

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

This section analyzes potential environmental impacts of the Proposed Action to construct and operate an IPBC at PTA. The discussion focuses on significant issues identified through the scoping process and Draft PEIS public comments. The locations of the proposed IPBC are all within the boundary of the impact area at PTA; therefore, many potential impacts are expected to be similar among the alternative locations. Live-fire training and maneuver training would be associated with the subsequent operation of the range once construction is completed. These impacts are analyzed under each Alternative. Live-fire training and maneuver training impacts were not analyzed under some of the resource areas, such as Airspace (Section 4.2), Socioeconomics (4.13), Public Services and Utilities (4.14), and Sustainability (4.16).

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 Final 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 Final 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

Impacts on land use were assessed based on the consistency of project activities with state and local plans and on compatibility with land uses at PTA. Impacts on recreational resources were assessed by determining the types of recreational uses in and around PTA, 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. The Army has coordinated with the state of Hawai'i to meet CZM consistency requirements and submitted a CZM negative determination to the State Department of Business, Economic Development & Tourism (HDBEDT) for training activities at PTA.

4.1.2 Factors Considered for Determining Significance

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
- Conflict with or be incompatible with the objectives, policies, or guidance of state and local land use plans.

Table 4.1-1 provides a summary of the potential recreational and land use impacts.

Table 4.1-1. Land Use Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
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 laws	○	○	○

LEGEND

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

4.1.3 Alternative 1: IPBC at Western Range Area

4.1.3.1 Construction Impacts

No Impact

Construction of the proposed Western Range Area IPBC would not change land uses in the General Range Area; this activity is fully compatible with the existing land use at PTA. The proposed IPBC would not involve any activity that conflicts with the enforceable policies of the State's CZMP.

4.1.3.2 Live-fire Training Impacts

No Impact

Siting the proposed IPBC at the Western Range Area Alternative would enhance live-fire training opportunities on the western side of the installation. The Western Range Area Alternative is located entirely within established impact area, and would not be expected to affect off-post land uses. The construction and operation of a new range 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, by using SOPs for range scheduling and using avoidance measures through SDZ planning, training conflicts can be avoided. In this instance, the lack of active ranges in the vicinity of the preferred location eliminates potential conflicts with other range activities and SDZs.

During the scoping process, the Army received several public comments about hunting restrictions. The proposed IPBC is not in the vicinity of recreational hunting areas at PTA, and, no added hunting restrictions are anticipated. Recreational activities would not be impacted because as training permits, existing public access to and use of areas currently open to public access at PTA for seasonal recreational hunting would not change. The Western Range Area Alternative would continue to be restricted to public access. Mauna Kea and its associated recreational and natural areas would not be expected to experience any noticeable impacts from live-fire training at PTA.

Constructing and operating an IPBC in the Western Range Area Alternative, including improvements to Charlie Circle Road for range accessibility, would be consistent with existing land uses within the range and training areas. Activities and uses associated with the proposed IPBC would be compatible with existing land uses in the area. The proposed project would improve access and enhance training capability – in alignment with the existing land use. The areas surrounding PTA are uninhabited, thus no residential areas, schools, hospitals or businesses would be affected. Impacts would be localized to the vicinity around the range. The project would have no impact on land use.

The proposed IPBC would not involve any activity that conflicts with the enforceable policies of the State's CZMP. Noise associated with live-fire activities (addressed in Section 3.5 and Section 4.5) would continue to be consistent with surrounding land uses. 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.

4.1.3.3 Maneuver Training Impacts

No Impact

Maneuver activities would be fully compatible with existing land uses at this portion of PTA. The proposed IPBC would not involve any activity that conflicts with the enforceable policies of the State's CZMP. Noise associated with live-fire activities (addressed in Section 3.5 and Section 4.5) would continue to be consistent with surrounding land uses. There would be no impacts on land use associated with maneuver training as a result of either the construction or operation of the proposed project.

4.1.4 Alternative 2: IPBC at Charlie Circle

4.1.4.1 Construction Impacts

No Impact

Construction of the proposed IPBC within Charlie Circle would not change land uses in the General Range Area; this activity is fully compatible with the existing land use at PTA. The proposed IPBC would not involve any activity that conflicts with the enforceable policies of the State's CZMP.

4.1.4.2 Live-fire Training Impacts

Significant Impact Mitigable to Less than Significant

A corner of the SDZs for the proposed IPBC at the Charlie Circle Alternative may encroach upon Training Area 23 and, without proper mitigation measures (e.g., restrictions on tracer ammunition), could result in operational restrictions under this alternative. Per DA PAM 385-63, SDZs from different ranges may overlap, but no SDZ will fall on a part of another range where Soldiers are training. This would interfere with training being conducted on both Charlie Circle and Training Area 23. The Army could use Training Area 23 in the future for nonlive-fire activities or other compatible training. The SDZs for Charlie Circle Alternative fall outside the outer ungulate exclusion fenced area at Training Area 23; however, there may be a potential risk for species there.

Recommended Mitigation

Arrange firing points to minimize SDZs falling 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.

No Impact

Siting the proposed IPBC at Charlie Circle would enhance live-fire training opportunities on the western side of the installation. Similar to the Western Range Area Alternative, Charlie Circle is located entirely within the impact area, and uses associated with the proposed IPBC would be compatible with existing land uses in the area. 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 IPBC 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.

4.1.4.3 Maneuver Training Impacts

No Impact

Maneuver activities would be fully compatible with existing land uses at this portion of PTA. The proposed IPBC would not involve any activity that conflicts with the enforceable policies of the State's CZMP.

4.1.5 No Action Alternative (No IPBC)

No Impact

Under the No Action Alternative, the IPBC would not be constructed at PTA. The Western Range Area Alternative would continue to be restricted from public access. Existing use of those areas as an impact area would remain unchanged.

4.2 AIRSPACE

4.2.1 Impact Methodology

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

4.2.2 Factors Considered for Determining Significance

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
- Create an obstruction to air navigation.

The Army determined constructing and operating the proposed IPBC would have no impacts on current use of 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 (MTR) 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 IPBC, would have no impact on airspace use because aircraft using the IPBC (helicopters utilizing LZs) would operate under existing airspace conditions.

Table 4.2-1. Airspace Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
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

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

4.2.3 Alternative 1: IPBC at Western Range Area

No Impact

Construction and operation of the proposed IPBC at the Western Range Area Alternative would have no impact on the airspace within the ROI of PTA. No new SUA or modification of existing SUA will be considered for the IPBC. Since there are no published military training routes in the ROI, the proposed IPBC would have no change to existing conditions. Aircraft maneuvering to PTA for training would follow similar procedures as have been followed in the past. There would be no impact on operations at private or commercial facilities within the ROI of PTA from construction and operation of the IPBC or the subsequent training activities conducted on the IPBC. The proposed IPBC would not obstruct navigation at off-post commercial or private facilities.

Training at the proposed IPBC at the Western Range Area Alternative would include a number of helicopter training activities that are currently conducted at Range 10. The amount of training may vary depending on the number of crews and training requirements for an individual unit. These helicopter training activities in the Western Range Area Alternative would not impact airspace.

4.2.4 Alternative 2: IPBC at Charlie Circle

No Impact

Impacts on airspace would be the same as those described for Section 4.2.3 Alternative 1: IPBC at Western Range Area.

4.2.5 No Action Alternative (No IPBC)

Under the No Action Alternative, the proposed IPBC would not be constructed and the existing impact area would remain in its current condition. There would be no risk of impacts on airspace from any construction- or training-related activities 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.

4.3 VISUAL RESOURCES

4.3.1 Impact Methodology

To determine the potential impacts from the proposed IPBC, the Army conducted a literature review and gathered 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.

4.3.2 Factors Considered for Determining Significance

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
- Be inconsistent with the visual resource policies of the County of Hawai'i General Plan (County of Hawai'i, 2005).

Table 4.3-1 provides a summary of the potential visual resources impacts.

Table 4.3-1. Visual Resources Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Introduce physical features that are out of character with adjacent developed areas	○	○	○
Extent to which the Proposed Action obscures or changes sensitive viewing areas	⊙	⊙	○
Inconsistent with County of Hawai'i visual resource policies	○	○	○

LEGEND

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

4.3.3 Alternative 1: IPBC at Western Range Area

4.3.3.1 Construction Impacts

Less than Significant Impact

The visual sensitivity of the General Range Area and its surrounding areas would not be significantly impacted because these areas are not identified as areas of high scenic quality and are not readily accessible to, or used by, large numbers of people. The Western Range Area Alternative is located entirely within the existing impact area, and activities and uses associated with the IPBC 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 IPBC are restricted areas, not accessible to the public; therefore, the scenic quality of the area would remain unchanged by a public viewpoint. Because this proposed project is located in a portion of the General 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 Alternative is classified as "average," then the construction of a new range would not result in downgrading that classification.

4.3.3.2 Live-fire Training Impacts

Less than Significant

Live-fire training activities in the Western Range Area Alternative would be consistent with existing uses of the General Range Area. Emissions of fugitive dust from aviation training activities such as rotary wing downwash could occur at unpaved LZs, but based on meteorological and soil conditions at PTA, fugitive dust emissions would be expected to remain within the impact area. If visible fugitive dust becomes an issue, the Army could modify the use of the LZs and/or identify improvements at these landing areas to minimize fugitive dust. Fugitive dust emissions and their potential effect on air quality are discussed in Section 4.4 Air Quality.

No Impact

The Western Range Area Alternative is not identified as an area of high scenic quality. While small arms live-fire activities do not currently occur in the Western Range Area Alternative, the designation of this parcel of land as an impact area presupposes its anticipated land use as being for live-fire. Changes that would occur to the viewshed or to the visual composition from small arms use associated with the IPBC in this area would not be significant.

4.3.3.3 Maneuver Training Impacts

Less than Significant

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

4.3.4 Alternative 2: IPBC at Charlie Circle

Impacts from construction, live-fire training activities, and maneuver training would be the same as described in Section 4.3.3. Alternative 1: IPBC at Western Range Area.

4.3.5 No Action Alternative (No IPBC)

No Impact

The installation would remain in its current configuration without the proposed IPBC. 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.

4.4 AIR QUALITY

4.4.1 Impact Methodology

This section includes an analysis of the potential impacts on air quality from criteria pollutants (SO₂, NO₂, CO, O₃, PM, and pB) and HAPs generated from the Proposed Action. Air quality impacts for the proposed modernization projects have been evaluated in terms of emissions associated with the activities to construct and operate the IPBC 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.

4.4.2 Factors Considered for Determining Significance

An activity could have a significant impact on 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* threshold of 100 tons per year is often used as a basis of comparison in analyzing air quality impacts, including those for TSP
- 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
- Potential for fugitive dust emissions to cause exceedances or visual obstructions outside the installation boundaries.

Table 4.4-1 provides a summary of potential air quality impacts.

Table 4.4-1. Air Quality Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
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

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

4.4.3 Alternative 1: IPBC at Western Range Area

Primary sources of emissions associated with the proposed IPBC at the Western Range Area Alternative 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 proposed IPBC would produce emissions of particulate matter. The use of heavy equipment on unpaved and paved roads would cause emissions of particulate matter, CO, and nitrogen oxides (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

4.4.3.1 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 the IPBC construction activities are presented in Table 4.4-2 and detailed emissions calculations are shown in Appendix E. The PM₁₀ and PM_{2.5} emissions were calculated for years one and two using an EPA emission factor for fugitive dust from heavy construction operations. These emissions are un-mitigated; appropriate mitigation measures to be undertaken as part of the construction activities are identified accordingly. 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 IPBC would occupy an estimated 110 ac (44.5 ha). The number of construction days for the IPBC is estimated to be 480 working days, (or 240 days per year for a two year period). 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 IPBC (in tons per year)

Disturbed Area in ac (ha)	Estimated Construction Days (per year)	Annual Emissions (tons/year)		
		TSP	PM ₁₀	PM _{2.5}
110 (44.5)	240	431.4	276.5	27.7

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. Requirements in the contract procurement would require compliance with this mitigation measure to minimize particulate matter 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 276.5 tons PM₁₀ per year. Based on the uncertainties associated with any estimate of emissions from construction activities and the potential wind erosion conditions, the Army considers health impacts to be significant; however, emissions would be of short duration and 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 PM₁₀ standards and impacts on visibility. Requirements in the contract procurement would require compliance with this mitigation measure to minimize particulate matter emissions.

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 a measurable effect on ozone levels. Engine emissions from construction vehicle activity would be less than significant.

Table 4.4-3 provides a summary of estimated emissions from the exhaust of equipment (e.g., graders, excavators, dozers, generators) and vehicles (e.g., water trucks, haul trucks) used during construction of the IPBC. Exhaust emissions were estimated using derived emission factors from the California Air Resources Board In-Use Off-Road Equipment (Construction, Industrial, Ground Support, and Oil Drilling) model for 2011. Detailed emissions calculations are shown in Appendix E.

Table 4.4-3. Annual Exhaust Emissions Estimated from Construction Vehicles and Equipment Used During the Construction of IPBC

Equipment	Annual Emissions (tons per year (tpy))			
	NO _x (tpy)	PM ₁₀ (tpy)	PM _{2.5} (tpy)	Hydrocarbons (HC) (tpy)
Construction Equipment	16.09	0.70	0.63	1.05
Construction Vehicles	17.7	0.75	0.69	1.23
Generators	5.02	0.36	0.33	0.40
Total (tons)	38.8	1.79	1.65	2.68
Total (tons per year)¹	19.4	0.90	0.83	1.34

¹ Assuming emissions split evenly across the two construction years.

4.4.3.2 *Live-fire Training Impacts*

Less than Significant

Estimated munitions use at the proposed IPBC 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 2.3.5). These estimates represent the maximum amount of munitions that could be used at the proposed IPBC ranges. While it is unlikely that units using the proposed IPBC 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 Alternative pose very little risk of creating adverse air quality effects. Consequently, air quality impacts expected from munitions use at this location are considered less than significant. The total emissions estimated from ordnance use for the proposed IPBC are shown in Table 4.4-4.

Table 4.4-4. Annual Emissions Estimated from Munitions Use at the IPBC (in tpy)

SO ₂	CO	NO _x	PM ₁₀	PM _{2.5}	CH ₄	TSP	CO ₂	TNMHC	Lead
5.07E-04	2.18	8.97E-02	1.09	8.10E-01	1.72E-02	1.42	5.87	1.36E-03	3.07E-02

NOTE: TNMHC = Total non-methane hydrocarbons

Secondary impacts from live-fire training include emissions from wildfires. 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 at the Western Range Area 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 at the Western Range Area Alternative (Preferred Alternative).

4.4.3.3 *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 emissions generated from these actions could be significant if not mitigated by soil monitoring and implementing dust monitoring and control measures. Vehicle support of training activities occurring at the IPBC would be limited primarily to logistical and support vehicle traffic. Tactical vehicle operations could occur on the IPBC; however, vehicle travel would be limited to established roads and trails.

Fugitive dust generated by training and associated vehicle activity would be widely dispersed by winds in the area; 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 General Range Area.

The IPBC may be managed by a contractor or 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 IPBC facilities when the ranges are open (242 days per year plus nine days of scheduled maintenance). Emissions of fugitive dust and exhaust emissions have been estimated for support personnel traveling to and from the IPBC 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 Alternative were estimated to be 14 mi (22.5 km) round-trip. Table 4.4-5 shows expected net increase in exhaust and fugitive dust annual emissions from POVs traveling to the Western Range Area Alternative from Range 10. Impacts on air quality from POV travel would be less than significant.

Table 4.4-5. Annual Commuting Personnel Emissions (in Tons per year)

Location	VOC	NO _x	CO
Western Range Area Alternative	0.03	0.02	0.32

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 Area Alternative. 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 4.4-6 below.

Table 4.4-6. Annual Commuting Personnel GHG Emissions (MT/year)

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

Approximately 12.0 MT/yr of CO₂e would be generated by POVs commuting from the Cantonment Area to the proposed Western Range Area Alternative location. In the absence of any regulatory standard, the results of the analysis were compared to the 2009 total U.S. GHG emissions of 6,639.7 MT CO₂e (EPA, 2011). While total U.S. emissions have increased by 7.4% from 1990 to 2009, emissions decreased from 2008 to 2009 by 6% primarily due to a decrease in economic output and energy consumption across all sectors and a decrease in the carbon intensity of fuels used to generate electricity as the price of coal increased and the price of natural gas decreased significantly. Since 1990, U.S. emissions have increased at an average annual rate of 0.4% (Ibid.). 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.

4.4.3.4 Aviation Training and Flight Activity

Less than Significant

Flight operations at PTA are dominated by helicopter activity; fixed-wing aircraft use represents a very small fraction of flight operations. Unmanned Aircraft Vehicles (UAV)/ Unmanned Aircraft Systems (UAS) are used during training exercises at PTA and could be used at the IPBC. Under the Proposed Action, there would be no substantial change to Army helicopter flight operations at PTA because no increase in training rotations is proposed. Current patterns of helicopter flight activity would continue to be the primary flight activity occurring at PTA. Although there is the potential for flight activity associated with UAVs to increase in the future, there are no firm plans for such an action at this time. Any 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 of fugitive dust from aviation training activities (such as rotary wing downwash) could occur at two unpaved LZs within the IPBC. Based on meteorological and soil conditions at PTA, fugitive dust emissions at unpaved LZs would be expected to remain within the impact area; the relatively large particle size of fugitive dust (compared to smaller particles resulting from combustion) tends to fall out of the atmosphere quickly. However, should visible fugitive dust become an issue, the Army would modify use of landing areas and/or identify improvements at these landing areas to minimize fugitive dust. The smaller particulates that are of concern for human health effects (e.g., PM₁₀) have been shown to remain within national and state standards during training activities, as reported in the Final EIS for Stationing of the 2/25th SBCT (U.S. Army and USACE, 2008a); training activities reviewed included both maneuver and live-fire training (small arms training and mortars). In addition, as part of the HAMET NEPA review, modeling of aviation training activities at unpaved LZs located on Mauna Loa and Mauna Kea determined that the impact of fugitive dust from helicopter activity would be less than significant and emissions would be below state and national standards (USAH-HI, 2011b).

4.4.4 Alternative 2: IPBC at Charlie Circle

4.4.4.1 Construction Impacts

Potential air quality impacts and mitigation measures would be the same as those described in Section 4.4.3 Alternative 1: IPBC at Western Range Area.

Less than Significant/Significant Impact Mitigable to Less than Significant

Air quality impacts from modernization activities at the proposed Charlie Circle IPBC site would be the same as those described in Section 4.4.3 Alternative 1: IPBC at the 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.

4.4.4.2 Live-fire Training Impacts

Less than Significant

Air quality impacts from live-fire training activities at Charlie Circle IPBC site would be the same as those described in Section 4.4.3 Alternative 1: IPBC at the Western Range Area.

4.4.4.3 *Maneuver Training Impacts*

Less than Significant

Air quality impacts from maneuver training at Charlie Circle IPBC site would be the same as those described in Section 4.4.3 Alternative 1: IPBC at the Western Range Area.

Emissions have been estimated from support personnel traveling to and from the IPBC for 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 Circle Alternative (discounting the current distance traveled from the Cantonment Area to Range 10) was estimated to be approximately 13 mi (21 km) round-trip. Table 4.4-7 shows the expected net increase in exhaust and fugitive dust emissions from POV travel to the Charlie Circle Alternative area.

Table 4.4-7. Annual Commuting Personnel Emissions (in Tons per year)

Location	VOC	NO _x	CO
Charlie Circle Alternative	0.02	0.02	0.29

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 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 4.4-8 below.

Table 4.4-8. Annual Commuting Personnel GHG Emissions (MT)

Location	CO ₂ MT/yr	CH ₄ MT/yr	N ₂ O MT/yr	Total CO ₂ e MT/yr
Charlie Circle Alternative	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 Circle IPBC 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 *Aviation Training and Flight Activity*

Less than Significant

Air quality impacts from aviation and flight training activities for the proposed IPBC at Charlie Circle would be the same as those described in Section 4.4.3 for the IPBC at the Western Range Area Alternative.

4.4.5 No Action Alternative (No IPBC)

No Impact

Under the No Action Alternative for the IPBC, there would be no change on ambient air quality. The installation would not construct the proposed IPBC. Air quality would be similar to the conditions described under Section 3.4, Air Quality Affected Environment.

4.5 NOISE

4.5.1 Impact Methodology

In March 2011, the U.S. Army Public Health Command (USAPHC) performed an *Operational Noise Assessment for Proposed Infantry Platoon Battle Area at Pōhakuloa Training Area, HI* (USAPHC, 2011a). The USAPHC modeled CDNL contours for the proposed IPBC in the Western Range Area Alternative. In May 2011, the USAPHC prepared an addendum to its March 2011 analysis for the hardening of targets at the proposed IPBC in the Western Range Area Alternative to support aerial gunnery training (USAPHC, 2011b). In September 2012, the USAPHC prepared a revised *Operational Noise Assessment for Proposed Infantry Platoon Battle Area at Pōhakuloa Training Area, HI* (USAPHC, 2012). This analysis updated the May 2011 addendum results and incorporated an analysis of the proposed IPBC at Charlie Circle Alternative; reflected adjustments in the aerial gunnery training and non-standard ground based activity (such as Carl Gustav Recoilless Rifle FFV552 training practice round, .50 caliber sabot light armor penetrator tracer (SLAP-T), TOW Missiles (inert), AT-4 Rocket 9 mm training round, mortars, hand grenades, simulators, and demolition charges) at both IPBC alternative locations. The above referenced noise reports are included in Appendix F.

The USAPHC modeled noise contours for large and small caliber weapons use and aerial gunnery training at both IPBC alternative locations analyzed in this Final EIS. The noise levels associated with the Proposed Action were reviewed to determine if they were compatible with surrounding land use (both on and off-post) and if the addition of the proposed IPBC would change noise zones beyond the boundary of the installation. We are now referring to helicopter use at the IPBC as air-ground integration rather than aerial gunnery. Aerial gunnery is a term of art and refers to the weapons qualification each helicopter crew member must complete. This qualification training will not occur at the IPBC; fewer flights and munitions will be involved. Despite this name change, however, the “aerial gunnery” activities considered in the noise study reflect accurately (or even overestimate) the helicopter-related noise that would occur at the IPBC. The IPBC exercise could include air-ground integration support. This would consist of support by VH-60s (transporting Soldiers) and OH-58 (firing support weapons to include TPT 2.75 in. rockets).

4.5.2 Factors Considered for Determining Significance

Significance thresholds 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	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Result in land use incompatibility issues	⊙	⊙	○

LEGEND

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

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

As described in Chapter 2, aviation training at PTA would be conducted for a total of 204 annual days. Helicopters would engage targets in the General Range Area with small arms (7.62 mm and 50-cal weapons) and larger munitions items such as the 2.75 in. rocket, and Advanced Cruise Missile (ACM)-114 Hellfire missiles (simulator munitions). It should be noted that practice rounds and trainers would not be as loud as the live weapons system.

During the scoping period of the EIS, a concern was submitted by the Department of Interior regarding noise levels and potential impacts on the natural soundscape at Volcanoes National Park. Figures 3.5-1 and 3.5-2 illustrate that Volcanoes National Park 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. 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.

4.5.3 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 Alternative. 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.

Table 4.5-2. Rotary Wing Overflight Annoyance Potential

Source	Ground Track Distance ²	dBA Maximum ³	Population Highly Annoyed ⁴
OH-58 – 50 ft AGL	0 ft	99	+35%
	1320 ft (1/4 mi)	71	7%
	1760 ft (1/3 mi)	66	<1%
OH-58 – 100 ft AGL	0 ft	93	+35%
	1320 ft (1/4 mi)	65	<1%
	1760 ft (1/3 mi)	60	<1%
UH-60 – 50 ft AGL	0 ft	100	+35%
	1320 ft (1/4 mi)	72	8%
	1760 ft (1/3 mi)	67	1%
UH-60 – 100 ft AGL	0 ft	94	+35%
	1320 ft (1/4 mi)	66	<1%
	1760 ft (1/3 mi)	61	<1%

¹ Percent annoyance shown is based upon 50 to 200 overflights per day. (Rylander 1974)

² Distance between receiver and the point on earth at which the aircraft is directly overhead.

³ Obtained via SelCalc Program (U.S. Air Force 2005)

⁴ Calculated percentage based upon regression using the known values in Table 13, see Appendix F, Noise Report dated September 10, 2012.

+ 35% The Rylander studies did not include sampling in excess of 90 dBA.

Military vehicle use on maneuver training areas would be fully compatible with existing conditions and land uses in the General Range Area. Helicopter overflight levels may annoy those alongside the PTA boundary, along Perimeter Road. However, the low number of operations, minimum flight altitudes, and standoff distance imposed greatly minimize this potential. Additionally, this area off-post along Perimeter Road is zoned Forest Reserve and is undeveloped.

Table 4.5-2 indicates the percent of population that would consider itself highly annoyed correlated with maximum noise levels for overflights. There is the potential that overflight levels may annoy those alongside the PTA boundary, along Perimeter Road. However, the low number of operations, minimum flight altitudes, and standoff distance imposed greatly minimize this potential. Additionally, this area off-post along Perimeter Road is zoned Forest Reserve and is undeveloped.

4.5.4 Alternative 1: IPBC at Western Range Area

The Army reviewed potential impacts from constructing the IPBC using live- and/or blank munitions and conducting vehicle maneuver to the IPBC. Some helicopter maneuvers may occur specifically at LZs within the IPBC. Air-ground integration training exercises at hardened targetry would also occur on the IPBC. The noise from helicopters would probably be less than expected for the IPBC because the noise modeling analysis conducted includes aerial gunnery at PTA and air-ground integration training at the IPBC.

4.5.4.1 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. Construction noise would be temporary in duration and would not be expected to permanently elevate noise levels in the Western Range Area Alternative. Impacts from the proposed IPBC would be less than significant.

4.5.4.2 Live-fire Training Impacts

Less than Significant

Use of the proposed Western Range Area IPBC would result in noise impacts from small arms and air-ground integration training (see Section 2.3.3). The proposed small arms IPBC activity includes: 5.56 mm rifle, 7.62 mm rifle, and 50-caliber machine guns (Appendix F).

Helicopters would engage targets at the IPBC with small arms (7.62 mm and 50 cal weapons) and larger munitions items such as the 2.75 in. rocket (practice round only), and ACM-114 Hellfire missiles (simulator munitions).⁷⁰ Target practice training rounds, trainers, and simulator munitions would not be as loud as the live weapons system.

Ground-based large ordnance firing may also accompany live-fire training on the IPBC, but would continue to be fired from existing firing points located in the northern portion of the General 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.

⁷⁰ This missile simulator device was not considered in the noise studies. But the noise of this device is less than the 2.75-in. rocket rounds and is delivered from the same helicopter. Therefore the noise from this device was taken into account in the noise contours.

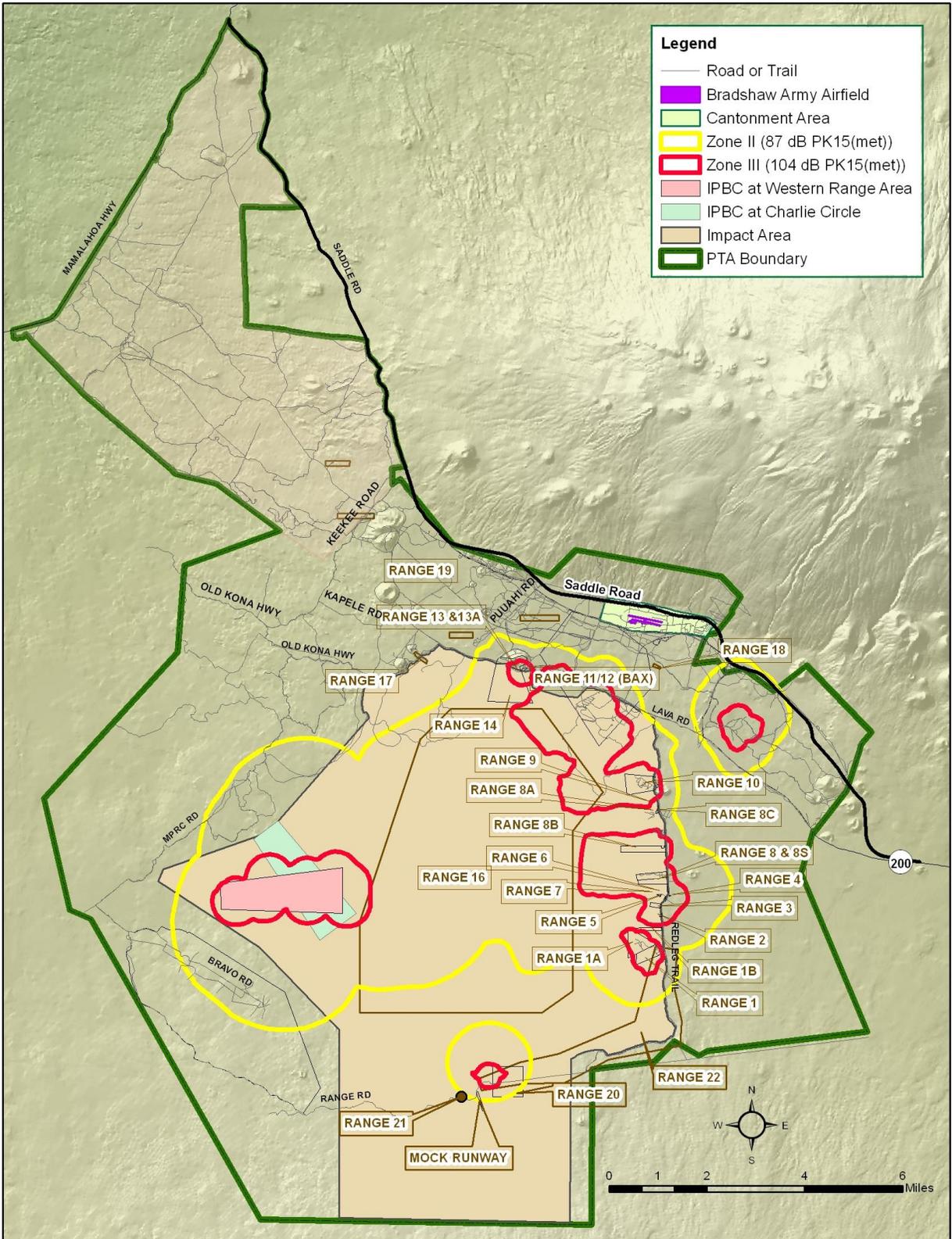
The USAPHC performed noise modeling analysis to determine the noise impacts of the proposed IPBC at the Western Range Area Alternative in a Draft Memorandum dated February 1, 2011, titled Operational Noise Consultation 52-EN-0EB2-11 Operational Noise Contours for Proposed IPBC. This analysis only included 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 air-ground integration activity at the proposed IPBC. This analysis included the proposed IPBC large arms noise impacts and helicopter overflights en route to PTA to conduct air-ground integration training. In September 2012, the USAPHC performed additional noise modeling analysis to incorporate the use of additional ammunition and weaponry on the proposed IPBCs at the Western Range Area Alternative and Charlie Circle Alternative in a Memorandum dated September 10, 2012, titled Operational Noise Consultation, No. W430000.02.03.01-b-12 Operational Noise Assessment Proposed Infantry Platoon Battle Area. This analysis included air-ground integration and non-standard ground based weapon activity at the proposed IPBC. Impacts were analyzed for small caliber noise, large caliber and demolition noise, and helicopter overflights en route to PTA to conduct aerial gunnery and air-ground integration training.

Figure 4.5-1 illustrates the Zone II and III noise contours for all small arms activities (existing General Range Area, the proposed Western Range Area IPBC, and air-ground integration operations). Except for small portions along Infantry Road, the noise zones remain within the PTA boundary. Along Infantry Road, Zone III extends less than 656 ft (200 m) beyond the boundary; within this area is forest reserve land. Figure 4.5-2 shows the Zone II and III noise contours for cumulative demolition and all large arms activities (existing General Range Area, proposed Western Range Area IPBC, and air-ground integration operations). Although this expands the noise zones near the IPBC, the additional activity would have no effect beyond the PTA boundary. Existing noise conditions are within Zone I; therefore, the noise impacts within the PTA are considered less than significant.

4.5.4.3 *Maneuver Training Impacts*

No Impact

Vehicles used at the IPBC would support training activities occurring there, but would be limited primarily to logistical support. Vehicles entering the IPBC would stay on the primary maintenance road and the rest of the trails would be used for dismounted training activity from the main road.



Source: Operational Noise Consultation No. W430000.02.03.01-b-12 (Army 2012)

Figure 4.5-1. Projected small arms noise exposure at IPBC Western Range Area Alternative

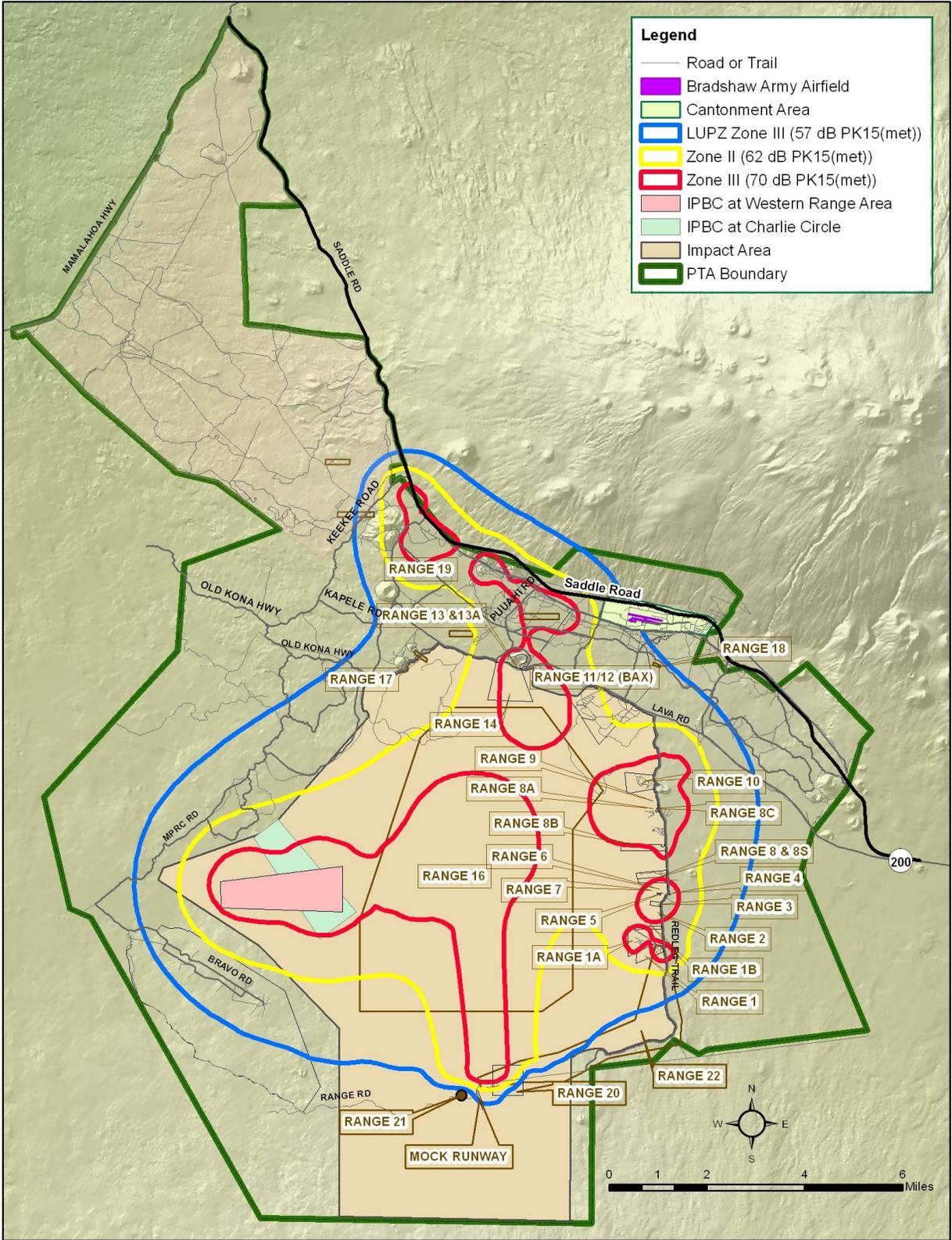


Figure 4.5-2. Projected cumulative demolitions and large arms noise exposure at IPBC Western Range Area Alternative

4.5.5 Alternative 2: IPBC at Charlie Circle

4.5.5.1 Construction Impacts

Less than Significant

Potential short-term noise impacts from construction vehicles and equipment operations would be the same as identified in Section 4.5.4 Alternative 1: IPBC at Western Range Area.

4.5.5.2 Live-fire Training Impacts

Less than Significant

Potential noise impacts from live-fire training at the Charlie Circle IPBC location are depicted in Figures 4.5-3 and 4.5-4. While the noise zones expand for the cumulative demolition and large arms activities from those for all small arms activities, the noise impacts would not extend beyond the PTA boundary. Existing noise conditions found at Charlie Circle are within Zone I.

4.5.5.3 Maneuver Training Impacts

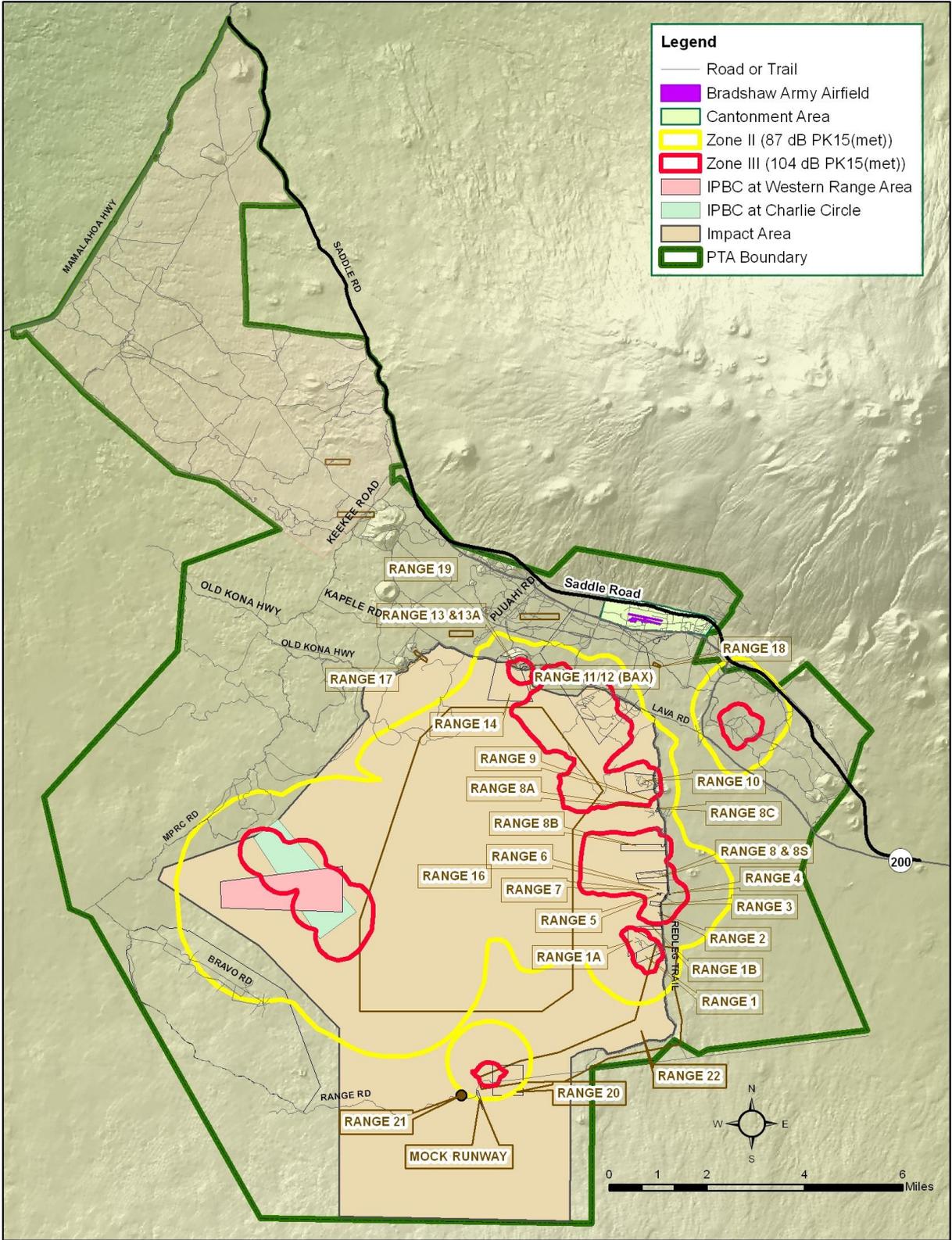
No Impact

As described in Section 4.5.4 Alternative 1: IPBC at Western Range Area, no noise impacts would be expected from vehicle maneuvers.

4.5.6 No Action Alternative (No IPBC)

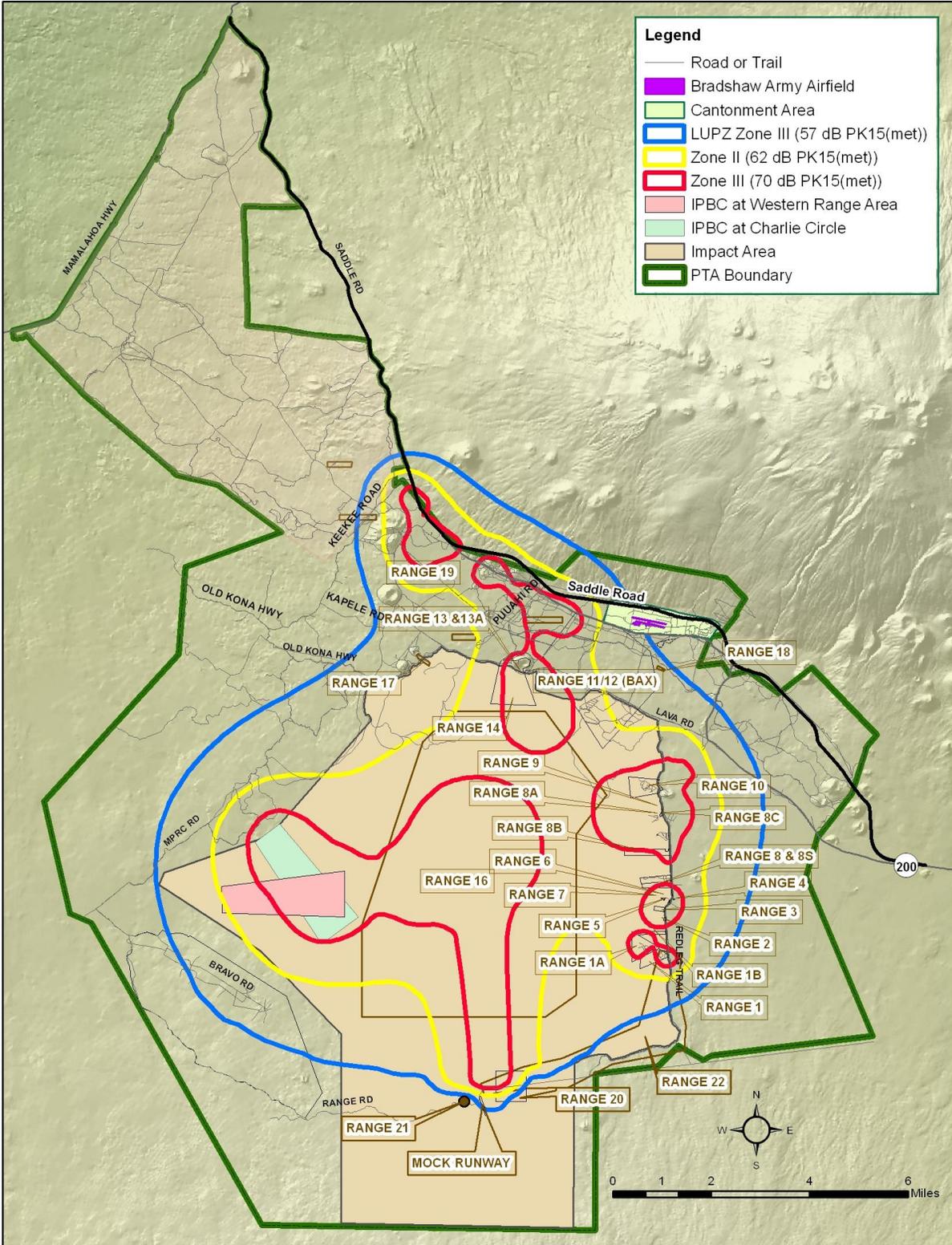
No Impact

Under the No Action Alternative, the proposed IPBC 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 of these activities would occur. There would be no noise impacts from the No Action Alternative.



Source: Operational Noise Consultation No. W430000.02.03.01-b-12 (Army 2012)

Figure 4.5-3. Projected small arms noise exposure at IPBC Charlie Circle Alternative



Source: Operational Noise Consultation No. W430000.02.03.01-b-12 (Army 2012)

Figure 4.5-4. Projected cumulative demolitions and large arms noise exposure at IPBC Charlie Circle Alternative

4.6 TRAFFIC AND TRANSPORTATION

4.6.1 Impact Methodology

This traffic impact analysis describes the potential impacts from transporting construction equipment on public roads to training ranges. The objectives of the impact analysis are to quantify the impacts of the proposed project alternatives on traffic and transportation resources, and to identify and evaluate potential strategies to mitigate traffic impacts.

This section provides a range of potential impacts on traffic from construction during the initial period of the project to accommodate slow moving equipment, supplies, and construction workers' POVs involved in the construction project. To determine potential impacts and their significance, the Army uses its NEPA Analysis Guidance Manual for Traffic and Transportation Systems (USAEC, 2007). The proposed IPBC is not envisioned to result in an over-all increase in troops training at PTA; therefore, the Army did not conduct a detailed traffic analysis based on long-term impacts from training at the IPBC at PTA.

4.6.2 Factors Considered for Determining Significance

Factors considered in determining whether each alternative would have a significant impact on 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 provides a summary of potential traffic and transportation impacts.

Table 4.6-1. Traffic and Transportation Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Impacts on local traffic circulation and safety hazards	⊙	⊙	○

LEGEND

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

4.6.3 Alternative 1: IPBC at Western Range Area

4.6.3.1 Construction Impacts

Less than Significant

The Army anticipates a temporary increase in traffic volume on Saddle Road during the initial period of range construction resulting from additional equipment, supplies, and construction worker POVs. This anticipated increase in traffic volume would 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. 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. Roadway deficiencies (such as poor LOS) and roadway conditions are presently the chief cause of traffic accidents.

Construction contracts would generally detail the numbers and type of equipment, and the general requirements for skilled labor. Upon initiating the construction contract, heavy equipment would be mobilized and would likely remain at the construction site 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. 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. Heavy equipment may enter the General Range Area directly with special access (bypassing the main gate), thereby reducing conflicts, and congestion at the main gate to the installation.

Additional minor impacts could occur at intersections where construction equipment accesses Saddle Road when travelling to PTA. These impacts cannot be quantified as there are existing and ongoing congestion-related impacts on intersections at Māmalahoa Highway, Waikoloa Road, Kawaihae Road, and Queen Kaʻahumanu Highway from regional traffic patterns, general population growth, and also largely from road improvement projects in those areas. Local contractors from all over Hawaiʻi bid on MILCON contracts and use equipment; skilled workers also are located throughout the island (sometimes skilled workers fly to Hawaiʻi from Oʻahu and other islands). For these reasons, it is not possible to assess potential impacts on traffic and congestion specifically in these areas.

Construction of the IPBC is expected to take two years. Construction of the IPBC 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 travel to the installation daily (during the work week) at peak commute times (6:00 am to 10:00 am and 4:00 pm to 7:00 pm local time). POVs would travel Saddle Road at the posted speed limit (versus heavy equipment for example), thereby minimizing the potential for contributing to a LOS reduction along that travel corridor. Construction worker POVs would likely be granted extended access passes to reduce congestion at the main range entrance.

Construction-related conflicts with military traffic (multi-service units using the General Range Area) would not occur because no ranges exist in the immediate area of the proposed IPBC. Given these factors, the potential impacts from the Proposed Action would be less than significant.

4.6.3.2 *Live-fire Training Impacts*

No Impact

The Western Range Area Alternative is underutilized. No ranges exist in the immediate area of the proposed IPBC at this location.

4.6.3.3 *Maneuver Training Impacts*

No Impact

The Western Range Area Alternative is underutilized. Maneuver training in the Western Range Area Alternative would not be hindered by road improvements to Charlie Circle or by IPBC construction in this area.

4.6.4 *Alternative 2: IPBC at Charlie Circle*

4.6.4.1 *Construction Impacts*

Similar impacts as described in Section 4.6.3 Alternative 1: IPBC at Western Range Area are anticipated.

4.6.4.2 *Live-fire Training Impacts*

No Impact

Live-fire training at the Charlie Circle IPBC would not be hindered by road improvements or by construction-related traffic in this area.

4.6.4.3 *Maneuver Training Impacts*

No Impact

Maneuver training at Charlie Circle IPBC would not be hindered by road improvements or construction-related traffic in this area.

4.6.5 *No Action (No IPBC)*

No Impact

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

4.7 *WATER RESOURCES*

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.

4.7.2 Factors Considered for Determining Significance

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 water uses within or outside the project region
- 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 9 Tap Water 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 provides a summary of potential water resources impacts.

Table 4.7-1. Water Resources Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Impacts on watersheds or water supply	⊙	⊙	○
Impacts on surface water	⊙	⊙	○
Wastewater impacts	⊙	⊙	○
Stormwater impacts	⊙	⊙	○

LEGEND

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

4.7.3 Alternative 1: IPBC at Western Range Area

The Proposed Action 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.

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

4.7.3.1 Construction Impacts

Less than Significant

Site clearing and grading for construction of the proposed IPBC 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 IPBC 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 Alternative. 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.

Construction of the proposed IPBC would require NPDES permits with the HDOH-CWB to mitigate potential non-point source pollution impacts on the water supply “downstream” of PTA. This would include an approved sedimentation and erosion control plan, pollution prevention control measures, and BMPs to be implemented and inspected during and after a weather-related rain event to ensure effectiveness for preventing any on- or off-site pollution due to runoff. 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.

4.7.3.2 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 into the Western Range Area Alternative 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. Small arms live-fire would be directed at targetry and live-fire operations at the IPBC. Less than significant impacts on water resources would be minimized through regular range maintenance procedures. BMPs would be implemented with each live-fire training activity.

The design of proposed IPBC would incorporate a layout to catch and control any contaminants that may be carried off-site by a storm event.

Additional septic systems or UIC wells are not anticipated as portable lavatories would be used during training activities, requiring local contractors to remove the systems on a regular basis. Construction of the proposed projects would require a 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.

4.7.3.3 *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 for maneuvering impacts on the environment. The presence of Soldiers for maneuver training may include foot traffic and trampling of the ground. This would have an incremental impact on soil compaction and infiltration. However, these impacts would not be expected to impact water resources given the high porosity of the soils and lack of water at the installation.

Vehicle use at the IPBC would be limited to the trails accessing the Western Range Area Alternative and access roads for the IPBC. Training at the proposed IPBC would be primarily dismounted (on foot) thereby minimizing erosive effects of training. Potable water would be transported into the Western Range Area Alternative. Impacts from maneuver training would have a less than significant impact on PTA's wastewater system.

4.7.4 *Alternative 2: IPBC at Charlie Circle*

Impacts from the proposed IPBC construction and operation at Charlie Circle are anticipated to be similar to those described for Section 4.7.3 Western Range Area Alternative.

4.7.5 *No Action Alternative (No IPBC)*

No Impact

Under the No Action Alternative, the proposed IPBC 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 on water resources from the No Action Alternative.

4.8 GEOLOGY AND SOILS

4.8.1 Impact Methodology

Impacts on 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 evaluating 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, who 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 account 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

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 9 PRGs for exposures in industrial settings
- EPA Generic Soil Screening Levels (included in the Region 9 PRG tables)
- EPA Region 5 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 potential impacts on geology and soils.

Table 4.8-1. Geology and Soils Impact Summary

Significance Criteria analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
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 Alternative 1: IPBC at Western Range Area

4.8.3.1 Construction Impacts

Less than Significant

Site clearing and grading for construction of the proposed IPBC 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 IPBC would be constructed on lava flow areas with little soil development using standard erosion control practices. Construction impacts would be temporary. There would be potential dust and surface runoff erosion from use of trails and roads at PTA near the Western Range Area Alternative. The impacts would not be significant relative to long-term soil loss or erosion because use of the roads would not significantly alter the rate of erosion. The Army would follow BMPs in maintaining these trails and unpaved roads.

The risk of exposure to contaminated soils at PTA would be low. Exposure to chemical contaminants in soils in the Western Range Area Alternative 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's soils. There are certain thresholds of exposure below which the health risks are so low that they cannot be distinguished from background risks.

The highest risks are associated with the iron and aluminum in the soil; however, these metals occur naturally in most soils at high concentrations. Workers 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 would represent a low risk to personnel.

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 training activity impacts at the proposed IPBC to ensure that fugitive dust emissions stay within acceptable ranges and environmental problems do not result from excessive soil erosion or compaction. The plan would also define contingency measures to mitigate potential training activity impacts that exceed the acceptable ranges for dust emissions or soil compaction.

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 poses no immediate risk. Kīlauea, however, continues to remain active; recent activity in early 2010 suggests that earthquakes and further eruption of that volcano are anticipated to increase, but it is unknown to what extent.

No Impact

Earthquakes are common on the island of Hawai'i, but most are relatively small. PTA is located in an area with about a 10% chance of experiencing horizontal ground acceleration greater than 40% of gravity in the next 50 years. The island of Hawai'i is in Zone 4 of the International Building Code. Although PTA is subject to periodic eruptions of lava from the Mauna Loa volcano, the risk of the proposed IPBC 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 Proposed Action, 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. These measures could include implementation of timely warning systems, appropriate planning and training, and appropriate engineering design. The proposed IPBC 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.

Conflicts with existing federal, state or DoD statutes, or regulations would not occur.

4.8.3.2 Live-fire Training Impacts

Less than Significant

Small arms live-fire would be directed at targetry. Potential damage to soils from live-fire training at the IPBC would be minimized through regular range maintenance procedures. Expended ammunition at the point of impact would contribute to increased lead levels in soils at the Western Range Area Alternative. Due to a lack of migration pathways for lead ammunition at PTA, the resulting contamination would be localized to the General Range Area.

Potential health hazards from contaminated soils exposure and impacts from geologic hazards would be similar to those described above for construction. Live-fire training would be limited in unit size and would occur primarily from dismounted maneuver training with Soldiers firing into the impact area. Significant impacts on soil loss, soil erosion, and compaction would be attributed to mounted maneuver training with substantial off-road vehicle (e.g., tactical vehicle) use. Vehicle use in the proposed IPBC would generally be limited to existing trails or roads. Fugitive dust emissions from aviation training would be expected to remain in the impact area at PTA; the relatively large particle size of fugitive dust (compared to smaller particle size from combustion) tends to fall out of the atmosphere quickly. Potential impacts from fugitive dust on air quality are discussed in greater detail in Section 4.4.

Potential health hazards from contaminated soils exposure and from geologic hazards would be similar to those described above in Section 4.8.3.

No Impact

Conflicts with existing federal, state, or DoD statutes or regulations would not occur.

4.8.3.3 Maneuver Training Impacts

Less than Significant

The presence of Soldiers for maneuver training may include foot traffic and trampling of the ground. This would have an incremental impact on soil compaction and infiltration; however, these impacts would be less than significant. Vehicle use at the IPBC would be limited to roads accessing the Western Range Area Alternative and the proposed IPBC. Training at the proposed IPBC would primarily be dismounted thereby minimizing erosive effects of training. Vehicles entering the IPBC would remain on the primary maintenance road and the rest of the trails would be used for dismounted training activities from the main road. Less than significant impacts are anticipated from geologic hazards.

Potential health hazards from contaminated soils exposure and from geologic hazards would be similar to that described above in Section 4.8.3.

No Impact

Conflicts with existing federal, state, or DoD statutes or regulations would not occur.

4.8.4 Alternative 2: IPBC at Charlie Circle

Impacts from the proposed IPBC construction and operation at Charlie Circle would be similar to those described in Section 4.8.3 Alternative 1: IPBC at Western Range Area.

4.8.5 No Action Alternative (No IPBC)

No Impact

Under the No Action Alternative, the proposed IPBC would not be constructed and the existing impact area would remain in its current condition. There would be no soil disturbance and, therefore, no impacts on soil erosion or compaction. No soil contamination would occur. There would be no risk of geology and soil concerns from construction- or training-related activities as none would occur. There would be no impacts on geology and soils from the No Action Alternative.

4.9 BIOLOGICAL RESOURCES

4.9.1 Impact Methodology

Potential direct and indirect impacts on biological resources were analyzed within the ROI (Table 4.9-1). 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 on 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 provided written concurrence of “not likely to adversely affect.”
- **May Affect / Likely to Adversely Affect**
An adverse effect on 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.

4.9.2 Factors Considered for Determining Significance

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 introduced species
- Cause long-term loss or impairment of a substantial portion of local species-dependent habitat.

Table 4.9-1. Biological Resources Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Impacts from the spread of introduced species	⊗	⊗	○
Disturbance to listed species or habitat	⊗	⊗	○
Disturbance to wildlife and habitat	⊗	⊗	○

LEGEND

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

4.9.3 General Range Area

Listed species in the General Range Area include the nēnē, Hawaiian hoary bat, fragile fern, aupaka, nehe, *Vigna o-wahuensis*, honohono, Leather-leaf sweet ear, ma‘aloa, ‘ihi makole, Hawaiian catchfly, popolu ku mai, creeping mint, and Hawaiian yellow wood. The USFWS acknowledged a no effect determination for the Hawaiian hawk on January 4, 2013, for all anticipated military training at PTA.

On January 11, 2013, the USFWS issued a BO (Appendix G) to address potential impacts on listed species within the Western Range Area Alternative, the Preferred Alternative location for the proposed IPBC. The requirements of this BO replace the requirements of the 2008 BO for Hawaiian geese (nēnē) for the entire PTA installation. Per the January 2013 BO, the Army may conduct hazing to deter Hawaiian geese from foraging, loafing, and nesting on or near any training range installation-wide at PTA. The goal of the program would be to haze the Hawaiian geese to such an extent that they are not present in areas where they could otherwise be harmed. Only the techniques outlined in the January 2013 BO may be used to haze the nēnē.

Mitigation measures for listed species include:

- **Mitigation Measure 1 (nēnē)**

To benefit Hawaiian geese off-site of PTA, the Army is funding a conservation partnership project for Hawaiian geese at Hakalau Forest National Wildlife Refuge (Refuge). The goal is to produce an average of 21 adult Hawaiian geese per year over the 20-year term of the BO. The Refuge is located on Keanakolu Road on the eastern flanks of Mauna Kea between 6,500 and 8,000 ft (2,438 m) elevation about 15 mi (24 m) east of the PTA Cantonment Area. Please refer to Appendix G for a detailed description of this conservation project.

Hawaiian geese may be hit by vehicles on improved and unimproved roads on the installation. To minimize the impacts on Hawaiian geese from vehicular strike at PTA, the following mitigation measure will be followed per the January 2013 BO:

- **Mitigation Measure 2 (nēnē)**

Vehicles will be driven at speeds no greater than 15 mi (24 m) per hour, day and night, unless the PTA Commander and PTA Range Operations have approved a waiver for a legitimate training need.

- **Mitigation Measure 3 (nēnē)**

Army environmental personnel will use the 60-day and 45-day briefs to keep unit leaders informed of their responsibilities to protect Hawaiian geese at PTA. The briefings will detail measures that Soldiers will be required to implement to avoid and minimize potential impacts on Hawaiian geese.

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 construction activities occurring within the General Range Area and KMA would be expected to be significant but mitigable to less than significant.

Recommended Mitigation

Mitigation measures to help control invasive species during construction related activities include:

- 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 washrack 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 on 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 on 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).

4.9.3.1 *Live-fire Training Impacts*

No Effect to May Affect / Likely to Adversely Affect

Live-fire training would be limited in unit size and would result mostly from 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 an increase in size and frequency of wildfires, which could impact federal and state listed species (see Section 4.15, Wildfires).

Impacts on listed species from live-fire training activities could range from “No Effect” to “May Affect / Likely to Adversely Affect.” The USFWS anticipates that a Hawaiian goose is unlikely to be struck by live-fire on Range 04 because of the distance and topography between the firing location and the area generally used by the geese. Many of the entire west side population of 130 Hawaiian geese from Puuanahulu are assumed to make a stopover on PTA once a year for several hours and up to 24 hours (USFW, 2013). Hawaiian geese traversing the impact area in flight or loafing undetected within the impact area could be killed by a direct hit of a round, shrapnel, or fragments from a detonation, or by compression due to blast overpressure resulting from detonation of rounds from weapons used (USFWS, 2013). If Hawaiian geese are not hazed off of a range prior to training, live-fire, compression or shrapnel resulting from detonation could injure or kill Hawaiian geese. Live-fire training would also result in increased noise, smoke, risk of mortality from increased stress, a direct strike, or shrapnel. Flying Hawaiian geese may be struck and killed by helicopters, fixed wing aircraft, or rounds as they are shot into the impact area on PTA. To date there has never been a documented air collision by a helicopter or fixed wing aircraft with a Hawaiian goose in Hawai‘i (USFWS, 2013). The USFWS determined this risk minimal in the 2013 BO due to nēnē behavior and the location of LZs.

Potential consequences of exposure to noise associated with live-fire training at PTA could affect Hawaiian geese by increasing their metabolism, discomfort, and causing temporary damage to auditory cells (USFWS, 2013). Noise generated by Army actions is expected to increase, startle, alarm, and alert behavior of Hawaiian geese at PTA. They may take flight to avoid the noise associated with training activities, increasing their risk of being struck by the live-fire rounds and increasing energetic demands from flying. Hawaiian geese in close proximity to detonations are expected to respond to loud noises and vibration with increased activity resulting in increased food demands. Studies on the impacts of aircraft overflights to Hawaiian geese have not been conducted, though studies have examined impacts on birds of prey (USFWS, 2013). These studies reported a wide range of reactions to overflights depending on the biology of the species, breeding times, aircraft type and altitude, and the lateral distance between the aircraft and the species. If birds do not perceive a direct threat they may habituate to the noise and not

respond to stimuli; however, the degree to which a species can habituate many also be limited. If the Hawaiian geese at PTA are returning adults, they may have been previously exposed to training noises and be habituated experiencing little to no stress as a result of the noise from training. Hawaiian geese that are from a new cohort may react differently and take flight during a training exercise. When the noise is too loud or disruptive, Hawaiian geese will either leave the area or they are not losing any metabolic resources (USFWS, 2013).

Recommended Mitigation

Develop in-briefing materials to ensure units can identify listed species and habitat to avoid during training.

The following mitigation measures for Hawaiian geese (nēnē) are required on direct fire ranges per the 2013 BO:

- **Mitigation Measure 4 (nēnē)**
The Army will incorporate into training that Hawaiian geese will not directly be targeted and will have an appropriate leader observing performance on the range during training. Take of Hawaiian geese should be limited at any time and should not exceed the typical flock size of six individuals. Once a take is observed, training will cease to provide further instructions to troops and minimize the chance of additional take.
- **Mitigation Measure 5 (nēnē)**
Take of a Hawaiian goose will be reported to USFWS; if a Hawaiian goose is killed by a helicopter or collision with a fixed wing aircraft, the take will also be reported to USFWS.

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 General 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 IWFMP 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 SDZs 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 – particularly Hawaiian hoary bats and the nēnē – would have temporarily left the area due to the short-term noise.

Impacts on 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.

Recommended Mitigation

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

4.9.4 Alternative 1: IPBC at Western Range Area

4.9.4.1 Construction Impacts

May Affect / Likely to Adversely Affect

Construction of the proposed IPBC may result in damage to the listed plant species and their habitats by mortality during ground softening activities, trampling from foot or vehicular traffic associated with the construction of the IPBC, dust from vehicular traffic along newly created roads and competition with introduced plants. Figure 4.9-1 depicts potential impacts on listed plant species from IPBC construction on the Western Range Area Alternative.

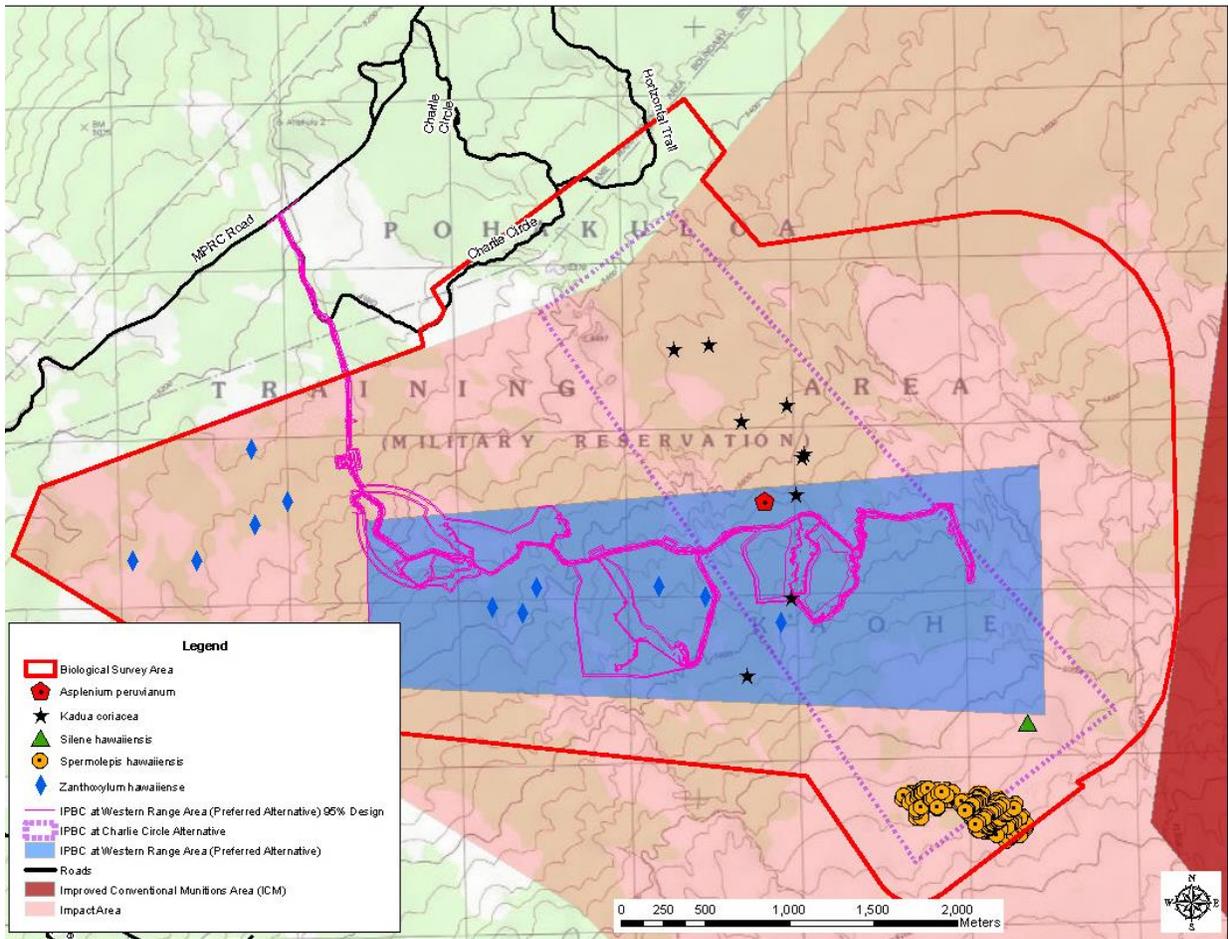


Figure 4.9-1. IPBC design overlay on listed plant species at the Western Range Area Alternative

Per the 2013 BO, if the Army selects the Western Range Area Alternative (Preferred Alternative) for the IPBC, *Spermolepsis hawaiiensis* would not be affected. Only one individual of two species (*Silene hawaiiensis* and *Asplenium peruvianum* var. *insulare*) are present in the proposed IPBC; therefore, the impacts on these species would be minor if they are killed. *Spermolepsis hawaiiensis* was declared stabilized statewide by the USFWS in 2010 and the proposed IPBC project would not affect a large percentage of its spatial distribution. The 15 individuals of *Zanthoxylum hawaiiense* present in the proposed IPBC represent less than 2% of the total estimated individuals for the species combined on Hawai'i and Maui. The plant species, *Kadua coriacea*, may be significantly affected by the proposed IPBC. The Army's conservation measures described below for this species is significant in the USFWS' consideration of the overall impacts on this species from the proposed IPBC.

Mitigation measures to reduce impacts on Listed Plant (LP) species from construction and operation of the IPBC at the Western Range Area Alternative include:

- **Mitigation Measure 1 (LP)**
Locate infrastructure to avoid listed species whenever possible.
- **Mitigation Measure 2 (LP)**
If avoidance is not possible for *Kadua coriacea* and *Zanthoxylum hawaiiense*, PTA environmental staff will, prior to infrastructure construction and after UXO has been cleared from the area, place protective hog wire exclosures around individual plants, demarcate locations using a five-foot Polyvinyl Chloride (PVC) pipe with Seibert markings or similar, and will provide contractors, maintenance personnel, and troops maps and briefings to avoid plant locations.
- **Mitigation Measure 3 (LP)**
PTA environmental personnel will make site visits to collect any available seeds from all *K. coriacea* within the UXO cleared area of the IPBC. As many cuttings as possible will be taken from all of those individuals, propagated in the PTA Rare Plant Facility, and seeds collected once the plants are reproductive. For at least as many plants located in the UXO cleared area, additional individuals from their genetic stock beyond pre-IPBC project plans will be out-planted and maintained until they reach reproductive maturity.
- **Mitigation Measure 4 (LP)**
If the one individual of *Asplenium peruvianum* var. *insulare* and the one individual of *Silene hawaiiensis* are within the UXO cleared area of the final IPBC design footprint, Army environmental personnel will compensate for their potential loss by collecting genetic material prior to construction, if possible, and propagating, out-planting, and maintaining at least one additional individual of each plant to reproductive maturity.
- **Mitigation Measure 5 (LP)**
The Army will address propagation and out-planting needs of *Zanthoxylum hawaiiense* to increase its abundance and distribution at PTA. Prior to construction and after UXO clearance of the proposed IPBC, PTA environmental personnel will conduct site visits to collect pollen and seeds from all individuals within the UXO cleared portions of the IPBC. The potential destruction of the 15 plants will be compensated by the Army's maintenance of up to 15 individuals to reproductive maturity.

Potential impacts and mitigation measures for Hawaiian geese (nēnē) from the proposed construction and operation of the IPBC are the same as those described in Section 4.9-3 General Range Area.

Not Likely to Adversely Effect

The USFWS issued, per the 2013 BO, that the proposed IPBC project is not likely to adversely affect the Hawaiian Hoary Bat (HHB) and Hawaiian Petrels (HAPE) if the following avoidance and minimization measures are followed:

- **Mitigation Measure 1 (HHB and HAPE)**
IPBC lighting will be amber, low-wattage lights down-shielded to minimize disorientation of flying animals.
- **Mitigation Measure 2 (HHB and HAPE)**
IPBC lights will only be used when night training is scheduled.
- **Mitigation Measure 3 (HHB and HAPE)**
PTA environmental personnel will complete ongoing studies of Hawaiian hoary bats and Hawaiian petrels in an attempt to describe each species' temporal and spatial patterns of occupancy at PTA.
- **Mitigation Measure 4 (HHB and HAPE)**
IPBC construction will not involve any tree trimming or tree removal work between June 1 and September 15.
- **Mitigation Measure 5 (HHB and HAPE)**
Training by military units will be preceded with instruction to avoid impacting or cutting native vegetation to minimize the effects of training maneuvers within treeland and shrubland habitats at the IPBC location.
- **Mitigation Measure 6 (HHB and HAPE)**
A 15 mph (24 km/h) speed limit will be strictly enforced day and night, except when a waiver has been approved by the PTA Commander and PTA Range Operations.
- **Mitigation Measure 7 (HHB and HAPE)**
Troops will receive instruction prior to driving at PTA to avoid hitting Hawaiian hoary bats and Hawaiian petrels.
- **Mitigation Measure 8 (HHB and HAPE)**
Use of smoke and obscurants in the IPBC will be excluded within 165 feet (50 m) of trees.
- **Mitigation Measure 9 (HHB and HAPE)**
Military targets in the IPBC will be placed away from trees where possible.
- **Mitigation Measure 10 (HHB and HAPE)**
Permanent barbed wire will not be used in the IPBC.

Significant Impact Mitigable to Less than Significant

Construction of the IPBC at the Western Range Area Alternative would impact the limited vegetation, wildlife, migratory birds, and habitats present in the area. Although construction of the IPBC would impact these biological resources, conservation measures would be implemented to limit the impacts. The 2013 BO addresses impacts on listed plants and/or wildlife from the possible introduction of invasive species resulting from the IPBC construction. The following mitigation measures would reduce the impacts from invasive species (Inv Sp) to less than significant:

- **Mitigation Measure 1 (Inv Sp)**
Construction areas and roads will be surveyed quarterly during construction and annually after completion of the IPBC construction.
- **Mitigation Measure 2 (Inv Sp)**
New weed introductions will be prioritized and target species ranked for management.

The Army currently institutes mitigations (e.g., herbicides, mechanical controls, and use of vehicle washracks) to minimize the significance of the spread of invasive species. These management controls would continue. Additionally, the following mitigation measures are currently in place to respond to new or increasing impacts on 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.

4.9.4.2 Live-fire Training Impacts

May Affect / Likely to Adversely Affect

Live-fire training occurring within the Western Range Area Alternative could result in the potential increase and frequency of wildfires, which could impact federally listed plant species. Hawaiian geese may be injured or killed by training activities while they are feeding or loafing in an SDZ at the IPBC or by vehicles transiting between the IPBC and the Cantonment Area while they are present on roadways. Many of the entire west side population of 130 Hawaiian geese from Puuanahulu are assumed to make a stopover on PTA once a year for several and up to 24 hours (USFWS, 2013). Nēnē traversing the impact area in flight or loafing undetected within the impact area could be killed by a direct hit of a round, shrapnel, or fragments from a detonation, or by compression due to blast overpressure resulting from detonation of rounds from these weapons.

Flying Hawaiian geese may be struck and killed by helicopters, fixed wing aircraft, or rounds as they are shot into the impact area on PTA. To date there has never been a documented air collision by a helicopter or fixed wing aircraft with a Hawaiian goose in Hawai‘i (USFWS, 2013). The USFWS determined this risk minimal in the 2013 BO due to nēnē behavior and the location of LZs. Mitigation measures for Hawaiian geese for live-fire training are the same as those described for the General Range Area.

Significant Impact Mitigable to Less than Significant

Live-fire training impacts from projects within the Western Range Area Alternative 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 some loss of the resource. Any visual flash or sound effects simulators used on the IPBC could ignite a wildfire that may result in damage or loss of known habitat. Vegetation in the area can recover from events such as wildfires and damage caused by bullets. Due to the sparsely vegetative nature of the Western Range Area Alternative location, wildfire within the boundaries of the proposed IPBC is unlikely. However, the land surrounding the proposed project area is more prone to wildfire; therefore, under the 2013 BO, illumination rounds are prohibited for the Proposed Action. To simulate a realistic training environment, the IPBC will incorporate the use of thermal targets, night illumination devices, and visual flash simulators. However, no parachute flares or other pyrotechnics, such as those shot up into the air to illuminate an area, will be used due to risks of igniting a fire.

Recommended Mitigation

Fuels monitoring corridor around the proposed IPBC for vegetation encroachment.

4.9.4.3 Maneuver Training Impacts

May Affect / Likely to Adversely Affect

Maneuver training impacts within the Western Range Area Alternative could result in the potential disturbance of federally listed species and their habitat, the risk of fire, habitat fragmentation, and dispersal of introduced plant seeds from foot or vehicular traffic and other activities associated with military training. 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. In general, vehicles would remain on established roads. The new access road to the IPBC would be sited to avoid known resources where necessary.

Significant Impact Mitigable To Less Than Significant

Maneuver training within the Western Range Area Alternative could introduce invasive plants and noxious weeds. To prevent the introduction of non-native plants and weeds to the Western Range Area Alternative, the maneuver training would follow established SOPs at PTA including the use of washracks. Washracks 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 is an active washrack located near the BAAF and a second washrack was recently constructed at the BAX.

Recommended Mitigation

Abide by established SOPs for control of invasive plants including inspecting and washing all military vehicles at washrack 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 Marine Corps Light Armored Vehicles (LAVs)⁷¹ 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 on listed species. The new access road to the IPBC would be sited to avoid known resources where necessary. 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 on general wildlife and their habitats, and vegetation would be considered less than significant.

4.9.5 Alternative 2: IPBC at Charlie Circle

Similar listed species and habitats were found at the Charlie Circle Alternative. In addition, as described in Section 3.9.4.3, surveys of the Charlie Circle Alternative identified a patch of *Spermolepis hawaiiensis*. Impacts from construction and operation of the IPBC at the Charlie Circle Alternative and recommended mitigation measures would be similar to impacts and mitigation described for the Western Range Area Alternative, Section 4.9.4. Figure 4.9-2 depicts the IPBC enhanced design in relation to listed plant species on Charlie Circle Alternative.

The Charlie Circle Alternative would have a greater impact on the listed plant species, *Spermolepis hawaiiensis*, because approximately half of the 26 ac (11 ha) of this listed species would be in the IPBC footprint. The following mitigation measure shall be implemented if the Army selects the Charlie Circle Alternative.

- **Mitigation Measure 6 (LP)**

If *Spermolepis hawaiiensis* occurs within the UXO cleared area of the final IPBC design footprint, Army environmental personnel will compensate for their potential loss by collecting a sample of seeds prior to construction and broadcasting the seeds in an established Army out-planting site. Once the location for the IPBC is determined, if *S. hawaiiensis* occurs outside the UXO cleared area, no further conservation action for this species would be taken.

⁷¹ The LAV-25 is an eight-wheeled amphibious reconnaissance vehicle used by the Marine Corps, similar in size to the Stryker.

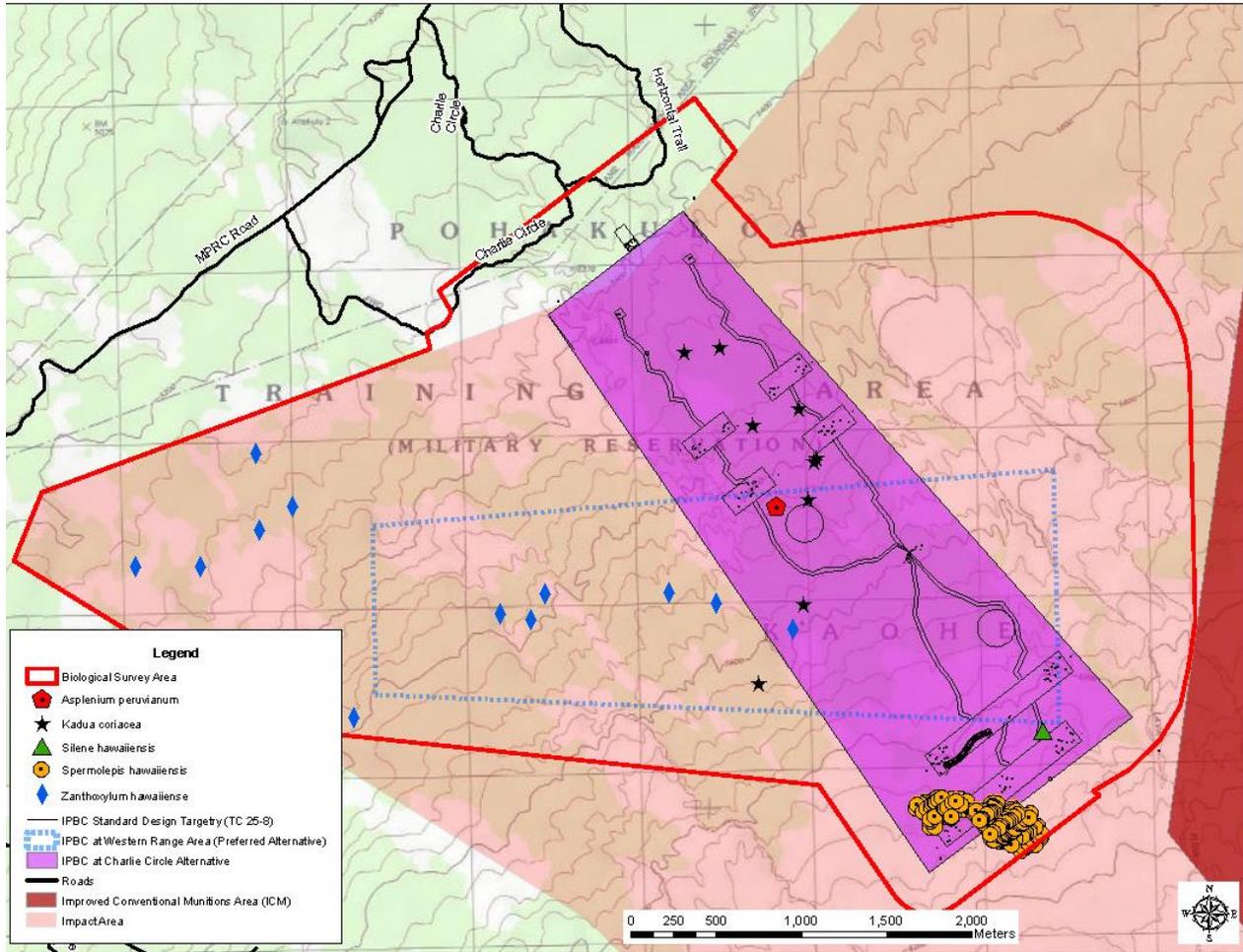


Figure 4.9-2. IPBC design overlay on listed plant species at Charlie Circle Alternative

4.9.6 No Action Alternative (No IPBC)

No Impact

Under the No Action Alternative, the proposed IPBC 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 Alternative would remain in the impact area. However, no construction- or training-related activities for the IPBC would occur to impacts federally listed species, vegetation, general wildlife and habitats, and the spread of invasive species. There would be no impacts on biological resources from the No Action Alternative.

4.10 CULTURAL RESOURCES

4.10.1 Impact Methodology

For the proposed IPBC, USAG-P developed an APE for the IPBC that includes both alternatives and required infrastructure in order to assess effects on cultural resources as a result of the proposed undertaking (Figure 3.10-1). 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 assessing effects to those resources.

4.10.2 Factors Considered For Determining Significance

Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on properties listed on or eligible for listing in the National Register. Pending formal evaluations, the Army treats all cultural resources as eligible for 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. Under 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)
- 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, NAGPRA or EO 13007. 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 under Section 106, and the extent to which it would violate the provisions of AIRFA, ARPA, or NAGPRA. Mitigation measures for other resource areas, such as clearing and detonating UXO, will be addressed under the provisions of the PA.

NHPA Section 106 Consultation

The Army recognizes that the spiritual characteristics of the area are difficult to measure in terms of archaeology or the other scientific tools at our disposal. The USAG-P initiated consultation with the SHPD and other consulting parties on the proposed IPBC alternatives on March 14, 2011. Based on the density of archaeological sites identified in the Phase I survey, USAG-P determined that there would be an adverse effect.

As part of the consultation efforts, the SHPD Archaeologist for the island of Hawai‘i visited the project area in January 2011; mitigations were discussed with SHPD archaeologists on November 2, 2011. The OHA visited PTA and the APE on April 9 and 10, 2012. The IPBC undertaking was introduced to the PTA Cultural Advisory Committee (CAC) members on November 19, 2010, and updates on the undertaking were presented on January 14, 2011; March 25, 2011; July 15, 2011; September 16, 2011; December 2, 2011, January 20, 2012; April 20, 2012; and August 31, 2012. The USAG-P released the draft PA and distributed it to 22 agencies and organizations in June 2012. In addition, the USAG-P has held several meetings with representatives of SHPD, OHA, and other parties between May and December 2012 and February 2013 to develop the PA outlining procedures the Army will follow for the construction and operation of the IPBC. A copy of the draft PA is included in Appendix D. USAG-P shall ensure that all NRHP determinations for cultural resources within the chosen alternative are completed prior to construction activities in the APE, and the remaining NRHP determinations for other cultural resources in the remainder of the APE will be completed within four years of signing the PA.

USAG-P provided information about the project to the following NHO: the Aha Wahine, Au Puni o Hawai‘i, Brian Kaniela Nae‘ole Naauao, Flores-Case ‘Ohana, Council for Native Hawaiian Advancement, Hawai‘i Island Burial Council, the Hawai‘i Island District Council of Hawaiian Civic Clubs, Hui Huliau, Hui Kao‘o ‘Āina Ho‘opulapula, Hui Malama I Na Kupuna o Hawai‘i Nei, I Mua Group, Kahu Ku Mauna, Kanu o ka ‘Āina Learning ‘Ohana, La‘i ‘Opua 2020, Machado-Akana-Aona-Namakaeha ‘Ohana, Maku‘u Farmers Association, Mauna Kea Anaina Hou, Na Ku‘auhau ‘o Kahiwakaneikopolei, Native Hawaiian Education Council, OHA, Office of Mauna Kea Management, ‘Ohana Keaweamahi, ‘Ohana Kapu, ‘Ohana Kala‘i, Aloha ‘Aina Educational Center, and the Royal Order of Kamehameha, for which PTA has religious and cultural significance, and invited the NHOs to sign the PA as concurring parties. USAG-P also consulted with the PTA CAC, Hawai‘i Volcanoes National Park (NPS), and the Kawaihae community regarding the effects of the Proposed Action on historic properties and invited them to participate in the development of the PA.

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

Table 4.10-1. Cultural Resources Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Physical destruction, damage or alteration to archaeological resources	⊗	⊗	○
Modify or alter the historic character of a property	⊗	⊗	○
Impacts on cultural items under NAGPRA	○	⊗	+
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

4.10.3 Alternative 1: IPBC at Western Range Area

4.10.3.1 Construction Impacts

Significant Impact

Irreversible damage and loss to archaeological sites is anticipated due to the nature of the range, constraints of the topography, and the density of sites in the APE (Figure 4.10-1). The extent of the lava tube system on the proposed range footprint is vast; some tubes may need to be collapsed to ensure the safety of construction workers on heavy equipment during construction and of Soldiers once the IPBC is completed. 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 excavated pits found throughout the range it would be impossible to avoid loss of some of these features. It may also not be possible to avoid loss of some surface sites. Irreversible impacts would occur to archaeological sites in the proposed IPBC footprint because of the potential loss of information about the past found in the lava tubes, surface sites, and excavated pits.

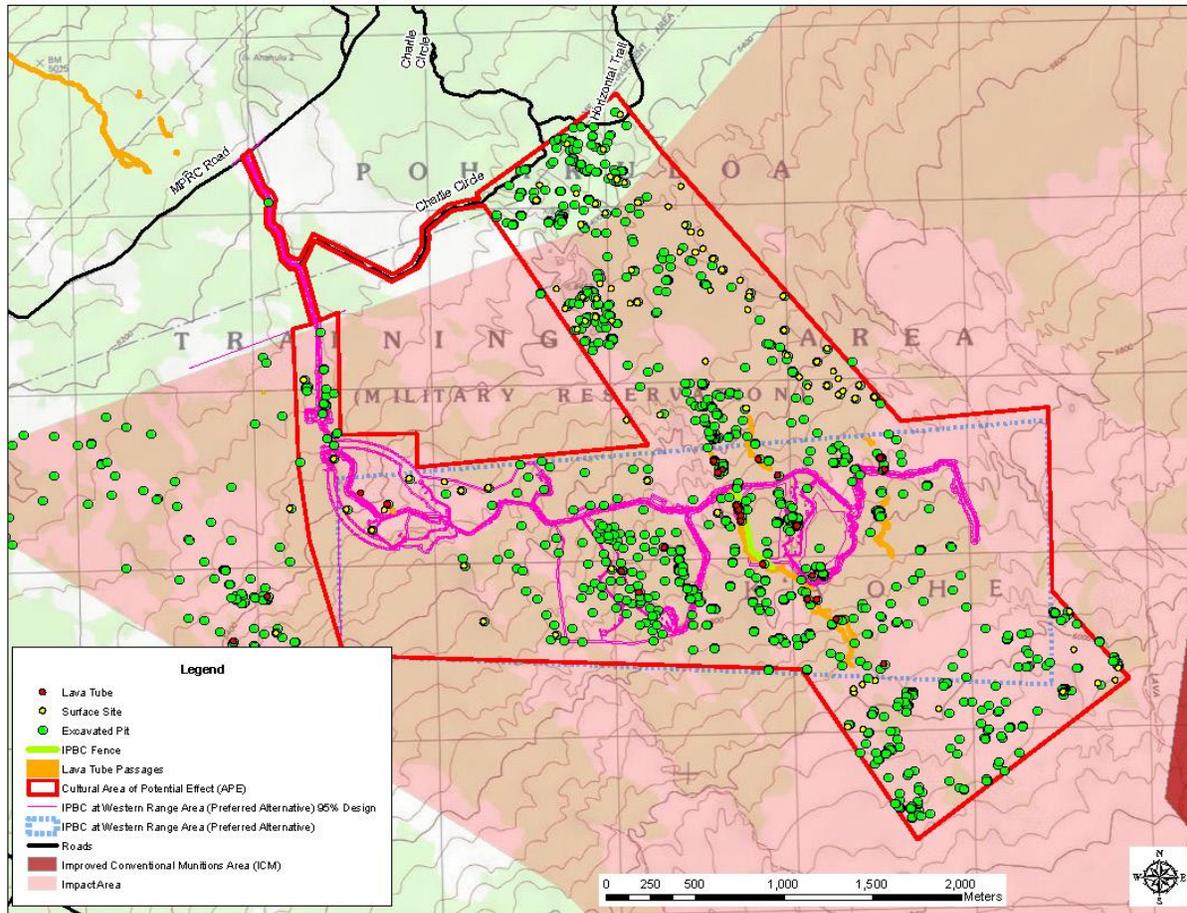


Figure 4.10-1. IPBC design overlay on archaeological sites at the Western Range Area Alternative
Significant Impact Mitigable to Less than Significant

Construction of the IPBC would involve ground softening, grading site surfaces, excavating the subsurface, and moving heavy construction equipment (Figure 4.10-2). All of these activities may result in direct destruction of or damage to archaeological resources. For some lava tubes and archaeological features, action can be taken to avoid construction impacts including through range design (Figure 4.10-3).

The PA in Appendix D sets forth all mitigation measures agreed upon by the consulting parties. These mitigation measures are hereby incorporated by reference in this Final EIS and the primary mitigation measures are set forth below.

- USAG-P shall continue to consider avoidance of National Register eligible sites during the finalization of the IPBC design.
- The USAG-P archaeologist will provide SHPD and consulting parties with a final list of historic properties to be avoided and protected by the IPBC design as well as those that will not be avoided in writing.
- Once construction plans are finalized and prior to the beginning of the construction activities, USAG-P shall ensure that a pre-construction cultural resources survey of the project area is conducted. The survey will ensure that no previously unidentified historic properties are within the project area. USAG-P shall also ensure that site visits take place before range construction begins.
- USAG-P shall implement a data recovery program on a sample of the affected historic properties when the determination is made that avoidance of these properties is not possible upon finalization of the IPBC design.
- USAG-P will provide in-briefing materials to raise awareness of cultural and environmentally sensitive sites for all construction personnel. Construction personnel shall contact the USAG-P Cultural Resources Section immediately upon encountering a previously unidentified lava tube.
- Any artifacts or other material remains collected as a result of the above mitigation measures and stipulations of the PA shall be curated at the PTA curation facility, which meets the standards in 36 CFR Part 76.
- USAG-P shall provide an opportunity for the consulting parties to see the APE for the IPBC during the pre-construction activities and to see the completed IPBC before it goes live.
- If human remains, associated and/or unassociated funerary objects, sacred objects, and/or objects of cultural patrimony (cultural items) are encountered by any employee (or contractor in the employ of) USAG-P, USAG-HI or USARPAC during project implementation, all activity in the vicinity of the discovery will cease and USAG-P Cultural Resources Section will be contacted immediately. USAG-P shall follow the stipulations under the PA. Earth moving activity shall not resume until the USAG-P Archaeologist or USAG-HI Cultural Resources Manager advises that work may proceed.
- If UXO is encountered, USAG-P will take steps to protect historic properties in the event that they are discovered within the blast radius of the UXO.
- USAG-P shall install protective measures, such as fencing or Seibert stakes, around identified historic properties within 82 ft (25 m) of the construction footprint that are to be avoided in advance of the earth disturbing activities.

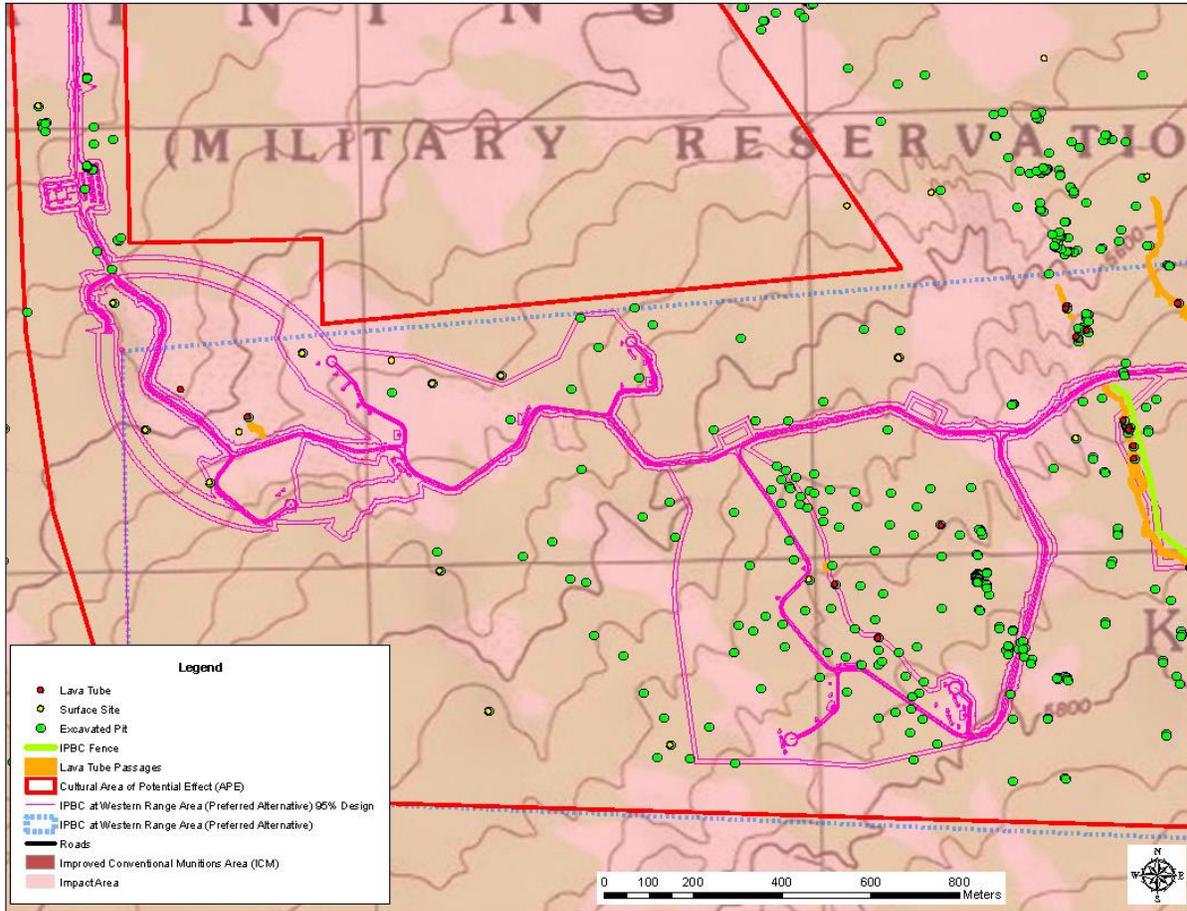


Figure 4.10-2. Enlargement of the IPBC design overlay on archaeological sites at Western Range Area Alternative (western portion)

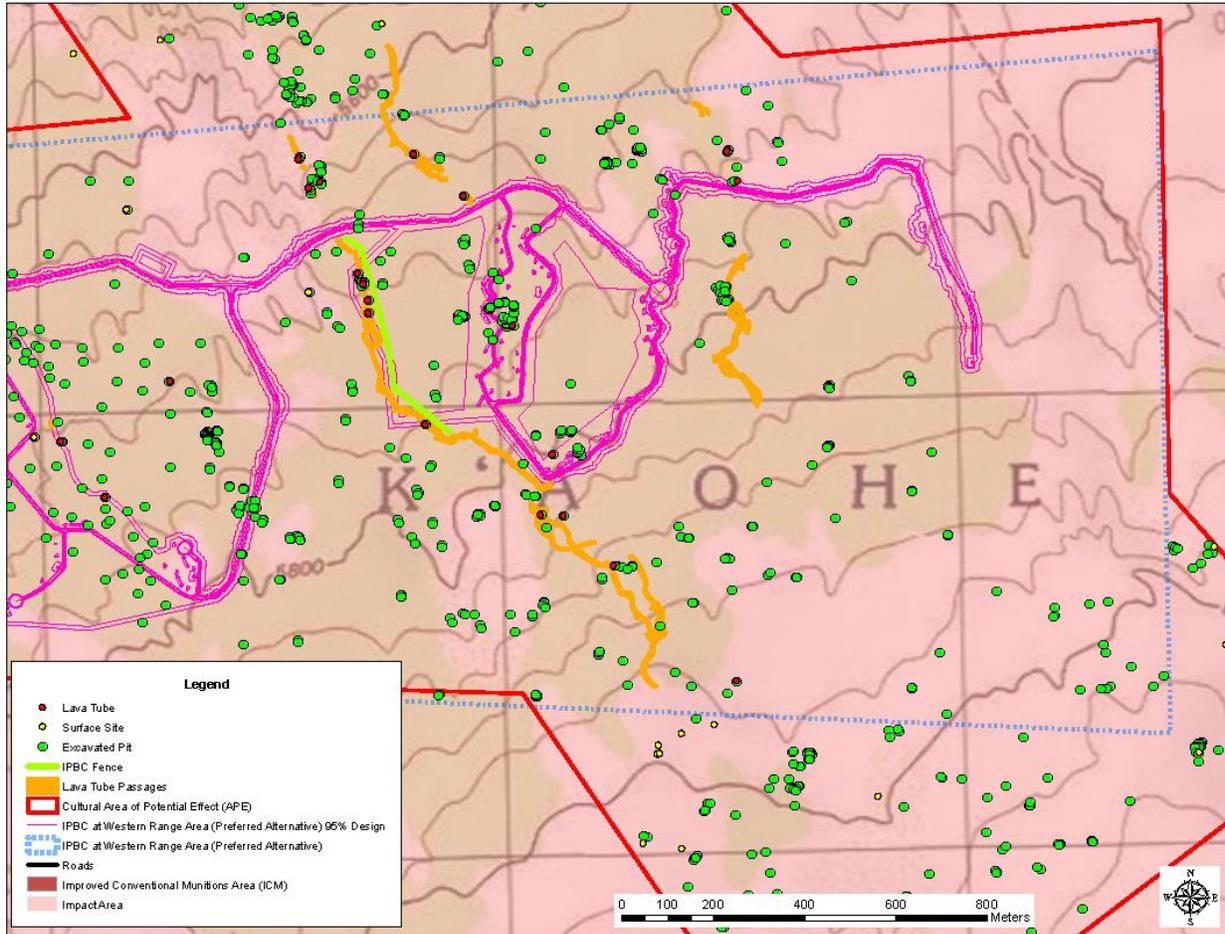


Figure 4.10-3. Enlargement of the IPBC design overlay on archaeological sites at Western Range Area Alternative (eastern portion)

No Impact

No cultural items, as defined by NAGPRA, were identified during the Phase I and Phase II archaeological surveys conducted in the Western Range Area Alternative.

4.10.3.2 Live-fire Training Impacts

Significant Impact Mitigable to Less than Significant

Ammunition rounds from small arms or from air-to-ground integration training on the IPBC could damage cultural resources resulting 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. Primary mitigation measures include:

- USAG-P will continue to consider avoidance of National Register eligible sites during the finalization of the IPBC design
- Establish individual range SOPs for exercises to avoid historic properties
- USAG-P will develop a long-term operational monitoring program of three target arrays based on munitions type used at the target, at which effects of training activities on historic properties shall be evaluated.

4.10.3.3 Maneuver Training Impacts

Less than Significant

Training at the IPBC would be primarily 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 cultural resources within dismounted maneuver areas would be incorporated into training scenarios as culturally sensitive areas. Vehicles would remain on established roads. New access road(s) to the IPBC would be sited to avoid known resources where possible.

4.10.4 Alternative 2: IPBC at Charlie Circle

Impacts from construction and operation of the IPBC under this alternative would be similar to impacts and recommended mitigation described for Alternative 1: IPBC at Western Range Area, Section 4.10.3 with one exception. As detailed in Section 3.9.5.3, during the Phase I archaeological survey effort for Charlie Circle, the USAG-P Cultural Resources staff encountered a lava tube that contained human remains. Selection of the Charlie Circle Alternative may result in a significant impact on these remains, unless the remains were repatriated after consultation under NAGPRA and a decision by USAG-P Commander. Therefore, impacts on cultural items under NAGPRA would be considered a significant impact for this alternative. Figure 4.10-4 shows archaeological sites at Charlie Circle relative to the IPBC design.

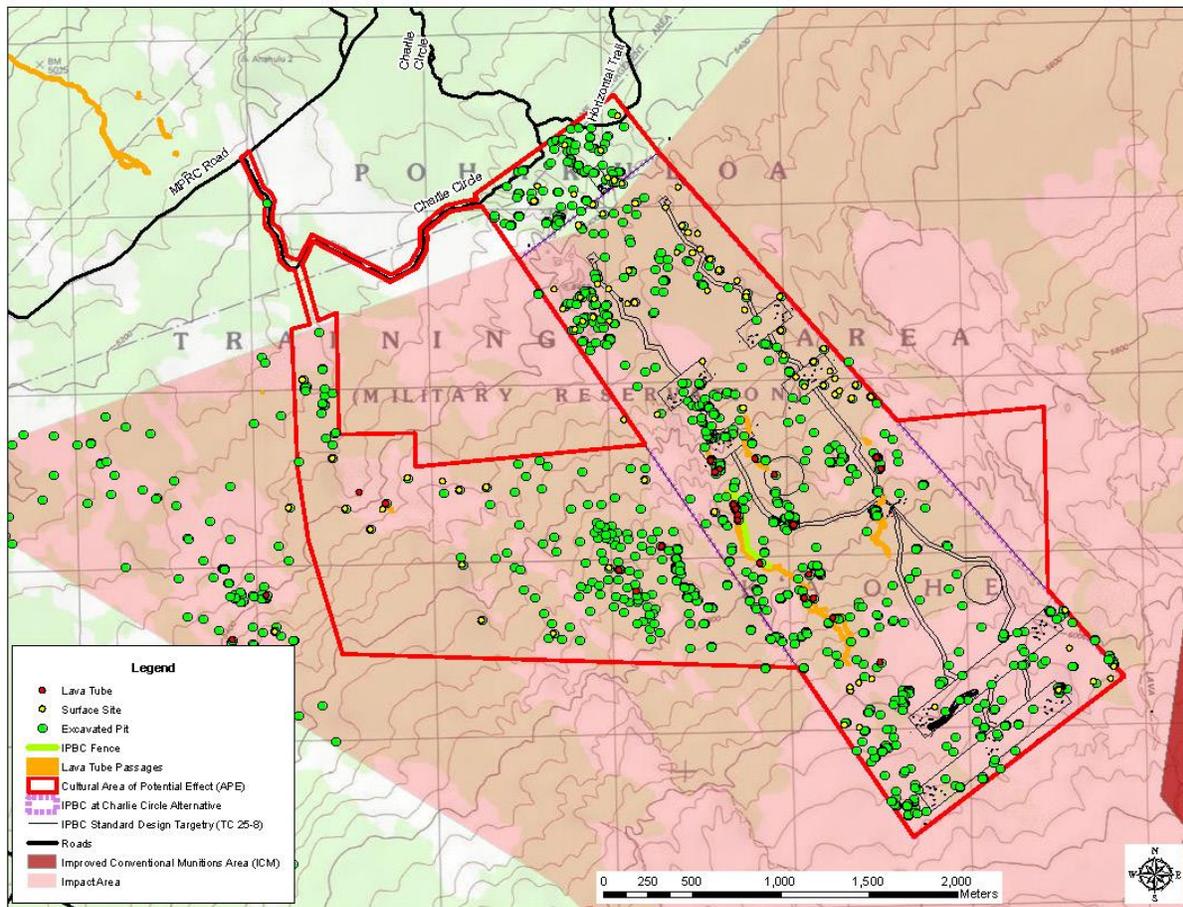


Figure 4.10-4. IPBC design overlay on archaeological sites at Charlie Circle

4.10.5 No Action Alternative (No IPBC)

Beneficial Impact

Through surveys of the Western Range Area and Charlie Circle Alternatives' APE, the USAG-P identified a number of cultural resources. These are resources that are permanently in the Army's inventory of known sites and must be managed accordingly. The USAG-P will take these sites into consideration for future projects. Therefore, this is considered a beneficial impact.

4.11 HAZARDOUS WASTE/HAZARDOUS MATERIALS

4.11.1 Impact Methodology

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

- Reviewing and evaluating the proposed project 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 the proposed activity with applicable site specific hazardous material and hazardous waste management plans
- Assessing the compliance of the proposed activity with applicable site specific SOPs and health and safety plans in order to avoid potential hazards
- Using professional judgment to determine if any additional known or suspected potential hazardous material and hazardous waste impacts or concerns relate to the proposed project, based upon existing PTA operations and facilities.

4.11.2 Factors Considered for Determining Significance

Significant impacts were determined based upon the extent that implementation of the project proposed in this Final 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 Sections 3.8 and 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
- 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 SBCT transformation Final EIS (U.S. Army and USACE, 2004) reviewed the transport of ammunition from Wheeler Army Airfield (O‘ahu) and Naval Magazine Lualualei (O‘ahu) to PTA via boat or helicopter reporting there have been no accidents involving the transportation of ammunition. This EIS would not result in the use of different types of ammunition to train at PTA. Units conducting their training on mission essential and required pre-deployment tasks at PTA will continue to do so in accordance with Army SOPs for the safe handling, packaging, and transportation of ammunition as outline in DA PAM 385-64. Storage and transportation of ordnance will continue to be conducted in accordance with established DOT, DoD, and Army safety procedures (HQDA, 2011b).*
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. The proposed project does not 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.

*Construction and operation of the IPBC would not involve shipment of additional munitions to PTA

Table 4.11-2 displays the overall anticipated impacts from implementing Proposed Action in this Final EIS, and also from the No Action Alternative.

Table 4.11-2. Hazardous Waste Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
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

4.11.3 Alternative 1: IPBC at Western Range Area

4.11.3.1 Construction Impacts

Significant Impact Mitigable to Less than Significant

MEC/UXO

The construction associated with the Proposed Action would involve the movement of soils in and around the impact area known to contain MEC/UXO. Surface MEC/UXO has been confirmed by a surface inspection and survey of the Western Range Area Alternative (see Section 3.11.2.2). If a decision is made to move forward with this alternative, 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 the MEC/UXO hazards from the Western Range Area Alternative, clearing it effectively prior to construction. MEC/UXO surveys were accomplished in 33 ft (10 m) transects and therefore, the potential exists for unidentified or covered MEC/UXO to remain on the Western Range Area, to be encountered during construction or later during operation. MEC/UXO presents a significant safety hazard that, as discussed in Section 4.11, may be mitigated through proper identification and reporting. Figure 4.11-1 depicts identified MEC/UXO at the Western Range Area Alternative.

Recommended Mitigation

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

Recommended Mitigation

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

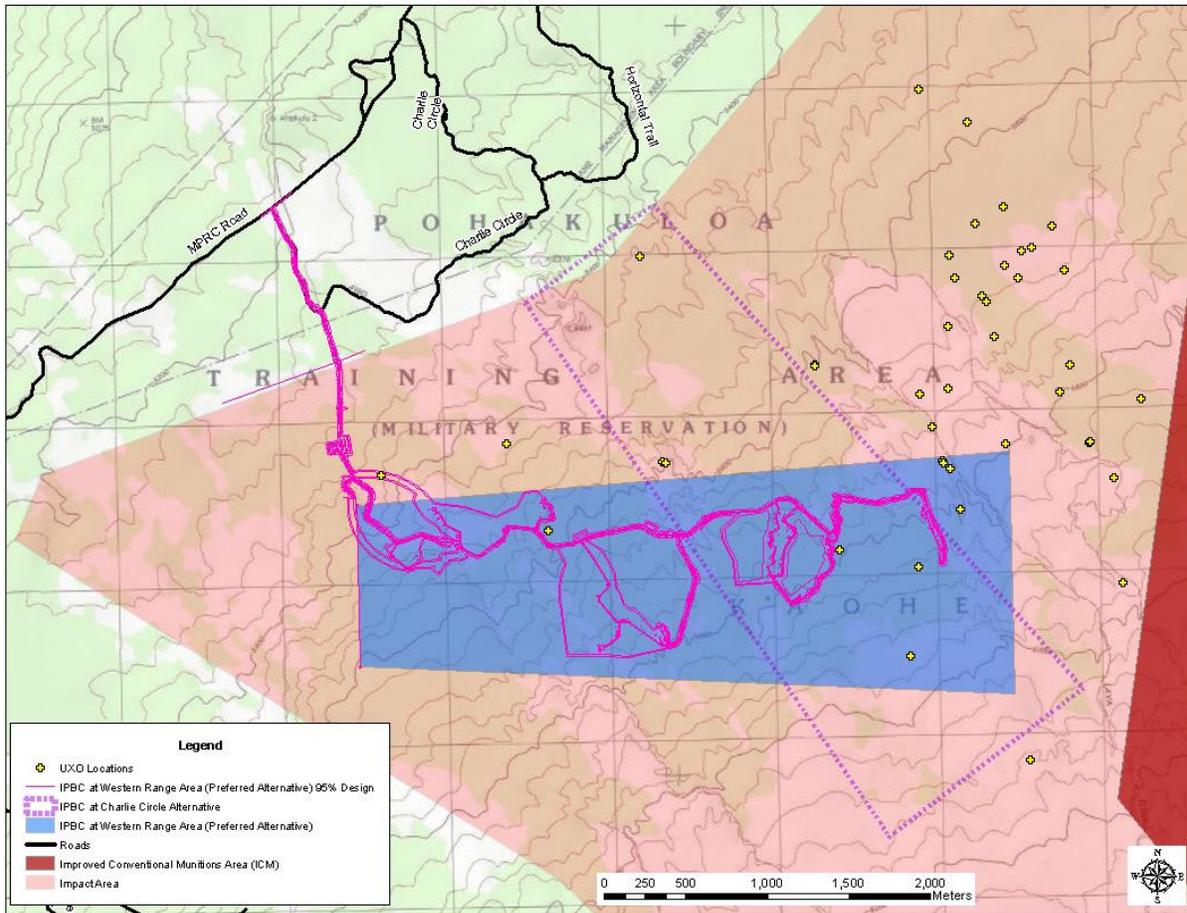


Figure 4.11-1. Identified MEC/UXO at the Western Range Area Alternative

Less than Significant

Lead from Ammunition

Construction activities at live-fire ranges would involve the movement of soil potentially 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 a 2002 soil study at PTA, samples containing high lead concentrations were detected at Ranges 9, 10, and 11, but no small arms live-fire ranges exist in the Western Range Area Alternative; 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 vehicles operating in the proposed IPBC area pose potentially adverse impacts related to POL spills. 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. 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), following the procedures outlined for responding to POL spills and proper reporting, would ensure quick and effective responses to spills and reduces the potential impact from contamination to less than significant.

Pesticides

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

No Impact

LBP/Asbestos/PCBs

No structures are present in the Western Range Area Alternative 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 Alternative that would have introduced PCBs to the environment.

4.11.3.2 *Live-fire Training Impacts*

Significant Impact Mitigable to Less than Significant

Lead from Ammunition

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 National Institute for Occupational Safety and Health (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.

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 on 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 proposed IPBC (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 PTA SOPs. SDZs are established per the exercise and type of weapons/ammunition to be fired during training.

The addition of an IPBC on the Western Range Area Alternative would introduce lead from small arms ammunition. 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 Alternative 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.

At many training ranges, earthen berms are used to stop projectiles that are expected to contain significant quantities of lead and potentially MEC/UXO. According to the USACE 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. To avoid lead accumulation in high concentration and environmental contamination, the Army implements several OMA procedures, design specifications, and BMPs. These ensure safety and prevent lead contamination. The measures and BMPs reduce the risk associated with lead contamination to less than significant.

Unused ammunition is stored at PTA in 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 O'ahu for storage. Permanent storage of ammunition is not authorized at PTA.

Recommended Mitigation

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

Recommended Mitigation

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

4.11.3.3 Maneuver Training ImpactsSignificant Impact Mitigable to Less than Significant*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. No new explosives ammunitions will be fired into the IPBC area where Soldiers will train. Nevertheless, Soldiers maneuvering through the IPBC on foot (dismounted), or within the IPBC on vehicles, may encounter MEC/UXO. Decades of use at PTA have resulted in MEC/UXO contamination throughout the General Range Area, but primarily in the impact area. Although the likelihood that MEC/UXO would be encountered within the footprint of the IPBC is minimized through MEC/UXO identification and GPS tagging for clearance (during a 2010 MEC/UXO survey), encountering MEC/UXO would still present 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 Alternative would result in less than significant impacts on the soil media there (see 4.11.4.3).

4.11.4 Alternative 2: IPBC at Charlie Circle

Given that the Proposed Action would be the same for the Charlie Circle and Western Range Area Alternatives, considerable land area is shared with the Western Range Area, and environmental conditions there are shared, it is reasonable to assume that the potential impacts from constructing and operating the IPBC at Charlie Circle Alternative would result in similar impacts and mitigation measures as identified in Section 4.11.3. Figure 4.11-2 depicts identified MEC/UXO at the Charlie Circle Alternative.

4.11.5 No Action Alternative (No IPBC)

No Impact

Under the No Action Alternative, the proposed IPBC 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.

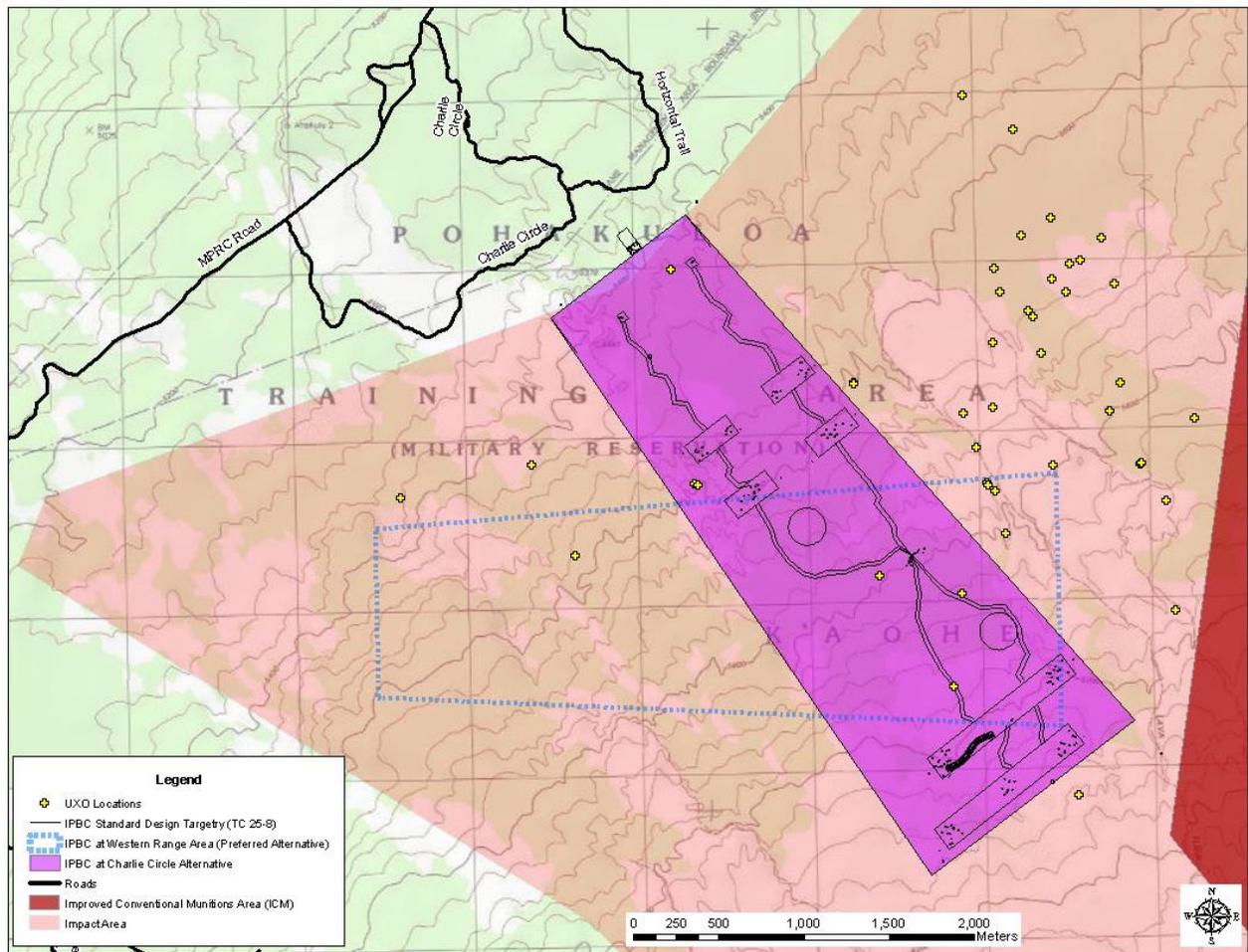


Figure 4.11-2. Identified MEC/UXO at the Charlie Circle Alternative

4.12 DEPLETED URANIUM

4.12.1 Impact Methodology

As stated in Section 3.12, "...based on what is currently known of DU at PTA, no adverse human health impacts are likely to occur as a result of exposure to the uranium present in the soils at the installation." The shipping records indicate that 714 M1 Spotting Rounds were delivered to Hawai'i and there is no reason to believe there was more than that. The Army does not know the exact number fired at each location; however, the Army does know that up to 714 rounds were fired in Hawai'i for training at PTA and Schofield Barracks. The rounds were split for usage at PTA and Schofield Barracks and were fired into the impact areas.

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. The chance that aerosolized particles in areas adjacent to where would currently remain available for exposure on the surface or re-suspended from construction activities in any quantities that could pose an unnecessary health risks remains low.

The methods for assessing potential hazards from DU at PTA include the following, which are discussed in more detail in Section 3.12.3.1:

- 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 that the fly-over surveillance reported having 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.

Additionally, MEC/UXO survey teams trained in the identification of DU-containing munitions components surveyed the Western Range Area IPBC and Charlie Circle alternative locations in support of the Cultural Resources inventory survey and Biological Resources survey for federally listed species. No DU-containing munitions were found during these surveys.

4.12.2 Factors Considered for Determining Significance

Factors considered in determining whether an alternative would have a significant impact include the extent or degree to which its implementation would result in causing an unnecessary risk to human health or safety by exposure to DU beyond the maximum exposure or radiological dosing limits. Significant impacts were determined based upon the risk that receptors would be exposed to DU exceeding the acceptable risk range that the EPA 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 at PTA.

Table 4.12-1. Depleted Uranium Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Risk of exceeding regulatory exposure limits	○	○	○

LEGEND

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

4.12.3 Alternative 1: IPBC at Western Range Area

4.12.3.1 Construction

No Impact

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 Alternative. Furthermore, there is no evidence to suggest that DU exists in soils in the Western Range Area Alternative in any measurable quantities that could pose a human health risk to users or caretakers of the IPBC. The nearest use of the Davy Crockett system was over 4 mi (6 km) away. Figure 4.12-1 depicts the Radiological Control Area (RCA) buffer at the PTA impact area in relation to the Western Range Area Alternative.

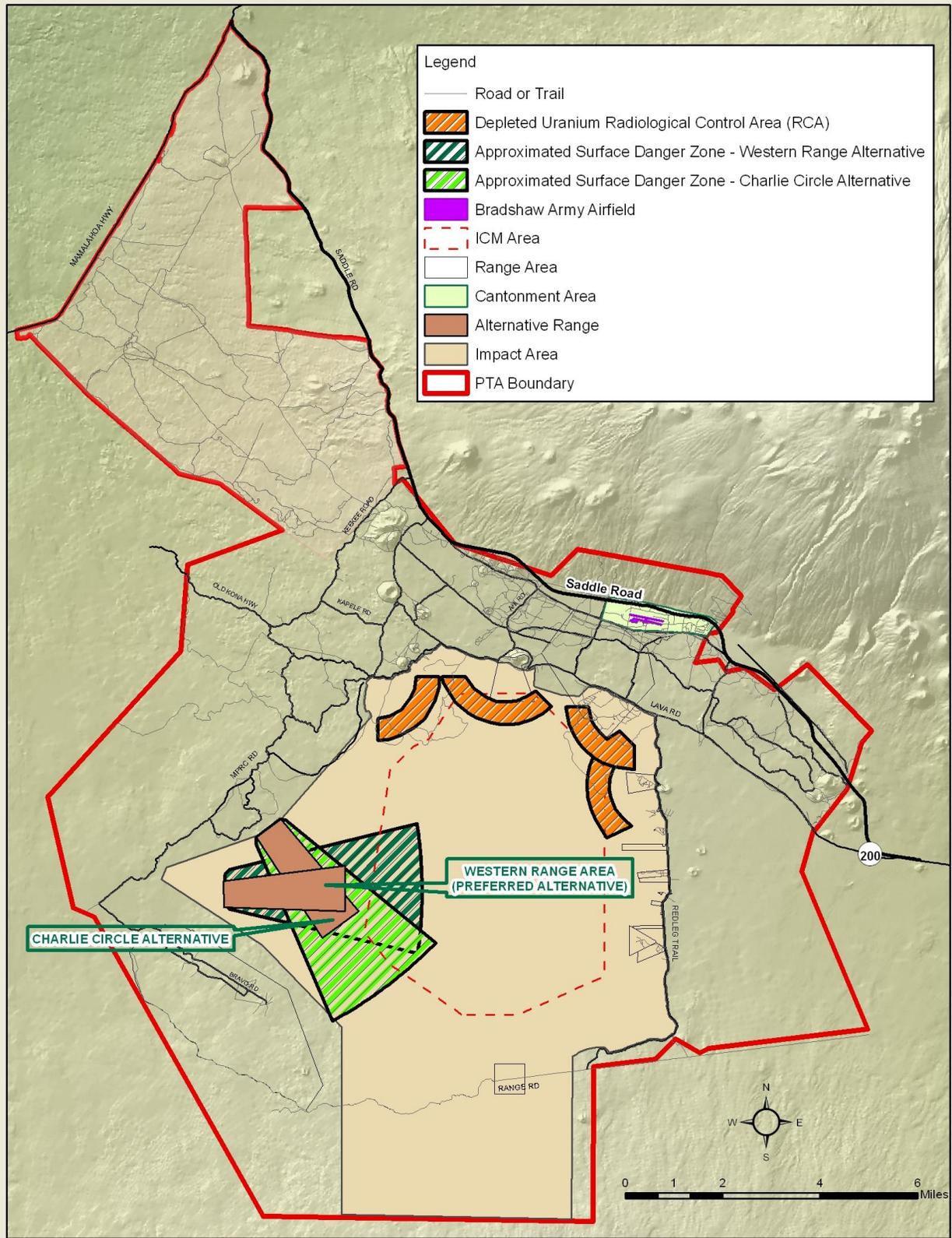


Figure 4.12-1. DU RCA buffer and surface danger zones at the PTA impact area in relation to the Western Range Area and Charlie Circle Alternatives

Uranium in soils would be most associated with naturally occurring uranium. The Army demonstrated through limited soil samples that DU does not exist in soils even in close proximity to where surveyors identified DU fragments. 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. Given the results of soil samples in areas where the Davy Crockett system was used, it is highly unlikely that DU-contaminated soils would be found in the Western Range Area.

Construction of the proposed IPBC would take about two years. Given that the maximum dose a construction worker could experience is well below EPA acceptable limits over a three year time period, coupled with the extremely low risk of exposure in the Western Range Area, construction workers operating on two year (or less) projects would not approach exposure limits or dosing limits (for gamma) under normal working conditions.

4.12.3.2 *Live-fire Training Impacts*

No Impact

For the DU at PTA to aerosolize and become inhalable or ingestible, it would need to be exposed to very high heat. Live-fire at the IPBC will not affect the areas that are suspected of having DU-containing munitions, as seen in Figure 4.12-1. Therefore no apparent risk would occur from operating the proposed IPBC in the Western Range Area Alternative.

4.12.3.3 *Maneuver Training Impacts*

No Impact

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 an area containing DU, the potential for chronic health effects from exposure to DU is extremely low (almost non-existent). The IPBC alternatives are not known to contain DU (Figure 4.12-1). Based on what is currently known of DU at PTA, and specifically the Western Range Area Alternative, no adverse human health impacts are likely to occur as a result of exposure to the uranium present in the soils at the installation.

4.12.4 *Alternative 2: IPBC at Charlie Circle*

Impacts at the proposed IPBC at Charlie Circle would be similar to those described in Section 4.12.3 for the Western Range Area Alternative. Figure 4.12-1 depicts the RCA buffer at the PTA impact area in relation to Charlie Circle Alternative.

4.12.5 No Action Alternative (No IPBC)

No Impact

Existing conditions would remain unchanged under the No Action Alternative. There is no evidence to suggest that a risk exists.

4.13 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

4.13.1 Impact Methodology

In order to analyze the effects on socioeconomic resources in the ROI, an Economic Impacts Forecast Model (EIFS) was used that allows for the evaluation of the significance of the impact to the ROI. The model analyzed the impact of the expenditures associated with the IPBC and was run using total expenditures associated with IPBC. 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 H 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 (see below).

4.13.2 Factors Considered for Determining Significance

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 provides a summary of the potential socioeconomic impacts.

Table 4.13-1. Socioeconomics Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
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

4.13.3 Alternatives 1 and 2: IPBC Construction and Operation

Beneficial Impacts

Construction costs associated with the development of the proposed IPBC are estimated at approximately \$30 million.

• **Employment**

There would be a slight increase in short-term construction-related jobs for the development of the proposed IPBC. Construction activities for the project would result in temporary increases in employment over the course of two years. 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. Long-term minor beneficial impacts would be expected as well. For example, the proposed IPBC may result in the employment of up to three individuals (contractors) to aid the Army in operating the range facilities there.

• **Income**

Changes in income represent the wage and salary payments made to construction workers, primarily during construction activities for the IPBC project. The Proposed Action would only temporarily increase total annual income of Hawai'i County for contracted construction workers and other skilled labor working on specific projects.

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. The resulting impact on sales and economic development from implementing the IPBC at PTA would be less than significant. The model inputs and outputs are available in Appendix H.

No Impact

There would be no relocation of personnel associated with the proposed IPBC. 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 IPBC 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 IPBC. 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 IPBC, 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 IPBC. All construction activities for the proposed IPBC 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.

4.13.4 No Action Alternative (No IPBC)

No Impact

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

4.14 PUBLIC SERVICES AND UTILITIES

4.14.1 Impact Methodology

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 training increases would result in less than significant impacts on the public services that are shared with the military (i.e., solid waste disposal, electricity, water usage, emergency medical). The HAMET EA (USAG-HI, 2011b) reported that the proposed increase in training activities could increase the demand for public services; however current public services at PTA were adequate to accommodate such an increase. The SBCT transformation Final EIS (U.S. Army and USACE, 2004) found that additional building space and facilities and any training increases at PTA would increase demand on utilities and services; however, additional utilities would be provided for projects requiring increased capacity and that existing systems would have adequate capacity for these projects and training. For this EIS, no additional Army units would come to PTA to conduct their training on mission essential and pre-deployment tasks.

4.14.2 Factors Considered for Determining Significance

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 to act beyond their capacity to the point that substantial expansion, additional facilities, or increased staffing levels would be necessary
- Generate additional quantities of stormwater runoff that could not be disposed of by the existing drainage system.

Only a temporary increase in solid waste creation (from construction) would occur from implementing the Proposed Action. The impacts from overall 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 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	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
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

4.14.3 Alternative 1: IPBC at Western Range Area

Demand on the power grid system caused by the proposed IPBC would not significantly contribute to capacity issues on the installation's power generation and/or distribution capability. Wastewater would continue to be handled following current procedures. The proposed IPBC would require portable latrines, placing only a slightly greater demand on the need for contract services to dispose of waste products off the installation.

The proposed IPBC would generate an increase in construction and demolition waste during the construction phase of the project. 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.

No utilities exist at the Western Range Area IPBC location; the nearest existing range is the currently-inactive Training Area 23. Utilities for the IPBC would tie into existing utilities running from the MPRC Road. Additionally, the Western Range Area Alternative is underutilized and presently, training does not occur there. While emergency services cover this portion of the impact area, historically there has not been a frequent reason to respond to emergencies in this area.

Less than Significant

The IPBC requires energy to operate targets that would be dynamic and automated, either fully mobile with a range of movement, or capable of being raised and lowered. Total demand placed on the electrical system from the proposed IPBC would increase slightly, but would remain within the capacity of the electrical grid to accommodate the IPBC operations.

Construction of the IPBC would generate a short-term increase in solid waste resulting from construction. Operation of the IPBC 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 IPBC at the Western Range alternative.

Construction and operation of the IPBC 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. Contracts for portable latrines would be required. Construction and operation of an IPBC in this part of the impact area could result in the collapse of lava tubes or encountering MEC/UXO, both of which would potentially require an emergency response. There is potential for 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 have a less than significant impact on demand of these services at this area, overall. 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 evaluated in this section.

No Impact

Water demand, as evaluated in prior NEPA documentation (Army, 2009a), is cyclical and is proportionate with the amount of training occurring at PTA. The HAMET EA (USAG-HI, 2011b) found that increased training maneuvers could increase the demand for potable water at PTA, but there would not be a significant adverse impact on the potable water supply system. For the proposed IPBC, water supplied to the range would be brought in by truck; no wells or distribution lines would be required.

The Proposed Action would not increase Army Soldiers/units training at the installation; therefore, there would be no additional demand on water use at the IPBC than that indicated from previous analysis.

Increased dwell time for Soldiers permanently stationed in Hawai‘i could mean that all units would resume their training on mission essential and required pre-deployment tasks METL training at PTA. 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. The demand on PTA MPs and PTA FD staffs would be commensurate with the level of training at PTA.

4.14.4 Alternative 2: IPBC at Charlie Circle

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

4.14.5 No Action Alternative (No IPBC)

No Impact

Under the No Action Alternative, the IPBC would not be built. There would be no increased demand for utilities or emergency services because the military would continue to use existing facilities to meet its training needs. The No Action Alternative would have no impact on utilities at PTA.

4.15 WILDFIRES

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 available 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 (HQDA, 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)
- 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 implementing 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
- Vegetative composition.

Potential direct impacts from wildfires include damage to biological and cultural resources and impairment of air quality. 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

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.

Table 4.15-1. Wildfires Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Wildfire Ignition	⊗	⊗	○

LEGEND

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

4.15.3 Alternative 1: IPBC at Western Range Area

4.15.3.1 Construction Impacts

Significant Impacts Mitigable to Less than Significant

The proposed IPBC 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 IPBC would expose lava flow areas and soils to enhanced erosion by water or wind and increase the potential to introduce invasive species. The spread of invasive plants or noxious weeds increases the potential of wildfires. 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 on wildfire potential from construction in the Western Range Area Alternative may occur based on the vegetation present. The Western Range Area Alternative predominantly consists of Subalpine Open Treelands and Low Shrub; this vegetative community has the potential of having dense shrubs, which can carry a fire. Furthermore, any invasive plants present in this area, such as fountain grass, have the ability to spread fire. Wildfires can impact vegetation, wildlife habitats, and cultural resources. The impacts would be considered less than significant based on established firefighting SOPs to mitigate and prevent wildfires in the area. Measures to reduce wildfire potential are discussed below.

Recommended Mitigation

Continue to implement established firefighting SOPs to mitigate and prevent wildfires in the area.

Mitigation Measure 1

The Army will adhere to the fire threat minimization measures in the most recent versions of the IWFMP (currently, 2003) for the IPBC.

Mitigation Measure 2

The Army will implement a system of fuel monitoring corridors (FMCs) to monitor and manage fuels adjacent to the IPBC; new FMCs will be developed and maintained according to the specifics detailed in the January 2013 BO to reduce fuel loads and minimize wildland fire.

4.15.3.2 Live-fire Training Impacts

Significant Impact Mitigable to 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 during maintenance activities, 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 on 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.

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 Western Range Area Alternative 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 4.15.3.1. Live-fire training impacts from activities within the Western Range Area Alternative could potentially result in an increase / frequency of wildfires, which could impact listed species and cultural resources. The proposed IPBC 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 temporarily leave the area during periods of loud noise and disturbance, but may return later.

Due to the presence of listed plant species within the Western Range Area Alternative, Section 7 formal consultation was initiated and completed with the USFWS, as discussed in Biological Resources (Section 4.9). Consultation with the Hawai'i ACHP, SHPD and other consulting parties for culturally significant areas within Alternative 1: IPBC at Western Range Area and Alternative 2: Charlie Circle is summarized in the PA, which is provided in Appendix D and discussed in Cultural Resources (Section 4.10).

In addition to the above mitigation measures to minimize potential wildfire impacts from the Proposed Action, the following mitigation measure, described in full in the January 2013 BO, will be implemented to reduce impacts from live-fire training.

Mitigation Measure 3

Standards of 20% total aerial cover over the 328 ft (99 m) wide FMC or those of the 148 ft (45 m) wide fuels management alternative must be met for live-fire training to occur.

Recommended Mitigation

The Army would continue to educate Soldiers.

4.15.3.3 Maneuver Training Impacts

Less than Significant

Vehicle use at the proposed IPBC would be limited to the roads accessing the Western Range Area Alternative and the access roads of the proposed IPBC. Training at the proposed IPBC would be primarily dismounted, thereby minimizing erosive effects of training and reduced potential for wildfires.

4.15.4 Alternative 2: IPBC at Charlie Circle

Wildfire impacts from the proposed IPBC construction and operation at the Charlie Circle Alternative would be similar to those described for the Western Range Area Alternative (Section 4.15.3).

4.15.5 No Action Alternative (No IPBC)

No Impact

Under the No Action Alternative, the proposed IPBC 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 on wildfires from the No Action Alternative.

4.16 SUSTAINABILITY

4.16.1 Impact Methodology

The analysis of impacts of the Proposed Action with respect to sustainability is based primarily on a qualitative review.

In September 2011, the DOE FEMP completed a NZEI assessment for PTA identifying the current energy usage from all on-site buildings and facilities, and fleet vehicles; water usage; GHG emissions; and waste production. This assessment served as the baseline to qualitatively review the potential impacts of the proposed IPBC project for sustainability, such as water, energy, waste production, fuel consumption, and GHG emissions. Section 4.4 provides the potential impacts on air quality from GHG emissions in terms of emissions associated with the activities to construct the IPBC facilities at the two site-specific project alternative locations.

Sustainability impacts may include beneficial impacts such as reduced energy consumption based on the installation of energy efficient systems (e.g., Heating, Ventilating, and Air Conditioning (HVAC)) and construction of new facilities or renovation of existing buildings designed to achieve energy efficiency by reducing electrical loads and water and energy usage, in accordance with EO 13514.

4.16.2 Factors Considered for Determining Significance

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 the Proposed Action at PTA.

Table 4.16-1. Sustainability Impact Summary

Significance Criteria Analyzed	Construct and Operate the IPBC		
	Western Range Area	Charlie Circle	No Action
Substantial increase in sustainability resources	○ - ⊙	○ - ⊙	○

LEGEND

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

4.16.3 Alternative 1: IPBC at Western Range Area

Less than Significant

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

Table 4.16-2. IPBC Power Requirements

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

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

In addition, any new contract entered into by PTA to construct the proposed IPBC must comply with the EO 13514 mandates governing environmentally sustainable and preferable acquisition.

No Impact

Constructing and operating the IPBC at the Western Range Area would have no impact on PTA's overall water usage in either the construction or the operation phases. GHG emissions associated with constructing and operating the IPBC 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 gal (1,519,956 L) of JP-8 per year (DOE, 2010). Overall fuel consumption may increase slightly since Soldiers driving to the new IPBC would travel slightly farther than they now do to get to Range 10. In addition, the fuel use reduction target of 2% annually set in EO 13514 does not apply to tactical vehicles. As the majority of IPBC traffic would be comprised of tactical vehicles using JP-8, implementing the proposed IPBC 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 (RF) operated using batteries or solar power and would not draw on the installation's power supply.

4.16.4 Alternative 2: IPBC at Charlie Circle

Impacts from construction and operation of the IPBC at the Charlie Circle Alternative would be similar to those described for the Western Range Area Alternative, Section 4.16.3. The proposed IPBC at Charlie Circle would share similar utility capabilities, infrastructure requirements, and these are located at similar distances to existing roads. The energy required to operate targets, lighting, and ROCA would not change regardless of the location of the IPBC.

4.16.5 No Action Alternative (No IPBC)No Impact

Under the No Action Alternative, the proposed IPBC would not be constructed and the existing impact area would remain in its current condition. Consequently, no impacts on PTA's overall energy and water use, waste production, fuel consumption, and GHG would result. GHG emissions associated with constructing and operating the IPBC are addressed in the discussion on Air Quality.

4.17 SUMMARY OF POTENTIALLY SIGNIFICANT IMPACTS

Table 4.17-1 summarizes potential impacts on Valued Environmental Components (VECs) as a result of the Proposed Action and Alternatives. Both action alternatives would result in significant impacts on cultural resources. The Western Range Area Alternative (Preferred Alternative) involves fewer impacts on cultural and natural resources than the Charlie Circle location. Selection of the Charlie Circle Alternative may result in a significant impact on human remains, unless the remains were repatriated after consultation under NAGPRA and a decision by USAG-P Commander. Additionally, a corner of the SDZs for the proposed IPBC at the Charlie Circle Alternative may encroach upon Training Area 23 and, without proper mitigation measures could result in operational restrictions under this alternative, creating a less than significant impact on land use. This could also pose a potential risk to species in the MPRC. Additionally, the terrain is not as favorable at Charlie Circle Alternative to conducting dismounted infantry training at this location.

The analysis conducted in the Final EIS shows that there would be significant but mitigable impacts on air quality, biological resources, hazardous materials and waste, and wildfires as a result of either action alternative.

With the No Action Alternative, only cultural resources have a significant but mitigable to insignificant impact. The remaining resources (VECs) were found to experience less than significant impacts. The impact tables appearing after some resource areas in this Chapter are broken out into sub-elements. For example, Air Quality is broken out into sub-elements such as fugitive dust and emission of criteria pollutants. The table below represents the most substantial potential impacts on each resource area.

Table 4.17-1. Summary of Potential Impacts

Valued Environmental Components Analyzed	IPBC at Western Range Area	IPBC at Charlie Circle	No Action Do Not Build IPBC
Land Use and Recreation	○	⊗	○
Airspace	○	○	○
Visual Resources	⊙	⊙	○
Air Quality	⊗	⊗	○
Noise	⊙	⊙	○
Traffic and Transportation	⊙	⊙	○
Water Resources	⊙	⊙	○
Geology and Soils	⊙	⊙	○
Biological Resources	⊗	⊗	○
Cultural Resources	⊗	⊗	+
Hazardous Materials and Waste	⊗	⊗	○
Depleted Uranium	○	○	○
Socioeconomics and Env. Justice	○+	○+	○
Public Services and Utilities	⊙	⊙	○
Wildfires	⊗	⊗	○
Sustainability	○-⊙	○-⊙	○

LEGEND

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

4.18 MITIGATION SUMMARY

Table 4.18-1 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 4.18-1. Summary of Mitigation Measures

Direct Effect	Additional Mitigation	Benefit of Mitigation
Land Use and Recreation– n/a		
<p>1 Impacts on land use as a result of live-fire training on Charlie Circle Alternative. A corner of the SDZs for the proposed IPBC may encroach upon Training Area 23 and could endanger listed species there.</p>	<p>Mitigation measures considered would include through proper range design, aligning firing points to avoid impacts on Training Area 23. As an alternative, the Army may consider restricting the use of tracer ammunition.</p>	<p>Would minimize potential interference with training being conducted on both Charlie Circle and Training Area 23, and would minimize potential risk to species in the area.</p>
Airspace – n/a		
Visual Resources – n/a		
Air Quality		
<p>1 Impacts on air quality as a result of IPBC construction at PTA and wind erosion from disturbed areas</p>	<p>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.</p>	<p>Would reduce the amount of fugitive dust generated by construction activities.</p>
Noise – n/a		
Traffic and Transportation - n/a		

Direct Effect	Additional Mitigation	Benefit of Mitigation
Water Resources		
1 Non-point source pollution effects on surface water quality	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, removal of built-up sediment from silt fences, and weekly Erosion and Sediment Control Inspections and Maintenance Practices.	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 IPBC construction at PTA	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 Land Rehabilitation and Maintenance (LRAM) program.	Would reduce the amount of erosion resulting from construction activities.

	Direct Effect	Additional Mitigation	Benefit of Mitigation
Biological Resources			
1	Impacts on Hawaiian geese installation wide at PTA	Mitigation measures include funding a conservation partnership project for Hawaiian geese at Hakalau Forest National Wildlife Refuge (Refuge).	Would reduce impacts on Hawaiian geese.
2	Impacts on Hawaiian geese, Hawaiian hoary bat, and Hawaiian petrel	Mitigation measures considered include a mandatory speed limit of no greater than 15 mph (24 km/h) at PTA.	Would reduce impacts on Hawaiian geese, Hawaiian hoary bat, and Hawaiian petrel.
3	Impacts on Hawaiian geese installation wide at PTA	Mitigation measures considered include 45-day and 60-day briefs to inform leaders of their responsibility to protect Hawaiian geese.	Would reduce impacts on Hawaiian geese.
4	Impacts on Hawaiian geese installation wide at PTA	Mitigation measures considered include designating a leader observing range performance during training to ensure Hawaiian geese will not be directly targeted; ceasing training if a take is observed to provide troops further instructions.	Would reduce impacts on Hawaiian geese.
5	Impacts on Hawaiian geese installation wide at PTA	Mitigation measures considered include reporting take of a Hawaiian goose to the USFWS, including those killed by a helicopter or collision with fixed-wing aircraft.	Would reduce impacts on Hawaiian geese.
6	Impacts on listed plant species in IPBC range area	Mitigation measures considered include seed collection, listed plant species propagation, outplanting, ex situ genetic storage, and site management.	Would reduce impacts from training on listed species.
7	Impacts on listed species present in IPBC range area	Mitigation measures considered include avoidance of known species built into infrastructure design.	Would reduce impacts from training to listed species and their habitats.

Direct Effect	Additional Mitigation	Benefit of Mitigation
8 Impacts on listed species and habitats	Mitigation measures considered include in-briefing materials to ensure units using proposed new IPBC can identify listed species and habitats.	Would reduce impacts from training on listed species and their habitats.
9 Impacts on Hawaiian hoary bat and Hawaiian petrels	Mitigation measures considered include the use of low lights and minimal use of lights, avoid tree trimming between June 1 and September 15, complete ongoing bird studies, train and educate troops about the species, exclude the use of smoke obscurants within 165 ft (50 m) of trees, placement of military targets away from trees, and avoid use of barbed wire.	Would reduce impacts from training on the Hawaiian hoary bat and Hawaiian petrels
10 Spread of invasive species	Mitigation measures considered include educating contractors on wearing weed-free clothes and maintaining weed-free vehicles, inspecting and washing all vehicles at washrack facilities prior to leaving PTA, invasive animal control protocols, and continued implementation of INRMPs and RTLA / LRAM plans to minimize and rehabilitate vegetation damage.	Would reduce spread of invasive species.
11 Spread of invasive species	Mitigation measures considered include surveying construction areas and roads quarterly during construction and annually after range construction. New weed introductions will be prioritized and target species ranked for management.	Would reduce spread of invasive species.

Direct Effect	Additional Mitigation	Benefit of Mitigation
Cultural Resources		
1 Impacts on cultural resources	Mitigation measures include having the PTA Archaeologist work with range planners and the USACE during the range design process to ensure avoidance measures are taken into consideration when locating firing points, targetry, and maneuver areas on the ranges.	Would result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
2 Impacts on cultural resources	Mitigation measures include conducting a subsequent archaeological survey of the project area. USAG-P shall also ensure that site visits take place before range construction begins.	Would result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
3 Impacts on cultural resources	Mitigation measures include developing and implementing data recovery mitigation measures.	Would result in information allowing further refinement of the documents used to evaluate sites.
4 Impacts on cultural resources (Live-fire Training, Maneuver Training)	Mitigation measures include development of in-briefing materials to ensure units using the proposed new range can identify sites and take avoidance measures during training.	Would result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
5 Impacts on cultural resources	Mitigation measures include avoidance of known sites built into the range design, establishment of individual range SOPs for firing points, adjusting firing points to avoid known cultural sites, and long-term site protective measures such as fencing and Seibert stakes for known sites.	Would result in site preservation to protect potential sites from further damage.

Direct Effect	Additional Mitigation	Benefit of Mitigation
6 Impacts on cultural resources	Mitigation measures include having the PTA Archaeologist participate during range planning and design meetings to build avoidance measures into the IPBC design. USAG-P shall provide SHPD and consulting parties a final list of historic properties to be avoided and protected by the IPBC design as well as those that will not be avoided in writing.	Would result in site preservation to protect potential sites from further damage.
7 Impacts on cultural resources	Mitigation measures include developing a data recovery plan to collect data and remove artifacts from a sample of sites that may need to be destroyed by construction activities.	Would result in site preservation to protect potential sites from further damage.
8 Impacts on cultural resources	Mitigation measures include development of in-briefing materials for all construction personnel.	Would result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
9 Impacts on cultural resources	Mitigation measures include development of a long-term operational monitoring program of three target arrays to evaluate training activities on historic properties.	Would result in site preservation and adoption of further avoidance measures to protect potential sites from further damage.
10 Impacts on cultural resources	Mitigation measures include that any artifacts or other material remains considered collected as a result of the above mitigation measures and stipulations of the PA shall be curated at the PTA curation facility.	Would result in preservation of material remains and artifacts.

Direct Effect	Additional Mitigation	Benefit of Mitigation
11 Impacts on cultural resources	Mitigation measures include that USAG-Pōhakuloa shall provide an opportunity for the consulting parties to see the APE for the IPBC during pre-construction activities and to see the completed IPBC before it goes live.	Would result in site knowledge for consulting parties prior to and following IPBC construction.
12 Impacts on cultural resources	Mitigation measures include that if human remains, associated and/or unassociated funerary objects, sacred objects, and/or objects of cultural patrimony (Cultural Items) are encountered by any employee (or contractor in the employ of) USAG-Pōhakuloa, USAG-HI or USARPAC during project implementation, all activity in the vicinity of the discovery will cease and USAG-P Cultural Resources Section will be contacted immediately.	Adoption of this mitigation measure would ensure adherence to NAGPRA.
Hazardous Wastes/Hazardous Materials		
1 MEC/UXO encountered during construction activities	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.	Continued education would reduce contamination concerns.
2 MEC/UXO encountered during training activities	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.	Would reduce potential from lead contamination.
3 MEC/UXO encountered at the proposed IPBC site(s).	Mitigation measures considered include removing/destroying known MEC/UXO with a 20-ft (6.1 m) to 30-ft (9.1 m) buffer area surrounding the IPBC access road, ROCA, and IPBC trails, objectives, firing points, and targets.	The benefit would be to ensure construction worker and Soldier safety when operating within the IPBC footprint.

	Direct Effect	Additional Mitigation	Benefit of Mitigation
4	Lead from ammunition	Continue to implement regular range clearance and maintenance at the IPBC in accordance with PTA External SOP.	Would reduce potential from lead contamination.
5	MEC/UXO encountered during training activities	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.	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	Mitigation measures considered include creating a firebreak around the IPBC to reduce the potential for fuels ignition; implement established fire-fighting SOPs.	Would reduce potential for wildfires.
2	Wildfires from IPBC construction	Mitigation measures considered include full implementation of the most recent version of the IWFMP to reduce the impacts associated with wildfires.	Would reduce potential for wildfires.
3	Wildfires from IPBC construction	Implement a system of FMCs to monitor and manage fuels adjacent to the IPBC; develop new FMCs and maintain them according to the specifics in the 2013 BO.	Would reduce potential for wildfires.

	Direct Effect	Additional Mitigation	Benefit of Mitigation
4	Wildfires from live-fire training activities	Mitigation measures considered include continuation of Soldier education.	Would reduce potential for wildfires.
Sustainability – n/a			