
CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

This section analyzes potential environmental impacts of the Proposed Action to modernize PTA, and specifically for the development and operation of the IPBA. The discussion focuses on significant issues identified through the scoping process. The locations of the proposed IPBA are all within the boundary of the impact area at PTA; therefore, many potential impacts are expected to be similar among the alternative locations.

To maintain consistent evaluation of impacts, thresholds of significance were used for each resource area. Although some thresholds have been designated based on legal or regulatory limits or requirements, other thresholds were determined through consultation with regulatory agencies or reflect discretionary judgment on the part of the Army in accomplishing their primary mission of military readiness, while also fulfilling their conservation stewardship responsibilities. Quantitative and qualitative analyses have been used in this Programmatic EIS, if appropriate, in determining whether, and the extent to which, a threshold is exceeded. Based on the analyses, Army subject matter experts determined whether particular impacts were significant, mitigable to less than significant, or less than significant.

The following terms will be used throughout this Programmatic EIS to indicate the relative degree of severity of predicted environmental impacts:

- **Less than Significant:** The term used to indicate the relative degree of severity of an environmental impact that is not significant, but even so may be readily apparent. The level of anticipated impacts may range from minor to moderate in scope and intensity. Mitigating predicted consequences of implementing an action may require additional care in following standard procedures, employing BMPs, or applying precautionary measures to minimize adverse impacts, however, significant impacts are not predicted in association with implementation of the Proposed Action.
- **Significant Impact Mitigable to Less than Significant:** A measure of either adverse or beneficial impact, in terms of the degree of severity of the environmental impact reflecting the context and intensity of the impact, as defined in CEQ Regulations (40 CFR §1508.27). Predicted consequences of implementing an action would be significant without the implementation of mitigation measures that may take the form of SOPs or BMPs, implementing specific mitigation measures, and applying precautionary measures to minimize impacts that will otherwise be “significant” adverse impacts.
- **Significant:** A measure of either adverse or beneficial impact, in terms of the degree of severity of the environmental impact reflecting the context and intensity of the impact, as defined in CEQ Regulations (40 CFR §1508.27).

4.1 LAND USE AND RECREATION

4.1.1 Impact Methodology

This section evaluates impacts on land use in the ROI, as described in Chapter 3.1. Land use includes activities that are being carried out on the land in the ROI and the designation of land as determined in local, state, and federal land use policies. This section describes the methods and significance criteria used to assess the level of impact from project alternatives on land use, provides an overview of land use and recreation noise factors, and then describes the impacts from No Action and the action alternatives.

Impacts on land use were assessed based on the consistency of project activities with state and local plans and on compatibility with land uses in the project area and surrounding area. Impacts on recreational resources were assessed by determining the types of recreational uses in and around the project area, then determining the sensitivity of those uses to the short term and long-term project effects, such as noise and visual disturbance. Also considered was the consistency of project activities with the objectives and policies of state and local recreation plans.

Factors specifically considered for determining significance include the following:

- Disruption of recreational use of conservation areas surrounding PTA;
- Long-term prevention of recreational use or use during peak season, or impede or discourage existing recreational activities;
- Conflict with existing or planned land uses on or around the site;
- Conflict with CZMA policies; or
- Conflict with or be incompatible with the objectives, policies, or guidance of state and local land use plans.

Table 4.1-1. Land Use Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges				Range Projects for Future Consideration	Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA							
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Impacts on recreational resources	○	○	○	○	⊕	○	○	○
Conflicts with existing or planned land uses	○	⊗	○	○	⊕	○	○	○
Conflicts with or is incompatible with objectives, policies or guidance of State and local land use plans	○	○	○	○	○	○	○	○

LEGEND

- ⊗ = Significant impact
- ⊗ = Significant impact mitigable to less than significant
- ⊕ = Less than significant impact
- = No impact
- + = Beneficial impact

4.1.2 No Action Alternative (No Modernization)

No Impacts – There would be no impact to land uses surrounding the installation as a result of the No Action Alternative. Under the No Action Alternative, no modernization improvements would take place. No upgrades to the Cantonment Area or range and training facilities would occur.

4.1.3 Modernize PTA Cantonment Area**Modernization/Construction Impacts**

No Impacts – Proposed modernization projects in the Cantonment Area include upgrades to barracks and billeting facilities, and consolidation of the DPW, DOL Baseyard, and Range Maintenance operations in a

PTA Industrial Area. These projects would enhance existing land uses in the Cantonment Area, would not require changes in land use designations, and would not have any impacts to land use in the Cantonment Area. In addition, noise generated from construction is unlikely to impact recreational activities at Mauna Kea State Park. Annoyances from construction noise would be temporary in nature and localized within the Cantonment Area as the Cantonment Area is located in excess of 2,000 ft (1 km) from the State park, and generally not distinguishable at that range.

Live-fire Training Impacts

No Impacts – Live-fire training does not occur at the PTA Cantonment Area, nor would it occur under any part of the Proposed Action. Impacts to live-fire training are not applicable to the PTA Cantonment Area.

Maneuver Training Impacts

No Impacts – Maneuver training does not occur at the PTA Cantonment Area, nor would it occur under any part of the Proposed Action. Impacts to maneuver training are not applicable to the PTA Cantonment Area.

4.1.4 PTA Range Area

4.1.4.1 General Range Area

Modernization/Construction Impacts

No Impacts – Modernization projects in the Range Area would include upgrades and infrastructure improvements at multiple ranges throughout the installation, and also the construction of new ranges. These projects would improve range utilization and enhance operations. They would not result in any changes to land use, as they would not require the conversion of one land use to another within PTA.

Live-fire Training Impacts

Less than Significant – Modernization of existing ranges (such as Range 1 ISBC) or the construction of new ranges has the potential to create conflicts with other ranges at PTA if, through the planning process, the Army determines that the best alternatives for these projects includes conflicts with other range's SDZs. However, with the use of SOPs for range scheduling, and using avoidance measures through SDZ planning, training conflicts would be less than significant.

No Impacts – None of the range projects are in the vicinity of recreational hunting areas at PTA, and therefore, no added hunting restrictions are anticipated. Furthermore, the areas surrounding PTA are uninhabited, thus no residential areas, schools, hospitals or businesses would be affected by live-fire activities.

Maneuver Training Impacts

No Impacts – Proposed modernization projects do not include increased maneuver to PTA. Improvements throughout the Range Area, including improvements to infrastructure, accessibility, capacity, and capabilities at various ranges would be consistent with existing land uses within the range

and training areas. These proposed projects would improve access and enhance training capability, in alignment with the existing land use. There would be no impacts to land use associated with maneuver training as a result of either the construction or operation of proposed modernization projects.

4.1.4.2 IPBA at Western Range Area

Modernization/Construction Impacts

No Impacts – Construction of the proposed IPBA within the Western Range Area would not change land uses in the Range Area; this activity is fully compatible with existing land uses at PTA.

Live-fire Training Impacts

No Impacts – Siting the proposed IPBA at the Western Range Area would enhance live-fire training opportunities on the western side of the installation. Since the Western Range Area is located entirely within an established training and Range Area, activities and uses associated with the proposed IPBA would be compatible with existing land use in the area, and the project would have no impact on land use. Recreational activities would not be impacted because this area would continue to be restricted to public access. The proposed IPBA would not involve any activity that conflicts with the enforceable policies of the State's CZMP. Noise associated with live-fire activities (addressed fully in Section 3.5 and Section 4.5) would continue to be consistent with surrounding land uses. The lack of active ranges in the vicinity of the preferred location eliminates potential conflicts with other range activities.

Maneuver Training Impacts

No Impacts – Maneuver activities would be fully compatible with existing land uses at this portion of PTA.

4.1.4.3 IPBA at Charlie's Circle

Significant Impact Mitigable to Less than Significant – The SDZs of the proposed IPBC at Charlie's Circle may encroach upon Training Area 23 and, without proper mitigation measures, could result in operational restrictions under this alternative.

Recommended Mitigation – Arrange firing points so that SDZs would not fall within Training Area 23. Given that the IPBC in this location is aligned southward toward Training Area 23, this mitigation may skew the line of fire eastward and establish an unrealistic training environment for units using the range. As an alternative, the Army may consider restricting the use of tracer ammunition. Tracer ammunition is essential for Soldiers to follow the bullet trajectory relative to the target in order to make corrections to their aim. In addition, PTA has long been an unrestricted training environment that allows Soldiers to train as they fight in combat.

4.1.4.4 IPBA at Southwest of Range 20

No Impacts – Land use conditions for the proposed IPBA southwest of Range 20 would be similar to those in the Western Range Area.

4.1.4.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the IPBA would not be constructed at PTA and the western and southwestern range area would continue to be restricted from public access. Existing use of these areas as impact area would remain unchanged.

4.1.5 Land Uses Surrounding PTA

No Impacts – Modernization projects at PTA would only impact land within the installation itself through improvements to roads, utilities, barracks, industrial facilities, and ranges. The Hawai‘i County General Plan does not propose any changes in the land uses surrounding PTA and advocates for a continuation of the conservation and agricultural land uses that currently surround the installation. Modernization projects would have no impact to land uses surrounding PTA.

4.2 AIRSPACE

4.2.1 Impact Methodology

Impacts on airspace use were assessed by evaluating the potential effects of the proposed programmatic activities and the proposed IPBA on the principal attributes of airspace use, as described in Section 3.2, at PTA. Specifically, the Army considered impacts from construction and operations activities for the proposed programmatic projects. Impacts on SUA were assessed by determining the project’s requirement for modifications to existing SUA.

4.2.2 Significant Criteria and Summary of Impacts

Factors considered in determining whether an alternative would have a significant impact on airspace, based in part on FAA Order 7400.2E, Procedures for Handling Airspace Matters (FAA, 2001), include the extent or degree to which its implementation would result in the following:

- Reduce the amount of navigable airspace;
- Lead to the assignment of new SUA (including prohibited areas, restricted areas, warning areas, and military operations areas) or require the modification of SUA;
- Change an existing or planned military training route or slow route;
- Restrict access to or affect the use of airports or airfields available for public use, or if it would affect commercial or private airfield or airport arrival and departure traffic flows; or
- Create an obstruction to air navigation.

None of the activities would have impacts on airspace within the ROI (Table 4.2-1). No changes to use of airspace or to airspace designations are proposed. None of the alternatives would reduce navigable airspace or create an obstruction to air navigation. No new SUA or modifications of existing SUA would be necessary to accommodate existing training activities.

There are no military training routes in the ROI, and the existing flight corridors used by participating aircraft would not change. There are no en route low-altitude airways in the ROI, and no IFR procedures would need to change. Access to and the approach and departure patterns associated with the airports and airfields in the ROI would not be restricted, nor would they be required to change. Well-established and understood aviation procedures and rules governing flight operations in both controlled and uncontrolled navigable airspace and SUA, coupled with the Army’s excellent aviation safety record in Hawai‘i, make future adverse impacts on public health and safety extremely unlikely.

Other training activities, such as those at the proposed IPBA, would have no impact on airspace use because aircraft using the IPBC portion of the IPBA (helicopters utilizing LZs) would operate under existing airspace conditions.

Table 4.2-1. Airspace Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie’s Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Reduce amount of navigable airspace	○	○	○	○	○	○	○	○
Assign new SUA	○	○	○	○	○	○	○	○
Modify military flight routes	○	○	○	○	○	○	○	○
Restrict access to public airports or airfields	○	○	○	○	○	○	○	○
Creates obstruction to air navigation	○	○	○	○	○	○	○	○

LEGEND

- ⊗ = Significant impact
- ⊙ = Significant impact mitigable to less than significant
- ◉ = Less than significant impact
- = No impact
- + = Beneficial impact

4.2.3 No Action Alternative (No Modernization)

Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. The installation would remain in its current condition. There would be no risk of impacts to airspace from any construction- or training-related activities at this time as none would occur. There would be no change to airspace from construction- or training-related activities as none would occur. There would be no reduction in the amount of navigable airspace, no assignment of new or modified SUA, and no change to an existing or planned military training route or slow route. There would be no construction that could obstruct air navigation and no new air traffic that could affect aviation safety.

4.2.4 Modernize PTA

No Impacts – None of the proposed modernization projects would influence navigable airspace within the ROI of PTA. The Army is not expanding their mission at PTA or increasing the number of fixed wing or rotary wing aircraft maneuvers either in support of programmatic projects or in support of training at the IPBA; rather, training will eventually recommence to historic levels already assessed in prior NEPA documentation. Although the Shadow 200 UAV could be used during training exercises at PTA, flight activity associated with UAVs may increase in the future as other modernization projects at PTA are completed and come on line (specifically at BAAF). Future NEPA documentation would be conducted to determine any potential impacts from the UAV and its flight activities⁸⁹.

No new SUA or modification of existing SUA is considered under any of the proposed modernization projects. Since there are no published military training routes in the ROI, proposed modernization projects would have no change to existing conditions. Aircraft maneuvering to PTA for training would follow similar procedures as has been followed in the past. There would be no impacts to operations at private or commercial facilities within the ROI of PTA from modernizing the Cantonment Area, ranges or other infrastructure at the installation.

Modernization projects at BAAF would not change approach and departure patterns for aircraft using the installation. BAAF realignment was analyzed in the Final EIS for the Permanent Stationing of the 2/25th SBCT (U.S. Army and USACE, 2008a); therefore, the actions proposed in that document have already been considered by the public and the Army. Proposed modernization projects would not obstruct navigation at off-post commercial or private facilities.

4.2.5 No Action Alternative (No Modernization)

Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. The installation would remain in its current condition. There would be no risk of impacts to airspace from any construction- or training-related activities at this time as none would occur. There would be no change to airspace. There would be no reduction in the amount of navigable airspace, no assignment of new or modified SUA, and no change to an existing or planned military training route or slow route. There would be no construction that could obstruct air navigation and no new air traffic that could affect aviation safety.

⁸⁹ There are no firm plans for such an action at this time, therefore, it is not at this point feasible to discuss additional UAV/UAS training in the cumulative impacts section of this document.

4.3 VISUAL RESOURCES

This section evaluates impacts on the Visual Resources within the ROI, as described in the Affected Environment. This section describes the methods and significance criteria used to assess the level of impact from the Programmatic Action (to modernize the Cantonment Area, infrastructure, and ranges at PTA), and the site-specific Proposed Action (to construct and operate an IPBA). In addition, this section provides an overview of visual impact factors and the potential impacts from the Programmatic Action, the three alternatives for the IPBA, and the No Action alternatives.

Significance thresholds and criteria for resource area are described in the beginning of the chapter.

4.3.1 Impact Methodology

To determine the potential impacts from modernization, the author first conducted a literature search to gather information on visual and aesthetic resources within the ROI. Sources used included maps, photographs, and past environmental documents that examined visual and aesthetic resources at and surrounding PTA.

Factors considered in determining whether the implementation of an alternative would have a significant impact on visual resources include the extent or degree to which its implementation would do the following:

- Introduce physical features that are substantially out of character with adjacent developed areas;
- Alter a site so that a sensitive viewing point or vista is obstructed or adversely affected, or if the scale or degree of change appears as a substantial, obvious, or disharmonious modification of the overall view; and
- Be inconsistent with the visual resource policies of the County of Hawai‘i General Plan (County of Hawai‘i, 2005).

Table 4.3-1. Visual Resources Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Introduce physical features that are out of character with adjacent developed areas	○	○	○	○	○	○	⊗	○
Extent to which modernization obscures or changes sensitive viewing areas	○	○	○	○	⊗	○	⊗	○
Inconsistent with County of Hawai'i visual resource policies	○	○	○	○	○	○	○	○

LEGEND

- ⊗ = Significant impact
- ⊗ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

4.3.2 No Action Alternative (No Modernization)

No Impacts – The installation would remain in its current configuration; therefore, visual resources impacts would be similar to those described under Section 3.3. No new physical features that are substantially out of character with adjacent developed areas would be introduced, and no sensitive viewing points or vistas would be obstructed or affected.

4.3.3 PTA Cantonment Area

Modernization projects may result in primary visual resources impacts from the new construction within the Cantonment Area, that overall, changes the visually distinct composition of the Cantonment Area.

Modernization/Construction Impacts

Less than Significant – The visual sensitivity of the Cantonment area and its surrounding areas would experience change because new facilities proposed would permanently replace Cantonment Area structures that provided the installation its visually distinct characteristic (i.e., Quonset Huts). However, replacement structures would be single story structures, similar to what’s at the Cantonment Area currently; and, because these areas are not identified as being of “high scenic quality” (i.e., designated scenic corridors or locations) and are not readily accessible to large numbers of people, the anticipated impacts from modernization in the Cantonment Area would be less than significant.

Live-fire Training Impacts

No Impacts – Live-fire training does not occur at the PTA Cantonment Area, nor would it occur under any part of the Proposed Action. Impacts from live-fire training are not applicable to the PTA Cantonment Area.

Maneuver Training Impacts

No Impacts – Maneuver training does not occur at the PTA Cantonment Area, nor would it occur under any part of the Proposed Action. Impacts to maneuver training are not applicable to the PTA Cantonment Area.

4.3.4 PTA Range Area

4.3.4.1 General Area

Modernization/Construction Impacts

No Impacts – The visual sensitivity of the Range Area and its surrounding areas would have less than significant impacts, because the areas are not identified as areas of high scenic quality and are not readily accessible to, or used by, large numbers of people. The proposed new construction would not introduce physical features that are out of character with the existing development, would not affect sensitive viewpoints or vistas, and would not be inconsistent with the visual resources policies of the 2005 County of Hawai‘i General Plan. Therefore, any impacts to visual and aesthetic resources would be less than significant.

Live-fire Training Impacts

No Impacts – Use of the Range Area for live-fire training would have less than significant impacts on visual resources, as the Range Area and its surrounding areas are not identified as areas of high scenic quality, and are not readily accessible to, or used by, large numbers of people; the training activities would be consistent with existing uses of the Range Area.

Maneuver Training Impacts

Less than Significant – Specific range projects, such as construction of the new ranges and modernizing existing ranges, would occur in or at the impact area or other designated training areas, and therefore, would continue to be compatible with training exercises there. The MOUT assault courses proposed at

the KMA also would not change the planned use of that maneuver area; however, since alternative locations within KMA has not been determined, we cannot say with any degree of certainty that, while unlikely, potential alternative locations for the MOUTs would be visible from Saddle Road and to motorists passing by. Since the use of KMA in this area would remain unchanged (military maneuvers permitted), and since this area is not of high scenic quality, the overall impact would be less than significant.

4.3.4.2 IPBA at Western Range Area

Modernization/Construction Impacts

No Impacts – Since the Western Range Area is located entirely within the existing training and Range Area, activities and uses associated with the IPBA would continue to be compatible with existing land use in the area. In addition, the impact area and the reclaimed portion that would accommodate the IPBA are restricted areas, not accessible to the public; therefore, the scenic quality of the area would remain unchanged by a public viewpoint. Because this modernization project is located in a portion of the Range Area of PTA that cannot be viewed by the public, no inconsistencies with the visual resources policies of the 2005 County of Hawai‘i General Plan would occur. Furthermore, since the visual character of the Western Range Area is classified as “average,” then the construction of a new range here would not result in downgrading that classification.

Live-fire Training Impacts

No Impacts – While small arms live-fire activities do not currently occur in the Western Range Area, the designation of this parcel of land as an impact area presupposes its anticipated land use as being for live-fire; therefore, no changes would occur to the viewshed or to the visual composition from small arms use associated with the IPBA in this area. The Western Range Area is not identified as an area of high scenic quality.

Maneuver Training Impacts

No Impacts – Maneuvers to and at the IPBA, similar to live-fire use, would continue to be consistent with the intended land use of this alternative location; therefore, no impacts would be experienced from vehicle or aircraft maneuver introduced to this currently underutilized portion of the impact area at PTA.

4.3.4.3 IPBA at Charlie’s Circle

Impacts from construction, live-fire activities, and maneuver training would be the same as described for the Western Range Area (Section 4.3.4.2).

4.3.4.4 IPBA at Southwest of Range 20

Impacts from construction, live-fire activities, and maneuver training would be the same as described for the Western Range Area (Section 4.3.4.2).

4.3.4.5 No Action Alternative (No IPBA)

No Impacts – The installation would remain in its current configuration without the proposed IPBA. Visual resources impacts would be similar to those described under Section 3.3. No new physical features that are substantially out of character with adjacent developed areas would be introduced, and no sensitive viewing points or vistas would be obstructed or affected.

4.3.5 Visual Resources Surrounding PTA

Less than Significant – Most views of the Range Area are skewed by the terrain of and surrounding PTA, and there is no completely unobstructed view of the Cantonment Area from Saddle Road. Additionally, Saddle Road is not classified as a scenic byway. While modernization of the Range Area would have little impact to the viewshed from Saddle Road, modernization of the Cantonment Area would permanently alter the visual composition of the Cantonment Area. However, as the Cantonment Area is not identified as being of “high scenic quality”, visual impacts to the surrounding areas would be less than significant.

4.4 AIR QUALITY

4.4.1 Factors Considered for Determining Significance of Impacts (Impact Methodology)

This section includes an analysis of the potential impacts on air quality from criteria pollutants and HAPs generated from the Proposed Action. Air quality impacts for the proposed range modernization projects have been evaluated in terms of emissions associated with the activities to construct the IPBA facilities at the different project alternative locations.

For purposes of analyzing the potential environmental consequences, emissions of criteria pollutants were calculated for construction activities, vehicle use, and ordnance use/weapons firing using methodologies and emission factors from EPA’s AP-42, *Compilation of Air Pollutant Emission Factors* (EPA, 1995). The best available data were used in conjunction with published sources for comparable equipment. For some emissions sources, such as construction equipment and typical off-road vehicles, emissions factors for equipment of similar horsepower ratings, sizes, and activity categories were used.

Estimated criteria pollutant emissions were evaluated by comparing them to the CAA conformity rule *de minimis* thresholds for maintenance areas (even though the rule is not applicable to Federal agency actions in Hawai‘i because the island is in attainment for all criteria pollutants). However, the *de minimis* level thresholds in the Conformity Rule provide a basis for assessing the relative significance of emissions generated from a Proposed Action.

An activity could have a significant impact to air quality if it would result in substantially higher air pollutant emissions or cause air quality standards to be exceeded. Major factors considered in determining whether an activity would have a significant impact on air quality include the following:

- The amount of net increase in annual emissions of criteria pollutants or the frequency of significant amounts of emissions. The CAA General Conformity *de minimis* threshold of 100 tons per year does not apply to Hawai‘i because the Island is an attainment area, however the *de minimis* thresholds are often used as a basis of comparison in analyzing air quality impacts;

- Whether relatively high emissions would occur on a continuing basis for periods longer than the time frame of relevant air quality standards (e.g., 8 hour period for ozone precursors, 24 hour periods for PM);
- Likelihood of emissions to cause or contribute to a violation of National or State ambient air quality standards; and
- Potential for fugitive dust emissions to cause exceedances or visual obstructions outside the installation boundaries.

Table 4.4-1. Air Quality Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Results in an unacceptable net increase in annual emissions of criteria pollutants or frequency of significant emissions.	⊗ - ⊗	⊗ - ⊗	⊗ - ⊗	○	⊗ - ⊗	⊗	⊗	○
Emissions violate State or National standards	⊗	⊗	⊗	○	⊗	⊗	⊗	○
High emissions may occur on a continuing basis	⊗	⊗	⊗	○	⊗	⊗	⊗	○
Fugitive emissions may affect receptors outside of PTA.	⊗ - ⊗	⊗ - ⊗	⊗ - ⊗	○	⊗ - ⊗	⊗	⊗	○

LEGEND

- ⊗ = Significant impact
- ⊗ = Significant impact mitigable to less than significant
- ⊗ = Less than significant impact
- = No impact
- + = Beneficial impact

4.4.2 No Action (Do Not Modernize PTA)

No Impacts – Under the No Action alternative, none of the modernization projects proposed would be implemented at this time, and therefore no construction-related modernization would occur at PTA. PTA would remain in its current condition. Because there would be no modernization activities, there would be no change in the use of munitions and ordnance or maneuver training at the sites, and no emissions from construction-related activities. No additional impacts to ambient air quality would occur; this scenario would be similar to the description provided in Chapter 3.4 Air Quality Existing Environment.

4.4.3 PTA Cantonment Area

Modernization/Construction Impacts

Construction-related air quality impacts in the Cantonment Area would be temporary, with construction activities associated with varying types of small (e.g., Transformer upgrade-Electrical upgrade) and large (e.g., Brigade HQ and Exercise Control Facility) projects anticipated to occur through FY16. A range of air quality impacts is expected from proposed construction and modernization projects at the Cantonment Area from less than significant to significant but mitigable to less than significant. Emissions associated with each individual proposed modernization project would vary depending on the nature of the project, but would be expected to cause a temporary increase in vehicle emissions, and fugitive dust generated from site preparation activities and heavy equipment operating at the construction sites.

Significant Impact Mitigable to Less than Significant – Construction of facilities that take longer to build and require more ground clearing, grading, and construction equipment and generators may considerably contribute to Fugitive Dust in the Cantonment Area. Construction contractors would comply with the provisions of Hawai‘i Administrative Rules, Sec. 11-60.1-33 on Fugitive Dust as part of the requirements of construction contracts. Consequently, impact from construction-related activities in the Cantonment Area would be significant but mitigable to less than significant.

Recommended Mitigation – Develop and implement a Dust and Soils Mitigation Monitoring Plan covering construction activities for larger projects, or projects that could occur concurrently. The plan would address mitigation measures such as, but not limited to, dust monitoring and control measures, vegetation and soil monitoring, and buffer zones to minimize dust emissions.

Less than Significant – Nitrogen oxide emissions from construction vehicle exhaust emissions are also of concern primarily as an ozone precursor. Each individual construction and modernization project is anticipated to be relatively short in duration and therefore, is expected to have a less than significant or lasting impact to air quality. Even though construction emissions would increase, annual emissions of ozone precursors from individual construction activities would be too small to have a measurable effect on ozone levels.

Live-fire Training Impacts

No Impacts – Air quality related construction impacts in the Cantonment Area would not cease training or have noticeable impacts to live-fire activities occurring in the Range Area at PTA.

Maneuver Training Impacts

No Impacts – Air quality related construction impacts in the Cantonment Area would not cease maneuver activities occurring in the Range Area at PTA.

4.4.4 PTA Range Area

Primary sources of emissions associated with the modernization projects at the PTA Range Area include emissions from construction activities, ordnance use, engine emissions from military maneuver training and personal vehicle use, fugitive dust emissions from vehicle travel on unpaved roads, and wind erosion from areas disturbed by off-road vehicle maneuvers.

The various construction activities for the Range Area modernization projects would produce emissions of PM. The use of heavy equipment on unpaved and paved roads would cause emissions of PM, CO, and NO_x. Soil disturbing activities (e.g., grading, bulldozing, trench digging, and travel on unpaved roads) are the main causes of these emissions. Tailpipe exhaust emissions from vehicular travel and emissions from equipment use would also occur.

Live-fire training occurs at designated locations in the Range Area adjacent to the existing impact area primarily consists of small arms ammunition which emits a minute amount of emissions per round from combustion of the propellant charge. A smaller percentage of ordnance with explosive or pyrotechnic components such as flares, smoke devices, and demolition charges is also used for some training exercises. Although there are current emissions related to munitions use, there would be no net increase in emissions as the Proposed Action would not increase ordnance use or involve new or increased live-fire training at PTA.

In general, training at all ranges increases the potential for frequency of wildfires. Emissions associated with wildfires include CO₂, CO, NO_x, and PM and can be significant depending on the fuel source (i.e., type of vegetation), extent of land burned, and duration of the burn.

Emissions from tactical and non-tactical vehicles traveling on a combination of on- and off-road areas at PTA may produce criteria pollutant emissions, including NO_x, CO, SO_x, and PM from fuel combustion and fugitive dust. Off-road maneuver activities may reduce or contribute to the elimination of vegetation in some areas. The removal of vegetation and continuous vehicle use in these areas would increase the potential for wind erosion of soils and, as a result, generation of PM-10 and PM-2.5.

4.4.4.1 General Range Area

Less than Significant – Flight operations at PTA are dominated by helicopter activity; fixed-wing aircraft use (C-130 aircraft) represents a very small fraction of flight operations. The Shadow 200 UAV could be used during training exercises at PTA. Under the Proposed Action, there would be no substantial change to Army helicopter flight operations at PTA. Current patterns of helicopter flight activity would continue to be the primary flight activity occurring at PTA. There is the potential for flight activity associated with UAVs to increase in the future as other modernization projects at PTA are completed and come on line (specifically at BAAF). Because the net increase in emissions resulting from this potential future increase in UAV flight activity is expected to be minimal and to have little effect on ambient pollutant concentrations, emissions are considered less than significant under the Proposed Action.

Estimated ordnance use at the PTA Range Area would be within historical levels. Increased training rotations are not proposed with the modernization and construction of the proposed range facilities. Current annual small arms ammunition emits no propellant charge. There are also several dozen firing points for large ordnance munitions (e.g., 155 mm artillery) in the northern portion of the Range Area which fire into the impact area. At the ranges in KMA, no live ammunition is used, but ordnance items with pyrotechnic components (such as smoke devices, flares or blast simulators) would represent a small percentage of the annual ordnance used for some training exercises, particularly with newly proposed MOUT assault courses there. Based on the low annual expenditure rates of these training devices, the general nature of detonation processes, and studies addressed in AP-42 emission factors published by the EPA, emissions from ordnance use at the ranges pose very little risk of creating adverse air quality effects. Consequently, air quality from munitions use at the PTA Range Area would be considered less than significant.

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant – Construction of the proposed MSR and three proposed MOUT Assault Courses at KMA would temporarily increase fugitive emissions from activities at construction sites. Future construction and modernization projects proposed for other Range Areas along the east, south and west sides of the impact area would experience similar air quality impacts as those at KMA. Throughout the construction periods, emissions of fugitive dust from disturbance of the site, materials and equipment emplacement, as well as exhaust from the operation of heavy construction vehicles and equipment would result in short-term impacts to air quality. Construction contractors would be required to comply with the provisions of Hawai‘i Administrative Rules, Sec. 11-60.1-33 on Fugitive Dust as part of the requirements of their construction contracts. Implementing mitigation measures would avoid exceeding the PM-10 standards and minimize impacts to visibility. Impacts from range construction at PTA would be significant yet temporary and mitigable to less than significant.

Recommended Mitigation – Develop and implement a Dust and Soils Mitigation Monitoring Plan for construction activities and training exercises. The plan would address mitigation measures such as, but not limited to, restrictions on the timing or type of training during high-risk conditions, dust monitoring and control measures, vegetation and soil monitoring, use of periodic application of water or dust control palliative products, use of washed gravel on military vehicle trails, and buffer zones to minimize dust emissions. Note that for projects proposed in KMA, existing BMPs and monitoring in that area, when applied to the MSR and MOUT Assault Courses, may satisfy or eliminate the need for additional mitigation. Tiered NEPA documentation for those projects would examine the issue in greater detail.

Live-fire Training Impacts

Less than Significant – Overall ordnance use by the 25th ID would be within historical levels and increased training rotations would not be expected with the modernization of the PTA Range Area. A majority of the annual ordnance use would consist of small arms ammunition. Ordnance items with explosive or pyrotechnic components (such as grenades, demolition charges, smoke devices, flares, or blast simulators) would represent a small percentage of annual ordnance use. However, based on the general nature of detonation processes and the very low emission rates that have been published in studies of munitions firing and open detonations, emissions associated with ordnance use at the Range Area would be very small and would include only small quantities of pollutants. Emissions associated with

ordnance use at the PTA Range Area poses very little risk of creating adverse air quality effects; air quality impacts would be considered less than significant.

Live-fire training has the potential to ignite wildfires which generate significant quantities of CO and ozone precursors such as NO_x and VOCs as well as PM. Since the number of units training at the PTA Range Area is not expected to increase, the number of rounds fired and therefore the risk of wildfires would remain the same. If the Army implements wildfire mitigation measures (see Section 4.15, Wildfires), emissions from wildfires would be minimized; thereby wildfires would have a less than significant impact to air quality.

Maneuver Training Impacts

Less than Significant – Vehicles maneuvering at the new MOUT Assault Courses at KMA would increase dust emissions. Tactical vehicles may be used to “surround” the MOUT while dismounted troops clear the buildings. Due to the activity of units operating on these new ranges, maneuver training activities have the potential to impact air quality.

Vehicle travel during maneuver training would also generate exhaust emissions. The net increase in military vehicle engine use would include emissions of NO_x, CO, SO_x, and PM-10. Because the increase in emissions for any pollutant are expected to result in too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels, emissions from vehicle travel are not expected to affect the attainment status of the area. Therefore, engine emissions from military vehicle use at the Range Area would be less than significant.

4.4.4.2 IPBA at Western Range Area (Preferred Alternative)

In terms of air quality, the Army reviewed potential impacts from constructing the IPBA, using live munitions, and conducting training maneuvers at the proposed IPBA in the western portion of the impact area at PTA that is historically underutilized.

The IPBC range would support live-fire training, helicopter maneuvers to LZs, and a ROCA with associated support facilities. The MOUT would support vehicle maneuvers and some small arms firing. Munitions firing related to the Live-fire Shoothouse would be contained indoors.

Associated support facilities would include electric service, transformers, lighting, roads and parking, and facilities within the ROCA.

Modernization/Construction Impacts

Less than Significant/Significant Impact Mitigable to Less than Significant – Short-term impacts throughout the construction period would result in emissions of fugitive dust from disturbance of the site and equipment emplacement, as well as exhaust and fugitive dust emissions from the operation of heavy construction vehicles and equipment. These impacts would be reduced by following mitigation measures outlined in PTA regulations. Construction contractors would be required to comply with the provisions of Hawai'i Administrative Rules, Sec. 11-60.1-33 on Fugitive Dust as part of the requirements of their construction contracts. Fugitive Dust Emissions calculated for construction activities are presented in Table 4.4-2 (Chapter 4.4). Detailed emissions are shown in Appendix D. The Proposed Action would

not result in the violation of existing Federal or State air quality standards; the impacts would be considered less than significant for exhaust emissions and significant but mitigable to less than significant for fugitive dust emissions.

Construction activities for the IPBA would occupy an estimated 200 acres (110 acres for the IPBC alone). The number of construction days for the IPBA is estimated to be 730 days of construction (270 construction days per year). Estimates for construction activity emissions include demolition and debris removal (bulldozing, truck loading and unloading of debris, truck travel), site preparation (bulldozing, scrapers, truck loading and unloading), and general construction (vehicular traffic).

**Table 4.4-2. Annual Fugitive Dust Emissions Estimated from Construction of IPBA
(in tons per year)**

Disturbed Area (acres)	Estimated Construction Days (per year)	Annual Emissions (tons/year)		
		TSP	PM ₁₀	PM _{2.5}
200	270	882.4	565.7	56.6

Recommended Mitigation – Develop and implement a Dust and Soils Mitigation Monitoring Plan for construction activities. The plan would address mitigation measures such as, but not limited to, dust monitoring and control measures, vegetation and soil monitoring, use of periodic application of water or dust control palliative products, use of washed gravel on military vehicle trails, and buffer zones to minimize dust emissions.

Significant Impact Mitigable to Less than Significant – Fugitive dust from construction site activities and construction vehicle use on unpaved roadways and off-road areas would be approximately 565.7 tons PM-10 per year. An increase in fugitive PM-10 emissions from construction activities would be significant, but temporary.

Recommended Mitigation – The impacts from fugitive dust from construction vehicle activity on unpaved roads would be considerably reduced through mitigation measures that include the use of periodic applications of dust control palliative products and the use of washed gravel on military vehicle trails. Implementing these measures would avoid exceeding the PM-10 standards and impacts to visibility.

Less than Significant – Nitrogen oxide emissions resulting from engine exhaust from construction equipment activities are of concern primarily as an ozone precursor. Even though construction-related emissions would temporarily increase, annual emissions of ozone precursors would be minimal and would have too small of a measurable effect on ozone levels. Engine emissions from construction vehicle activity would be less than significant.

Live-fire Training Impacts

Less than Significant – Estimated munitions use at the proposed IPBC and Live-fire Shoothouse are based upon doctrinal requirements for units of the 25th ID (stationed in Hawai‘i) with a mission to train at these ranges (see Section 2.1.3). While there are no doctrinal requirements for these units to train at the MOUT facility, STRAC identifies the munitions that could be expended there. These estimates represent the maximum amount of munitions that could be used at the proposed IPBA ranges. While it is unlikely that units using the proposed IPBA would expend these amounts of ammunition annually, these estimates represent a conservative number for calculating emissions.

Based on the general nature of detonation processes and the very low emission rates calculated for munitions firing and open detonations, emissions associated with ordnance use at the Western Range Area pose very little risk of creating adverse air quality effects. Consequently, air quality impacts expected from munitions use under the Preferred Alternative are considered less than significant. The total emissions estimated from ordnance use for the proposed IPBA are shown in Table 4.4-3.

Table 4.4-3. Annual Emissions Estimated from Ordnance Use (in Tons per Year)

Facility	SO ₂	CO	NO _x	PM-10	PM-2.5	CH ₄	TSP	CO ₂	TNMHC	Lead
IPBC	1.07E-05	0.47	0.01	0.32	0.16	3.44E-03	0.25	1.72	5.48E-04	0.02
MOUT	3.74E-04	0.18	0.01	0.53	0.21	8.11E-04	0.39	0.19	1.10E-03	2.81E-04
Shoothouse	3.05E-06	0.05	<0.01	<0.01	0.002	3.19E-04	<0.01	0.03	2.40E-08	0
Total	3.87E-04	0.70	0.03	0.85	0.38	4.57E-03	0.65	1.94	1.64E-03	0.02

Note: TNMHC = Total nonmethane hydrocarbons

Secondary impacts from live-fire training include emissions from wildfires; specifically from the use of tracers, flares, and pyrotechnics. Wildfire events would be expected to be infrequent and typically small in size which would result in only small quantities of emissions. Emissions from wildfire events are expected to be a less than significant impact under the Preferred Alternative.

Additionally, live-fire training can disturb soils and vegetation through troop training activities such as dismounted movements, vehicle travel, and trenching and digging. Disturbed soils can be more easily eroded, and the removal of protective vegetation exposes soils to wind erosion and an increase in the presence of fugitive dust. Emissions from live-fire training would be a less than significant impact under the Preferred Alternative.

Maneuver Training Impacts

Less than Significant – PTA soils consist of fine volcanic ash that is often prone to wind erosion and dust generation. Training activities would reduce or eliminate vegetative cover in some sections of the training areas, resulting in increased susceptibility to emissions associated with vehicle travel and wind

erosion. Fugitive dust would be generated from these actions; emissions could be significant if not mitigated by soil monitoring and implementing dust monitoring and control measures. Vehicle support of training activities occurring at the IBPA facilities would be limited primarily to logistical and support vehicle traffic. Tactical vehicle operations could occur at the MOUT facility or on the IBPC; however, vehicle travel would be limited to established roads and trails. The military vehicles may be used to “surround” the MOUT facility while dismounted troops clear the buildings. Fugitive dust generated by training and associated vehicle activity would be widely dispersed due to the winds in the area and therefore downwind locations would experience low concentrations of PM. PM impacts from vehicle maneuver exercises are expected to be less than significant and would not be expected to result in exceedances of fugitive dust standards outside of the range.

The IPBA facilities may be contractor run or alternately may be operated by Government Civilians. Range personnel would drive their own vehicles to the ranges (POVs). Three additional support personnel are expected to be required to operate the IPBA facilities when the ranges are open (242 days per year plus 9 days of scheduled maintenance). Emissions of fugitive dust and exhaust emissions have been estimated for support personnel traveling to and from the IBPC facilities on unpaved roads. Additional travel distances on unpaved roads from the existing Range 10 to the new range facility at the Western Range Area were estimated to be 14 miles round-trip (22.5 km). Table 4.4-4 shows expected net increase in exhaust and fugitive dust annual emissions from POVs traveling to the Western Range Area from Range 10. Impacts to air quality from POV travel would be less than significant.

Table 4.4-4. Annual Commuting Personnel Emissions (in Tons per Year)

Location	VOC	NO _x	CO	PM-10	PM-2.5
Western Range	0.03	0.02	0.32	TBD	TBD

Note: Additional information needed to estimate PM emissions from construction activities.

GHG emissions (CO₂, CH₄, N₂O) were also estimated for the POV commuting activities at the proposed locations using estimated vehicle miles traveled (VMT) from the cantonment area to the Western Range. Multiplying the VMT by emission factors from generally accepted GHG protocols for the specific fuel used generates an estimate of GHG emissions. The GHG emissions were converted to a CO₂e basis using the global warming potential (GWP) of each gas; the results are shown in Table 4.4-5 below.

Table 4.4-5. Annual Commuting Personnel GHG Emissions (metric tons)

Location	CO ₂ MT/yr	CH ₄ MT/yr	N ₂ O MT/yr	Total CO ₂ e MT/yr
Western Range	11.3	0.28	0.41	12.0

Approximately 12.0 MT/yr of CO₂e would be generated by POVs commuting from the cantonment to the proposed Western Range area location. In the absence of any regulatory standard, the results of the analysis for this PTA Modernization Project were compared to the 2009 total U.S. GHG emissions of 6,639.7 million metric ton (MT) CO₂e (EPA, 2011). The emissions associated with the Proposed Action would result in a negligible increase when compared to the 2009 total GHG emissions (12.0 MT/yr vs. 6,639.7 MT/yr) and as such would not be a significant source of GHG emissions.

4.4.4.3 IPBA at Charlie's Circle

Modernization/Construction Impacts

Less than Significant – Air quality impacts from modernization/construction activities at the IPBA at Charlie's Circle site would be the same as those described in 4.4.4.2 for the IPBA at Western Range Area. The impacts would be considered less than significant for exhaust emissions and significant but mitigable to less than significant for fugitive dust emissions.

Live-fire Training Impacts

Less than Significant – Air quality impacts from live-fire training activities at the IPBA at Charlie's Circle site would be the same as those described in 4.4.4.2 for the IPBA at the Western Range Area.

Maneuver Training Impacts

Less than Significant – Air quality impacts from maneuver training at the IPBA at Charlie's Circle site would be the same as those described in 4.4.4.2 for the IPBA at Western Range Area.

Emissions have been estimated from support personnel traveling to and from the IPBA facilities that would occur from fugitive dust and exhaust emission generated from travel on unpaved roads. The net increase in travel distance from the Cantonment area to the new range facility at Charlie's Circle Range location (discounting the current distance traveled from the Cantonment area to Range 10) was estimated to be approximately 13 miles round-trip (21km). Table 4.4-6 shows the expected net increase in exhaust and fugitive dust emissions from POV travel to the Charlie's Circle area.

Table 4.4-6. Annual Commuting Personnel Emissions (in Tons per Year)

Location	VOC	NO _x	CO	PM-10	PM-2.5
Charlie's Circle	0.02	0.02	0.29		

Note: Additional information needed to estimate PM emissions from construction activities.

GHG emissions (CO₂, CH₄, N₂O) were also estimated for the POV commuting activities at the proposed locations using estimated VMT from the cantonment area to Charlie's Circle Range. Multiplying the VMT by emission factors from generally accepted GHG protocols for the specific fuel used generates an estimate of GHG emissions. The GHG emissions were converted to a CO₂e basis using the GWP of each gas; results are shown in Table 4.4-7 below.

Table 4.4-7. Annual Commuting Personnel GHG Emissions (metric tons)

Location	CO ₂ MT/yr	CH ₄ MT/yr	N ₂ O MT/yr	Total CO ₂ e MT/yr
Charlie's Circle	11.8	0.29	0.43	12.5

Approximately 12.5 MT of CO₂e would be generated by POVs commuting from the Cantonment area to the proposed Charlie's Circle Range area location. In the absence of any regulatory standard, the results of the analysis for this PTA Modernization Project were compared to the 2009 total U.S. GHG emissions of 6,639.7 MT CO₂e (EPA, 2011). The emissions associated with the Proposed Action would result in a negligible increase when compared to the 2009 total GHG emissions (12.5 MT/yr vs. 6,639.7 MT/yr) and as such would not be a significant source of GHG emissions.

4.4.4.4 IPBA at Southwest of Range 20

Modernization/Construction Impacts

Significant or Significant but Mitigable to Less than Significant – Air quality impacts from modernization/construction activities at the IPBA at Southwest of Range 20 site would be similar to those described in 4.4.4.2 for the IPBA at Western Range Area. Additional temporary significant impacts would result from the extensive ground softening required at this location due to the deep ruts and rough terrain.

Live-fire Training Impacts

Less than Significant – Air quality impacts from live-fire training activities at the IPBA at Southwest of Range 20 site would be the same as those described in 4.4.4.2 for the IPBA at Western Range Area.

Maneuver Training Impacts

Less than Significant – Air quality impacts from maneuver training at the IPBA at Southwest of Range 20 site would be the same as those described in 4.4.4.2 for the IPBA at Western Range Area.

Emissions have been estimated from support personnel traveling to and from the IBPC facilities that would occur from fugitive dust and exhaust emission generated from travel on unpaved roads. Additional travel distances to the new range facility at Southwest of Range 20 location were estimated to be approximately 10 miles round-trip (16.1 km). There would be a small net increase of 0.02 tpy VOC, 0.02 tpy NO_x, and 0.23 tpy CO expected in exhaust annual emissions from these contractor POVs traveling to Southwest of Range 20.

Emissions have been estimated from support personnel traveling to and from the IBPC facilities that would occur from fugitive dust and exhaust emission generated from travel on unpaved roads. Additional travel distances to the new range facility at Southwest of Range 20 location were estimated to be approximately 10 miles round-trip (16.1 km). Table 4.4-8 shows expected exhaust and fugitive dust emissions from POV to the Southwest of Range 20.

Table 4.4-8. Annual Commuting Personnel Emissions (in Tons per Year)

Location	VOC	NO _x	CO	PM-10	PM-2.5
Southwest of Range 20	0.02	0.02	0.23		

Note: Additional information needed to estimate PM emissions from construction activities.

GHG emissions (CO₂, CH₄, N₂O) were also estimated for the proposed POV commuting activities at the proposed locations, based on the total vehicles miles traveled and applying emissions factor specific to the fuel consumed from generally accepted GHG protocols. The GHG emissions were converted to a CO₂e basis using the GWP of each gas. The CO₂e generated from the Proposed Action are shown in Table 4.4-9 below.

Table 4.4-9. Annual Commuting Personnel GHG Emissions (metric tons)

Location	CO ₂ MT/yr	CH ₄ MT/yr	N ₂ O MT/yr	Total CO ₂ e MT/yr
Range 20	6.1	0.15	0.22	6.5

Approximately 6.5 MT of CO₂e would be generated by POVs commuting from the Cantonment area to the proposed Range 20 area location. In the absence of any regulatory standard, the results of the analysis for this PTA Modernization Project were compared to the 2009 total U.S. GHG emissions of 6,639.7 MT CO₂e (EPA, 2011). The emissions associated with the Proposed Action would result in a negligible increase when compared to the 2009 total GHG emissions (6.5 MT/yr vs. 6,639.7 MT/yr) and as such would not be a significant source of GHG emissions.

4.4.4.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative for the IPBA, there would be no change to ambient air quality. The installation would not construct the proposed IPBA. Air quality impacts would be similar to those described under Section 3, Affected Environment.

4.5 NOISE

This section evaluates impacts on noise within the ROI, as described in the Affected Environment. This section describes the methods and significance criteria used to assess the level of impact from the Programmatic Action and the proposed IPBA. In addition, this section provides an overview of noise and the potential impacts from the Programmatic Action, the three alternatives for the IPBA, and the No Action alternatives.

4.5.1 Factors Considered for Determining Significance of Impacts (Impact Methodology) and Summary of Impacts

Significance thresholds (see bullets below) were evaluated based on whether or not land use compatibility issues would be created in terms of DoD guidelines, as outlined in AR 200-1.

The Army considered these criteria and evaluated if implementation of the proposed projects could exceed the following thresholds:

- Less than Significant: Zone I noise levels impacting any type of land use.
- Significant Impact Mitigable to Less than Significant: Zone II noise levels affecting noise-sensitive/ incompatible land uses (i.e., residential, school, hospital, church or daycare). Predicted consequences of implementing an action would be significant without the implementation of mitigation measures.
- Significant: Zone III noise levels affecting noise-sensitive/incompatible land uses (i.e., residential, school, hospital, church or daycare). Such noise levels are not compatible with these land uses.

Table 4.5-1 presents a summary of the noise impacts discussed in the following subsections.

Table 4.5-1. Noise Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Land use compatibility issues would result	⊙	⊙	⊙	○	⊙	⊙	⊙-⊗	○

LEGEND

- ⊗ = Significant impact
- ⊗-⊙ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

4.5.2 No Action (Do Not Modernize PTA)

No Impact - Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. The installation would remain in its current condition. There would be no noise impact from any construction- or training-related activities as none would occur.

4.5.3 PTA Cantonment Area

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant – Noise impacts in the Cantonment Area would be temporary and occur intermittently through 2022 as different construction projects are initiated.

Temporary incompatible noise issues associated with larger projects such as the multipurpose training facility could result from site preparation activities and heavy equipment, and construction worker POVs operating at construction sites. As each of the construction and modernization projects are anticipated to be temporary in duration, annoyances to PTA personnel may occur through the construction period.

Construction noise, given all the projects (many of which may begin simultaneously or may overlap) may result in significant impacts, which would be mitigable to less than significant impacts.

Recommended Mitigation – Mitigation measures to be considered for construction activities may include, but not limited to, restricting construction activities by time of day to avoid persistent noise exposure, using different equipment or construction methods to limit noise exposure, temporary relocation of PTA personnel to offices/buildings located farther away from construction activities and/or offices facing away from construction areas, and performing periodic noise measurements to determine construction noise levels as compared to background noise levels.

Less than Significant – For areas surrounding PTA, which consist mainly of forested reserve and open area, it is likely that construction-related noise impacts would be less than significant due to the distance from the construction activities and unpopulated nature of the surrounding areas. The Army would prepare future NEPA documentation addressing each of the proposed modernization projects individually.

Because of the unpopulated nature of the area and the relatively low volume of traffic on Saddle Road, ambient noise levels surrounding PTA are generally low. As shown in Figure 3.5-1, Figure 3.5.2, and Figure 4.5-1, Zone II and Zone III contours are contained mostly within PTA and impact areas of compatible forested and open land outside PTA. In addition, these figures illustrate that PTA is surrounded by forested reserve land and open area, most of which is mountainous terrain. Thus, in terms of human impact in the areas surrounding PTA, noise impacts are less than significant, as there are no incompatible land uses within the small arms and large arms Zone II and III contours.

Live-fire Training Impacts

No Impacts – Noise related construction impacts in the Cantonment Area would not cease training or have noticeable impacts to live-fire activities occurring in the Range Area at PTA.

Maneuver Training Impacts

No Impacts – Noise-related construction impacts in the Cantonment Area would not cease training or have noticeable impacts to maneuver training occurring in the Range Area at PTA.

4.5.4 PTA Range Area

Primary sources of noise would include construction of new ranges or range infrastructure (including roads and utility poles), or improvements to existing ranges. There would be an increase in construction equipment and skilled workers operating in the Range Area to accomplish the proposed projects. Live-

fire and maneuver training would be associated with the subsequent operation of ranges once modernization projects have completed. Noise associated with range operations for most ranges would be consistent with current conditions in the Range Area; with the notable exception of proposed new ranges.

4.5.4.1 General Range Area

Live-fire training would occur at designated locations in the Range Area adjacent to the existing impact area, and would primarily consist of small arms ammunition. A smaller amount of large ordnance and munitions with explosive or pyrotechnic components such as flares, smoke devices, and demolition charges is also used for some training exercises.

Modernization/Construction Impacts

Less than Significant - Construction of the proposed range roads and three proposed MOUT facilities at KMA would temporarily increase noise from activities at construction sites. Construction vehicles and equipment operations may cause intermittent elevated noise levels that may pose annoyances to training activities begin conducted nearby. Given that construction noise would not be permanent, the anticipated impacts are expected to be less than significant. Future NEPA documentation would address these issues on an individual project basis.

Live-fire Training Impacts

Less than Significant – New ranges considered, such as the AGR may have alternatives (not currently defined) that influence existing noise contours. While unlikely, off-post receptors could be impacted by noise from ordnance explosions associated with these ranges.

Existing ranges would continue to operate at historical levels of firings. As such, the noise impacts presented in the 2010 SONMP would be applicable. Therefore, noise impacts in the PTA Range Area from live-fire training would be less than significant.

During the scoping period, a concern was submitted by the Department of Interior regarding noise levels and potential impacts to the natural soundscape at Volcanoes National Park. Figures 3.5-1 and 3.5-2 illustrate that VNP is located outside the Zone II noise contours of PTA. Areas outside of Zone II contours are considered compatible with all types of land uses. Furthermore, the Proposed Action would not increase the average number of aircraft and training/firing operations beyond historic levels experienced at PTA. An assessment of ambient noise levels versus noise events beyond Zone II noise contours would require additional noise modeling as well as on-site noise measurements, which is beyond the scope of this study.

In terms of live-fire noise exposure surrounding PTA and its relationship to local wildlife, refer to Section 4.9, Biological Resources.

Maneuver Training Impacts

No Impacts – Military vehicle use on maneuver training areas would be fully compatible with existing conditions and land uses in the Range Area.

4.5.4.2 IPBA at Western Range Area (Preferred Alternative)

The IPBA would include an IPBC, Live-fire Shoothouse, and MOUT. In terms of noise, the Army reviewed potential impacts from constructing the IPBA; using live- and/or blank munitions at all three of the above facilities; and conducting vehicle maneuver to the IPBA and through the MOUT and bivouac area. Some helicopter maneuvers may occur specifically at LZs within the IPBC, and also to conduct live-fire training at hardened targetry on the IPBC.

Modernization/Construction Impacts

Less than Significant - Short-term noise impacts from construction vehicles and equipment operations may cause intermittent noise limited to the construction phase of the project. As the construction project is anticipated to be temporary in duration, they are not expected to permanently elevate noise levels in the Western Range Area. Impacts from the proposed IPBA would likely be less than significant given the location.

Live-fire Training Impacts

Less than Significant – Use of the proposed IPBA for the Western Range Area would result in noise impacts from small arms and aviation live-fire (see Section 2.1.3). The proposed small arms IPBC activity includes: 5.56mm rifle, 7.62mm rifle, and 50-caliber machine guns (Army 2011).

Helicopters would engage targets at the IPBC with small arms (7.62mm and 50-caliber weapons) and larger munitions items such as the 2.75 inch FFAR (practice round only), and the Captive Hellfire Trainer (simulator munition). It should be noted that practice rounds and trainers are not as loud as the live weapons system. In addition, aerial gunnery operations would only be conducted 3 days per year.

Ground-based large ordnance firing may also accompany live-fire training on the IPBA, but would continue to be fired from existing firing points located in the northern portion of the Range Area. Soldiers training at the IPBC would still hear the ordnance and may see its impact at the adjacent impact area. Large ordnance fired from existing firing points has been reviewed as part of the PTA SONMP.

The USAPHC performed noise modeling analysis to determine the noise impacts of the proposed IPBC at Western Range Area in a Draft Memorandum dated February 1, 2011 titled Operational Noise Consultation 52-EN-0EB2-11 Operational Noise Contours for Proposed IPBC. This analysis only included the proposed IPBC small arms noise impacts and the existing condition small arms noise impacts. The USAPHC issued an addendum to this memorandum dated May 19, 2011 which included additional aerial gunnery activity at the proposed IPBC. This analysis included the proposed IPBC large arms noise impacts and helicopter overflights en route to PTA to conduct aerial gunnery training.

Figure 4.5-1 illustrates the Zone II and III noise contours for all small arms activities (existing PTA Ranges and proposed Western Range Area alternative and aerial gunnery operations). Figure 4.5-2 shows the Zone II and III noise contours for all large arms activities (existing PTA Ranges and proposed Western Range Area and aerial gunnery operations). The alternative location for the proposed IPBA in the Western Range Area is outside the existing PTA small and large arms Zone II and III noise contours. Existing noise conditions are within Zone I; therefore, the noise impacts within the PTA are considered less than significant.

Noise Surrounding PTA (regarding live-fire training)

Because of the unpopulated nature of the area and the relatively low volume of traffic on Saddle Road, ambient noise levels surrounding PTA are generally low (see Section 3.6, Transportation and Traffic). As shown in Figures 4.5-1 and 4.5-2, Zone II and Zone III noise contours are contained mostly within PTA and impact small areas of forested land outside PTA. In addition, Figures 4.5-1 and 4.5-2 illustrate that PTA is surrounded by forested reserve land and open area, most of which is mountainous terrain. These are considered compatible land uses.

The USAPHC Operational Noise Consultation also addresses the impacts of helicopter overflight noise from operations of UH-60 and OH-58 models flying along the perimeter road to and from the Western Range Area. The USAPHC report concludes that helicopter noise levels which would be incompatible with land uses and/or have the potential to annoy people would not affect any nearby populations surrounding PTA, due to the undeveloped nature of the surrounding Forest Reserve. Furthermore, aerial gunnery operations would only be conducted 3 days per year.

Maneuver Training Impacts

No Impacts – Vehicles used at the IPBA would support training activities occurring there, but would be limited primarily to logistical support. Vehicle travel would be limited to established roads and trails. Vehicles maneuvering in the Range Area would not result in changes to existing noise contours (zones) and would not result in impulse noise that could impact sensitive receptors.

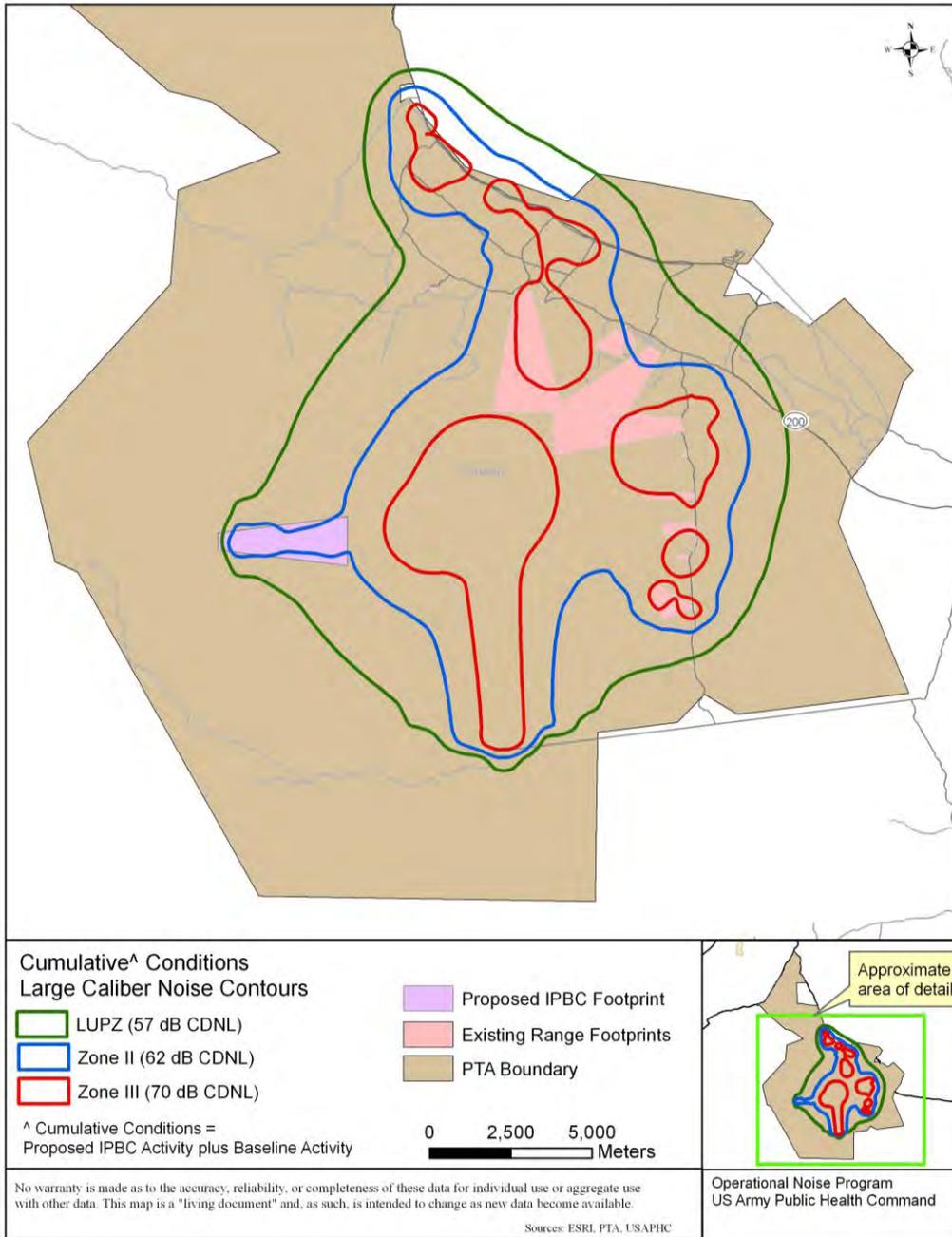


Figure 4.5-2. Projected Large Arms Noise Exposure at IPBA Western Range Area

4.5.4.3 IPBA at Charlie's Circle

Modernization/Construction Impacts

Less than Significant – Short-term noise impacts from construction vehicles and equipment operations would be the same as identified in Section 4.5.4.2 IPBA at Western Range Area.

Live-fire Training Impacts

Less than Significant – Noise impacts at the IPBA at Charlie’s Circle cannot be determined because noise modeling was not performed by the USAPHC for this alternative. Further analysis would be performed if the Army were to change the Preferred Alternative to Charlie’s Circle. Similar to the IPBA alternative location in the Western range, the Charlie’s Circle alternative is located outside the existing PTA noise contours. Existing noise conditions found at Charlie’s Circle are within Zone I.

Maneuver Training Impacts

No Impacts – As described in Section 4.5.4.2 IPBA at Western Range Area, no impacts would be expected from vehicle maneuvers.

4.5.4.4 IPBA at Southwest of Range 20

Modernization/Construction Impacts

Less than Significant – Short-term noise impacts from construction vehicles and equipment operations would be the same as identified in Section 4.5.4.2 IPBA at Western Range Area.

Live-fire Training Impacts

Less than Significant – Noise impacts at the IPBA at Southwest of Range 20 cannot be determined because noise modeling was not performed by the USAPHC for this alternative. Further analysis would be performed if the Army were to change the Preferred Alternative to Southwest of Range 20. Similar to the IPBA alternative location in the Western Range Area, the Southwest of Range 20 alternative is located outside the existing PTA noise contours. Existing noise conditions found at Southwest of Range 20 are within Zone I.

Maneuver Training Impacts

No Impacts – As identified in Section 4.5.4.2 IPBA at Western Range Area, no noise impacts would be expected from vehicle maneuvers.

4.5.4.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the proposed IPBA would not be constructed and the existing impact area would remain in its current condition. There would be no noise from construction- or training-related activities as none would occur. There would be no impacts to noise from the No Action Alternative.

4.6 TRAFFIC AND TRANSPORTATION

This traffic impact analysis describes the potential impacts from transporting construction equipment on public roads to training ranges. Because there is no increase in training over historic levels at PTA, the Army anticipates traffic impacts from modernization only. The analysis covers potential impacts from construction traffic on the local circulation network. The objectives of the impact analysis are to quantify the impacts of the project alternatives on traffic and transportation resources, and to identify and evaluate potential strategies to mitigate traffic impacts.

Based on the nature of the proposed PTA modernization projects (see Table 2.1-1), PTA modernization could have some limited consequences related to traffic including several potential impacts in the short term; but given the number of projects and their anticipated start dates, it is likely that construction-related impacts would occur over a 10 year timeframe having cumulative effects to transportation to and from PTA. It is currently not known if some or many of the proposed projects could be implemented based upon existing information; therefore, impacts from construction over the long-term (10-year period) are best discussed in both site-specific analysis tiered from this Programmatic EIS, and in the cumulative impacts assessment (Chapter 5). Nonetheless, this section provides a range of potential impacts to traffic from construction during the initial period of each project to accommodate slow moving equipment, supplies, and worker's POVs involved in construction/modernization projects. To determine potential impacts and their significance, the Army uses their guide for Analyzing Traffic and Transportation for NEPA Documents.

Consequences to transportation routes are tied to the characteristics of the modernization projects proposed by the Army. The proposed PTA modernization is not envisioned to result in an increase in troops training at PTA; therefore, the Army did not conduct a detailed traffic analysis based on long-term impacts from training at PTA.

4.6.1 Significance Criteria/Impact Methodology

Factors considered in determining whether each project alternative would have a significant impact to traffic / transport include the extent or degree to which its implementation would result in increased traffic on public roads that would disrupt or alter local circulation patterns, and to the extent that the Proposed Action would cause safety hazards on roadways.

Table 4.6-1. Traffic and Transportation Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Impacts to local traffic circulation and safety hazards	⊙	⊙	⊙	○	⊙	⊙+	⊙	○

LEGEND

- ⊗ = Significant impact
- ⊙ = Significant impact mitigable to less than significant
- ⊕ = Less than significant impact
- = No impact
- + = Beneficial impact

4.6.2 No Action Alternative (Do Not Modernize PTA)

No Impacts – Under the No Action, the proposed modernization projects would not be implemented or constructed. The installation would remain in its current condition. There would be no risk from construction on any of these projects, or from training-related activities on proposed range projects.

4.6.3 Modernizing PTA Cantonment Area

The projects listed in Section 2.1.1 are planned to begin periodically within FYs 12-16. Eleven of these projects are related to the Cantonment Area. Individually, construction of these projects could last for approximately six months (i.e., MP Station) to 18 months (i.e., Brigade HQ facility). Given the number of projects, there may be overlap in construction schedules.

Modernization/Construction Impacts

Less than Significant – The primary impacts to transportation from projects related to the Cantonment Area would be from construction equipment travelling on Saddle Road. Each project would be conducted in phases requiring different types of heavy equipment (e.g., demolition/excavation, grading, front loaders or cranes), and a variation in the amount of construction worker POV trips required. During the initial period of each project, a temporary increase in roadway congestion particularly on Saddle Road is expected as additional equipment and supplies would increase traffic volume and also likely reduce the speed at which traffic normally flows. The slight increase in heavy equipment traffic would also contribute to potential safety hazards as motorists in passenger vehicles encounter trucks carrying construction equipment. Ongoing Improvements to Saddle Road would improve the current roadway deficiencies (such as line of sight) that are presently the chief cause of traffic accidents.

Some LOS is anticipated to occur at the main gate to PTA from an increase in construction worker POVs during peak commuter travel times. For larger projects (such as a Brigade HQ facility) construction workers are likely to be issued extended visitor access passes that would effectively mitigate delays at the main gate.

Large equipment would likely remain at construction sites on the installation for extended periods of time thereby minimizing the potential for daily traffic conditions to be affected by slow moving equipment on Saddle Road. Construction worker POVs would travel to the installation daily (during the work week) at peak commute times (6:00a.m. to 10:00a.m. and 4:00p.m. to 7:00p.m. local time). POVs would expectedly travel Saddle Road at the posted speed limit (versus heavy equipment for example), thereby minimizing the potential for contributing to a LOS along that travel corridor. Improvements to Saddle Road (Sections I through III) would be complete by the time the first cantonment modernization project would begin; therefore the base LOS would have improved to below E, creating sufficient capacity to

accommodate construction traffic for individual modernization projects. In addition, heavy equipment construction traffic would be limited to non-peak commute times to further minimize conflicts with other users of Saddle Road and minimize safety hazards posed by passenger cars encountering heavy equipment. Given these factors, the potential impacts from modernizing the Cantonment Area would be less than significant.

Additional minor impacts could occur at intersections where construction equipment access Saddle Road when travelling to PTA. These impacts cannot be quantified as there are existing and ongoing congestion-related impacts to intersections at Māmalahoa Highway, Waikoloa Road, Kawaihae Road, and Queen Ka‘ahumanu Highway from regional traffic patterns, general population growth, and also largely from road improvement projects in those areas. Local contractors from all over Hawai‘i bid on MILCON contracts and use equipment, and skilled workers also are located throughout the island (sometimes skilled workers fly to Hawai‘i from O‘ahu and other islands). Given the currently unknown contract initiation and start dates for future projects (including the IPBA), coupled with a variation in project size (that would presume general numbers of contractors and equipment), it is infeasible to assess potential impacts to traffic and congestion specifically in these areas.

Live-fire Training Impacts

No Impacts – The projects planned for the Cantonment Area would not conflict with live-fire training activities.

Maneuver Training Impacts

No Impacts – The projects planned for the Cantonment Area would not conflict with maneuver training activities.

4.6.4 Modernizing PTA Range Area

Chapter 2 references several projects planned for the PTA Range Area that involve upgrading existing infrastructure, and in some cases, construction of new facilities.

4.6.4.1 General Range Area

The Army is presently considering modifications to existing roads specifically at KMA in the northwestern portion of the range, improving Charlie’s Circle in the currently underutilized western portion of the range, building an MSR to improve installation travel conditions from the main Range Area to KMA, and also widening portions of Red Leg Trail and Hilo Kona Road in the southeast Range Area to minimize conflicts with other military traffic when the recently built USMC CLF range is in use.

Modernization/Construction Impacts

Less than Significant – Heavy equipment travelling on Saddle Road to PTA may cause safety conflicts with other motorists. These types of conflicts are largely anticipated to be mitigated by ongoing improvements to Saddle Road and scheduling movement of heavy equipment to non-peak periods. Similar to projects planned for the Cantonment Area, projects planned for the Range Area would have related construction that may require heavy equipment and skilled labor (such as building an AGR), or much smaller efforts such as modernizing targetry on the existing footprint of Range 10 (IPBC).

Construction contracts would generally detail the numbers and type of equipment, and the general requirements for skilled labor. As with projects planned for the Cantonment Area, the Army anticipates a temporary increase in traffic volume on Saddle Road during the initial period of each range project resulting from additional equipment, supplies, and construction worker POVs. Heavy equipment may enter the Range Area directly with special access (bypassing the main gate), thereby reducing conflicts and congestion at the main gate to the installation. However, some range gate access conflicts are anticipated.

Construction-related conflicts with military traffic (multi-Service units using the Range Area) may temporarily cause congestion on range roads, particularly along Red Leg trail where most active ranges are located.

Beneficial Impact – As most of the Range Area is currently actively used; additional access roads or roadway enhancements are expected to provide improved access for military units using different portions of the Range Area at PTA.

Live-fire Training Impacts

Less than Significant – The projects planned for the Range Area would have limited conflicts with live-fire training as most roadway operations would continue because roads are located away from SDZs. For modernization projects of existing ranges, some live-fire activities may need to be moved to other ranges while construction is underway (if an approved range is available). Modernization may have temporary impacts to throughput at PTA. Conflicts may also occur when improving Red Leg Trail and Hilo Kona Road adjacent to the USMC CLF range; but these conflicts would be temporary and overall would result in eliminating future conflicts.

Maneuver Training Impacts

No Impacts – Construction-related traffic is not anticipated to conflict with maneuver training in the Range Area.

4.6.4.2 IPBA at Western Range Area

Modernization/Construction Impacts

Less than Significant – The slight increase in heavy equipment travelling on Saddle Road may cause some safety conflict with other motorists, but these conflicts are anticipated to be reduced by ongoing improvements to Saddle Road itself. Additionally, upon initiating the construction contract, heavy equipment would be mobilized and would remain on-site for an extended period of time.

Construction for the IPBA may last two years or more. Construction of the IPBA would be conducted in phases over this time and therefore a temporary increase in construction worker POVs and construction-related equipment travelling to PTA would not be readily noticeable. Construction worker POVs would likely be granted extended access passes to reduce congestion at the main range entrance.

Live-fire Training Impacts

No Impacts – The Western Range Area is underutilized. No ranges exist in the immediate area of the proposed IPBA at this location.

Maneuver Training Impacts

No Impacts - The Western Range Area is underutilized. Maneuver training in the Western Range Area would not be hindered by road improvements to Charlie's Circle or by IPBA construction in this area.

4.6.4.3 IPBA at Charlie's Circle

Modernization/Construction Impacts

Similar impacts as described in Section 4.6.4.2 IPBA at Western Range Area are anticipated.

4.6.4.4 IPBA at Southwest of Range 20

Modernization/Construction Impacts

Similar impacts are anticipated as described earlier under Section 4.6.4.2 IPBA at Western Range Area.

Live-fire Training Impacts

Less than Significant – The area Southwest of Range 20 is currently underutilized; however, some live-fire aerial training at Range 20 may be temporarily impacted to avoid conflicts with construction workers. No live-fire activities occur at Training area 23 which is located west of this alternative.

Maneuver Training Impacts

No Impacts – Similar impacts are anticipated as described in Section 4.6.4.2 IPBA at Western Range Area.

4.6.4.5 No Action (Do Not Build and Operate the IPBA)

No Impacts – Under the No Action Alternative, the Army would not construct the IPBA at PTA but would continue to use the existing IPBC at Range 10 as efficiently as possible. No impacts from construction-related activities are anticipated from implementing the No Action alternative.

4.7 WATER RESOURCES

This section evaluates impacts on water resources in the ROI, as described in Affected Environment (Chapter 3.7). This section describes the methods and significance criteria used to assess the level of impact from the Programmatic Action (to modernize the Cantonment Area, infrastructure, and ranges at PTA) and the site-specific Proposed Action to construct and operate an IPBA. In addition, this section provides an overview of water resources and the potential impacts from the Programmatic Action, the three alternatives for the IBPA, and the No Action alternatives.

4.7.1 Impact Methodology

Impacts on water resources were assessed based on the consistency of project activities with Federal, State, and local regulations and on compatibility with water resources in the project area and surrounding area. Impacts on water resources were assessed by determining the types of water resources in and around the project area, then determining the sensitivity of those resources to the short- and long-term project impacts from wastewater to stormwater point source and non-point source pollution.

Factors considered in determining a significant impact on water resources can include the extent or degree to which its implementation would result in the following:

- Exceedance of TMDLs for sediments causing a change in surface water impairment status;
- Degrade water quality in a manner that would reduce the existing or future beneficial uses of the water or Reduce the availability of, or accessibility to, one or more of the beneficial uses of a water resource;
- Substantially increase risks associated with human health or environmental hazards;
- Alter water movement patterns in a manner that would adversely affect the uses of the water within or outside the project region; and
- Non-compliance with existing or proposed water quality standards or require an exemption from permit requirements in order for the project to proceed.

Regulatory standards against which water resources impacts are evaluated include, but are not limited to, the following:

- Federal and State primary and secondary drinking water standards under the SDWA.
- EPA Region IX Tap Water Preliminary Remediation Goals (PRGs).
- Point and nonpoint source discharge permit requirements under the CWA, and State and local plans and policies protecting surface water and groundwater resources.

Table 4.7-1. Water Resources Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie’s Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Impacts on watersheds or water supply	⊙	⊙	⊙	○	⊙	⊗	⊗	○
Impacts on surface water	⊙	⊙	⊙	○	⊙	⊗	⊗	○
Wastewater impacts	⊙	⊙	⊙	○	⊙	○	⊗	○

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Stormwater impacts	⊙	⊙	⊙	○	⊙	⊖	⊖	○

LEGEND

- ⊗ = Significant impact
- ⊖ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

4.7.2 No Action Alternative (Do Not Modernize PTA)

No Impacts – Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. PTA would remain in its current condition. No upgrades to the Cantonment Area or range and training facilities would occur. There would be no risk from construction on any of these projects, or from training-related activities on proposed range projects. There would be no impacts to water resources.

4.7.3 PTA Cantonment Area

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant – Additional proposed modernization projects in the Cantonment Area include upgrades to barracks and billeting facilities, and consolidation of the maintenance operations in the PTA Industrial Area. These projects would require some ground disturbance from construction-related activities. Although no water resources are present in the Cantonment Area, any future modernization projects would require a variety of permitting in order to protect, maintain, and mitigate any adverse impacts to the natural environment.

Recommended Mitigation – The Army would work with construction contractors to obtain any applicable permits or requirements, which could include:

- As a DoD entity, compliance with Section 438 of the EISA will be required for facility construction projects with a footprint greater than 5,000 gross ft². DoD will be required to maintain the predevelopment hydrology of the area for facilities that meet these criteria.
- The Army would be required to obtain a NPDES permit with HDOH-CWB for any and/or all phases of construction for the modernization of the Cantonment Area. This permit is required for any construction activities, including excavation, grading, clearing, demolition, uprooting of vegetation, equipment staging, and storage areas that result in the disturbance of equal to or greater than one acre of total land area. NPDES applicants are required to submit a construction

plan with their application that consists of: site information, non-stormwater information, flow charts, construction site BMPs, and post-construction pollution control measures.

- The proposed modernization projects for a future wastewater system to treat wastewater would require an array of permitting with SWDB and HDOH wastewater branch (WWB).
- Some future modernization projects at PTA may require additional UIC permits with the HDOH-SDWB.

Live-fire Training Impacts

No Impacts – No live-fire training would occur in the Cantonment Area. No water resources concerns.

Maneuver Training Impacts

No Impacts – No maneuver training would occur in the Cantonment Area. No water resources concerns.

4.7.4 PTA Range Area

4.7.4.1 General Range Area

Modernization/Construction Impacts

Less than Significant – Modernization projects in the Range Area would include upgrades and infrastructure improvements at multiple ranges throughout the installation, and also the construction of new ranges, to improve range utilization and enhance operations. The proposed modernization projects in the Range Area would not have an impact on the existing water supply watersheds in the area. There currently are no bodies of fresh water within PTA due to the high porosity of the area, which does not allow water to accumulate. Potable water would still be trucked in as it is currently for the foreseeable future. The proposed modernization projects do not include any water catchment, harvesting or alteration of the natural infiltration of rainfall. Therefore, all watersheds that are fed from rainfall on PTA would continue to with no impact.

There would be potential surface runoff erosion from use of trails at PTA. Given the porosity of the soils coupled with the general lack of gulches or surface water, impacts to water resources would be considered less than significant.

Proposed projects may require a NPDES permit to mitigate potential impacts to the water supply “downstream” of PTA or also known as non-point source pollution. NPDES permitting requires an approved BMP plan (such as an erosion and sediment control plan with the HDOH-CWB) that would discuss pollution prevention measures that must be implemented during construction activities with continuous monitoring; in particular, weekly inspection during and after a weather-related rain event.

Examples of pollution prevention BMPs may include:

- Stabilized construction entrances to provide and reduce vehicle tracking of sediments.

- Erosion and Sediment Control Inspections and Maintenance Practices; all control measures would be inspected once each week and following a rain event to ensure effectiveness.
- Built-up sediment would be removed from silt fences when it has reached one-third the height of the fence and or on a bi-weekly basis.

Live-fire Training Impacts

Less than Significant – Live-fire training at PTA would generate a less than significant impact on the water supply at PTA, as there are no bodies of freshwater at PTA. Potable water would continue to be trucked in for support of training activities. Live-fire training activities at PTA would have little to no effect on the wastewater system.

Stormwater events have the capacity to carry non-point source pollution off-site, if not managed properly. With the lack of vegetation, live-fire training activities coupled with a storm event have the potential to carry contamination from munitions; BMPs are implemented with each live-fire training activity. The design of proposed range modernization projects would incorporate a layout to catch and control any contaminants that may be carried off-site by a storm event.

Maneuver Training Impacts

No Impacts – The proposed modernization projects do not include increased maneuver to PTA. There would be no impacts to water resources associated with maneuver training as a result of either the construction or operation of proposed modernization projects. The presence of Soldiers for maneuver training may include foot traffic and trampling of the ground. However, these impacts would not be expected to impact water resources given the lack of water at the installation.

Impacts from maneuver training at the ranges would have no consequences to wastewater collection at PTA. Additional septic systems or UIC wells are not anticipated as portable lavatories would be utilized, requiring local contractors to remove the systems on a regular basis.

4.7.4.2 IPBA at Western Range Area

Modernization/Construction Impacts

Less than Significant – Site clearing and grading for construction of the proposed IPBA, including the MOUT and Live-fire Shootouse, would expose lava flow areas and soils to enhanced erosion by water. This impact would be expected to be less than significant because the proposed IPBA would be constructed on lava flow areas with no presence of water in the area. There would be potential surface runoff erosion from use of the roads or trails at PTA near the Western Range Area. These impacts would not be considered significant because use of roads and trails would not significantly alter the rate of erosion. The Army would follow BMPs in maintaining these trails or roads.

The proposed IPBA would require an NPDES permits with the HDOH-CWB that would include an approved sedimentation and erosion control plan, pollution prevention control measures, and BMPs to be

implemented and inspected to ensure effectiveness for preventing any on- or off-site pollution due to runoff. Examples of these mitigation measures are described in Section 4.7.4.

Live-fire Training Impacts

Less than Significant – Small arms live-fire would be directed at targetry and live-fire operations at the IPBC would be minimized through regular range maintenance procedures. The Shoothouse would be designed to minimize the occurrence of live-ammunition from leaving the facility, but the occurrence would be possible but rare. Live ammunition fired at these ranges would not result in significant surface water impacts. Due to the porosity of the soils, the proposed modernization and construction of the IPBA at the Western Range Area would not significantly impact watersheds at PTA. Potable water would be transported into the Western Range Area.

Additional septic systems or UIC wells are not anticipated as portable lavatories would be utilized, requiring local contractors to remove the systems on a regular basis. The proposed projects would require an NPDES permit with the HDOH-CWB for an approved sedimentation and erosion control plan, pollution prevention control measures, and BMPs to be implemented and inspected to ensure effectiveness for preventing any on- or off-site pollution due to runoff. Examples of mitigation measures are described in Section 4.7.4.

No Impacts – Live ammunition would not be used at the MOUT and therefore no impacts are anticipated from operations at that facility.

Maneuver Training Impacts

Less than Significant – Impacts from maneuver training would have a less than significant impact on the watersheds that are supported by PTA as the Army has management action plans that discuss maneuvering impacts on the environment. Vehicle use at the IPBA would be limited to the trails accessing the Western Range Area and access roads for the IPBC and MOUT. Training at the proposed IPBC would be dismounted thereby minimizing erosive effects of training. Potable water would be transported into the Western Range Area. Impacts from maneuver training would have less than significant impact on the wastewater system of PTA.

4.7.4.3 IPBA at Charlie's Circle

Impacts from the proposed IPBA construction and operation at Charlie's Circle are anticipated to be similar to those described for the Western Range Area (Section 4.7.4.2).

4.7.4.4 IPBA at Southwest of Range 20

While this proposed location does not share a footprint with the Western Range Area, impacts from the proposed IPBA construction and operation at Southwest of Range 20 are anticipated to be similar to those described for the Western Range Area (Section 4.7.4.2) due to the lack of water resources at PTA.

4.7.4.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the proposed IPBA would not be constructed and the existing impact area would remain in its current condition. There would be no risk of soil erosion and runoff from construction-related activities. There would be no impacts to water resources from the No Action Alternative.

4.8 GEOLOGY AND SOILS

This section evaluates impacts on geology and soils within the ROI, as described in the Existing Environment.

Based on the nature of the planned modernization projects (Table 2.1-1), PTA modernization could have some limited consequences related to geology and soils including potential short-term construction-related impacts; however, given the number of projects and their anticipated start dates, it is likely that construction-related impacts would occur over a 10-year timeframe having cumulative impacts to geology and soils at PTA. It is currently not known if some or many of the proposed projects could be implemented based upon existing information; therefore, impacts from construction over the long-term (10-year period) are best discussed in both site-specific analysis tiered from this Programmatic EIS, and in the cumulative impacts assessment in this document. Nonetheless, this section provides a range of potential impacts to geology and soils at PTA from the construction/modernization projects.

4.8.1 Impact Methodology

Impacts to geology consider the effects resulting from the interaction between elements of the Proposed Action (such as construction) and the geologic environment. Available geologic studies, reports, observations, and engineering judgment were reviewed to assist with reasonable inferences related to the potential effects of the Proposed Action, based on the existing conditions described in Section 3.8, Geology and Soils. In addition, regulatory requirements or guidelines were also considered. Regulatory requirements include State and local building codes, grading ordinances, and restrictions on development in protected areas or in areas subject to specific geologic hazards.

In 2002, the Army conducted a soil investigation of PTA's training ranges to obtain information about existing concentrations of chemical constituents in the soils, identify potential chemicals of concern, and determine if exposure to these chemicals might impact human health. The Army also evaluated the impacts of training on land condition, including effects such as soil erosion, compaction, and damage to vegetation.

The concentrations of chemicals observed or anticipated in soils at PTA were compared to EPA Region IX PRGs, which are conservative cleanup goals designed to be used as a screening tool for determining whether additional, more detailed site-specific analysis of risk is needed. The assumptions on which the PRGs are based are therefore not intended to be representative of all sites. The EPA has assigned PRGs for two basic scenarios: residential exposures and industrial workplace exposures. Residential exposures are lifetime exposures, beginning from childhood and continuing to age 70. Industrial soil PRGs are based

on standard assumptions about worker exposures to soils over a 30-year time period. Both of these scenarios likely overestimate the risks to military personnel, whom make up the population that would be most exposed to these risks, albeit only for brief periods of time. The industrial exposure scenario more closely approximates the exposures of military personnel and is used as a basis for comparison in the analysis presented in this EIS.

The impact analysis attempts to reasonably and conservatively account for the effects of the Proposed Action and alternatives on future conditions, based on information from a variety of sources, including data on existing conditions. However, there is a degree of uncertainty inherent in the analysis. To provide additional assurance that unforeseen impacts do not go undetected, continued monitoring studies have been proposed as part of the mitigation of significant impacts.

4.8.2 Factors Considered for Determining Significance of Impacts

Thresholds of significance were determined for each resource area. Factors considered in determining a significant impact on geology and soils include the extent or degree to which its implementation would result in the following:

- Result in loss of soil (through increased erosion) or terrain modification (e.g., altering drainage patterns through large-scale excavation, filling or leveling) that exceeds the amount of soil loss at which the quality of a soil can be maintained to sustain existing vegetation;
- Impacts conflict with existing Federal, State or local statutes or regulations;
- Result in soil or sediment contamination exceeding regulatory standards or other applicable or relevant human health or environmental effects thresholds;
- Increase in the exposure of people or structures to geologic hazards (e.g., ground shaking, liquefaction, volcanism, slope failure, expansive soils, and hazardous constituents of soils) that could result in injury, acute or chronic health problems, loss of life, or major economic loss;

Regulatory standards against which potential soil and sediment contamination impacts have been evaluated include the following:

- EPA Region IX PRGs for exposures in industrial settings;
- EPA Generic Soil Screening Levels (included in the Region IX PRG tables); and
- EPA Region V Ecological Data Quality Levels for surface soils and sediments (also known as Ecological Screening Levels); and Hawai'i Administrative Rules, Title 11.

Table 4.8-1 presents a summary of the geology and soils impacts.

Table 4.8-1. Geology and Soils Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges		Modernize Training	Modernize Training	No Action (Do Not
	Construct and Operate the IPBA	Range			

	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action (Do Not Build IPBA)	Projects for Future Consideration	Support Infrastructure (Roads and Utilities)	Support Facilities (Cantonment Area)	Modernize PTA)
Loss of soil (or erosion)	⊙	⊙	⊙	○	⊙	⊙	⊗	○
Conflicts with Federal/State/local or DoD regulations would result	○	○	⊗	○	○	○	○	○
Soil contamination	⊙	⊙	⊙	○	⊙	⊙	⊙	○
Exposure to geologic hazards	○	○	○	○	○	○	○	○

LEGEND

- ⊗ = Significant impact
- ⊗ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

4.8.3 No Action Alternative (Do Not Modernize PTA)

No Impacts – Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. PTA would remain in its current condition. No upgrades to the Cantonment Area or range and training facilities would occur. There would be no risk from construction on any of these projects, or from training-related activities on proposed range projects. There would be no soil disturbance; therefore, no impacts to soil erosion or soil contamination would occur.

4.8.4 PTA Cantonment Area

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant – Proposed modernization projects in the Cantonment Area include upgrades to barracks and billeting facilities, and consolidation of the DPW, POL, and Range Maintenance operations in the PTA Industrial Area. These projects would require some ground disturbance from construction-related activities. Site clearing and grading for construction of the proposed new facilities would expose soils to enhanced erosion by water or wind. This impact would be expected to be less than significant because the new facilities would be constructed on relatively level land using standard erosion control practices and because the construction impacts would be temporary. Additionally, much of the proposed facilities would replace existing facilities; therefore, soils in these areas have already been permanently altered by prior activities.

Recommended Mitigation – Develop and implement an Erosion and Sediment Control Management Plan to address measures such as, but not limited to, restrictions on vegetation and soil monitoring, and buffer

zones to minimize dust emissions in populated areas such as the Cantonment Area, and implementation of land rehabilitation projects, as needed, within the LRAM program.

Less than Significant – Exposure to soil contaminants in the Cantonment Area would represent a low risk to personnel. No live-fire or maneuver training is conducted in the Cantonment Area, and airborne pathways (such as windblown contaminated dust) is not a migration pathway that soils contaminated with munitions constituents would reach receptors outside the Range Area. Therefore, no significant exposures to chemical contaminants related to munitions constituents in soils would be expected.

No Impacts – Earthquakes are common on Hawai‘i Island, but most are relatively small. PTA is located in an area with about a 10 percent chance of experiencing horizontal ground acceleration greater than 40 percent of gravity in the next 50 years. Hawai‘i Island is in Zone 4 of the Uniform Building Code. Although PTA is subject to periodic eruptions of lava from the Mauna Loa volcano, the risk of any particular site in the Cantonment Area being inundated by a lava flow is small because flows tend to be narrow and occur relatively infrequently. If a lava flow were initiated in an area upslope from PTA, it is likely that PTA would be affected and a quick evacuation would be needed. Potential hazards would include hazards to human safety, loss of property, detonation of stored munitions, and loss of useable land and facilities for training.

For the modernization projects, implementation of standard procedures and engineering practices would be expected to reduce the volcanic and seismic hazards to acceptable levels, although these measures cannot eliminate the hazards. Most of these measures would include implementation of timely warning systems, appropriate planning and training, and appropriate engineering design. The proposed modernization projects at PTA would be designed to meet all Federal, State, and local building code requirements. The Hawaiian Volcano Observatory provides warnings to local officials and the public of volcanic hazard conditions. The Army prepares and implements volcanic and seismic hazard plans and training, including evacuation plans for personnel and munitions in the event of an emergency.

Live-fire Training Impacts

No Impacts – No live-fire training activities would occur within the Cantonment Area, nor would it occur under any part of the Proposed Action. There would be no impacts to geology and soils.

Maneuver Training Impacts

No Impacts – No maneuver training activities would occur within the Cantonment Area. There would be no impacts to geology and soils.

4.8.5 PTA Range Area

4.8.5.1 General Range Area

Modernization/Construction Impacts

Less than Significant – Modernization projects in the Range Area would include upgrades and infrastructure improvements at multiple ranges throughout the installation, and also the construction of new ranges, to improve range utilization and enhance operations. Site clearing and grading for construction of the proposed ranges and new facilities would expose soils to enhanced erosion by water or

wind, however, this would be expected to be less than significant because the upgrades or new ranges and facilities would be constructed on relatively level land using standard erosion control practices and construction impacts would be temporary.

Exposure to chemical contaminants in soils in the general Range Area could occur through several pathways, including direct contact with contaminated soils, ingestion of soils or inhalation of windblown dust at close range. Exposure estimates are based on assumptions about the amount of soil that might be ingested by a person who works in an area soils. Not all exposures result in unacceptable health risks and there are certain thresholds of exposure below which the health risks are so low that they cannot be distinguished from background risks.

The USACE composite soil sampling at selected ranges at PTA revealed the presence of metals, explosives, and SVOCs (see Section 3.8). The observed concentrations were generally less than industrial PRGs. Only one explosive compound (RDX) was detected in samples from Range 5 and Range 9 at concentrations above the industrial PRG, whereas samples from Training Area 12 were below. The risks from multiple chemical exposures are additive, and similar calculations can be done for each of the contaminants to which Soldiers or personnel may be exposed at PTA. The risks from HMX, nitroglycerin, and TNT are very small compared to the risk from RDX; the sum of their risks is less than 0.74×10^{-6} .

The risks associated with each of the metals can be calculated similarly, with similar results. The highest risks are associated with the iron and aluminum in the soil, both of these metals occur naturally at high concentrations.

Overall, the sum of the carcinogenic and non-carcinogenic risks, based on the available soil sampling data and using PRGs as an estimate of risk, is less than the EPA threshold for worker exposure. It is unlikely that exposures to RDX or other chemicals by Soldiers on the ranges would be similar to worker exposures in an industrial setting. For example, workers are assumed to ingest 100 mg of soil per day, 250 days per year for 25 years. This assumption over-estimates troop exposures as troops would only be exposed temporarily and for short durations. In addition, the public would not have any contact to the General Range Area or these soils. Based on this analysis, soil contamination would represent a less than significant impact.

In general, the risk due to exposure to contaminated soils at PTA would be low. Even though the construction of proposed or new ranges and facilities would require the conversion of a portion of the range impact area, Soldiers would be exposed to contaminated soils in a limited capacity for a period of days or weeks. The level of chemical compounds present would be below their respective industrial PRGs. Considered together, the potential duration of exposure to the chemical concentrations on the training ranges at PTA would represent a low risk to personnel.

There would be potential dust and surface runoff erosion from use of roads at PTA. The impacts would not be considered to be significant relative to long term soil loss or erosion because the porosity of soils there coupled with a general lack of gulches or surface water would highly localize sedimentation from runoff erosion.

No Impacts – Geology and soil conditions would be similar to those described in Section 4.8.4. Therefore, conflicts with existing regulations or exposure to geologic hazards would not occur.

Live-fire Training Impacts

Less than Significant – Soil impacts from live-fire training activities would be less than significant as vehicle use would be generally limited to existing trails or roads. Significant impacts to loss of soil, soil erosion, and compaction are attributed to mounted maneuver training with substantial off-road vehicle (e.g., tactical vehicle) use. Live-fire training would be limited in unit size and mostly dismounted maneuver training firing into the impact area. Vehicle use would be generally limited to existing trails or roads.

No Impacts – Geology and soil conditions would be similar to those described in Section 4.8.4. Therefore, conflicts with existing regulations or exposure to geologic hazards would not occur.

Maneuver Training Impacts

No Impacts – The proposed modernization projects do not include increased maneuver to PTA. There would be no impacts to geology and soils associated with maneuver training as a result of either the construction or operation of proposed modernization projects.

4.8.5.2 IPBA at Western Range Area

Modernization/Construction Impacts

Less than Significant – Site clearing and grading for construction of the proposed IPBA, including the MOUT facility and Live-fire Shoothouse, would expose lava flow areas and soils to enhanced erosion by water or wind. This impact would be expected to be less than significant because the proposed IPBA would be constructed on lava flow areas with little soil development using standard erosion control practices and because the construction impacts would be temporary.

Similar to Section 4.8.5.1, in general, the risk due to exposure to contaminated soils at PTA would be low. Even though the construction of the proposed IPBA would require the conversion of a portion of the range impact area, Soldiers would be exposed to contaminated soils in a limited capacity for a period of days or weeks. The level of chemical compounds present would be below their respective industrial PRGs. Considered together, the potential duration of exposure to the chemical concentrations on the training ranges at PTA would represent a low risk to personnel.

There would be potential dust and surface runoff erosion from use of roads at PTA near the Western Range Area. The impacts would not be considered to be significant relative to long term soil loss or erosion because use of the trail would not significantly alter the rate of erosion. The Army would follow BMPs in maintaining these trails or roads.

The Army would develop and implement a management plan for PTA to address measures such as, but not limited to, restrictions on the timing or type of training during high risk conditions, vegetation and soil monitoring, and buffer zones to minimize dust emissions. The Army would monitor the impacts of training activities at the proposed IPBA to ensure that fugitive dust emissions stay within the acceptable

ranges as predicted and environmental problems do not result from excessive soil erosion or compaction. The plan would also define contingency measures to mitigate the impacts of training activities that exceed the acceptable ranges for dust emissions or soil compaction.

No Impacts – Geology and soil conditions would be similar to those described in Section 4.8.4. Therefore, conflicts with existing regulations or exposure to geologic hazards would not occur.

Live-fire Training Impacts

Less than Significant – Small arms live-fire would be directed at targetry. Damage to soils from live-fire operations at the IPBC would be minimized through regular range maintenance procedures. The Live-fire Shoothouse would be designed to minimize the occurrence of live-ammunition from leaving the facility, but the occurrence would be possible but rare. Damage to soils from live ammunition fired at these ranges would not occur.

Additionally, expended ammunition at the point of impact would contribute to an increase in lead in soils at the Western Range Area. Due to a lack of migration pathways for lead ammunition at PTA, the resulting contamination would be localized to the Range Area.

Less than significant impacts are anticipated from geologic hazards. The Saddle region has experienced a relatively long period of stability and volcanic activity in the immediate PTA area to pose no immediate risk. Kīlauea, however, continues to remain active; recent activity in early 2010 suggests that earthquakes and further eruption of that volcano is anticipated to increase, but it is unknown to what extent.

No Impacts – Live ammunition would not be used at the MOUT and therefore no impacts are anticipated from operations at that facility.

Maneuver Training Impacts

Less than Significant – Vehicle use at the IPBA would be limited to the roads accessing the Western Range Area and the access roads of the proposed IPBA and MOUT. Training at the proposed IPBC would be dismounted thereby minimizing erosive effects of training.

4.8.5.3 IPBA at Charlie's Circle

Impacts from the proposed IPBA construction and operation at Charlie's Circle are anticipated to be similar to those described for the Western Range Area (Section 4.8.5.2).

4.8.5.4 IPBA at Southwest of Range 20

Significant – The terrain in this part of the Range Area is thought to be extremely rugged. Extensive ground softening, grading, and leveling would need to occur here to accommodate for the proposed IPBA, and specifically for line-of-sight requirements between the firing point and targetry on the IPBC. The costs associated with making this a feasible location would exceed construction costs of the preferred alternative location at the Western Range Area or Charlie's Circle. Furthermore, the Army would need to request additional funding through the MILCON process that requires Congressional authorization. This is a time consuming process that would hinder current plans for the proposed IPBA construction. Cost

and time are limiting factors, but as explained in Section 2.2.3.5, would not eliminate this alternative from consideration⁹⁰.

Less than Significant – While this proposed location does not share a footprint with the Western Range Area, the relative geologic setting, erosive properties of soils, and migration pathways for resulting contamination would be similar to the preferred location.

4.8.5.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the proposed IPBA would not be constructed and the existing impact area would remain in its current condition. There would be no risk of geology and soil concerns from construction- or training-related activities as none would occur. The impact area would remain unchanged. There would be no impacts to geology and soils from the No Action Alternative.

4.9 BIOLOGICAL RESOURCES

Impacts to biological resources can result from various types of activities, including construction activities such as demolition, grading, excavation, and construction that could alter or destroy habitat, either temporarily or permanently. In addition, live-fire training could result in impacts to certain species. This section evaluates impacts on biological resources within the ROI, as described in the Existing Environment (Section 3.9). These resources include vegetation communities and vegetation, terrestrial wildlife, listed wildlife and plant species, and critical habitats. This section describes the methods and significance criteria used to assess the level of impact from implementing projects of the Programmatic Action, the three alternatives for the IPBA, and the No Action alternatives.

The analysis of the intensity and extent of impacts on listed species that would result from the Proposed Action incorporates the results of past Section 7 consultations with the USFWS that were conducted in 2003 and 2008, and also the results of more recent surveys and the pending consultation on the potential effects of the preferred IPBA alternative on listed species and critical habitats.

A discussion of wildfires and their potential are provided in Section 4.15.

4.9.1 Conservation Programs

The management of natural resources on PTA is based on the Pōhakuloa Implementation Plan (PIP) and requirements of existing BOs. The PIP was developed in cooperation with USFWS and other agencies.

⁹⁰ AR 350-19, Section 3-23b(1) b. “Changes to the approved design specifications must be kept to an absolute minimum during the construction phase, to avoid cost changes and the associated risks of—(1) Exceeding congressionally approved project funding.”

TC 25-8, Chapter 4-1: “Training ranges are major contributors to keeping the Army ready to accomplish its missions. They also represent a considerable investment in time, land, and fiscal resources. Once a training capability shortfall is verified, the installation range planning team must evaluate the most effective and cost efficient method of supporting the training requirement...”

The INRMP, IWFMP, and PIP establish measures to reduce the magnitude of impacts on biological resources from training activities and operations. Each of these plans is discussed below.

4.9.1.1 Pōhakuloa Implementation Plan

The draft PIP, which was completed in May 2008, outlines the management actions necessary to ensure the long-term survival of endangered species at PTA. The PIP is designed to assure proper conservation of species as construction and use of ranges and facilities occur. The PIP serves as a conservation guide for efforts that will result in the conservation of federally listed threatened and endangered plant and animal species and Palila Critical Habitat that could be affected by military training activities at PTA. In addition, the PIP includes monitoring protocols developed for each species to evaluate success of these management actions. Major management actions identified in the PIP include propagation and outplanting, weed control, survey protocols for flora and fauna, rodent control, ungulate control, large-scale fencing, invasive invertebrate control, and an incipient weed program. The majority of actions within the PIP are planned on Army lands.

Objectives and tasks of the PIP include:

- Management and monitoring protocols for the conservation, augmentation, and reintroduction of listed plant species on PTA;
- Invasive plant, rodent, and invertebrate management to reduce and control the threats from nonnative species and enhance habitat quality;
- Survey methodology for the endangered bird species that occur at PTA including the ‘Io, nene, and the Hawaiian dark-rumped petrel;
- Hawaiian hoary bat conservation plan to include survey and monitoring methodology, and enhancement and restoration of habitat; and
- Feral ungulate removal and establishment and maintenance of ungulate-proof fencing.

4.9.1.2 Integrated Natural Resource Management Plan

The INRMP provides guidance on biological resources and includes conservation and restoration measures. The USARHAW Natural Resource Environmental Management Program fosters responsible management of Army lands to ensure long-term natural resource productivity to help the Army achieve its mission; this program is described in the INRMP (USAG-HI, 2010c; USARHAW, 2001). These documents outline the steps the Army has taken and will continue to take to fulfill its obligation as a Federal agency to help in the management of natural resources, and recovery of ESA species and other species and habitat recognized by Federal regulations.

4.9.1.3 Integrated Wildland Fire Management Plan

An IWFMP has been developed for PTA to reduce the likelihood of fire outbreak as a result of training activities. For PTA, the IWFMP SOPs include, but are not limited to, establishment and maintenance of fuel breaks, fire breaks, and fuel management corridors; dip tanks; suppression measures; and implementation of a Fire Danger Rating System. PTA’s BO (2003) required implementation of an

IWFMP. Section 3.15, Wildfires, provides greater detail about the IWFMP and fire outbreak protection at PTA.

4.9.2 Impact Methodology

Factors considered in determining the significance of an impact on biological resources for plants, terrestrial wildlife, and ESA-listed species include the extent or degree to which its implementation would result in the following:

- Cause the “take” of a protected species, such as a Federally listed threatened or endangered species;
- Have an adverse effect on a designated critical habitat identified in local or regional plans, policies, or regulations or by the USFWS or alter or destroy highly valuable to moderately valuable habitat and prevent biological communities in the area from re-establishing themselves after habitat is disturbed;
- Introduce or increase the prevalence of undesirable non-native species; or
- Cause long-term loss or impairment of a substantial portion of local species-dependent habitat.

Potential direct and indirect impacts on biological resources were analyzed within the ROI. Direct impacts on biological resources result when biological resources or critical habitats are altered, destroyed, or removed during the project. Indirect impacts may occur when project-related activities result in environmental changes that indirectly influence the survival, distribution, or abundance of protected or native species (or increase the abundance of undesirable nonnative [invasive] species). Examples of indirect impacts may include effects of noise, chemical contamination, or incidence of human activity levels that may disturb or harm wildlife. Beneficial impacts may also result.

Impacts to Federally listed threatened and endangered species have been evaluated using terminology defined under the ESA as follows:

No Effect. Listed species or designated critical habitat would not be impacted or listed species or designated critical habitats are not present.

May Affect / Not Likely to Adversely Affect. Effects on listed species or designated critical habitat are insignificant, discountable (i.e., extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated) or beneficial. During consultation, USFWS would provide written concurrence of “not likely to adversely affect.”

May Affect / Likely to Adversely Affect. An adverse effect to a listed species or designated critical habitat may occur as a direct or indirect result of the alternatives to implement the Proposed Action or its interrelated or independent actions, and the effect is neither discountable nor insignificant; nor is it beneficial. The conclusion that a proposed project is “likely to adversely affect” requires initiation of formal Section 7 consultation.

Likely to Jeopardize Proposed Species / Adversely Modify Proposed Critical Habitat. Situations are identified in which the alternatives to implement the Proposed Action could jeopardize a proposed species or adversely modify critical habitat to a species. If this criterion is reached, the Reasonable and Prudent

Alternative process would be required with USFWS to identify reasonable and prudent measures and conservation recommendations.

Table 4.9-1. Biological Resources Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie’s Circle	IPBA Southwest of Range 20	No Action (Do Not Build IPBA)				
Impacts from the spread of non-native species	⊖	⊖	⊖	○	⊖	⊖	⊖	○
Disturbance to listed species or habitat	⊗	⊗	⊗	○	○ - ⊗	○	○	○
Disturbance to wildlife and habitat	⊖	⊖	⊖	○	⊕	⊖	⊕	○

LEGEND

- ⊗ = Significant impact // May Affect / Likely to Adversely Affect
- ⊖ = Significant impact mitigable to less than significant // May Affect / Not Likely to Adversely Affect
- ⊕ = Less than significant impact
- = No impact // No Effect
- + = Beneficial impact

4.9.3 No Action Alternative (Do Not Modernize PTA)

No Impacts – Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. PTA would remain in its current condition. No upgrades to the Cantonment Area or range and training facilities would occur. There would be no risk from construction on any of these projects, or from training-related activities on proposed range projects. There would be no biological resources impacts.

4.9.4 PTA Cantonment Area

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant – In general, invasive species pose a threat to Native Hawaiian ecosystems. Movement of equipment into Hawai‘i from the continental U.S. or foreign ports, as well as from other islands or sub-installations within Hawai‘i, would increase the likelihood of non-native plant and animal introductions. Construction activities can introduce invasive species and other weeds through the use of sand and gravel that contains non-native plant seeds. The spread of invasive species

would have both short- and long-term impacts on vegetation resources and listed plants and wildlife, thus affecting the recovery of species.

Although the possible introduction of invasive species in the Cantonment Area could have impacts to vegetation resources and listed plants and wildlife, conservation measures would be implemented to reduce these impacts to less than significant. Currently, PTA has developed guidelines (e.g., vehicle washing requirements) to prevent the establishment of non-native species. Invasive species are managed by PTA Natural Resources Staff through requirements in the 2003 and 2008 BOs, invasive plant management guidance, and a weed control program.

PTA also follows HQDA guidance developed in consultation with the Invasive Species Council and compliance with EO 13112, which determines Federal agency duties with regard to preventing and compensating for invasive species impacts. PTA would implement feasible and prudent measures recommended by the Invasive Species Council.

Recommended Mitigation – Construction-related activities with the potential for invasive species may include, but are not limited to, the following mitigation measures:

- Educating contractors about the need to wear weed-free clothes and maintaining weed-free vehicles when coming onto the construction site and avoiding introducing nonnative species to the project site.
- Preparing a one-page insert to construction contract bids informing potential bidders of the requirement.
- Educating contractors, Range Maintenance personnel, and other staff about the transport of invasive ants from the Cantonment Area to the General Range Area.
- Inspecting and washing all vehicles at wash rack facilities prior to leaving PTA to minimize the spread of weeds, such as fountain grass, and animal (invertebrate) relocations.
- Invasive animal control to include protocols for the removal of introduced animals, and education about the introduction of invasive species.

Less than Significant – There are limited areas of vegetation within the Cantonment Area and construction projects would be located mostly in existing, disturbed areas, thus limiting impacts to vegetation. Habitats within the footprints of the modernization projects in the Cantonment Area would likely be either developed, disturbed or otherwise managed. Wildlife and migratory birds would be temporarily disturbed during construction; however, species likely to be present in areas of cantonment construction are those habituated to human presence, and would not be adversely affected. Proposed modernization activities occurring within the Cantonment Area would have a less than significant impact to vegetation and general wildlife and habitats.

No Impacts – Proposed modernization projects in the Cantonment Area include upgrades to barracks and billeting facilities, and consolidation of the maintenance operations in the PTA Industrial Area. These projects would require some ground disturbance from construction-related activities. The endangered Hawaiian hoary bat has been recently observed (2010-2011) flying at night near the Cantonment Area; no

roosting bats have been observed within the Cantonment Area. According to the 2003 BO, a Hawaiian hoary bat “take” is defined in acres of potential roosting treeland habitat within the PTA Action Area. The 2003 BO defines shrublands with māmane and naio as dominant or co-dominant species as potential roosting habitat (USAG-PTA et al., 2010). The Cantonment Area consists of shrubland and disturbed vegetation community types. No treeland habitat is present and shrubland is minimal and not contiguous. Furthermore, modernization activities would be occurring in mostly disturbed areas. Habitat that could be used for roosting is not present or in abundance for the bats to use. Therefore, modernization projects in the Cantonment Area would likely result in a “No Effect” impact to the Hawaiian hoary bat.

Live-fire Training Impacts

No Impacts – No live-fire training activities would occur within the Cantonment Area. There would be no impacts to biological resources.

Maneuver Training Impacts

No Impacts – No maneuver training would occur within the Cantonment Area. There would be no impacts to biological resources.

4.9.5 PTA Range Area

Biological resources could be disturbed or damaged resulting from construction; foot and vehicle traffic related to training or construction activities; training exercises involving machine gun fire, ordnance projectiles, explosions; UXO demilitarization; and wildfires. Direct impacts, such as the physical disturbance of sites, may lessen the integrity of known habitats. Indirect impacts may include increased fire potential as a result of potential ignition sources, such as catalytic converters and sparks associated with construction vehicles and machinery.

4.9.5.1 General Range Area

Modernization/Construction Impacts

No Effect to May Affect / Likely to Adversely Affect – The location and type of proposed modernization project within the General Range Area, including the KMA, would determine the potential impact on listed species. For example, the proposed modernization of ranges along Red Leg trail (east side of PTA Range Area) or construction projects in the KMA could have impacts to listed species. Listed species in the Range Area include the nene, Hawaiian hoary bat, diamond spleenwort, aupaka, nehe, *Vigna o-wahuensis*, honohono, kio‘ele, ma‘aloa, ‘ihi makole, Hawaiian catchfly, popolu ku mai, creeping mint, and Hawai‘i pricklyash. Future NEPA analysis would be conducted to determine site-specific impacts to listed species from the proposed modernization projects occurring within the General Range Area and KMA; conservation measures may be similar to what has been recommended from prior BOs to reduce impacts. Examples of these mitigation measures may include:

- Listed plant conservation and management projects and goals that include monitoring federally listed species, weed control, invasive plant inventory, and ungulate and ant control.
- Listed plant species propagation, outplanting, *ex situ* genetic storage, and site management.
- Biological studies on impacts of foot traffic on federally listed species.

- Annual reporting on nene research.
- Annual reporting on Hawaiian hoary bat research.
- Report on dead nene and Hawaiian hoary bats.
- Avian surveys to detect changes in population demographics, vigor, and total population numbers.
- Determine and execute habitat improvements (e.g., control of invasive, non-native plants, feral ungulates, rodents, invertebrates, dust, etc.).
- Construct fences and determine the frequency and logistics for fence maintenance and hunting programs to accomplish ungulate removal.
- Develop reintroduction and augmentation protocols for plant species.

Significant Impact Mitigable to Less than Significant – As previously mentioned, invasive species pose a threat to Native Hawaiian ecosystems. The spread of invasive species would have both short and long-term impacts on vegetation resources and listed plants and wildlife, thus affecting the recovery of species.

Impacts from the introduction of invasive species from modernization/construction activities occurring within the Range Area and KMA would be expected to be significant but mitigable to less than significant. Future NEPA analysis would be conducted to determine site-specific impacts resulting from invasive species occurring within the Range Area and KMA.

Recommended Mitigation – Construction-related activities with the potential for invasive species may include, but are not limited to, the following mitigation measures:

- Educating contractors about the need to wear weed-free clothes and maintaining weed-free vehicles when coming onto the construction site and avoiding introducing nonnative species to the project site.
- Preparing a one-page insert to construction contract bids informing potential bidders of the requirement.
- Inspecting and washing all vehicles at wash rack facilities prior to leaving PTA to minimize the spread of weeds, such as fountain grass, and animal (invertebrate) relocations.
- Invasive animal control to include protocols for the removal of introduced animals, and education of contractors about the introduction of invasive species.

Less Than Significant – Impacts to native vegetation, general wildlife, wildlife habitats, and migratory birds are expected to be negligible. Elevated noise levels would displace various wildlife species during construction activities; however, impacts from range construction to wildlife would be similar to impacts from normal operations and activities occurring in the anticipated construction footprints. Increased noise as a result of construction would not be expected to impact terrestrial wildlife because field surveys have shown that it is not a significant factor in behavior and does not affect reproductive success (U.S. Army and USACE, 2008b). Future NEPA analysis would be conducted to determine site-specific impacts to

general wildlife, vegetation, and habitats from any proposed modernization projects occurring within the General Range Area.

Live-fire Training Impacts

No Effect to May Affect / Likely to Adversely Affect – Live-fire training would be limited in unit size and mostly dismounted maneuver training firing into the impact area. Vehicle use would be generally limited to existing trails or roads. Live-fire training impacts (e.g., stray ammunition rounds from small arms or muzzle flashes) within the General Range Area could result in the potential increase and frequency of wildfires, which could impact Federal and State listed species (see Section 4.15, Wildfires).

Recommended Mitigation – Develop in-briefing materials to ensure units using proposed new ranges can identify listed species and habitat to avoid during training.

Impacts to listed species from live-fire training activities could range from “No Effect” to “May Affect / Likely to Adversely Affect.” Future NEPA analysis would be conducted to determine site-specific impacts to listed species from live-fire training impacts occurring within the Range Area.

Significant Impact Mitigable to Less than Significant – Live-fire training has the potential to introduce and spread invasive plants and noxious weeds by potential fires that would place native plant species at competitive disadvantage. The primary invasive species of concern from a wildfire standpoint is fountain grass as this species establishes wherever substrate is sufficient for its needs, but prefers disturbed sites. Fountain grass produces substantial biomass and copious seed crops, and is well adapted to fire (see Section 4.15).

Vegetation communities within the Range Area could be disturbed by live-fire training. The use of certain types of ammunition increases the chances of starting fires in the impact area and within fire danger areas. The Army has developed and implemented an Integrated Wildland Fire Management Plan to control the frequency, intensity, and size of fires on USAG-HI lands in order to comply with Federal and State laws and meet land stewardship responsibilities. Specific SOPs for wildfire management at PTA are addressed in the plan and in Section 4.15, Wildfires.

Operation of ranges has the potential to displace various wildlife species, including migratory birds. Displacement could be caused by human presence in the area, as well as elevated noise levels. Wildlife entering into the impact area and associated SDZ could be directly affected by ordnance or other munitions. The use of new ranges at PTA would not likely significantly impact wildlife or their habitats because the ranges would be constructed in previously disturbed areas. Wildlife species in or around these ranges are more tolerant of human activity, and it is assumed that listed species would have previously left the area.

Impacts to vegetation and general wildlife or from the introduction of invasive species from live-fire training activities occurring within the General Range Area could be significant impact mitigable to less than significant. Future NEPA analysis would be conducted to determine site-specific impacts resulting from invasive plants occurring within the Range Area.

Recommended Mitigation – Abide by established SOPs for control of invasive plants including inspecting and washing all military vehicles at wash rack facilities prior to leaving PTA to minimize the spread of weeds, such as fountain grass, and animal (invertebrate) relocations, and other measures.

Maneuver Training Impacts

No Impacts – The proposed modernization projects do not include increased maneuver to PTA. The resulting operation of maneuver training in the General Range Area may impact biological resources from ground maneuvers. While impacts would be less than those from live-fire exercises, the presence of Soldiers could impact vegetation and wildlife habitat through foot traffic.

Recommended Mitigation – In-briefing and education would reduce the potential for vegetation and habitats to become damaged during maneuver training.

4.9.5.2 IPBA at Western Range Area

Modernization/Construction Impacts

May Affect / Likely to Adversely Affect – Construction of the Western Range Area may result in damage to listed plant species and their habitats. The following federally listed plants were identified within the IPBA at Western Range Area: diamond spleenwort, kio‘ele, Hawaiian catchfly, and Hawai‘i pricklyash. There has also been preliminary telemetry data of nene visiting the Western Range Area. For the construction of the proposed IPBC, a small amount of woodland habitat (potential habitat for the Hawaiian hoary bat) would be impacted based on the sparse trees present in the area. Under the USFWS 2003 BO, the Army is allowed to cut down 118 acres of woodland habitat per year at PTA. The Army plans only to ground soften approximately 110 acres of land to accommodate range construction for the IPBC; therefore, the Army would not exceed the 118 acre tree-clearing threshold. The Live-fire Shoothouse and MOUT facility will not be constructed in the same year as the IPBC, therefore, the Army will consider tree clearing requirements when those ranges are constructed.

Due to the presence of listed species within the Western Range Area, a Section 7 formal consultation will be initiated with the USFWS. The USFWS will issue a BO in the near future to address impacts to listed species, and the Service may recommend conservation and mitigation measures to reduce potential adverse impacts.

Recommended Mitigation – The Army will consider the woodland habitat tree clearing requirements (in accordance with the USFWS 2003 BO) for the Live-fire Shoothouse and MOUT facility when those ranges are ready for construction.

Significant Impact Mitigable to Less than Significant – Construction of the Western Range Area would impact the limited vegetation, wildlife, migratory birds, and habitats present in the area. Although construction of the Western Range Area would have impacts to these biological resources, conservation measures would be implemented to limit the impacts. The BO will also address impacts to listed plants and/or wildlife from the possible introduction of invasive species resulting from IPBA construction. The Army currently institutes mitigations (e.g., herbicides, use of vehicle wash racks) to minimize the significance of the spread of invasive species. These management controls would continue.

Recommended Mitigation – The following measures are currently in place to respond to new or increasing impacts to vegetation, and are continually reviewed and revised.

- Continue implementation of INRMPs, with specific actions for management of vegetation and wildlife (invasive and listed).
- Require construction contractors to adhere to the BMPs outlined in the 2003 BO for transformation construction projects.
- Continue RTLA and LRAM programs to minimize and rehabilitate vegetation damage.

Live-fire Training Impacts

May Affect / Likely to Adversely Affect – Live-fire training occurring within the Western Range Area could result in the potential increase and frequency of wildfires, which could impact federally listed plant species.

As previously mentioned, Section 7 formal consultation is pending with the USFWS. The USFWS will issue a BO to address impacts to listed plant and wildlife species from live-fire training and invasive plants concerns, as well as recommend conservation and mitigation measures to reduce potential impacts.

Significant Impact Mitigable to Less than Significant – Live-fire training impacts from projects within the Western Range Area would disturb vegetation, wildlife, migratory birds, and wildlife habitats.

Ammunition rounds from small arms could damage vegetation and habitats or disturb wildlife that could result in a permanent loss of the resource. Any visual flash or sound effects simulators used on the IPBC could ignite a wildfire that may result in permanent damage or loss of known habitat. Although live-fire training occurring within the Western Range Area would have impacts to vegetation resources, conservation measures would be implemented.

The MOUT would not employ live ammunition; however, visual flash or sound effects simulators may be used. Live ammunition used at the Shoothouse would likely be contained within the building; however, there is a small possibility that a round may escape and damage nearby vegetation and habitats. Due to the extent of clearing and ground softening the Army would undertake to accommodate these facilities within the Western Range Area, the potential for wildfires would be less than significant (see Section 4.15, Wildfires).

Recommended Mitigation – Avoidance of known habitats could be built into the design of both ranges.

Maneuver Training Impacts

May Affect / Likely to Adversely Affect – Maneuver training impacts within the Western Range Area could result in the potential disturbance of federally listed species and their habitat. Training at the IPBC would be primarily dismounted, thereby limiting maneuver on the range to foot traffic. Foot traffic would have less of an impact than the presence of large vehicles for tactical maneuvers. Any mounted training at the MOUT facility would be limited to roads built between the pre-fabricated structures. Roads leading to the MOUT would be sited to avoid known habitats. Only a few vehicles would travel the access road to reach the Live-fire Shoothouse. In general, vehicles would remain on established roads. The new access road to the IPBA would be sited to avoid known resources where necessary.

A Section 7 formal consultation is pending with the USFWS to address potential impacts to listed species, as well as conservation and mitigation measures to reduce impacts.

Significant Impact Mitigable To Less Than Significant – Maneuver training within the Western Range Area could introduce invasive plants and noxious weeds. To prevent the introduction of non-native plants and weeds to the Western Range, the maneuver training would follow established SOPs at PTA including the use of wash racks. Wash racks are provided at PTA for vehicles used for training activities to clean off weed seeds before leaving PTA to reduce the risk of exporting invasive and noxious weeds to other areas, as well as minimizing threats to federally listed species (USAG-HI, 2010c). Currently, there are two active washracks located near the BAAF.

Recommended Mitigation – Abide by established SOPs for control of invasive plants including inspecting and washing all military vehicles at wash rack facilities prior to leaving PTA to minimize the spread of weeds, such as fountain grass, and animal (invertebrate) relocations, and other measures.

Less Than Significant – As mentioned earlier, training at the IPBC would be primarily dismounted, although some mounted training may occur in Strykers, HMMWVs, or USMC Light Armored Vehicles (LAVs)⁹¹, but maneuvers would largely be limited to foot traffic. Foot traffic would have less impact than the presence of large vehicles for tactical maneuvers. In general, vehicles would remain on established roads or trails to avoid impacts to listed species. The new access road to the IPBA would be sited to avoid known resources where necessary. SOPs would be implemented for bivouac areas following a “carry in/carry out” policy. Fire potential would be very low at the IPBC given the sparse vegetation. Fuel monitors would be conducted every year to two years to assess for sparse trees and fountain grass (which catch fire easily). By implementing these measures, the Army anticipates that impacts to general wildlife and their habitats, and vegetation would be considered less than significant.

4.9.5.3 IPBA at Charlie’s Circle

Although the entire Charlie’s Circle location was not surveyed during the recent species survey, this location overlaps half of the Western Range Area surveyed. Similar listed species and habitats would be expected at Charlie’s Circle. Impacts from construction and operation of the IPBA at Charlie’s Circle and recommended mitigation measures would be similar to impacts and mitigation described for the Western Range Area, Section 4.9.5.2.

4.9.5.4 IPBA at Southwest of Range 20

Impacts from construction and operation of the IPBA at Southwest of Range 20 would be similar to impacts described for the Western Range Area, Section 4.9.5.2. Although Southwest of Range 20 has not been surveyed for federally listed species, the following federally listed plants have the potential to occur within the range due to their association with plant community types within the area: diamond spleenwort, ‘ihi makole, and Hawaiian catchfly. Furthermore, there have been preliminary sightings northwest of the range.

⁹¹ The LAV-25 is an eight-wheeled amphibious reconnaissance vehicles used by the Marine Corps. It is similar in size to the Stryker.

4.9.6 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the proposed IPBA would not be constructed and the existing impact area would remain in its current condition. Known listed plant species identified in the recent survey for Western Range Area would remain in the impact area. However, no construction- or training-related activities for the IPBA would occur to impacts federally listed species, vegetation, general wildlife and habitats, and the spread of invasive species. There would be no impacts to biological resources from the No Action Alternative.

4.10 CULTURAL RESOURCES

4.10.1 Impact Methodology and Summary

The Army defines cultural resources and the ROI for the proposed projects in Section 3.10.1. The Army has surveyed several areas of PTA and, in concert with the Hawai‘i SHPD and other consulting parties, to determine the significance of many of those sites in relation to past projects. Effects of a proposed action on cultural and historic resources are conducted on a project-by-project basis. A review of the Army’s inventory of resources at PTA shows that ranges located to the northeast and east of the impact area have been thoroughly surveyed. Likewise, the KMA and areas west and southwest of the impact area have been thoroughly surveyed. Cultural resources that are determined NRHP-eligible are subject to protection under the NHPA. Additional protection for cultural resources is provided under ARPA, AIRFA, and NAGPRA.

At PTA, not all cultural landscapes surveyed have been formally evaluated. Resources that are pending evaluations for National Register eligibility are treated as eligible until formal determinations are made. Evaluation for National Register eligibility and collecting additional information on the location of culturally important places are done in consultation with the Hawai‘i SHPD and other consulting parties, in compliance with Section 106 of the NHPA of 1966.

The projects discussed in Chapter 2 are spread throughout the Cantonment Area and Range Area; and are proposed in locations where prior surveys have been done, and where no surveys have been conducted (e.g., IPBA Charlie’s Circle and Southwest of Range 20 alternatives, and alternative courses of action for other proposed ranges on the modernization list).

Impacts were assessed by identifying the nature and locations of the Proposed Actions in relation to the locations of known sensitive cultural resources. It should be noted that without site-specific information on most of the proposed projects (Table 2.1-1), including exact proposed locations, identified and evaluated APE for individual projects, and credible alternatives to consider, impacts can only really be inferred based upon what is known at the time this Programmatic EIS was prepared.

The method for assessing potential impacts on cultural resources involves identifying sensitive cultural resources in the ROI, identifying project activities that could affect those resources, and determining the type and magnitude of potential direct and indirect impacts on those resources.

It should be noted that additional surveys are pending for areas north and west of the proposed IPBA range footprints (see Section 2.2.3.1 Surveys and Consultations Remaining). These surveyed areas will be included in the Army's Section 106 process. Potential impacts for these areas cannot be determined until more information is available.

Factors Considered for Determining Significance of Impacts

Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on properties listed in- or eligible for listing in the National Register. Pending formal evaluations, the Army treats all cultural resources as eligible to the National Register.

An adverse effect on a historic property, as defined by the NHPA, is not necessarily a significant impact under NEPA. While mitigation under the NHPA does not necessarily negate the adverse nature of an effect, mitigation measures under NEPA can reduce the significance of an impact. NHPA and NEPA compliance are separate and parallel processes, and the standards and thresholds of the two acts are not precisely the same.

Section 106 and its implementing regulations, 36 CFR 800, state that an undertaking has an effect on a historic property (i.e., National Register-eligible resource) when it could alter those characteristics of the property that qualify it for inclusion in the National Register. An undertaking is considered to have an adverse effect on a historic property when it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Section 106 adverse effects include, but are not limited to, the following:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property or alteration of the character of the property's setting when that character contributes to the property's qualifications for the National Register;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or changes that may alter its setting;
- Neglect of a property, resulting in its deterioration or destruction (also referred to as demolition by neglect); and,
- Transfer, lease or sale of a property without adequate provisions to protect its historic integrity.

Native Hawaiian sites, including sacred sites, burials, and cultural items, whether or not they are considered eligible for the National Register, may also be protected under AIRFA, ARPA, or NAGPRA. Factors considered in determining whether an action would have a significant impact for NEPA purposes on cultural resources include whether its implementation would result in an adverse effect, and the extent to which it would violate the provisions of AIRFA, ARPA, or NAGPRA. Also, mitigation measures for other resource areas, such as clearing UXO, may involve undertakings that could create adverse effects on cultural resources under the NHPA. Before being implemented, these actions would also undergo review to determine if they would require additional Section 106 review.

In addition, archeological sites would be adversely affected if they cannot be avoided or protected, requiring mitigation through data recovery, such as archeological excavation.

A summary of potential impacts to cultural resources is found at Table 4.10-1 below.

Table 4.10-1. Cultural Resources Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Physical destruction, damage or alteration to archaeological resources	⊗	⊗	⊗	⊗	⊙ - ⊗	⊙ - ⊗	⊗	○
Modify or alter the historic character of a property	○	○	○	○	⊙ - ⊗	⊙ - ⊗	⊗	○
Impacts on archaeological sites	⊗	⊗	⊗	⊗	⊙ - ⊗	⊙ - ⊗	○	○
Deny access to archaeological sites	⊗	⊗	⊗	⊗	⊙ - ⊗	⊙ - ⊗	○	○

LEGEND

- ⊗ = Significant impact
- ⊗ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

The Army initiated consultation with the SHPD and other consulting parties on the IPBA on March 14, 2011. The letter, seen in Appendix C of this document, discusses that some of the sites within the APE of the Western Range alternative can be considered eligible for nomination to the National Register. Based upon the information of the Phase I survey and on information in ongoing investigations, the Army has determined that, if implemented at the preferred location, the project will have an adverse effect on historic properties there. The March 14, 2011 letter further seeks to work closely with the SHPD and other consulting parties to identify mitigation measures to reduce potential adverse effects.

4.10.2 No Action Alternative (No Modernization)

No Impacts – If the proposed modernization projects do not occur, then the Army does not anticipate impacts to known resources listed in Table 2.1-1 at this time. There would be no ground disturbing activities that would influence the integrity of known cultural resources or archaeological sites. Access to sites at PTA would continue as they are under existing conditions.

4.10.3 PTA Cantonment Area

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant – The proposed construction projects within the PTA Cantonment Area include construction of buildings and the related infrastructure, such as wells, walkways, landscaping, and additional mission essential facilities. Given the extent of construction proposed in the Cantonment Area, the Army would need to demolish some number of Quonset Huts to make room for new facilities. The condition of the Quonset Huts has been assessed, and the Quonset huts have lost their integrity and are not eligible for the NRHP. Although none of structures have been determined to be eligible (Hays, 2002), the Army has agreed to preserve four Quonsets huts located next to Pu‘u Pōhakuloa as mitigation for the Saddle Road construction that removed a number of buildings.

PTA’s Cantonment Area has long been highly disturbed. Several archaeological monitoring projects in the Cantonment Area, such as Information Infrastructure Improvements, septic tank replacement, and the sprung shelter construction failed to identify any subsurface resources, despite excavations between 1 and 2 m below ground surface. It is unlikely that archaeological resources exist or remain in a state that is recognizable; however, unidentified (buried) resources may exist beneath small structures (such as Quonset Huts as they have relatively shallow footers) that would be demolished as part of the proposed Cantonment Area modernization. Demolition of Quonset Huts and the subsequent construction of new facilities in their place could permanently destroy resources there.

Recommended Mitigation –As part of the Section 106 consultation for the realignment of Saddle Road, the Army agreed to the mitigation recommended to preserve six Quonset Huts, currently used as female billets. Given the continued deterioration of existing Quonset Huts at PTA, by implementing this mitigation, the Army may better preserve some facilities rather than continue to maintain more than 100 of these structures that were never meant to be permanent fixtures of the installation.

No Impacts – No archaeological sites or TCPs exist within the Cantonment Area at PTA. Therefore, implementation of projects in the Cantonment Area would not result in physical damage to Native Hawaiian Culture.

4.10.4 PTA Range Area

The types of training and activities that could disturb or damage cultural resources include construction, foot and vehicle traffic, machine gun fire, ordnance projectiles, explosions, UXO demilitarization, and wildfires. Direct impacts, such as the physical disturbance of sites, may lessen the integrity of known sites.

It should be noted that additional live-fire and maneuver training may occur at PTA under this Programmatic EIS, however, only at the proposed IPBA. The proposed actions involve the improvement of existing facilities and infrastructure, and the construction of some new or replacement facilities and

infrastructure. For projects where modernization would improve upon existing structures in their existing footprint, the Army would continue to protect known resources in the area. For projects where modernization would build new structures, the Army would conduct the appropriate surveys and site investigations to fully characterize the presence of resources in those areas. Some proposed projects involve siting and operating new live-fire ranges within the impact area of PTA but at new locations in the impact area that have not been previously surveyed. It is appropriate to evaluate the potential impacts from operation of these facilities on a site-by-site basis. Similarly, some projects propose the expansion of undersized ranges in the impact area. Further site investigations would accompany those projects and the Army would conduct subsequent consultations as necessary to determine the extent of impacts and to identify mitigation and conservation measures of any sites found in those areas.

4.10.4.1 General Range Area

Modernization/Construction Impacts

Given the variety of projects proposed in the Range Area, as discussed in Section 4.10.4, a range of impacts could be anticipated. Projects could be evaluated with greater specificity on an individual basis. See the sub-headers below for additional information.

Significant Impact – The construction of the proposed projects would have a significant impact on cultural resources based on the known number and range of resources within the PTA Range Area. A review of the Army’s inventory of resources at PTA shows that ranges along the northeast and east of the impact area have been thoroughly surveyed, as have the KMA and some areas west and southwest of the impact area.

For projects such as the AGR, new parts of the impact area may need to be reclaimed and it is likely that surveys would uncover an undetermined number of potentially eligible sites or archaeological sites. To the extent possible, ranges could be developed to avoid cultural resources identified in the proposed development areas. Where cultural resources could not be avoided, other mitigation measures would be developed through the Section 106 consultation process.

Significant Impact Mitigable to Less than Significant – Construction of proposed projects would likely involve ground softening, grading site surfaces, excavating the subsurface, and moving heavy construction equipment. All of these activities may result in direct destruction of or damage to archaeological resources.

The identification of known sites would assist the PTA Archaeologist in preparing avoidance measures to aid in site preservation and protection. The recommended mitigation measures below could minimize the severity of anticipated impact. Additional mitigation measures may be identified through the Section 106 process and consultation with the SHPD and other consulting parties.

Recommended Mitigation 1 – Work with range planners and the Corps of Engineers during the range design process to ensure avoidance measures are taken into consideration when locating firing points, targetry, and maneuver areas on the ranges. Where a range cannot avoid cultural sites, cultural sites would be incorporated into training scenarios as features to be avoided. Culturally or environmentally sensitive areas and features would be marked and recorded accordingly.

Recommended Mitigation 2 – Develop a monitoring program for archaeological sites to observe for long-term impacts and corrective measures.

Recommended Mitigation 3 – Continue providing in-briefing materials to raise awareness of cultural and environmentally sensitive sites and legal constraints for all Soldiers and units using ranges at PTA.

Less than Significant – For projects such as the Range 10 upgrade, or modernization of Range 1, these ranges have been previously surveyed, as has much of the land surrounding these ranges. These ranges have been in use for many years and were designed to avoid impacting nearby resources. By continuing to monitor resources in these areas, and continuing to work with range planners on avoidance measures during range upgrades, the chances that known sites may be impacted by modernization activities would be less than significant.

Proposed roads or other infrastructure in the Range Area could be positioned to avoid known sites.

Live-fire Training Impacts

Significant Impact Mitigable to Less than Significant – Stray ammunition rounds from small arms could damage cultural properties. Wildfires could ignite from the use of muzzle flash or hostile target/kill simulators and damage nearby resources.

Recommended Mitigation 1 – Continue providing in-briefing materials to raise awareness of cultural and environmentally sensitive sites and legal constraints for all Soldiers and units using ranges at PTA. Where training cannot avoid cultural sites, cultural sites would be incorporated into training scenarios as features to be avoided. Culturally sensitive areas and features would be marked and recorded accordingly.

Recommended Mitigation 2 – Revise existing cultural resources monitoring plan at PTA to take into account new range areas or training activities.

Maneuver Training Impacts

Less than Significant – For any range project, the resulting operation may impact archeological resources from ground maneuvers. While impacts would be less than from live-fire training, the presence of personnel could affect resources through foot traffic, vandalism, or accidental damage. Trampling may damage artifacts or alter structures, which would reduce the potential information these sites contain.

4.10.4.2 IPBA at Western Range Area

Modernization/Construction Impacts

Significant Impact – Irreversible damage and loss to the lava tube system and excavated pits (any traditional importance associated with these features) could not be avoided. The extent of the lava tube system on the proposed range footprint is vast and some tubes may need to be destroyed to insure the safety of Soldiers using the proposed IPBA and the safety of construction workers on heavy equipment building the IPBA. Lava tubes that are close to the surface could collapse when encountered by heavy construction equipment, thereby jeopardizing the safety of the equipment operator. Given the number of pits found throughout the range it would be impossible to avoid loss of some of these features. Because

of cultural material found in some lava tubes, and because excavated pits may have served a traditional purpose or served as a means for subsistence, irreversible impacts would occur to archaeological sites in the proposed IPBA footprint.

Construction of the IPBA would involve ground softening, grading site surfaces, excavating the subsurface, and moving heavy construction equipment. All of these activities may result in direct destruction of or damage to archaeological resources. The mitigation measures given below could minimize the severity of the impacts.

Significant Impact Mitigable to Less than Significant – For some lava tubes and archaeological features, action can be taken to avoid construction impacts including through range design and monitoring during construction.

Recommended Mitigation 1 – The PTA Archaeologist would participate during the range design charrette(s) to build avoidance measures into the design process.

Recommended Mitigation 2 – The Army could develop a monitoring plan to insure site protection during construction activities. If destruction of a lava tube is unavoidable, the PTA archaeologist could excavate and remove artifacts from the lava tube prior to construction activities.

Live-fire Training Impacts

Significant Impact Mitigable to Less than Significant – Ammunition rounds from small arms and/or from aviation gunnery on the IPBC could damage cultural properties that could result in a permanent loss of the resource. Any visual flash or sound effects simulators used on the IPBC could ignite a wildfire that may result in permanent damage or loss of known sites.

Recommended Mitigation 1 – Avoidance of known sites could be built into the design of both ranges.

Recommended Mitigation 2 – Establish individual range SOPs for right and left parameters for firing.

Recommended Mitigation 3 – Develop and implement long-term site protective measures such as fencing and Siebert stakes for sites.

Less than Significant – Live ammunition would not be used at the MOUT facility, however, visual flash or sound effects simulators may be used there at the company commander's discretion. Live ammunition used at the Shoothouse would likely be contained within the confines of the structure; nonetheless, there is a small chance that a round may escape and damage nearby resources. Due to the extent of clearing and ground softening the Army would undertake to accommodate these facilities, the potential for wildfires or damage to nearby sites would be less than significant.

Maneuver Training Impacts

Less than Significant – Training at the IPBC would be dismounted, thereby limiting maneuver on the range to foot traffic. Damage caused by foot traffic would cause considerably fewer impacts than damage by tactical vehicle maneuvers. Any mounted training at the MOUT facility would be limited to roads built between pre-fabricated structures. Roads for the MOUT facility would be sited to avoid known resources. Traffic to the Live-fire Shoothouse would be limited to the few vehicles travelling the access

road to access the facility. Vehicles would remain on established roads. New access road(s) to the IPBA would be sited to avoid known resources where necessary.

4.10.4.3 IPBA at Charlie Circle

Impacts from construction and operation of the IPBA under this alternative would be similar to impacts and recommended mitigation described for the IPBA at Western Range Area, Section 4.10.4.2.

4.10.4.4 IPBA at Southwest of Range 20

Impacts from construction and operation of the IPBA under this alternative would be similar to impacts and recommended mitigation described for the IPBA at Western Range Area, Section 4.10.4.2.

4.10.4.5 No Action Alternative (No IPBA)

Significant Impact Mitigable to Less than Significant – Through survey of the Western Range Area alternative APE, the Army identified a number of resources for which it will complete consultation with the Hawai‘i SHPD and other consulting parties. These are resources that are permanently in the Army’s inventory of known sites and must be managed accordingly. A great deal of MEC/UXO was also found to be present in the easternmost portion of the proposed IPBC range, which suggests that munitions resulting from indirect fire (firing points) may occasionally reach the western side of the impact area.

Recommended Mitigation - The Army may consider adjusting firing points to avoid known cultural sites within that portion of the impact area.

4.11 HAZARDOUS WASTE/HAZARDOUS MATERIALS

4.11.1 Impact Methodology and Summary

This section describes impacts on the resource area within the ROI, as described in the Affected Environment. This section describes the methods and significance criteria used to assess the level of impact from the proposed actions.

The methods for assessing potential hazardous material and hazardous waste impacts are derived from the following observations:

- Reviewing and evaluating each of the proposed projects to identify the action’s potential to use hazardous or toxic substances or to generate hazardous waste;
- Comparing the location of proposed training activities with baseline data on known or potentially contaminated areas (i.e., potentially MEC/UXO-contaminated land);
- Assessing the compliance of each proposed activity with applicable site specific hazardous material and hazardous waste management plans;
- Assessing the compliance of each proposed activity with applicable site specific SOPs and health and safety plans in order to avoid potential hazards; and,

- Using professional judgment to determine if any additional known or suspected potential hazardous material and hazardous waste impacts or concerns relate to the proposed projects based upon existing PTA operations and facilities.

Significant impacts were determined based upon the extent that implementation of projects proposed in this Programmatic EIS would result in the following actions:

- Expose military personnel or the public to areas potentially containing MEC/UXO;
- Contaminate soils or other media with lead from ammunition (soil contamination from munitions constituents are addressed in Section 3.8/4.8 Geology and Soils);
- Cause a spill or release of a hazardous substance, as defined by 40 CFR Part 302 (CERCLA), or Parts 110, 112, 116, and 117 (CWA); or increase the risk of accidental release (e.g., POLs) from vehicles, equipment or training practices;
- Expose military personnel or the public to PCBs, Asbestos or LBP;
- Generate increases in hazardous materials resulting in increased regulatory requirements over the long term or violating the standards established for the safe handling of herbicides and pesticides; and
- Cause a release of pesticides or herbicides or potentially expose military personnel or the public to pesticides.

The Army did not review some hazards that were reviewed in previous EISs covering actions at PTA; the actions and reasons are discussed below in Table 4.11-1.

Table 4.11-1. Hazards Eliminated from Analysis

Hazard	Reason hazard was eliminated from analysis
Transportation of Ammunition	The transportation of ammunition to/from PTA has been thoroughly assessed in past NEPA documentation. The actions proposed in this Programmatic EIS will not result in an increase in Soldiers training at PTA over baseline (historic) levels, nor do they require new units using different types of ammunition to train at PTA. Units conducting their semi-annual training at PTA will continue to do so in accordance with the methods described in past EISs, and will be governed by the same safe handling, packaging and transportation procedures.
Biomedical Wastes	PTA has facilities that currently are licensed to handle and temporarily store biomedical wastes until they may be properly disposed of off the installation. None of the proposed projects involve additional storage, handling, or disposal of these wastes.
Radon	Radon occurs in low concentrations in the Hawaiian Islands and is not considered a specific risk at PTA. Proposed facilities at PTA would not contain basements or areas where radon could accumulate (without proper ventilation) that could pose a health risk to employees or Soldiers at the installation.

Table 4.11-2 displays the overall anticipated impacts from implementing projects proposed in this Programmatic EIS, and also from the No Action.

Table 4.11-2. Hazardous Waste Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Exposure to UXO	⊗	⊗	⊗	○	⊗	⊗	○	○
Contaminate soils with lead from ammunition	⊗	⊗	⊗	○	⊙	⊙	○	○
Cause a spill or release of a hazardous substance	⊙	⊙	⊙	○	⊙	⊙	⊗	○
Exposure to lead, asbestos, or PCBs	○	○	○	○	○	⊙	⊗	○
Cause a release of herbicides or pesticides	⊙	⊙	⊙	○	⊙	⊙	⊙	○
Generate increases in hazardous materials	⊙	⊙	⊙	○	⊙	⊙	⊙ +	○

LEGEND

- ⊗ = Significant impact
- ⊗ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

4.11.2 No Action Alternative (No Modernization)

No Impact – Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. The installation would remain in its current condition. There would be no risk of introducing hazardous materials and/or hazardous waste from any construction-related or training-related activities at this time.

4.11.3 PTA Cantonment Area

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant –*OWS, Wash Racks, and Grease Traps*

The addition of the proposed facilities and packaged sewer system through modernization of the Cantonment Area may require the installation of OWS, grease traps, and potential wash racks. This need would be assessed in future site-specific documents once more information is known about the proposed project(s). If such a need exists, and the OWS is used incorrectly, then device failure could result in potential releases of POLs. Given the lack of surface and groundwater at the Cantonment Area, potential releases would likely impact the areas immediately around the release and not readily contaminate water supplies believed to occur deep below PTA. The DPW maintains a list of waste generating facilities on PTA and these facilities are inspected regularly by the USAG-HI Environmental Compliance Office (ECO).

Lead / Asbestos

The proposed modernization projects involve the renovation or demolition of older buildings within the Cantonment Area. Under these circumstances, LBP coatings may be encountered and small amounts of hazardous waste may be generated during construction. All operations involving the removal of LBP coatings and hazardous waste would be accomplished by qualified contractors and the wastes would be disposed of in accordance with State and County regulations.

The renovation or demolition of older buildings within the PTA cantonment area may involve encountering and removal of asbestos, which will generate small amounts of hazardous waste. Asbestos removal, similar to LBP, would be accomplished by qualified contractors licensed to handle and dispose of asbestos, and in accordance with local regulations. Exposures to asbestos can have lasting health effects to humans, but early identification and the implementation of safe handling practices would reduce the potential of exposures to less than significant.

Recommended Mitigation 1 – Implement OWS educational programs based on proper usage and maintenance.

Recommended Mitigation 2 – Conduct surveys and identification (pre-demolition) of facilities to determine asbestos or LBP hazards to reduce exposures.

Less than Significant*POLs*

Construction vehicles operating in the Cantonment Area may have accidental releases of POLs. USAG-HI Regulation 200-4 establishes policy for clean-up and reporting of small spills, and has ready spill kits for use when necessary. These procedures, coupled with construction site monitoring, would result in less than significant impacts to soils at PTA.

Pesticides/Herbicides

The addition of new facilities and additional ranges at PTA is anticipated to increase pesticide and herbicide usage throughout the installation. Since these materials are stored in the cantonment area,

additional storage may be required to accommodate product and product disposal. The NRO would continue to manage these resources in accordance with installation and Army policy.

Beneficial Impact –

Hazardous Waste Management

The proposed construction of vehicle and aircraft maintenance facilities at PTA would be an improvement over the facilities and conditions where tactical and non-tactical vehicles and aircraft are maintained currently. Facility improvements would translate into improvements in the storage of hazardous materials generated from maintenance activities currently. Since the installation is in compliance presently, the beneficial impacts of waste management at PTA would be less than significant. DPW would continue to implement the management practices within the IHWMP, installation spill plan, and maintenance facilities BMPs.

4.11.4 PTA Range Area

4.11.4.1 General Range Area

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant –

MEC/UXO

The construction associated with the modernization of live-fire ranges at PTA would involve the movement of soils in and around the impact area known to contain MEC/UXO. Construction would be preceded by Army-sponsored surface and subsurface clearance and if necessary followed by ordnance health and safety monitoring during construction in order to reduce potential exposure and impacts. Qualified EOD technicians would remove MEC/UXO hazards found in the Range Area for a proposed project, clearing it effectively prior to construction activities. Although MEC/UXO presents a significant impact, USAG-HI would follow proper abatement techniques.

Ammunition

Construction or modernization activities at live-fire ranges would involve the movement of soil contaminated with lead from ammunition. Expended lead ammunition at PTA does not readily corrode. Rather, it largely stays intact due to environmental conditions (semi-arid steppe conditions) and overall may not pose a significant health risk to workers exposed to expended lead ammunition in the Range Area. However, based upon the results of a 2002 soil study at PTA, some samples containing high lead concentrations were detected at Ranges 9, 10, and 11. Two of these samples exceeded the industrial soil PRG, as reported in the 2009 Final EIS for Military Training Activities at MMR (Alternative 4-PTA). Samples taken at other ranges did not exceed PRGs. One of the range modernization projects would relate to upgrading targetry on Range 10. Elevated levels of lead in soils at Range 10 could pose a potential health hazard to workers there during construction resulting from involuntary consumption or inhalation of soils/dust containing lead. While the duration of modernization at that range would be relatively short compared to constructing new ranges, workers could reduce their exposure to lead salts or dust by wearing personal protective equipment.

The USACE Engineer Research and Development Center reported in an EA (TR-07-11, 2007) that as a projectile (e.g., lead bullets) ejects through the bore hole of the end of a weapon (fired towards a target), the bore of the weapon may scour copper and/or lead from the projectile, resulting in a very small amount of copper and/or lead to be first airborne, and then deposited at the point where the weapon was fired. In addition, projectile fragments are made at the point of impact. The NIOSH, in Publication 76-130, reports that without proper ventilation, and design criteria indoor ranges present health hazards, chiefly in the form of lead poisoning. The Army has incorporated protective design features into its standard Live-fire Shootouse design, and has additionally adopted indoor air quality monitoring procedures to continually monitor for airborne hazards in these types of ranges.

Recommended Mitigation 1 – The Army would continue to educate Soldiers on how to identify MEC/UXO and the proper safety procedures for handling MEC/UXO.

Recommended Mitigation 2 – The Army could conduct a follow on soil study at Range 10 to better characterize the potential hazards there from lead contamination or other munitions constituents; and if necessary, take remedial action. The Army would also continue to provide safety guidance and, if necessary, protective equipment, to construction workers operating at Range 10.

Less than Significant –

POLs

Construction vehicles operating in the General Range Area pose potentially adverse impacts related to POL spills. However, similar to the impacts described for the Cantonment Area, the implementation of safety briefings for contractors, including following guidelines of USAG-HI Regulation 200-4, PTA's External Standard Operational Procedures (Annex G(5)c), and proper reporting, would ensure quick and effective responses to spills reducing the potential impact from contamination to less than significant.

Pesticides/Herbicides/Hazardous Waste Management

The addition of ranges would equate to greater responsibility of the NRO to apply controls at these facilities to minimize impacts from invasive species, protect listed species, and control fuels that could otherwise easily be ignited and cause wildfires. Storage for additional materials would continue to be provided in the Cantonment Area. The application of these materials, while overall would increase accumulation within the Range Area may not result in significant impacts providing proper procedures are followed for application and handling in accordance with manufacturer guidelines. Therefore, the impacts from further contamination and impacts to human health from exposures to these materials would be less than significant.

No Impacts –

LBP/Asbestos/PCBs

These materials are not anticipated to be found in the Range Area, and therefore do not pose a potential hazard to human health.

A preliminary assessment/site inspection was conducted of four potential contaminant sources (a former pesticide storage area, a fire training area, and two landfills) within the boundaries of PTA during March

and April 1993. The analytical results for soil sampling in these areas indicated that PCB concentrations were all below the listed PRG. Devices that were found to contain regulated levels of PCB have been either removed and upgraded with non-PCB devices, or were retrofilled or removed, drained, packaged, and disposed of in accordance with 40CFR Part 761. No PCB-containing transformers remain at PTA.

Live-fire Training Impacts

Significant Impact Mitigable to Less than Significant –

Ammunition

Prior soil studies at PTA determined that potential hazards from lead exist at only a few ranges; and therefore may expose Soldiers operating at those ranges to unnecessary health hazards. .

Ammunition would continue to be expended in the live-fire areas into the foreseeable future and introduce additional lead into approved areas at PTA. Because lead, like other munitions, does not readily migrate from live-fire ranges at PTA, the impact to surrounding areas would be minimal, and there is no anticipated impact to off-post lands and environmental media.

Additionally, hazards posed to Soldiers and other users of the range (such as maintenance workers, ITAM personnel, planners, etc.) from live-fire training, while quite hazardous in nature, would be minimized by continuing to follow proper safety protocols established by the Army and in PTA SOPs. SDZs are established per the exercise and type of weapons/ammunition to be fired during training.

MEC/UXO

Dudged munitions, per AR 385-64, are required to be fired into an ordnance impact area and not onto ranges where Soldiers maneuver. Nevertheless, Soldiers or range maintenance personnel, or other personnel monitoring ranges for natural or cultural resources, may encounter MEC/UXO. Through proper identification and reporting, MEC/UXO hazards may be safely removed, thereby reducing the potential hazard to less than significant.

Recommended Mitigation 1 – The Army would continue to educate Soldiers on how to identify MEC/UXO and the proper safety procedures for handling MEC/UXO.

Recommended Mitigation 2 – The Army could conduct monitoring and additional studies to better characterize the potential hazards from lead contamination or other munitions constituents; and if necessary, take remedial action.

Less than Significant –

Ammunition

Unused ammunition is stored at temporary holding facilities (igloos) or holding areas for the purpose of safety and security. At the completion of a deployment to PTA, any unused ammunition is safely transported back to Oahu for storage. Permanent storage of ammunition is not authorized at PTA.

Maneuver Training Impacts

Less than Significant –*MEC/UXO*

Maneuver training would be conducted in the same training areas as presently used. While no live-fire training would be conducted to introduce additional MEC/UXO, the current existence of MEC/UXO in these areas is expected. The KMA is part of the former Waikoloa Maneuver Area, which is a FUDS and supported live-fire training in the past. Following a risk-based analysis, the probability of MEC/UXO exposure in the KMA was determined to be low. Although MEC/UXO presents a significant impact, USAG-HI would follow proper abatement techniques, which would reduce this impact to acceptable. In addition, the Army would continue to educate Soldiers on how to identify MEC/UXO and the proper safety procedures for handling MEC/UXO.

As previously described for range construction, the Army would employ qualified personnel to conduct a MEC/UXO survey of the proposed maneuver areas. With continued implementation of standard Army SOPs, impacts associated with MEC/UXO are expected to be less than significant. These same procedures would be followed during construction or improvements of roads and utilities in the General Range Area.

POLs, and Ammunition

The construction of a MSR, a gravel range road, through the KMA as well as road improvements in the southwest Range Area and Charlie's Circle would allow for the transport of materials and equipment on these improved routes. Transportation of personnel and use of flammable or combustible materials, such as fuel or ordnance (i.e., weaponry or equipment), could increase the potential for spills or releases of hazardous materials, especially in areas not previously used frequently. Proper control, handling, and reporting of incidents would ensure that the effects of spills or releases remain less than significant.

4.11.4.2 IPBA at Western Range Area**Modernization/Construction Impacts**Significant Impact Mitigable to Less than Significant –*MEC/UXO*

Surface MEC/UXO has been confirmed by a surface inspection and survey of the Western Range Area (see Section 3.11.3.2). If a decision is made to move forward with this alternative, qualified EOD technicians would remove the MEC/UXO hazards from the Western Range Area, clearing it effectively prior to construction. MEC/UXO surveys were accomplished in 10m transects and therefore, the potential exists for unidentified or covered MEC/UXO to remain on the range, to be encountered during construction or later during operation. MEC/UXO presents a significant safety hazard that, as discussed in Section 4.11.4.1, may be mitigated through proper identification and reporting.

Recommended Mitigation 1 – The Army would continue to educate Soldiers on how to identify MEC/UXO and the proper safety procedures for handling MEC/UXO.

Recommended Mitigation 2 – Remove/destroy known MEC/UXO with a 6.1 m (20 ft) to 9.1 m (30 ft) buffer area surrounding the IPBA/IPBC access road, ROCA, areas surrounding the MOUT and Live-fire Shoothouse, and IPBC trails, objectives, firing points, and targets. The benefit would be to ensure construction worker and Soldier safety when operating within the IPBA footprint.

Less than Significant –

Lead from Ammunition

No small arms live-fire ranges exist in the Western Range Area; therefore, lead from expended ammunition (including lead salts) is not anticipated in any quantities that could pose significant human health hazards.

POLs/Hazardous Materials Management

Construction at PTA would pose short-term adverse impacts related to POL usage and potential spills. Proper control, handling, reporting and response to spills is highly encouraged at PTA and response measures are written into PTA SOPs and Regulations. Following the procedures outlined for responding to POL spills would equate to an overall impact that is less than significant.

Pesticides

The construction of an IPBA in the Western Range Area would increase pesticide/herbicide usage in this area in order to control pests and fire hazards in this area (by reducing fuels that could easily be ignited), and for controlling invasive plant species. Storage for additional materials would continue to be provided in the Cantonment Area. The application of these materials, while overall would increase accumulation within the Range Area may not result in significant impacts providing proper procedures are followed for application and handling in accordance with manufacturer guidelines. Therefore, the impacts from further contamination and impacts to human health from exposures to these materials would be less than significant.

No Impacts –

LBP/Asbestos/PCBs

No structures are present in the Western Range Area that requires demolition; the area is devoid of any buildings presently. Therefore, no structures containing LBP or asbestos are present. There are no historical activities in the Western Range Area that would have introduced PCBs to the environment.

Live-fire Training Impacts

Significant Impact Mitigable to Less than Significant –

Lead from Ammunition

The addition of an IPBA on the Western Range Area would introduce lead from small arms ammunition of more than an (conservative) approximate 253,000 rounds per year by units of the 25th ID (58,000 of these being contained within the Shoothouse). Although the soils here have not been sampled like other areas of the range, and therefore have not been fully characterized; it is expected that properties of soils at

the Western Range Area would be similar to soils elsewhere within the impact area. Greater discussion on this is offered in Section 3.8 Geology and Soils.

Taking this into consideration, the potential for lead hazards to accumulate and cause health concerns to users and workers at the IPBC could be mitigated to a level of less than significant. It should be noted that live-ammunition expenditures at the IPBC portion of the IPBA may not result in considerable amounts of lead accumulating on the range anyhow. At many training ranges, earthen berms are used to stop projectiles fired at the ranges that are expected to contain significant quantities of lead and potentially MEC/UXO. According to the US Army Corps of Engineers Design Guide for an IPBC standard design target berms are not recommended for simulation of battlefield conditions, as it trains Soldiers to identify target berms rather than the enemy (USACE, 2004a). Under these circumstances the general impact area would serve as an ammunition collection point for all ammunition fired down range. The addition of a Live-fire Shootouse would generate a significant source of lead. To avoid lead accumulation in high concentration and environmental contamination the Army implements several OMA procedures, design specifications, and BMPs in order to ensure safety and prevent lead contamination. The measures and BMPs taken reduce the risk associated with lead contamination from a live-fire Shootouse to less than significant.

No lead ammunition will be fired at the MOUT site; however, ammunition may include lead primers. The MOUT site is restricted to the use of training ammunition.

Recommended Mitigation 1 – Continue to implement regular range clearance and maintenance at the IPBC in accordance with PTA External SOP.

Recommended Mitigation 2 – Implement measures such as, but not limited to, proper soil and erosion control, proper ventilation to ensure both indoor and outdoor air quality, bullet absorbing designs, and lead decontamination procedures.

Maneuver Training Impacts

Significant Impact Mitigable to Less than Significant –

MEC/UXO

Soldiers maneuvering through the IPBC on foot (dismounted), or within the IPBA on vehicles, may encounter MEC/UXO. Decades of use at PTA has resulted in MEC/UXO contamination throughout the Range Area, but primarily in the impact area. Although the likelihood that MEC/UXO would be encountered within the footprint of the IPBA is minimized through MEC/UXO identification and GPS tagging for clearance (during a 2010 MEC/UXO survey), encountering MEC/UXO still presents a significant hazard. Proper identification and prompt reporting of MEC/UXO sightings would reduce this potentially significant impact to less than significant.

Recommended Mitigation – The Army would continue to educate Soldiers on how to identify MEC/UXO and the proper safety procedures for handling MEC/UXO.

Less than Significant –

Petroleum, Oils, and Lubricants, and Storage Tanks

Providing that proper procedures for handling hazardous materials and appropriate measures of response and reporting are followed in accordance with PTA External SOPs (USAG-HI, 2008), then the accidental release of these materials at the Western Range Area may result in less than significant impacts to the soil media there (see 4.11.4.3).

4.11.4.3 IPBA at Charlie's Circle

Given that the proposed action is the same for the Charlie's Circle alternative as with the Western Range Area alternative, a vast majority of the land area is shared with the preferred alternative, and environmental conditions there are shared, it is reasonable to assume that the potential impacts from constructing and operating the IPBA at Charlie's Circle would result in similar impacts and mitigation measures as identified in Section 4.11.4.2.

4.11.4.4 IPBA at Southwest of Range 20

Given that the proposed action is the same for the proposed IPBA at Southwest of Range 20 as with the Western Range Area alternative, and similar environmental conditions are present at both locations, it is reasonable to assume that the potential impacts from constructing and operating the IPBA at Charlie's Circle would result in similar impacts and mitigation measures as identified in Section 4.11.4.2.

Due this location's proximity to Range 20, there is an anticipated higher probability that MEC/UXO may be encountered at this location. These hazards could be mitigated through conducting MEC/UXO surveys (if this alternative were selected); identifying and clearing MEC/UXO hazards; and also through the continued education of MEC/UXO identification and response for IPBA users.

4.11.4.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the proposed IPBA would not be implemented or constructed. The installation would remain in its current condition. There would be no risk of introducing hazardous materials and/or hazardous waste from any construction-related or training-related activities at this time.

4.12 DEPLETED URANIUM

4.12.1 Impact Methodology and Summary

This section describes the methods and significance criteria used to assess the level of impact from projects proposed in this Programmatic EIS with respect to residual DU. Factors considered in determining whether each project would have a significant impact include the extent or degree to which its implementation of a project would result in causing an unnecessary risk to human health or safety by exposure DU beyond maximum exposure or radiological dosing limits.

The methods for assessing potential hazards from DU at PTA include the following, which are discussed in more detail in Section 3.12.13.1:

- Conducted archived literature searches for historical use of DU-containing munitions items (i.e., M101 spotting Round for the Davy Crockett weapons system) (PTA impact area-wide assessment);
- Conducted aerial surveillance of the PTA impact area, searching for visual confirmation of use of the Davy Crockett weapons system (i.e., pistons);
- Conducted ground reconnaissance of areas of the fly-over surveillance reported sightings of pistons from the Davy Crockett weapons system;
- Estimated likely firing points and points of impact from use of the M101 Spotting Round based on visual evidence of past use (i.e., locations of pistons);
- Conducted soils sampling and characterization of suspected areas of impact of the M101 Spotting Round;
- Evaluated air samples over a one year period of time taken from three locations of PTA’s border, to assess the occurrence of uranium in suspended particulates (Airborne Uranium Study);
- Prepared a Health Risk Assessment for receptors at/near PTA, based upon the results of PTA DU studies and exposure pathways, to evaluate the potential risks of exposure to DU when compared to WHO and ATSDR exposure guidelines; and;
- MEC/UXO survey teams trained in the identification of DU-containing munitions components surveyed the Western Range Area IPBA alternative, and portions of the Charlie’s Circle alternative, in support of the Cultural Resources inventory survey and Biological Resources survey for federally listed species.

Significant impacts were determined based upon the risk that receptors would be exposed to DU exceeding the acceptable risk range that the USEPA considers safe (10^{-6} to 10^{-4} millirems/yr).

Table 4.12-1 summarizes the potential impacts from exposure to DU as a result of implementing Proposed Action(s) at PTA.

Table 4.12-1. Depleted Uranium Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie’s Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Risk of exceeding regulatory exposure limits	○	○	○	○	⊙	○	○	○

LEGEND

- ⊗ = Significant impact
- ⊙ = Significant impact mitigable to less than significant
- ⊕ = Less than significant impact
- = No impact
- + = Beneficial impact

4.12.2 No Action Alternative (No Modernization)

No Impacts – Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. The installation would remain in its current condition and existing hazards would remain unchanged from current conditions.

4.12.3 PTA Cantonment Area**Modernization/Construction Impacts**

No Impacts – Uranium in soils in the Cantonment Area would be most associated with naturally occurring Uranium. Air sampling in 2009 from monitoring stations near the installation boundary (including near the Cantonment Area) confirmed that, for most samples, isotopes of Uranium (^{234}U and ^{235}U) were undetectable and therefore, not present in measurable quantities and well below standards established by WHO and the ATSDR. While few other samples demonstrated higher levels of Uranium isotopes, the levels were not within reportable limits and well below internationally recognized standards that would validate a human health risk or complete an exposure pathway for off-post receptors. When compared with soil samples taken in the Range Area (only one sample showed results for naturally occurring Uranium with no indication of DU), it is highly unlikely that DU-contaminated soils are found in the Cantonment Area.

Individual construction projects in the Cantonment Area would have an average duration of less than two years. Given that the maximum dose a construction worker could experience is well below USEPA acceptable limits over a three year time period, coupled with the extremely low risk of exposure in the Cantonment Area, construction workers operating on two year (or less) projects would not approach exposure limits or dosing limits (for gamma) under normal working conditions.

4.12.4 PTA Range Area**4.12.4.1 General Range Area****Modernization/Construction Impacts**

Less than Significant – Most proposed range modernization projects are not within DU fans for ranges with known DU contamination, with the exception of the proposed modernization of targets at Range 10. Target upgrades are not time intensive projects, therefore, the duration of construction (possible exposure) Range 10 would be relatively short and workers would not be placed in excessive risk of being exposed to Uranium isotopes for that project. DU is approximately twice as dense as lead. Studies have determined that DU tends to remain in the immediate area that it was deposited. Re-suspension is primarily due to particle size rather than particle density or chemical form. Therefore, even before DoD restricted the use

of HE rounds in areas where DU is found, the chance that aerosolized particles would currently remain available for exposure on the surface or re-suspended from construction activities in any quantities that could pose an unnecessary health risk would be less than significant.

Other projects in the Range Area, such as the construction of new ranges, although may not be located within existing DU fans, would be surveyed if a project falls within a risk area for encountering DU (Ranges 10, 11T, 14, and 17).

No Impacts – Construction of roads and utilities at PTA would be projects of very short duration. Workers would not meet the maximum exposure limits or dosing limits of Uranium given the short duration of these projects.

Live-fire Training Impacts

No Impacts – For the DU at PTA to aerosolize and become inhalable or ingestible, it would need to be exposed to very high heat. DODI 4715.11 prohibits the use of HE munitions in areas known to contain DU; therefore no apparent risk would occur from operating ranges proposed for modernization.

Maneuver Training Impacts

Less than Significant – Vehicle exposure to DU was considered in the Baseline Human Health Risk Assessment (CABRERA 2010) and factored into exposure variables for receptors that could experience complete exposure pathways at PTA. The hazard would exist through radiation (gamma) contact (or dosing) with receptors, with Soldiers and construction site workers having the highest exposure rates among potential receptors. Given the very low exposure limits even for Soldiers and construction site workers operating on Range 10, the potential for chronic health effects from exposure to DU is extremely low (almost non-existent).

4.12.4.2 IPBA at Western Range Area

No Impacts – Extensive searches of historical records and known capabilities and policies concerning the Davy Crockett weapons system have provided the Army with a high probability of understanding where usage of that system could have occurred historically at PTA. No evidence suggests that DU-containing munitions were used or fell in the Western Range Area. Furthermore, there is no evidence to suggest that DU exists in soils in the Western Range Area in any measurable quantities that could pose a human health risk to users or caretakers of the IPBA. The Army demonstrated through limited soil samples that DU does not exist in soils even in close proximity to where surveyors identified DU fragments. Therefore, it is unlikely a complete exposure pathway is present in the Western Range Area.

4.12.4.3 IPBA at Charlie's Circle

Impacts at the proposed IPBA at Charlie's Circle would be similar to those described in Section 4.12.4.2 for the Western Range Area.

4.12.4.4 IPBA at Southwest of Range 20

Impacts at the proposed IPBA southwest of Range 20 are likely to be similar to those described in Section 4.12.4.2 for the Western Range Area.

4.12.4.5 No Action Alternative (No IPBA)

No Impacts – Existing conditions would remain unchanged under the No Action Alternative. There is no evidence to suggest that a risk exists regardless of the IPBA alternative.

4.13 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE – ENVIRONMENTAL CONSEQUENCES

4.13.1 Impact Methodology

In order to analyze the effects on socioeconomic resources in the ROI, a model was used that allows for the evaluation of the significance of the impact to the ROI. The result of construction spending in the ROI was examined for both direct and indirect effects. Direct effects include employment and the salaries that employment provides to construction workers. Indirect effects are the effect of those salaries and associated spending on the larger economy in the ROI. Subsequent changes in local economic activity are computed as the product of initial changes in sales volume, either as increase or decrease, and a local impact multiplier. In total, the model examines changes in sales volume, income, employment, and population in the ROI, accounting for the direct and indirect effects of the action. Appendix D discusses this methodology in more detail and presents the model input and output tables developed for this analysis.

To determine the historical range of economic variation, the model calculated a rational threshold value (RTV) profile for the ROI. This analytical process uses historical data for the ROI and calculates fluctuations in sales volume, income, employment, and population patterns. The historical extremes for the ROI become the thresholds of significance (i.e., the RTVs) for social and economic change. If the estimated effect of an action falls above the positive RTV or below the negative RTV, the effect is considered to be significant.

The model was run in two parts. The first part analyzed the impact of the expenditures associated with the IBPA and was run using total expenditures associated with IPBA. The second part looked at projected expenditures associated with modernization of ranges, training support infrastructure, and the cantonment area. This portion was run using total projected construction dollars for all modernization projects; therefore, it presents the “worst case scenario”, in that it looks at the ROI’s ability to absorb the maximum impact of spending associated with the Proposed Action. In reality, effects are likely to be less significant on a year-to-year basis.

Thresholds of significance were determined for each resource area. Factors considered in determining a significant impact on socioeconomics include the extent or degree to which its implementation would result in the following:

- Disproportionate environmental economic, social or health impacts on minority or low-income populations (environmental justice). Impact on economic activity, to include input or loss of economic activity to the local region that exceeds the RTV; adverse effect the unemployment rate for the county; change in total income or business volume; affect the local housing market and vacancy rates, particularly with respect to the availability of affordable housing; and loss of employment near the project site either in the short- or long-term.
- Disproportionately endanger children in areas on or near the project site.

Table 4.13-1. Socioeconomic Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie’s Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Impact on economic activity	○ - +	○ - +	○ - +	○	⊗ - +	○ - +	○ - +	○
Protection of children	○	○	○	○	○	○	○	○
Environmental justice concerns	○	○	○	○	○	○	○	○

LEGEND

- ⊗ = Significant impact
- ⊗ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

Economic development impacts were combined for the proposed modernization projects within the Cantonment Area and the General Range Area. Impacts to socioeconomics would be identical for the proposed modernization projects, regardless of the location of the projects within PTA, therefore individual locations were not analyzed separately.

4.13.2 No Action Alternative (Do Not Modernize PTA)

No Impacts – Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. PTA would remain in its current condition. No upgrades to the Cantonment Area or range and training facilities would occur. There would be no risk from construction on any of these projects, or from training-related activities on proposed range projects. There would be no impacts to socioeconomics or environmental justice.

4.13.3 PTA Modernization Projects

This section provides the potential impacts related to the proposed modernization projects at PTA (e.g., within the Cantonment Area and Range Area). Impacts to socioeconomics would be similar for the proposed modernization projects as they would require the temporary employment of construction workers and other skilled laborers and technicians to make improvements to facilities, ranges, utilities, and roads throughout the installation. Therefore, individual locations were not analyzed separately. However, one notable difference is that overall range construction does not require the same level of building materials that would be required in the Cantonment Area. In other words, only a few structures would be built to control range operations and the majority of expenditures for range construction would account for softening the Range Area, re-grading, and adding design features of the range, including additional expenditures on targetry emplacement.

The length of time required to construct a range generally accounts not so much for construction as for ensuring key designs (i.e., targets, firing points, defilade positions, etc.) are properly sited and engineered. Construction crews are not present at the range construction site constantly throughout the approximately two to four years it may take to build a large training range. For the Cantonment Area, approximately half of the cost of construction is related to labor and the other half on building materials. Various levels of construction crews remain on-site through the duration of the construction project, and construction of proposed facilities in the Cantonment Area can last from six months to more than a year. Given this insight, the impacts to the local economy in terms of sales and income would have more beneficial impacts from Cantonment Area construction than would be realized from construction in the General Range Area. In all, for both actions, these benefits would be temporary, lasting the duration of the construction job.

Long-term minor beneficial impacts would be expected as well. For example, the proposed IPBA may result in the employment of up to three individuals (contractors) to aid the Army in operating the range facilities there. Similarly, the construction of multiple facilities in the Cantonment Area may result in a small increase in full time employees operating and maintaining the new structures. Some of the facilities proposed would replace existing structures (i.e., vehicle maintenance shop) that exist today as Quonset Huts. Some of the facilities proposed would be new, improving upon the capability of PTA to offer some training and mission support services (i.e., Multipurpose Training Facility).

Beneficial Impacts – Construction costs associated with the development of the modernization projects within PTA, excluding development of the proposed IPBA, are estimated at approximately \$249 million. An increase in construction-related employment in the ROI would occur for short-term construction-related jobs. The execution of these projects is expected to have a beneficial impact on employment and income. The model inputs and outputs are available in Appendix H.

- **Employment.** Construction activities for individual projects would result in temporary increases in employment over the course of the approximate 10 years of projects proposed. Subsequent indirect effects would be produced by increased spending by construction employees. Increased construction employment in Hawai'i County would be temporary and less than significant.
- **Income.** Changes in income represent the wage and salary payments made to construction workers, primarily during construction activities for the modernization projects. The proposed

actions would only temporarily increase total annual income of Hawai'i County for contracted construction workers and other skilled labor working on specific projects.

No Impacts – Since there would be no relocation of personnel associated with the proposed modernization projects, new personnel and accompanying salaries were not included in the model to determine the impacts on the ROI. In addition, there were no changes to the ROI as a result of the additional modernization projects within the Cantonment Area and General Range Area, as all activities are proposed to take place within PTA at Hawai'i County. There would be no significant effects on demographics resulting from the proposed modernization projects within the Cantonment Area and General Range Area, since there would be no staff or personnel stationed at PTA as a result, and therefore, would be no changes to the demographic composition of the ROI.

The proposed modernization projects in the Cantonment Area and General Range Area would have no significant effects on housing as no relocation of personnel is expected; therefore an increased demand for housing within the ROI would not occur. Similarly, there would be no significant effect on public services, as no in-migration to the ROI is expected. Since there would be no direct increase in population resulting from the proposed modernization projects, there would be no significant additional burden expected on schools, hospitals, fire and rescue services, and police services. Section 3.13 Public Services and Utilities does address some less than significant impacts associated with slight increases in demand for emergency services, but this is unrelated to economic impact from modernization itself.

There would be no disproportionately high and adverse impacts on low-income or minority groups as a result of the proposed modernization projects within the Cantonment Area and General Range Area. All construction activities would occur within PTA's boundaries. Poverty in the CCDs surrounding PTA declined between 2000 and 2009, and remains at or below the State level (see Section 3.13).

4.13.4 IPBA Construction and Operation

Beneficial Impacts – Construction costs associated with the development of the proposed IPBA are estimated at approximately \$30 million. There would be a slight increase in short-term construction-related jobs for the development of the proposed IPBA. The prospective increases in local employment would be beneficial to the ROI; however, the increase would not produce any significant beneficial effects to long-term economic development. An estimated three full-time positions would be created specifically to operate the IPBA. These would be contract employees. The resulting impact to sales and economic development from implementing the IPBA at PTA would be less than significant. The model inputs and outputs are available in Appendix H.

No Impacts – Similar to PTA modernization projects in the Cantonment Area and General Range Area, there would be no relocation of personnel associated with the proposed IPBA. No new personnel and accompanying salaries were included in the model to determine the impacts on the ROI. In addition, there were no changes to the ROI as a result of the proposed IPBA as all activities are proposed to take place within PTA at Hawai'i County.

There would be no changes to demographics as no staff or personnel would be stationed at PTA. There would be no changes to the ROI and no expected change to the overall demographic composition.

There would be no significant effects on housing resulting from the proposed IPBA. Personnel would not be relocated, and there would not be an increased demand for housing within the ROI.

There would be no significant effect on public services resulting from the proposed IPBA, as no in-migration to the ROI is expected. There is no direct increase in population. There would be no significant additional burden expected on schools, hospitals, fire and rescue services, and police services.

There would be no disproportionately high and adverse impacts on low-income or minority groups from construction and operation of the IPBA. All construction activities for the proposed IPBA would occur within the boundaries of the PTA impact area. Poverty in the CCDs surrounding PTA declined between 2000 and 2009, and remains at or below the State level.

4.13.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the proposed IPBA would not be constructed and the existing impact area would remain in its current condition. There would be no impacts to socioeconomic resources from construction-related activities. There would be no impacts to socioeconomic resources from the No Action Alternative.

4.14 PUBLIC SERVICES AND UTILITIES

4.14.1 Impact Methodology and Summary

Factors considered in determining if an alternative would have a significant impact on utilities include the extent or degree to which its implementation would result in the following:

- Require a public utility service provider or emergency services provider beyond their capacity to the point that substantial expansion, additional facilities, or increased staffing levels would be necessary; or,
- Generate additional quantities of stormwater runoff that could not be disposed of by the existing drainage system.

The Army did not address a disruption in public services that could result from increased, sustained demand beyond the capacity of service providers, as it has done in prior EISs. Prior actions at PTA demonstrated that an increase in training would result in less than significant impacts to the public services that are shared with the military (i.e., solid waste disposal, electricity, water usage, emergency medical). There is no increase in training beyond historic levels proposed in this Programmatic EIS. No additional Army units would come to PTA to conduct their semi-annual training. Only a temporary increase in solid waste creation (from construction) would occur from implementing the Proposed Action. The impacts from power usage, water usage, and emergency medical have been analyzed in prior NEPA documentation. An overall improvement is anticipated in electricity usage and water usage is anticipated to occur from building more energy efficient, sustainable systems than what exists today (Table 4.14-1).

Table 4.14-1. Public Services and Utilities Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie's Circle	IPBA at Southwest of Range 20	No Action Do Not Build IPBA				
Impacts capacity of public utility or service providers	○ - ⊙	○ - ⊙	○ - ⊙	○	⊙	○ - +	⊙ - +	⊙
Impacts to existing drainage system	⊙	⊙	⊙	○	⊙	⊙ - +	⊙ - +	⊙

LEGEND

- ⊗ = Significant impact
- ⊙ = Significant impact mitigable to less than significant
- ⊕ = Less than significant impact
- = No impact
- + = Beneficial impact

4.14.2 No Action Alternative (No Modernization)

Less than Significant – Under the No Action Alternative, no modernization projects would be implemented at PTA and all existing systems would be maintained in their current state. This would have adverse impacts on both the demand of existing utilities at PTA, as the current system would be inefficient; and on the ability to emergency services to respond to incidents throughout the installation.

4.14.3 Modernization

Less than Significant – As part of the Proposed Action, multiple energy-efficient technologies and overall upgrades to the electrical system within PTA are proposed, including a new substation transformer with a structure to house it. As part of PTA’s Net Zero Energy Assessment and Recommendations, completed by NREL, geothermal, wind power, and PV farms are all possibilities for inclusion in electrical upgrades at the installation. As with other utility systems at PTA, the current system is inefficient and outdated. Current electricity usage at PTA was 1,896 MWh, up 10% from total installation energy usage in 2007 (DOE, 2010). An upgraded system would increase efficiency of transmission and reduce the overall energy demand because of the energy that could be generated within the installation. The proposed new facilities all provide opportunities for additional energy savings measures, such as those recommended in the NZEI assessment including installing occupancy sensors and photovoltaic panels, insulating hot water pipes, and upgrading fluorescent lighting (DOE, 2010). Upgrading facilities to include these components, among others, has the potential to save PTA an estimated 15 41,015 kW of electricity and 270,571 gallons of water annually from the operation of each building (DOE, 2010). Despite an increase in demand for electricity that could likely result from the improved and expanded facilities in the Cantonment Area, including constructing new buildings with HVAC to replace buildings that are

currently without climate control, the overall impact to the demand for and use of electricity is not expected to be significant. Demand on the power grid system caused by new ranges proposed in the Range Area too would not significantly contribute to capacity issues on the installation's power generation and/or distribution capability.

Wastewater in the Range Area would continue to be handled as they are presently. New ranges would require portable latrines, placing only a slightly greater demand on the need for contract services to dispose of waste products off the installation.

Proposed modernization projects would generate an increase in construction and demolition waste during the construction phase of each project proposed. The facilities to be constructed would generate construction and demolition waste that could reduce the useful life of the landfill, but this reduction should be negligible. In particular, several Quonset huts may require demolition, including foundations, concrete slabs, utility poles, and utilities. This waste stream would be minimized by recycling materials whenever possible. These changes should be within the capacity of the existing waste collection and disposal system. The County of Hawai'i landfill overall is experiencing greater demand due to population growth and construction on the island, but in comparison, Army projects proposed here would not contribute to any greater demand than commercial and private growth has to the landfill. Therefore, increases due to construction at PTA are not expected to be significant to overall demand.

Increased dwell time for Soldiers permanently stationed in Hawai'i would equate to all units resuming their semi-annual FSO METL training at PTA at its baseline (historic) level. This may place some additional demand on outside (outside PTA) emergency medical services over what has been seen since 2001 when units began deploying overseas. Because overall quality of training and training equipment has improved since 2001, Soldier safety has also improved; therefore, the demand on public emergency medical services is anticipated to be less than significant. In addition, the demand on PTA MPs and PTA FD fire staffs would be commensurate with the level of training at PTA. This demand has not changed over time as training at PTA is cyclical due to deployments to the operational environment (less training at PTA due to deployments). PTA will remain fully capable of handling multiple brigades training at the installation simultaneously, and therefore, as training demand approaches historic levels so will the demand on police and fire services at PTA.

Beneficial Impact – Proposed new fire and police facilities would have a beneficial impact on the Army staffs at PTA to be able to respond to emergency situations. New or improved roads and utilities proposed throughout the installation would also contribute to improved response times.

The proposed modernization projects would not result in any impacts to PTA's overall water usage in either the construction or the operation phases. Improving the water system at PTA is a major priority goal for the sustainability of the installation (DOE, 2010). Implementation of the PTA well project, which would allow the installation to source its own water instead of relying on external sources, would have a substantial beneficial impact to the sustainability of the installation and help promote the construction of new infrastructure there, but would have a less than significant beneficial impact to the Waimea well by reducing Army demand of resources on that source. Demand by the Army at PTA on the Waimea Well accounts for a very small percentage of draw from that well to supply water for local residential and business purposes.

Other proposed activities, including new barracks and vehicle wash facilities, would increase the demand for water on the installation, however they are proposed to replace older, outdated facilities that are inefficient and are unable to keep pace with planned growth. Furthermore, as discussed in greater detail below, the installation of a packaged sewer system and subsequent opportunity to use recycled water for certain functions would reduce the overall demand for potable water. The implementation of modernization projects would not create any significant impact to the supply of or demand for water on the installation.

As part of the proposed upgrades to the water system, the Proposed Action would include the installation of a 100,000 gallon per day (gpd) packaged sewer system that would produce R-1 irrigation water. Per Hawai'i Department of Health Standards, R-1⁹² water is recycled water that has been treated to have a significant reduction in viral and bacterial pathogens. While upgrades in facilities and billeting capacity at PTA, along with the installation of a tactical vehicle wash facility, would result in increased production of wastewater commensurate with cyclical training at the installation, implementation of the packaged sewer system would provide a greater capacity for wastewater treatment, as well as an improved level of water treatment over the septic systems currently in use. In addition, the potential to use recycled wastewater for certain uses, which is not an option currently available within the installation, would allow for a reduction in the use of potable water, thus reducing the overall water demand at the installation, and producing a beneficial, but not significant, impact.

4.14.3.1 IPBA at Western Range Area

No utilities exist at the Western Range preferred location; the nearest existing range is the currently-inactive Training Area 23. Utilities for the IPBA would tie into existing utilities running from the MPRC road. Additionally, the Western Range Area is underutilized and training does not occur there presently, therefore emergency services, while their responsibility area covers this portion of the impact area too, have not historically had a persistent reason to respond to emergencies in this area of PTA.

Less than Significant –Total demand placed on the electrical system from the proposed IPBA would result in a slight increase, but would remain within the capacity of the electrical grid to accommodate the IPBA operations. The IPBA requires energy to be operated targets would be dynamic and automated, either fully mobile with a range of movement, or capable of being raised and lowered

The construction of the IPBA would generate a short-term increase in solid waste resulting from construction. The operation of the IPBA would result in a minor increase in solid waste generation as maintenance would be required over time. The increase in solid waste generation would be within the capacity of the existing municipal solid waste management system, and there would be no significant impacts as a result of constructing the IPBA at the Western Range alternative.

The construction of the IPBA would require the installation of portable latrines, requiring contractors to remove the systems for treatment and disposal on a regular basis. There would be no generation of wastewater as a result of the IPBC, Live-fire Shootouse, and MOUT facility. Contracts with contractors

⁹² R-1 water is suitable for multiple agricultural and industrial uses, such as spray or pressure washing, commercial laundry, and flushing toilets and urinals, among others (HDOH, 2002).

who handle the range-related wastewater would likely require modification to account for servicing the range in a new part of the PTA range complex; this would not equate to a significant impact to the services provided.

Construction and operation of an IPBA in this part of the impact area could result from demolishing lava tubes or encountering MEC/UXO. There would be a slight increase in demand on emergency services responding to this area. The use of safe equipment, coupled with design features that minimize the potential for accidents and fire ignition, would overall have a less than significant impact on demand of these services at this area. It should be noted that Section 3.15 Wildfires examines the potential for wildfires to occur and places a significant but mitigable to less than significant impact from wildfire ignition and the resulting damage. That is somewhat different than the overall ability or capacity that the installation would have to respond to such emergencies, which is what is being evaluated in this section.

Proposed new facilities are anticipated to use sustainable and energy efficient designs. Long-term demand from both the community and the military at PTA will continue to grow, but present projections (DOE, 2010) on energy demand from PTA and from the local community is expected to have an overall less than significant draw on the total grid capacity for the island.

No Impacts – Water demand, as evaluated in prior NEPA documentation (Army, 2009), is cyclical and is proportionate with the amount of training occurring at PTA. The Proposed Action will not increase Army Soldiers/units training at the installation; therefore, there would be no additional demand on water use at the IPBA over what has been analyzed before.

In addition, targets on the IPBC are radio frequency operated using batteries or solar power and would not draw on the installation's power supply.

4.14.3.2 IPBA at Charlie's Circle

The Charlie's Circle alternative is located in close proximity to the Western Range Area alternative, and partially overlaps that alternative. Utilities would connect to the site directly from Charlie's Circle Road. Emergency medical services would also extend to this area similar to the Western Range Area alternative (Section 4.14.3.1).

4.14.3.3 IPBA at Southwest of Range 20

Impacts from implementing this alternative would be similar in nature to those of the Western Range Area alternative. Demand on police, fire and emergency medical, and on the need for utility services would be similar because the proposed location southwest of range 20 is also currently underutilized and does not have presently have a need for these services. Overall impacts from demand would be less than significant. Demand on potable water would not experience an impact over what has been evaluated in the past.

4.14.3.4 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the IPBA would not be built, and there would be no increased demand for utilities or emergency services because the military would continue to use existing

facilities to meet their training needs (albeit not entirely to training doctrine). The No Action Alternative would have no impact on utilities at PTA.

4.15 WILDFIRES

This section evaluates the potential for wildfires and resulting impacts within the ROI, as described in the Existing Environment (Section 3.15), and describes the methods and significance criteria.

4.15.1 Impact Methodology

Limited fire history files for PTA are available as the installation follows the disposition of records guidance in the Modern Army Recordkeeping System (USARHAW and 25th ID, 2003) guidance to destroy manual records after five years. As a result, limited historical wildfire records are still available and complete to compare wildfire incidences from previous training to the proposed training. To provide historical wildfire data, the following documents were used as the primary sources of information:

- Integrated Wildland Fire Management Plan, O‘ahu and PTA (HDQA, 2006);
- Integrated Natural Resources Management Plan and EA/Finding of No Significant Impact (FNSI) 2002–2006 PTA (Stout et al., 2006);
- Final EIS, Permanent Stationing of the 2/25th SBCT (U.S. Army and USACE, 2008a); and
- Final EIS, Military Training Activities at MMR, Hawai‘i, (USAEC, 2009b).

Based on the wildfire information provided by these documents and on previous Army training activities at PTA, the likelihood of starting a wildfire by the Proposed Action was assessed. The following issues influence wildfire ignition:

- Frequency, timing, and location of training activities;
- Type of weapons used during training;
- Implementation of the IWFMP; and
- Vegetation composition.

Potential direct impacts from wildfires include, for example, damage to biological and cultural resources and impairment of air quality. Examples of potential indirect impacts from wildfires include increased soil erosion rates due to removal of vegetation from the land and reduced water quality from water running over land cleared by fire. Wildfires could occur from the ignition and spread of a wildfire, either from training activities or the re-ignition of a fire thought to be extinguished. Because it is possible for many fires to affect a relatively limited area (resulting in limited impacts), or for a wildfire to affect a large area (resulting in many impacts), the frequency of wildfires is not used as a means for assessing the

impacts of wildfires. Instead, the potential for wildfire ignition is used as the criterion for assessing wildfire impacts.

This methodology assumes no white phosphorus would be used during training and that vegetation management would continue to take place at PTA. Vegetation management is used to prevent the spread of a fire by creating firebreaks and to control the abundance of highly flammable plants to prevent fires from easily igniting. Conducting prescribed burns, mowing, and applying herbicides are all vegetation management techniques.

In general, smoking by Soldiers is permitted only in the administration area, bivouac sites, or other designated areas. In the event of a fire at any location, training activities are stopped immediately and the unit takes all appropriate actions to put out the fire.

4.15.2 Factors Considered for Determining Significance of Impacts

Factors considered in determining significance of wildfire ignition potential include the following:

- High probability of increasing the frequency and intensity of wildfires, especially in protected ecological areas.

The potential ignition of a wildfire was analyzed within the ROI. Table 4.15-1 provides a summary of impacts.

Table 4.15-1. Wildfires Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie’s Circle	IPBA Southwest of Range 20	No Action (Do Not Build IPBA)				
Wildfire Ignition	⊗	⊗	⊗	○	⊗ - ⊙	⊙	⊙	○

LEGEND

- ⊗ = Significant impact
- ⊗ = Significant impact mitigable to less than significant
- ⊙ = Less than significant impact
- = No impact
- + = Beneficial impact

4.15.3 No Action Alternative (No Modernization)

No Impacts – Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. The installation would remain in its current condition. Vegetation management would continue to take place at PTA as would the need to maintain the condition of fire

breaks. There would be no additional risk of wildfires occurring or other related impacts from any construction-related activities at this time as none would occur.

4.15.4 PTA Cantonment Area

Modernization/Construction Impacts

Less than Significant – Proposed modernization projects in the Cantonment Area would include upgrades to barracks and billeting facilities, and consolidation of the DPW, POL, and Range Maintenance operations in the PTA Industrial Area. These projects would require some ground disturbance from construction-related activities. As mentioned in Biological Resources (Section 4.9), invasive species can be introduced through construction projects. The spread of invasive plants or noxious weeds increases the potential of wildfires occurring. In addition, possible ignition sources, such as catalytic converters and sparks associated with construction vehicles and machinery, have the potential to cause wildfires. Wildfires can have impacts to vegetation, wildlife habitat, and cultural resources. However, these impacts would be considered less than significant based on the overall lack of vegetation present and the presence of firefighting infrastructure (firebreaks and dip tanks).

Live-fire Training Impacts

No Impacts – No live-fire training activities would occur within the Cantonment Area. There would be no potential for wildfires.

Maneuver Training Impacts

No Impacts – No maneuver training activities would occur within the Cantonment Area. There would be no potential for wildfires.

4.15.5 PTA Range Area

4.15.5.1 General Range Area

Modernization/Construction Impacts

Significant Impact Mitigable to Less than Significant – Modernization projects in the Range Area would include upgrades and infrastructure improvements at multiple ranges throughout the installation, and also the construction of new ranges, to improve range utilization and enhance operations. Site clearing and grading for construction of the proposed ranges and new facilities could occur with the potential for the introduction of invasive species. The spread of invasive plants or noxious weeds increases the potential of wildfires occurring. In addition, possible ignition sources, such as catalytic converters and sparks associated with construction vehicles and machinery, have the potential to cause wildfires. Wildfires can have impacts to vegetation, wildlife habitats, and cultural resources. However, these impacts would be considered less than significant based on established firefighting SOPs to mitigate and prevent wildfires in the area. Future NEPA analysis would be conducted to determine site-specific impacts to wildfire potential from the introduction and spread of invasive plants from the proposed modernization projects occurring within the General Range Area.

Recommended Mitigation – Implement established firefighting SOPs to mitigate and prevent wildfires in the area.

Live-fire Training Impacts

Less than Significant – Live-fire training activities have the potential of causing wildfires due to the weapons fired, detonation of munitions, use of welding torches, vehicle engines, and other training-related activities. Live-fire training could destroy habitat for wildlife or increase incidental mortality to wildlife from potential increases in wildfire. Wildfires also have the potential to displace various wildlife species. As mentioned in the Biological Resources (Section 4.9), potential wildfires caused by live-fire training activities within the General Range Area could result in short- and long-term impacts to listed species.

In addition, wildfires caused by live-fire training activities could remove large areas of vegetation that normally protect soil from erosion by slowing surface runoff, intercepting raindrops before they reach the soil surface, and anchoring the soil with roots. Vegetation removal resulting from wildfires could result in increased soil erosion by water and wind, indirectly causing large scale removal and re-deposition of soils, gullying, or unstable slopes in areas of steep slopes and rapid runoff. Although wildfires, particularly grass fires, could occur at PTA, the effects on soil loss would be localized because much of the land contains shallow soil or exposed rock outcrops. Removing grassland vegetation by fire would temporarily expose soils to increased water erosion and wind erosion. Many areas with soils on PTA are somewhat protected from water erosion because they are surrounded by rock outcrops.

As the modernization projects in the Range Area are for existing ranges or proposed within the existing impact area, and training at PTA would remain at historical levels, these projects would not significantly impact the potential for wildfires from training activities.

Maneuver Training Impacts

No Impacts – The proposed modernization projects do not include increased maneuver to PTA. There would be no potential for wildfires associated with maneuver training as a result of either the construction or operation of proposed modernization projects.

4.15.5.2 IPBA at Western Range Area

Modernization/Construction Impacts

Significant Impacts Mitigable to Less than Significant – The proposed IPBA would be constructed in a largely undisturbed environment (mostly still in its natural state dominated by native species) within the PTA impact area. Site clearing and grading for construction of the proposed IPBA, including the MOUT and Live-fire Shoothouse, would expose lava flow areas and soils to enhanced erosion by water or wind. There may be an increase in wildfire potential as a result of possible ignition sources, such as catalytic converters and sparks associated with construction vehicles and machinery. Impacts to wildfire potential from construction in the Western Range Area may occur based on the vegetation present. The Western Range Area predominantly consists of Subalpine Open Treelands and Low Shrub as this vegetation community has the potential of having dense shrub, which can carry a fire. Furthermore, any invasive

plants present in this area, such as fountain grass, have the ability to spread fire. Measures to reduce wildfire potential are discussed below:

Recommended Mitigation 1 – The Army would fully implement the IWFMP for these new training areas to reduce the impacts associated with wildfires.

Recommended Mitigation 2 – Actions such as fuel reduction and Soldier education would continue. The addition of fuel management corridors and/or fuelbreaks could also be considered.

Live-fire Training Impacts

Significant Impact Mitigable to Less Than Significant – Small arms live-fire would be directed at targetry. Wildfires resulting from live-fire training activities at the IPBC would be minimized through regular range maintenance procedures. The Shootouse would be designed to minimize the occurrence of live-ammunition from leaving the facility; however, the occurrence would be possible but rare. The Western Range Area predominantly consists of Subalpine Open Treelands and Low Shrub, which has the potential to carry a fire. Measures to reduce wildfire potential from live-fire training activities are the same as those described under Section 4.15.4.1. Live-fire training impacts from activities within the Western Range Area could potentially result in an increase / frequency of wildfires, which could impact listed species and cultural resources. The proposed IPBA would be constructed in a largely undisturbed environment (mostly still in its natural state dominated by native species) within the PTA impact area. It is assumed that the majority of wildlife species would have temporarily leave the area during periods of loud noise and disturbance, but may return.

Due to the presence of listed plant species within the Western Range Area, Section 7 formal consultation has been initiated with the USFWS, as discussed in Biological Resources (Section 4.9). Consultation with the Hawai‘i SHPD and other consulting parties for culturally significant areas within the Western Range Area are also underway, as discussed in Cultural Resources (Section 4.10).

Recommended Mitigation 1 – The Army would fully implement the IWFMP for these new training areas to reduce the impacts associated with wildfires.

Recommended Mitigation 2 – Actions such as fuel reduction and Soldier education would continue. The addition of fuel management corridors and/or fuelbreaks would be considered.

Maneuver Training Impacts

Less than Significant – Vehicle use at the proposed IPBA would be limited to the roads accessing the Western Range Area and the access roads of the proposed IPBA and MOUT. Training at the proposed IPBC would be dismounted, thereby minimizing erosive effects of training and reduced potential for wildfires.

4.15.5.3 IPBA at Charlie’s Circle

Wildfire impacts from the proposed IPBA construction and operation at Charlie’s Circle are anticipated to be similar to those described for the Western Range Area (Section 4.15.5.2).

4.15.5.4 IPBA at Southwest of Range 20

The terrain in this part of the Range Area is thought to be extremely rugged. While this proposed location (Southwest of Range 20) does not share a footprint with the Western Range Area, the location shares similarities of limited vegetation. Wildfire impacts from the proposed IPBA construction and operation at Charlie’s Circle are anticipated to be similar to those described for the Western Range Area (Section 4.15.5.2).

4.15.5.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the proposed IPBA would not be constructed and the existing impact area would remain in its current condition. Vegetation management would continue to take place at PTA as would maintenance of fire breaks. There would be no risk of wildfires occurring or other related impacts from construction- or training-related activities as none would occur. There would be no impacts to wildfires from the No Action Alternative.

4.16 SUSTAINABILITY

4.16.1 Impact Methodology and Summary

This section describes the methods and significance criteria used to assess the level of impact from projects proposed in this Programmatic EIS with respect to sustainability. Factors considered in determining whether each project would have a significant impact include the extent or degree to which its implementation of a project would result in:

- Substantial increase in sustainability resources, such as energy and water use, waste production, fuel consumption, and GHG emissions levels

Table 4-16.1 summarizes the potential impacts for sustainability as a result of implementing Proposed Action(s) at PTA.

Table 4.16-1. Sustainability Impact Summary

Significance Criteria Analyzed	Modernize Training Ranges					Modernize Training Support Infrastructure (Roads and Utilities)	Modernize Training Support Facilities (Cantonment Area)	No Action (Do Not Modernize PTA)
	Construct and Operate the IPBA				Range Projects for Future Consideration			
	IPBA at Western Range Area	IPBA at Charlie’s Circle	IPBA Southwest of Range 20	No Action Do Not Build IPBA				
Substantial increase in sustainability resources	○ - ⊙	○ - ⊙	○ - ⊙	○	○ - ⊙	○	⊙ - +	○

LEGEND

- ⊗ = Significant impact
- ⊙ = Significant impact mitigable to less than significant
- ⊕ = Less than significant impact
- = No impact
- + = Beneficial impact

4.16.2 No Action Alternative (No Modernization)

No Impacts – Under the No Action Alternative, the proposed modernization projects would not be implemented or constructed. The installation would remain in its current condition. No upgrades to the Cantonment Area or range and training facilities would occur. Energy and water use, waste production, fuel consumption, and GHG emissions levels would remain on par with the current training and operations activities conducted at the installation. However, the No Action Alternative would not be beneficial toward PTA’s energy reduction or renewable energy utilization goals under EO 13514 and DoD/ARs.

4.16.3 PTA Cantonment Area

Less than Significant – Facility construction projects have the potential to affect sustainability at PTA through GHG emissions, and energy and fuel use during construction; and GHG emissions and energy, fuel and water use during facility operations. Construction impacts would have less than significant, temporary, impacts on energy consumption due to increase fuel use from construction vehicles, and potentially increased energy and water usage from construction activities. Permanent GHG emissions as a result of construction or operation of the proposed Cantonment Area modernization projects are discussed in Air Quality (Section 4.4).

Though new facilities can be upgraded to include energy consumption-reducing components, the Proposed Action also has the potential to increase energy intensity in the Cantonment Area. For example, many of the Quonset huts at PTA are over 50 years old, and are not equipped with running water or heating/cooling systems (DOE, 2010). New facilities, such as the proposed Multipurpose Training Facility and barracks, with HVAC systems would have significantly elevated energy intensity and energy use as compared to the older facilities. However, the overall impact on energy consumption is not expected to be significant.

Even though new barracks (as an example) would use more energy than old temporary stay facilities, the proposed barracks projects, along with other proposed facility-related projects, are all slated to be constructed over the next ten years. These facilities must be designed to achieve zero-net-energy by 2030, in accordance with EO 13514, so an increase in energy intensity would be offset in the long-term. No significant impacts on energy usage would result. In addition to the restriction on buildings after FY 2020, all proposed Cantonment Area construction or renovation projects must comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings.

Beneficial Impacts – There are at least proposed 12 modernization projects that are slated for personnel-occupied facilities, as opposed to storage facilities or other largely unpeopled buildings. Implementing

these projects would help PTA comply with sustainable energy and building requirements. The NZEI assessment found that PTA has the potential to implement a 22% electrical load reduction, 24% propane use reduction, 33% water use reduction, and 22.3% total energy reduction through modernizing and upgrading its facilities (DOE, 2010). While the majority (86%) of the facility-related energy usage at PTA is from electricity, the installation's current energy use index (EUI) for buildings is very low, indicating that the buildings at PTA are relatively energy efficient (DOE, 2010).

As identified in Chapter 2 and Appendix A, one proposed modernization project is an electrical upgrade project slated for FY 2015. The purpose of this project is to modernize the electrical grid by upgrading the main transformer in the Cantonment Area and upgrading the installation wiring system. This project would likely result in a more efficient electrical system and an upgrade of some of the system components to make use of the high renewable energy capability at PTA, such as solar water heating rather than electric heating, and installation of photovoltaic panels (DOE, 2010). The installation's potential to derive energy from solar and wind resources is rated as 'high' and 'excellent to outstanding,' respectively (DOE, 2010). Upgrading the general electrical system to include solar and wind power sources would aid PTA in reaching its goal of a 25% increase in electricity from renewable energy sources by 2025; while not undertaking any modernization projects would keep PTA's renewable energy usage at current levels.

Implementing the proposed modernization projects can be beneficial for energy conservation, energy intensity reduction, and increased utilization of renewable energy, all of which are sustainability requirements with which PTA must comply. The NZEI assessment found ample potential for the installation to reduce energy, electricity, and water usage loads, and increase renewable energy use through facility modifications and upgrades alone.

Some of the suggested recommendations in the NZEI assessment to improve energy efficiency and decrease energy use align with the modernization projects in the Cantonment Area. The proposed new facilities all provide opportunities for additional energy savings measures such as those recommended in the NZEI assessment including installing occupancy sensors, installation of photovoltaic panels, insulating hot water pipes, and upgrading fluorescent lighting (DOE, 2010). Upgrading facilities to include these components, among others, has the potential to save PTA an estimated 41,015 kW of electricity and 270,571 gallons of water annually from the operation of each building (DOE, 2010).

The proposed electrical upgrade project would also likely have beneficial impacts on PTA's overall energy use, because the current transformer would not be able to meet the installation's electrical needs throughout modernization, and does not meet Hawai'i or Military Standard utility codes. In addition to replacing the installation's transformer, the proposed electrical upgrade would involve rewiring, and may increase PTA's incorporation of renewable sources of energy into the electrical system, with the potential for solar and wind projects recommended in the NZEI assessment. Incorporating renewable sources of energy into an upgraded electrical system has the potential to significantly reduce current electrical and fuel loads, and also aid PTA's renewable energy targets as established by EO 13514.

4.16.4 General Range Area

Less than Significant – Construction-related activities for the proposed modernization projects in the General Range Area would result in temporary increased fuel use due to construction vehicle traffic, and may result in temporary increase electricity usage for lighting erected during construction activities. In

addition, many of the ranges require energy to be operated for the targetry or lighting; lighting requirements are determined by training requirements and site-specific factors (USACE, 2004a). Downrange power centers (PCs) and associated components located on the range would be utilized to distribute power to targets either individually or in load centers where targets are clustered (USACE, 2004a).

No Impacts – Construction and operation of the proposed modernization projects in the General Range Area would not result in any impacts to PTA’s overall water usage in either the construction or the operation phases. GHG emissions associated with constructing and operating the IPBA are addressed in the discussion on Air Quality.

4.16.4.1 IPBA at Western Range Area

Less than Significant – Construction of the IPBA would result in temporary increased fuel use due to construction vehicle traffic, and may result in temporary increase electricity usage for lighting erected during construction activities.

The ROC requires electricity, as it is equipped with the technology necessary to manage event-specific target scenarios, which are computer driven. Both the ROC and the IPBA range are lighted. There is no standard lighting design for IPBAs, and lighting requirements are determined by training requirements and site-specific factors (USACE, 2004a).

Table 4.16-2. IPBA Power Requirements

	Peak Load	Static Load
Range Control System in ROC	Associated Control Equipment	
Lighting		

Source: USACE 2004; Section: Downrange Power & Data Distribution – Over 300M

In addition, any new contract entered into by PTA to construct the proposed IPBA must comply with the EO 2009 mandates governing environmentally sustainable and preferable acquisition.

No Impacts – Constructing and operating the IPBC, MOUT, and Live-fire Shoothouse at the Western Range Area would have no impacts on PTA’s overall water usage in either the construction or the operation phases. GHG emissions associated with constructing and operating the IPBA are addressed in the discussion on Air Quality (Section 3.3).

Fuel consumption is comprised mainly of JP-8, which is exclusively used in tactical vehicles, accounting for 89% of total consumed at PTA (DOE, 2010). At the time of the NZEI assessment, PTA consumed 401,530 gallons of JP-8 per year (DOE, 2010). Overall fuel consumption would not increase as a result of training taking place at the IPBA, the Live-Fire Shoothouse or the MOUT, because no net increase in training is proposed along with the construction of the IPBA. In addition, the fuel use reduction target of 2% annually set in EO 2009 does not apply to tactical vehicles. As the majority of IPBA traffic would be comprised of tactical vehicles using JP-8, implementing the proposed IPBA would not negatively affect PTA’s sustainability requirement to decrease petroleum use.

Additionally, targetry on the IPBC would be dynamic and automated, either fully mobile with a range of movement, or capable of being raised and lowered. The targets are radio frequency operated using batteries or solar power and would not draw on the installation's power supply.

4.16.4.2 IPBA at Charlie's Circle

Impacts from construction and operation of the IPBA at Charlie's Circle would be similar to impacts described for the Western Range Area, Section 4.16.4.2. The proposed IPBA at Charlie's Circle would share similar utility capabilities, infrastructure requirements, and are located at similar distances to existing roads. The energy required to operate targets, lighting, and ROC would not change regardless of the location of the IPBA.

4.16.4.3 IPBA at Southwest of Range 20

Impacts from construction and operation of the IPBA at Southwest of Range 20 would be similar to impacts described for the Western Range Area, Section 4.16.4.2. The proposed IPBA at Southwest of Range 20 would share similar utility capabilities and infrastructure requirements. The energy required to operate the targets, lighting, and ROC would not change regardless of the location of the IPBA.

The amount of tactical fuel required to access the proposed IPBA Southwest of Range 20 area would be slightly more than that required for the proposed Western Range Area or Charlie's Circle location, because this alternative is slightly farther from the Cantonment Area. In addition, the existing utility capability in this area is not as developed as the Western Range Area or Charlie's Circle. Additional electrical poles and wires would need to be installed to connect the Southwest of Range 20 area to the PTA main power grid.

4.16.5 No Action Alternative (No IPBA)

No Impacts – Under the No Action Alternative, the proposed IPBA would not be constructed and the existing impact area would remain in its current condition. No construction- or training-related activities for the IPBA would occur. Energy and water use, waste production, fuel consumption, and GHG emissions levels would remain on par with the current training and operations activities conducted at the installation. However, the No Action Alternative would not be beneficial toward PTA's energy reduction or renewable energy utilization goals under EO 13514 and DoD/Army regulations.

4.17 MITIGATION SUMMARY

Table 4.17-1 provides an overview of all recommended mitigation measures, including BMPs, discussed within Chapter 4. Mitigation measures are implemented to avoid, minimize, rectify, reduce/eliminate, or provide compensation for a significant impact from an action. CEQ defines mitigation as:

- Avoidance: Avoids the impact by changing the action.
- Minimization: Minimizes impacts by changing the intensity, timing, magnitude, or duration of the action and its implementation.
- Rectifying: Rehabilitate, repair or restore damage that may be caused by implementing the action.
- Reducing/Eliminating: Reduction or elimination of the impact over time.
- Compensation: Replacing damage and improving the environment elsewhere, or providing substitute resources (i.e., funds) to pay for the environmental impact.

BMPs are management actions implemented as part of DoD policies or SOPs to comply with local, State or Federal regulations to ensure environmental protection and are ongoing, regularly occurring practices. This table provides the public and reviewers an overview of the mitigation measures, including BMPs, recommended to reduce impacts from the proposed action to less than significant.

Table 4.17-1. Summary of Mitigation Measures

Direct Effect	Additional Mitigation	Regulatory/ Administrative Mitigation	Benefit of Mitigation
Land Use and Recreation			
1 Conflicts with range SDZs (General Range Area - Live- fire Training)	Mitigation measures considered would include implementing SOPs for range scheduling and utilizing avoidance measures through SDZ planning.	None identified.	Would reduce range conflicts.
2 SDZs of the proposed IPBC may encroach upon Training Area 23 and could endanger listed species in the area, resulting in operational restrictions (IPBA Charlie's Circle Alternative - Live-fire Training)	Mitigation measures considered would include, through proper range design, firing points could be aligned in a manner as to avoid impacts to Training Area 23.	None identified.	Would reduce Training Area 23 encroachment concerns and protect listed species in the area.
Airspace – n/a			
Visual Resources – n/a			
Air Quality			
1 Impacts on air quality as a result of range construction at PTA and wind erosion from disturbed areas (Modernization/ Construction Impacts, and IPBA Construction)	Mitigation measures considered would include the use of periodic application of water or dust control palliative products, use of washed gravel on military vehicle trails, and development/implementation of a Dust and Soils Mitigation Monitoring Plan. .	None identified.	Would reduce the amount of fugitive dust generated by construction activities.
Noise			

Direct Effect	Additional Mitigation	Regulatory/ Administrative Mitigation	Benefit of Mitigation
1 Noise from construction activities (Modernization/ Construction Impacts)	Mitigation measures considered include construction noise can include restricting construction activities by time of day and day of week, using different equipment or construction methods to limit noise exposure, and performing periodic noise measurements to determine construction noise levels as compared to background noise levels.	None identified.	Would reduce noise levels to less than significant by avoiding days and times when noise is more noticeable.
Traffic and Transportation - n/a			
Water Resources			
1 Non-point source pollution effects on surface water quality (Modernization/ Construction Impacts)	Mitigation measures considered include compliance with applicable permits and the use of pollution prevention BMPs such as stabilized construction entrances to provide and reduce vehicle tracking of sediments, and weekly Erosion and Sediment Control Inspections and Maintenance Practices.	None identified.	Would reduce impacts on water quality by decreasing the risk of non-point source pollution.
Geology and Soils			
1 Impacts on geology and soils as a result of range construction at PTA (Modernization/ Construction Impacts)	Mitigation measures considered would include development of an Erosion and Sediment Control Management Plan to include restrictions on vegetation and soil monitoring, buffer zones to minimize dust emissions, and implementation of land rehabilitation projects, as needed, within the LRAM program.	None identified.	Would reduce the amount of erosion resulting from construction activities.
Biological Resources			

Direct Effect	Additional Mitigation	Regulatory/ Administrative Mitigation	Benefit of Mitigation
<p>1 Impacts to listed species (IPBA Modernization/ Construction Impacts, Live-fire Training, Maneuver Training)</p>	<p>Mitigation measures for IPBA construction and operation will be identified in the BO, to be issued by USFWS. The BO will be included in the Final EIS. Any conservation measures discussed in the BO will be considered in the ROD.</p>	<p>Would reduce impacts to listed species.</p>	
<p>2 Impacts to listed species present in range area (Maneuver Training)</p>	<p>Mitigation measures considered include avoidance of known habitats built into the design of the ranges.</p>	<p>None identified.</p>	<p>Would reduce impacts from training to listed species and their habitats.</p>
<p>3 Spread of invasive species (Modernization/ Construction Impacts, Live-fire Training, Maneuver Training)</p>	<p>Mitigation measures considered include educating contractors on inspecting and washing all vehicles at wash rack facilities prior to leaving PTA, invasive animal control protocols, and continued implementation of INRMPs and RTLA / LRAM plans to minimize and rehabilitate vegetation damage.</p>	<p>None identified.</p>	<p>Would reduce spread of invasive species.</p>
Cultural Resources			
<p>1 Impacts to cultural resources (Modernization/ Construction Impacts)</p>	<p>Mitigation measures considered include working with the Hawai'i SHPD to preserve select Quonset Huts that could also be available for visitor access.</p>	<p>Hawai'i SHPD</p>	<p>Adoption of this mitigation measure would follow Section 106 consultation requirements.</p>

Direct Effect	Additional Mitigation	Regulatory/ Administrative Mitigation	Benefit of Mitigation
2 Impacts to cultural resources (Modernization/ Construction Impacts)	Mitigation measures considered include working with range planners and the Corps of Engineers during the range design process to ensure avoidance measures are taken into consideration when locating firing points, targetry, and maneuver areas on the ranges.	None identified.	Adoption of this mitigation measure could result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
3 Impacts to cultural resources (Modernization/ Construction Impacts)	Mitigation measures considered include development of a monitoring program for eligible archaeological sites to observe for long-term impacts and corrective measures.	None identified.	Adoption of this mitigation measure could result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
4 Impacts to cultural resources (Live-fire Training, Maneuver Training)	Mitigation measures considered include development of in-briefing materials to ensure units using proposed new ranges can identify sites and take avoidance measures during training.	None identified.	Adoption of this mitigation measure could result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
5 Impacts to cultural resources (Live-fire Training)	Mitigation measures considered include revisions to the existing cultural resources monitoring plan at PTA to take into account new range areas or training activities.	None identified.	Adoption of this mitigation measure could result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
6 Impacts to cultural resources (IPBA Modernization/ Construction Impacts)	Mitigation measures considered include having the PTA Archaeologist participate during range planning and design meetings to build avoidance measures into the IPBA design.	None identified.	Adoption of this mitigation measure could result in site preservation to protect potential sites from further damage.
7 Impacts to cultural resources (IPBA Modernization/ Construction Impacts)	Mitigation measures considered include developing a monitoring plan to insure site protection during construction.	None identified.	Adoption of this mitigation measure could result in site preservation to protect potential sites from further damage.

Direct Effect	Additional Mitigation	Regulatory/ Administrative Mitigation	Benefit of Mitigation
8 Impacts to cultural resources (IPBA Live-fire Training)	Mitigation measures considered include avoidance of known sites built into the range design, establishment of individual range SOPs for firing points, and long-term site protective measures such as fencing and Siebert stakes for known sites.	None identified.	Adoption of this mitigation measure could result in site preservation to protect potential sites from further damage.
9 Impacts to cultural resources (IPBA Western Range Area No Action Alternative - Live-fire Training)	Mitigation measures considered include adjusting firing points to avoid known cultural sites within the Western Range Area of the impact area.	None identified.	Even if the Western Range Area IPBC alternative is not selected, some adjustment of firing points to avoid that portion of the impact area could serve as an effective avoidance measure from damaging or destroying recently surveyed resources.
10 Impacts to cultural resources (IPBA – all alternatives)	The Army is presently in consultation with the SHPD on the proposed action. Recommended mitigation measures from the SHPD will be available in the Final EIS, and considered in the ROD.		
Hazardous Wastes/Hazardous Materials			
1 Soil contamination from construction activities (Modernization/ Construction Impacts)	Mitigation measures considered include implementing OWS educational programs based on proper usage and maintenance.	None identified.	Continued education would reduce contamination concerns.

Direct Effect	Additional Mitigation	Regulatory/ Administrative Mitigation	Benefit of Mitigation
2 Soil contamination from construction activities (Modernization/ Construction Impacts)	Mitigation measures considered include conducting surveys and identification (pre-demolition) of facilities to determine asbestos or LBP hazards to reduce exposures.	None identified.	Would reduce exposure to asbestos or LBP hazards from construction activities.
3 MEC/UXO encountered during construction activities (Modernization/ Construction Impacts)	Mitigation measures considered include continuing to educate contractors and Soldiers on how to identify MEC/UXO and the proper safety procedures for handling MEC/UXO.	None identified.	Continued education would reduce contamination concerns.
4 Soil contamination from construction activities (Modernization/ Construction Impacts, Live-fire Training)	Mitigation measures considered include conducting a follow on soil study at Range 10 to better characterize the potential hazards there from lead contamination or other munitions constituents; and if necessary, take remedial action.	None identified.	Would reduce potential for soil contamination.
5 MEC/UXO encountered during training activities (IPBA Live-fire Training)	Mitigation measures considered include monitoring and additional studies to better characterize the potential hazards from lead contamination or other munitions constituents; and if necessary, take remedial action.	None identified.	Would reduce potential from lead contamination.
6 MEC/UXO encountered at the proposed IPBA site(s) (IPBA Construction)	Mitigation measures considered include removing/destroying known MEC/UXO within a 20 ft to 30 ft buffer area surrounding the IPBA/IPBC access road, ROCA, areas surrounding the MOUT and Live-fire	None identified.	The benefit would be to ensure construction worker and Soldier safety when operating within the IPBA footprint.

Direct Effect	Additional Mitigation	Regulatory/ Administrative Mitigation	Benefit of Mitigation
	Shoothouse, and IPBC trails, objectives, firing points, and targets.		
7 MEC/UXO encountered during training activities (Live-fire Training)	Mitigation measures considered include continuing to implement proper soil and erosion control, proper ventilation to ensure both indoor and outdoor air quality, bullet absorbing designs, and lead decontamination procedures.	None identified.	Would reduce contamination concerns.
Depleted Uranium – n/a			
Socioeconomics and Environmental Justice – n/a			
Public Services/Utilities – n/a			
Wildfires			
1 Wildfires from construction activities (Modernization/ Construction Impacts, Live-fire Training)	Mitigation measures considered include creating a firebreak around the individual ranges of the IPBA and the bivouac area to reduce the potential for fuels ignition.	None identified.	Would reduce potential for wildfires.
2 Wildfires from training activities (Maneuver Training)	Mitigation measures considered include full implementation of the IWFMP for new training areas to reduce the impacts associated with wildfires.	None identified.	Would reduce potential for wildfires.

Direct Effect	Additional Mitigation	Regulatory/ Administrative Mitigation	Benefit of Mitigation
3 Wildfires from live-fire training activities (Live-fire Training)	Mitigation measures considered include fuel reduction, continuation of Soldier education, and the addition of fuel management corridors and/or fuel breaks.	None identified.	Would reduce potential for wildfires.
Sustainability – n/a			

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