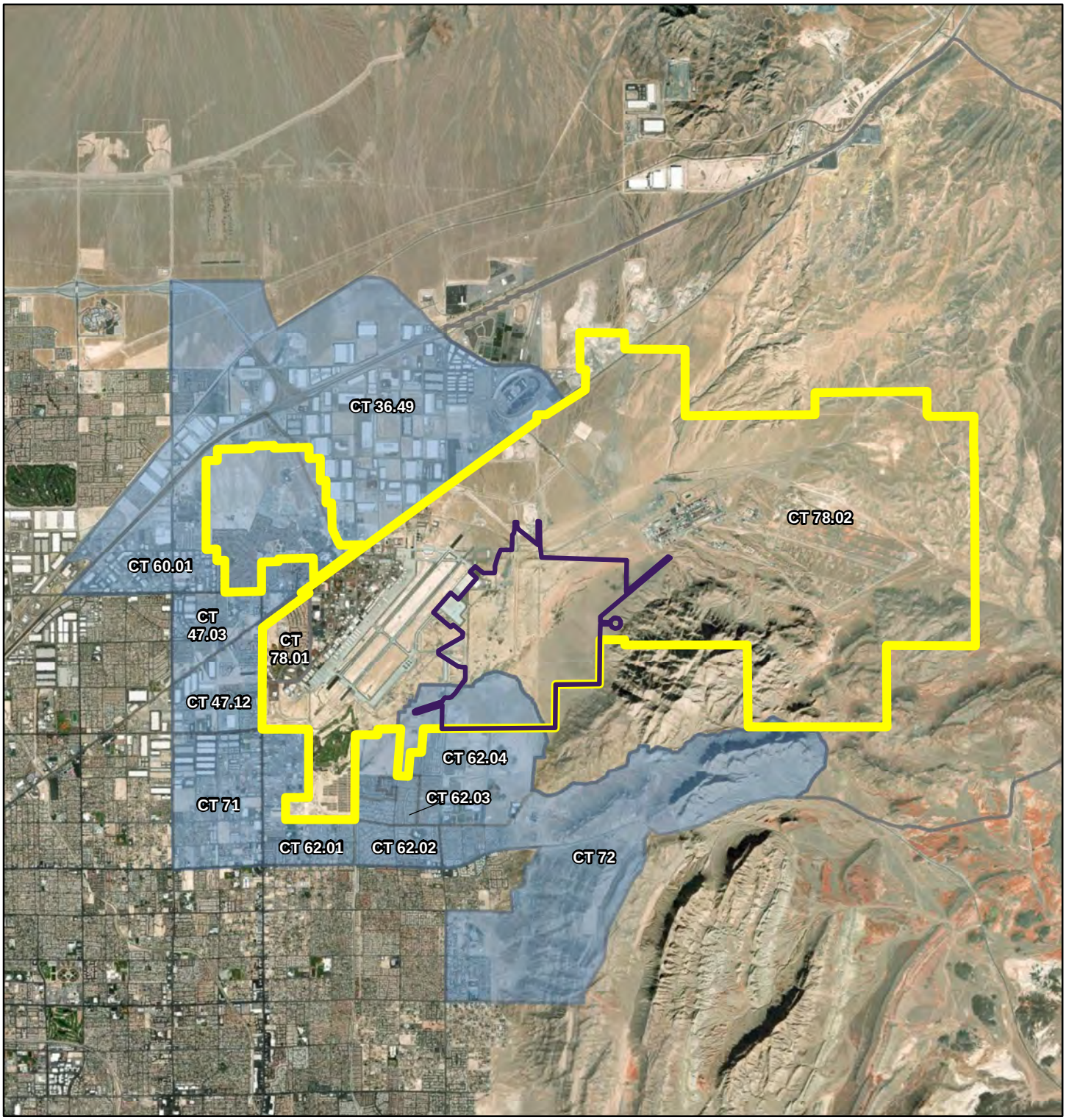


FIGURE 3-51
Protection of Children Region of Influence

3.15.2 Environmental Consequences

3.15.2.1 Evaluation Criteria

Protection of children analysis applies to potential adverse health and safety effects on youth populations.

3.15.2.2 Alternative 1

Alternative 1 would take place entirely within the boundaries of the Installation. Future construction actions under Alternative 1 would be anticipated to result in temporary increases in noise for communities adjacent to Nellis AFB (see **Section 3.10.2.2**). This temporary change to the noise environment would not disproportionately impact youth populations within the ROI, and noise levels would be anticipated to return to previous levels following completion of construction activities. No operational increases in noise would occur under the Proposed Action.

Under Alternative 1, trucks hauling construction materials and demolition debris would have the potential to create a future short-term impact to air quality and future short-term increases in noise levels along the roadways upon which construction traffic would travel to the Installation. However, such construction vehicles would not use roads within residential neighborhoods, and trucks already use these routes to travel to and from Nellis AFB. Therefore, it would not be anticipated that vehicles associated with future construction activities under Alternative 1 would pose a substantial health and safety risk on youth populations in the ROI.

As described in **Section 3.5.2.2**, the closest sensitive receptors for air quality emissions include Shadow Rock Park, which lies approximately 0.9 mile due south of the southernmost extent of the Proposed Action area, and a cluster of public schools (Sunrise Mountain High School, Dr. William H. “Bob” Bailey Middle School, and Liliam Lujan Hickey Elementary School), just south and west of Shadow Rock Park, approximately 1.4 miles from the southernmost boundary of the Proposed Action area. These sensitive receptors could experience airborne emissions associated with future construction during the cooler months (October–February), when seasonal winds cause air movements from the northeast toward the southwest. The likelihood of significant emissions reaching the park and school areas would be low because construction activity levels would fluctuate throughout the day as well as from day to day. Localized wind conditions also vary throughout the day, while construction sources would move around the site such that potential pollutant concentration increases would not persist in any single location. As a result, any potential exposure to elevated pollutant concentrations would be limited on any given day and would be further limited to the seasonal period when winds are more likely to blow toward the southeast (October–February). The future use of heavy construction equipment within the Proposed Action area would contribute to a temporary, negligible-to-minor increase in fugitive dust emissions that could result in short-term impacts to air quality in the vicinity, including at Shadow Rock Park, Sunrise Mountain High School, Dr. William H. “Bob” Bailey Middle School, and Lilliam Lujan Hickey Elementary School.

J.E. Manch Elementary School and Mary & Zel Lowman Elementary School are both located within approximately 1 mile of Las Vegas Boulevard, the main thoroughfare for travel to Nellis AFB, and upon which future construction traffic would travel to reach the Installation. However, construction vehicle traffic would not be anticipated to significantly increase air quality impacts to the elementary schools when considered in conjunction with other daily traffic currently occurring. It would be anticipated that trucks involved in future construction and demolition activities would have short-term impacts to air quality and would create temporary increases in noise levels along Las Vegas Boulevard. However, as stated previously, trucks already use these routes for travel to and from Nellis AFB, and the potential short-term impacts to air quality and noise from vehicles associated with future construction activities under Alternative 1 would not pose an adverse health and safety impact to children.

3.15.2.3 Alternative 2

As with Alternative 1, under Alternative 2, all future construction activities would take place entirely within the boundaries of the Installation. However, Alternative 2 would have a reduced development footprint and

would involve fewer future construction activities than Alternative 1. Any temporary impacts to air quality or noise from future construction vehicles or activities under Alternative 2 would be anticipated to be shorter in duration than those under Alternative 1 due to the reduced space for development under Alternative 2. No adverse health and safety impacts to children would be anticipated to occur under Alternative 2.

3.15.2.4 No Action Alternative

Under the No Action Alternative, development of the east side of Nellis AFB would not occur. There would be no potential for impacts to children in the ROI beyond baseline conditions. The 99 ABW would continue to utilize existing facilities and infrastructure as its number of personnel and missions continue to grow. Demand for current facilities and infrastructure would continue to outpace capacity. Without development of the east side of Nellis AFB, existing facilities and infrastructure at Nellis AFB could be insufficient to meet DAF and DoD future mission requirements and would require current missions to continue to operate in deficient facilities.

3.15.3 Resource-Specific Mitigation Measures and Best Management Practices

As described in **Sections 3.5.3** and **3.12.3**, BMPs such as water spraying, soil stabilization, and re-vegetation of disturbed areas would be implemented to reduce fugitive dust emissions, and construction equipment would be equipped with appropriate mufflers to reduce air quality and noise impacts during future construction.

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