6.5 AIR QUALITY

6.5.1 Affected Environment

There are no air quality monitoring stations close to DMR. The closest air quality monitoring stations are on the south side of O'ahu. Vehicle traffic and aircraft flight operations represent the major Army emission sources that are present intermittently at DMR. Live-fire training exercises are not conducted at DMR, but blank ammunition and ground-based smoke devices are used in other types of training exercises. Army use of the airfield at DMR is rather limited, accounting for about three percent of total annual flight operations. DMR sometimes is used as a refueling and re-arming location for Army OH-58D helicopters during training operations at other installations (Fanscher 2003). Private aircraft are the dominant users of Dillingham Airfield.

There are no meteorological stations at DMR, but the Army has a remote weather station on the ridge between DMR and MMR. The Mākua Ridge monitoring station is probably more representative of conditions at DMR than is the Army's monitoring station at KTA. Wind speeds recorded on the northeast shore of O'ahu tend to be stronger than those that would occur at DMR. Maximum wind speeds exceed the 15 mph (24 kmph) threshold commonly associated with wind erosion processes about nine percent of the time.

6.5.2 Environmental Consequences

Summary of Impacts

One significant air quality impact has been identified at DMR under the Proposed Action or the RLA Alternative. Fugitive dust PM_{10} emissions from military vehicle use on unpaved roadways and off-road areas would increase by 211 tons (191 metric tons) per year compared to No Action conditions. Visible dust is a clear indication of airborne PM_{10} concentrations that are typically in the range of several thousand micrograms per cubic meter. It takes only a few hours of such concentrations to produce a 24-hour average that exceeds the state and federal 24-hour average PM_{10} standard of 150 micrograms per cubic meter. PM_{10} emissions are important because they are easily airborne and are small enough to be inhaled deep into the lungs creating potential adverse health effects. The substantial increase in fugitive PM_{10} emissions from military vehicle use at DMR, the likelihood of exceeding the federal 24-hour standard, and the potential impacts to quality of life to surrounding communities combined may result in a significant air quality impact at DMR under the Proposed Action.

Construction activities associated with DMR under the Proposed Action or Reduced Land Acquisition would include three FTI antennas and Dillingham Trail. Maximum annual emissions from construction activities would be 56 tons (51 metric tons) of nitrogen oxide emissions in 2006. Nitrogen oxide emissions are of concern primarily as an ozone precursor. Emissions of ozone precursors from construction activities associated with the Proposed Action or the RLA Alternative would be too small to have a measurable effect on ozone levels, and would not change the attainment status of the area. Compared to No Action, ordnance use quantities at DMR would decrease by about 25 percent under the Proposed Action or the RLA Alternative. Because emission quantities from ordnance use are very small and include only trace quantities of hazardous components, no significant air quality impacts would occur and there would be no change in the attainment status of the area.

SBCT Transformation would add the Stryker armored vehicle to the tactical and support vehicle inventory used at DMR. As a result, vehicle use and resulting vehicle engine emissions

would increase at DMR under the Proposed Action or the RLA Alternative. The net increase in military vehicle engine emissions would be 0.45 tons (0.4 metric tons) per year for reactive organic compounds, 4.3 tons (3.9 metric tons) per year for nitrogen oxides, 1.3 tons (1.2 metric tons) per year for carbon monoxide, 0.05 ton (0.05 metric ton) per year for sulfur oxides, and 0.39 ton (0.35 metric tons) per year for PM_{10}. The net increase in military vehicle engine emissions would be too small to have meaningful effects on ambient air quality conditions or to affect the attainment status of the project area. Consequently, the increase in military vehicle engine emissions would have a less than significant impact on air quality.

Increased off-road vehicle use under the Proposed Action or RLA Alternative would increase the extent of land disturbance by vehicle use, leading to an increase in wind erosion at DMR. The net increase of 30 tons (27 metric tons) per year of emissions would be too small to have a meaningful effect on ambient air quality conditions. Consequently, increased wind erosion would have a less than significant air quality impact at DMR. The addition of UAV flight operations at DMR under the Proposed Action or the RLA Alternative would result in a less than significant increase in overall aircraft emissions associated with DMR.

There would be no change in the risk of wildfires at DMR under the Proposed Action or RLA. Emissions associated with wildfires at DMR would remain a less than significant impact. No personnel are based at DMR, so there would be no air quality impact at DMR from changes in personnel numbers under the Proposed Action or RLA.

Table 6-11 summarizes the significance of air quality impacts at DMR under the Proposed Action, RLA, and No Action.

Proposed Action (Preferred Alternative)

Significant Impacts

Impact 1: Fugitive dust from military vehicle use. Vehicle travel on unpaved areas at DMR and along the Dillingham Trail would increase by an estimated 21 percent under the Proposed Action. Resulting PM_{10} emissions would be approximately 537 tons (487metric tons) per year, an increase of about 211 tons (191 metric tons) per year compared to No Action conditions. Approximately 32 percent of the net increase in fugitive PM_{10} emissions would be associated with vehicle travel on unpaved roads, while the remaining 68 percent represents potential emissions from off-road vehicle maneuver activity.

Fugitive dust generated by off road military vehicle maneuver traffic inside DMR poses a greater potential for creating either nuisance conditions at nearby off-post locations or localized violations of the state or federal 24-hour average PM_{10} standards. PM_{10} emissions are important because they are easily airborne and are small enough to be inhaled deep into the lungs creating potential adverse health effects. Off road use will remove vegetation and expose bare soil to wind erosion creating reoccurring exposure of civilian users of DMR and those on the nearby beach.

Convoy traffic on military vehicle trails between DMR and SBMR would be relatively sporadic in nature, with convoy traffic on any particular trail segment lasting for periods much shorter than the time frame of the relevant state and federal PM_{10} standards. Consequently, dust from vehicle convoy traffic on military vehicle trails would be unlikely to produce high fugitive dust concentrations lasting long enough to create any violations of the 24-hour average PM_{10}

standards. Fugitive dust caused by convoy traffic on military vehicle trails between installations would be a relatively small component of overall fugitive dust generation by military vehicle use.

Table 6-11
Summary of Potential Air Quality Impacts at Dillingham Military Reservation

Impact Issues	Proposed Action	Reduced Land Acquisition	No Action
Emissions from construction activities	⊙	⊙	○
Emissions from ordnance use	⊙	⊙	⊙
Engine emissions from military vehicle use	⊙	⊙	⊙
Fugitive dust from military vehicle use	⊗	⊗	⊙
Wind erosion from areas disturbed by military vehicle use	⊙	⊙	⊙
Emissions from increased aircraft operations	⊙	⊙	⊙
Emissions from wildfires	⊙	⊙	⊙
Other emissions from personnel increases	○	○	○

In cases when there would be both beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

LEGEND:

⊗ = Significant
⊘ = Significant but mitigable to less than significant
⊙ = Less than significant
○ = No impact
\+ = Beneficial impact
N/A = Not applicable

The substantial increase in fugitive PM_{10} emissions from military vehicle use at DMR, the likelihood of exceeding the federal 24-hour standard, and the potential impacts to quality of life to surrounding communities combined may result in a significant air quality impact at DMR under the Proposed Action. Although feasible mitigation measures are available to reduce the magnitude of this impact, it is unlikely that the impact could be reduced to a less than significant level.

Regulatory and Administrative Mitigation 1. No regulatory or administrative mitigations have been identified.

Additional Mitigation 1. As discussed in Chapter 5, Section 5.5.2, potential mitigation measures for this impact include using gravel, paving, spraying water, and applying dust control treatments to unpaved roads, and rotating and reseeding on maneuver areas. These mitigation measures, if implemented, would reduce the quantity of fugitive dust emissions but probably would not reduce the quantity to a less than significant level.

The Dillingham Trail already is planned as a gravel road, with paved sections where necessary to control erosion problems. The gravel surface has been taken into account in the fugitive dust emission estimates. Asphalt or concrete paving of the entire trail would further reduce dust generation from vehicle travel but would not affect dust generation from off-road vehicle activity.

Water applications whenever road surface materials become dry could reduce fugitive dust emissions by 75 to 90 percent but would require the use of large quantities of water. Required water quantities have not been estimated but could become substantial over the course of a year.

Periodic application of synthetic dust control chemicals has proven effective in controlling fugitive dust from unpaved roads and tank trails at other military installations (USAEC 1996). Dust control effectiveness from chemical application would be very high initially but would decline over time. Control effectiveness values of over 50 percent generally can be expected for periods of 30 to 60 days under heavy use conditions. Army tests at Fort Hood and Fort Sill indicated that calcium chloride solutions were more effective and longer lasting than various synthetic polymers or calcium lignosulfonate. Use of chemical dust suppressants would be a feasible method to control fugitive dust from unpaved roads, parking lots, and similar well-defined dust sources.

Effective mitigation measures are more difficult to identify for off-road maneuver areas. Rotation of maneuver activities among available areas is effective only when the available area substantially exceeds the area needed for individual exercise events. That may not be the case for DMR. Activity rotations at DMR may not provide sufficient time for vegetation to recover between repeated disturbances.

Vegetation reseeding programs normally would be linked with rotating maneuver activities among available areas. The effectiveness of reseeding programs depends on having adequate germination and vegetation establishment periods between repeated disturbances. This may not be possible, even with the limited number of off-road maneuvers that would occur at DMR.

It is unclear if implementing all of these proposed mitigations in coordination with the ITAM geographic information system and erosion-control and revegetation efforts discussed in Sections 6.8, 6.9, and 6.10 of this chapter would reduce the impact of fugitive dust emissions to less than significant.

Less than Significant Impacts

Emissions from construction activities. The Proposed Action would include two construction projects at DMR, with construction activities occurring from 2005 into 2007. Construction projects would include a military vehicle trail between SBMR and DRM and three FTI antennas. Most construction activity would be completed in 2006. Figure 6-7 summarizes estimated emissions from the construction projects according to current construction schedules. Maximum annual emissions from construction equipment would be 56 tons (51 metric tons) per year of nitrogen oxide emissions in 2006. Nitrogen oxide emissions are of concern primarily as an ozone precursor. Emissions of ozone precursors from construction activities associated with the Proposed Action would be too small to have a measurable effect on ozone levels, and would not change the attainment status of the area. Consequently, construction activities at DMR would have a less than significant air quality impact under the Proposed Action.

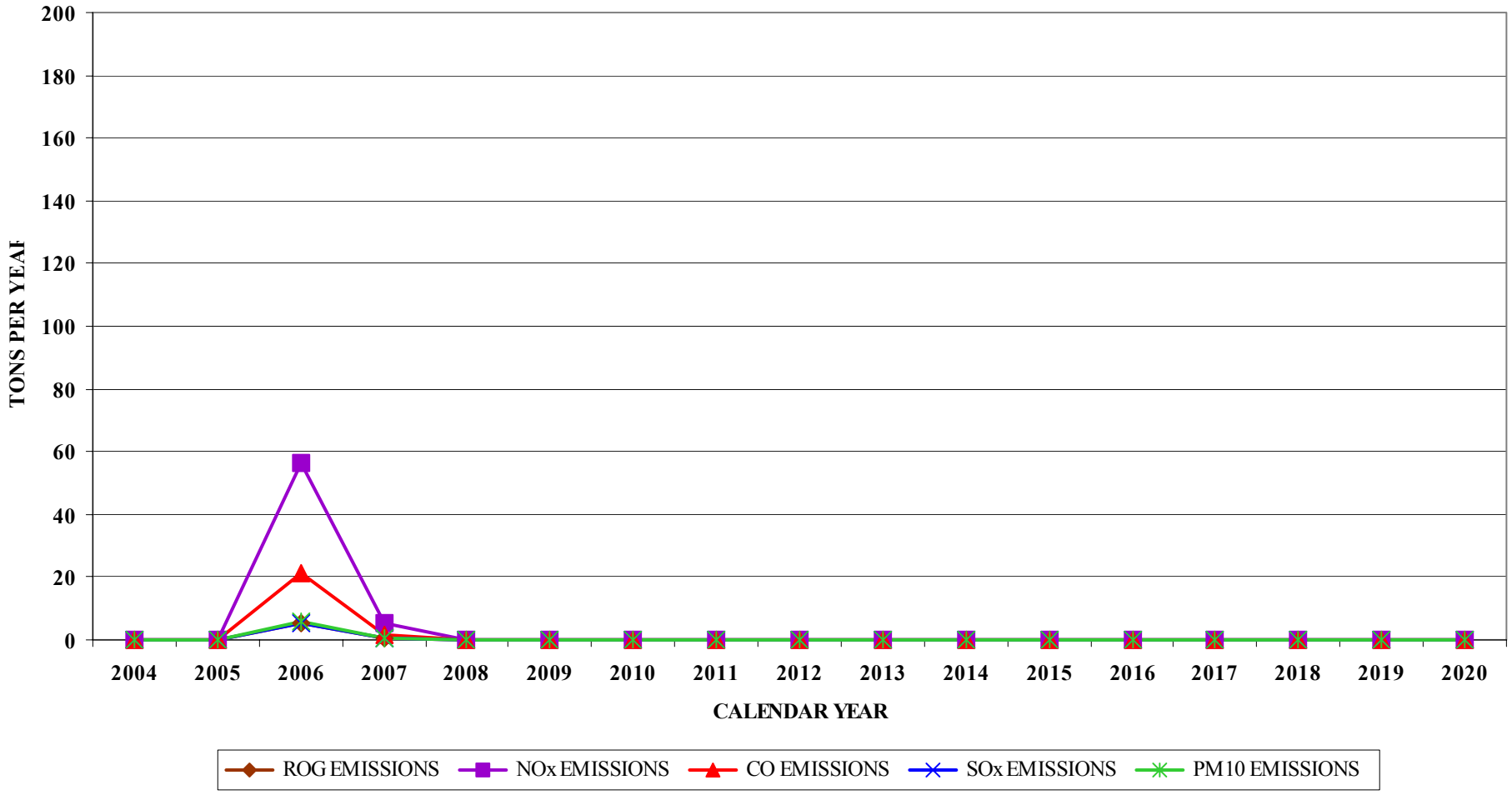

Figure 6-7 Estimated Emissions from Construction Projects at Dillingham Military Reservation

Emissions from ordnance use. Live ordnance is not used at DMR, but blank ammunition and ground-based smoke devices are used for some training exercises. The total estimated ordnance use by the 2nd Brigade at all USARHAW installations would decrease by about 25 percent under the Proposed Action. Smoke, flare, and simulator items would remain the predominant munitions used at DMR. Emissions from ordnance use have not been quantified. However, as discussed in Chapter 5, Section 5.5.2, pollutant emission quantities from ordnance use are small. Based on the general nature of detonation processes and the very low emission rates that have been published in studies of munitions firing and open detonations, emissions associated with ordnance use at DMR pose very little risk of creating adverse air quality impacts. Consequently, air quality impacts from munitions use under the Proposed Action are considered less than significant.

Engine emissions from military vehicle use. Estimated annual use of military vehicles at DMR would result in a 32 percent increase in annual military vehicle emissions, compared to No Action. Figure 6-8 summarizes an estimated net increase in annual engine emissions from military vehicle use at DMR under the Proposed Action. The net increase in military vehicle engine emissions would be 0.45 tons (0.4 metric tons) per year for reactive organic compounds, 4.3 tons (3.9 metric tons) per year for nitrogen oxides, 1.3 tons (1.2 metric tons) per year for carbon monoxide, 0.05 ton (0.05 metric ton) per year for sulfur oxides, and 0.39 ton (0.35 metric tons) per year for PM_{10}. The net increase in military vehicle engine emissions would be too small to have meaningful effects on ambient air quality conditions or to affect the attainment status of the project area. Consequently, emissions from military vehicle use at DMR would be a less than significant impact under the Proposed Action.

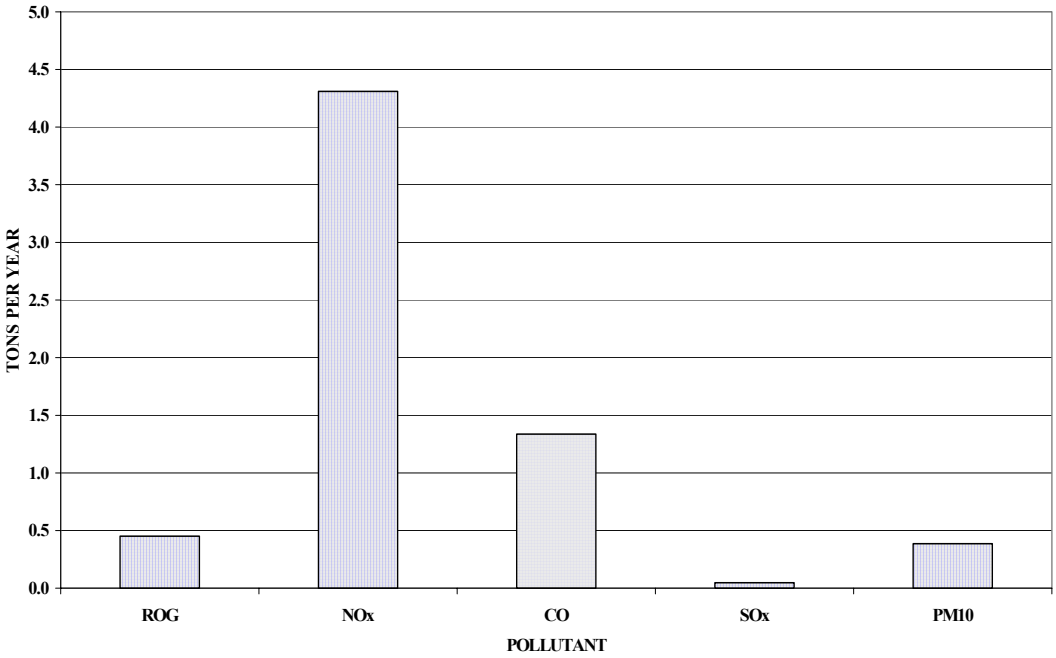

Figure 6-8. Net Change in Military Vehicle Emissions for the Proposed Action: Dillingham Military Reservation

Wind erosion from areas disturbed by military vehicle use. Off-road vehicle activity can reduce or eliminate vegetation cover in affected areas, resulting in increased susceptibility to wind erosion. The amount of off-road vehicle activity at DMR would increase by 28 percent under the Proposed Action. This increase in off-road vehicle activity would reduce vegetation cover in the maneuver areas. An estimated 90.5 tons (82 metric tons) per year of PM_{10} would be generated by wind erosion from the affected areas, a net increase of about 30 tons (27 metric tons) per year compared to No Action. The net increase in emissions would be too small to have a meaningful effect on ambient air quality conditions. Consequently, wind erosion from disturbed areas would be a less than significant impact under the Proposed Action.

Emissions from increased aircraft operations. The Proposed Action would not result in any major change to existing Army helicopter flight operations in Hawai'i. Some UAV flight activity could be based at DMR, but the total flight time would be relatively low. The net increase in emissions resulting from UAV flight activity would be too small to have a meaningful effect on ambient air quality conditions. Consequently, the increase in aircraft emissions at DMR under the Proposed Action would be a less than significant impact.

Emissions from wildfires. Because there are no live-fire exercises at DMR and overall munitions use would decrease by 25 percent under the Proposed Action, there is little chance that the Proposed Action would increase the risk of wildfires at DMR. Because the frequency and size of wildfires at DMR is not expected to change, emissions from wildfires would be a less than significant impact under the Proposed Action.

No Impact

Other emissions from personnel increases. No Army personnel are based at DMR, and the installation does not have any stationary emission sources; consequently, the Proposed Action would not result in any emissions from personal vehicle use or any increase in emissions from fixed facilities.

Reduced Land Acquisition

Air quality impacts and mitigations under the RLA Alternative would be the same as under the Proposed Action.

No Action

Less than Significant Impacts

Emissions from ordnance use. Overall ordnance use under No Action would be about 34 percent greater under No Action than under the Proposed Action or the RLA Alternative. Based on the general nature of detonation processes and the very low emission rates that have been published in studies of munitions firing and open detonations, emissions associated with ordnance use at DMR pose very little risk of creating adverse air quality impacts. Consequently, air quality impacts from munitions use under No Action are considered less than significant.

Engine emissions from military vehicle use. Vehicle use associated with DMR would remain at present levels under No Action. Estimated annual emissions from vehicle engine operations would be approximately the following:

- 1.4 tons (1.3 metric tons) of reactive organic compounds;
- 13.4 tons (12 metric tons) of nitrogen oxides;
- 4.1 tons (3.8 metric tons) of carbon monoxide;
- 0.15 ton (0.14 metric ton) of sulfur oxides; and
- 1.2 tons (1.1 metric tons) of PM_{10}.

The amount of military vehicle engine emissions would be too small to have meaningful effects on ambient air quality conditions. Consequently, military vehicle engine emissions would have a less than significant impact under No Action.

Fugitive dust from military vehicle use. Vehicle numbers and estimated annual use levels would remain at current conditions under No Action. Fugitive dust PM_{10} emissions from military vehicle use at DMR would remain at the current level of about 326 tons (296 metric tons) per year. Because existing conditions at DMR have not led to any known violations of state or federal ambient air quality standards, the fugitive dust from military vehicle use at DMR would have a less than significant impact under No Action.

Wind erosion from areas disturbed by tactical vehicle use. Vehicle maneuver activity at DMR would remain the same as current conditions under No Action. An estimated 60.5 tons (55 metric tons) per year of PM_{10} would be generated by wind erosion from the affected areas. Wind erosion from disturbed areas would be too small to have a meaningful effect on ambient air quality conditions, and therefore would be a less than significant impact under No Action.

Emissions from increased aircraft operations. There would be no change in aircraft operations and no increase in aircraft emissions at DMR under No Action. Because there would be no change from current conditions and because current conditions have not created any known violations of state or federal ambient air quality standards, emissions from aircraft operations under No Action would have a less than significant impact on air quality.

Emissions from wildfires. The risk of wildfires at DMR would remain the same as for current conditions under No Action. Because the frequency and size of wildfires at DMR is not expected to change, emissions from wildfires would be a less than significant impact under No Action.

No Impact

Emissions from Construction. No construction projects are associated with No Action, so there would be no air quality impact from construction under No Action.

Other emissions from personnel increases. No Army personnel are based at DMR, and the installation does not have any stationary emission sources; consequently, No Action would not result in any emissions from personal vehicle use or any increase in emissions from fixed facilities.